Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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Communications: Live by the Word, *Die* by the Word

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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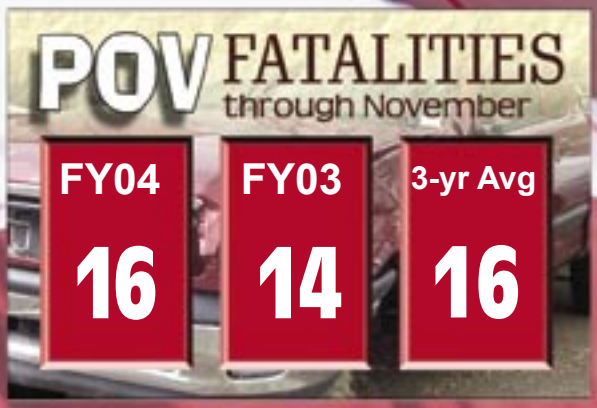

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

VCSA Sends:

The Army has been engaged in continuous combat operations for over 3 years with no decrease in operational commitment expected in the near term. Army Aviation remains a vital member of the combined and joint arms team we have deployed to win the Global War on Terrorism.

During the course of this conflict, Army Aviation has amassed over a half million flight hours, sustaining an OPTEMPO on our personnel and equipment that cannot be duplicated by any other aviation fighting force in the world. Every day our Army successfully conducts complex and integrated air and ground operations to defeat our enemies while minimizing the impact on those we intend to protect. We have fielded combat proven aviation formations with the best-trained, most experienced aviators, the most competent maintainers, and the finest equipment that our Army has ever produced. Simultaneously, based upon lessons learned and the aviation task force findings, we have begun to transform our aviation brigades into more robust, capabilities-based organizations populated with professional aviators and Soldiers who have internalized the Army's warrior ethos. Even so, it is time for commanders at all levels to pause and assess the status of their aviation units and the procedures used to identify and mitigate risk. This message is prescriptive in that it mandates certain actions by commanders at all levels and descriptive in that it also provides recommendations to enhance both safety and mission accomplishment through increased commander involvement and oversight.

Army Aviation has had 32 Class A accidents with 21 fatalities in the past 12 months. We must all realize that there are many factors and conditions affecting the force that exacerbate the risk associated with aviation operations and training. Aviation transformation, aviation reset, and preparation for combat increases the need for commanders at all levels to properly balance the challenges of individual aviator readiness level (RL) progression, aviation collective training, combined arms training and aviation maintenance, as well as safety and standardization. Commanders must recognize the competing demands of preparing their aviation units for the next combat rotation with the requirements to reset the aircrews, the aircraft, and restructure aviation formations.

We all appreciate the impact of reset on our collective training programs, but there are other, more subtle factors that also impact the force and our ability to prepare for extended combat operations. The lack of synchronization between the reset of aircraft returning from the fight and the preset (application of mission equipment package and aircraft MWOs) of aircraft going to the fight remains a challenge with which our aviation commanders must contend. This training detractor has become even more pronounced as the number of aircraft sourced for upcoming rotations exceeds the number currently in theater by more than a hundred airframes. Many of these additional airframes were added into the

rotation late, but with priority missions that necessitated interruptions in the planned reset/preset schedule thereby extending the time to complete modifications. New aviators posted to these formations are challenged to receive the benefit of collective training with formations of dissimilar aircraft, so essential to today's current operating environment.

Recognizing these challenges, there are clearly trends or common threads associated with aviation incidents which must be addressed by senior leaders. Recurring factors in recent aviation mishaps include poor weather decisions, inappropriate crew mix, inadequate air mission briefs (AMB), stressed maintainers attempting to keep pace with the OPTEMPO, ill-advised single-ship missions, and compressed training and preparation timelines prior to deployment. The difference between a Class C and a Class A aviation accident, in many cases, might only be a couple of inches or even a couple of seconds. By improving the mechanisms used to assess aircrew preparedness and mission suitability, we will continue to foster an aggressive but disciplined approach to mission accomplishment. Combat, or training for combat, is not an excuse to deviate from standards.

The AMB is one such mechanism. When vetted and approved by experienced professionals, it serves as much more than authorization for the flight. The AMB requires the attention of the entire chain of command and plays a critical role in risk identification and risk mitigation when used as intended. It also allows the AMB briefing officer (company commander) to assess the aircrews' technical and tactical situational awareness, their level of training, their pre-mission planning, their risk assessment understanding, etc. Therefore, effective upon receipt of this message, you are to immediately change AR 95-1, paragraph 2-14, that only pilots-in-command (PCs) may serve as briefing officers. Commanders in the grade of 05 and higher will select briefing officers based upon their aviation experience, personnel qualified and current in the mission profiles they are to brief, and possessing the ability to quickly assess and apply risk mitigation techniques for the mission and aircrew. These commanders will designate their formation's briefing officers in writing. Once the briefing officer and the crew have mitigated the risk to the lowest level, the mission approval will be delegated to the appropriate approval authority IAW the unit SOP and local policies.

Second, in all instances of an aviation Class A accident, the first general officer in the chain of command is required to accept the outbrief from the Army Safety Center or any centralized safety investigation team. This is commander's business and the Army, its Soldiers, and their families require your personal attention in the matter. Moreover, all assistant division commanders will attend the division commander's course at Fort Rucker, AL, to elevate the awareness and increase the involvement of the Army's senior leadership in aviation issues and decision making. Ultimately, aviation mission accomplishment is about maintenance and training standards. You will rigidly enforce these standards; the result will be enhanced aviation safety and a more disciplined force with pride in their unit, pride in their aircraft, and pride in their accomplishments.

Third, we are considering developing guidance for the brigade and battalion command boards with respect to minimum pilot qualifications and experience level for command selectees to enhance the tactical and technical competence of our aviation commanders in the field.

We must rely more on the leading indicators as tools to evaluate their state of readiness, training and safety, and less on lagging indicators such as the unit status report (USR), flying hour reports, and accident reports. The absence of an accident does not mean the presence of safety. Monthly updates on such activities as combat mission simulator (CMS) utilization rates, aviation maintenance, especially the mission abort rates; company commanders that are non-PCs; and aviator RL progression are great leading metrics to assess if

your formation is at risk. I strongly encourage commanders to visit the CMSs and evaluate the instructor pilots as they review emergency procedures in the device with an aircrew, then observe the quality of the debrief that follows. Check the flight line periodically and see if the crew chief launching or recovering the aircraft matches the name on the aircraft logbook and nose, and then ask the NCOIC why or why not. Check the AMB files in Flight Ops and have the mission briefer brief you on what questions he is asking the aircrews, especially the PC. Proactive measures such as these will increase awareness of day-to-day activities in your command and will alert you to problems before they arise.

Additionally, our aviation battalion commanders should hold weekly pilot briefings. These events should be protected like Sergeants' Time training and noted on the training calendar, ensuring attendance rosters are maintained. Subject matter should facilitate and feed into individual and collective training IAW the quarterly training plan. Aircrew survival equipment (ASE), standardization and safety issues, weapons employment (air and ground), maintenance procedures, weather decisions, crew coordination, and Operations Iraqi Freedom and Enduring Freedom (OIF/OEF) lessons learned are just some of the topics. Battalion commanders should develop evaluation criteria for PC boards, select members to serve on that board, and centrally screen and evaluate all candidates coming before that panel as a method to vet and standardize the skills of the most basic building block of our aviation formations—the pilot in command. This procedure should be codified in the battalion aircrew training program (ATP). Further, brigade and battalion commanders should require their company commanders to achieve PC status prior to deploying to combat.

Commanders will involve their command sergeants major and their first sergeants in this endeavor as well. Our NCOs have a wealth of experience and knowledge to share. Count stripes when on the flight line. The quality of launch, recovery, and FARP operations are directly proportional to the number of stripes on the flight line. Battalions should establish criteria for certification of crew chiefs in the unit and incorporate this concept into the unit ATP. It should culminate in a board analogous to the PC board. The OPTEMPO challenges that face our aircraft maintainers demand that we select only the finest from our AVIMs and AVUMs to maintain, launch, and recover these platforms.

The Army's senior leadership understands that aviation is inherently dangerous, and is even more so at this time because of the factors already discussed. A good risk assessment program does not result in mission cancellation; instead, it produces modifications to the plan before the operation order is briefed, and mitigates risk during the execution phase.

I want to assure commanders and aviators in the field that this message is not intended to imply that we want to foster a zero defect or a risk averse climate. The Army's senior leadership understands that aviation is inherently dangerous, and is even more so at this time because of the factors already discussed above. A good risk assessment program does not result in mission cancellation; instead, it produces modifications to the plan before the operation order is briefed, and mitigates risk during the execution phase. Our Soldiers, their families, and our Army depend on your increased safety awareness and vigilance in identifying risks and implementing the proper control measures. I believe the prescriptions and recommendations above will help ensure we maintain the world's finest Army Aviation force. I expect us to work together for the benefit of our service and begin *NOW*.

—Adapted from General Richard A. Cody's message to the field January 2005. GEN Cody, an Army Aviator, became the 31st Vice Chief of Staff on 24 June 2004.

Investigators' Forum

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

Communications: Live by the Word, Die by the Word

MAJ Bart R. Tragemann
U.S. Army Safety Center

Communications. If you think of all the situations leading up to a mishap, you can pinpoint a breakdown (at some point) in communications. A breakdown in communications is usually the first hazard that creates a chain of events, a chain that ultimately leads to a mishap. Read on!

As a flight of two OH-58Ds were about to enter mission profile for a zone reconnaissance, the lead aircraft called back to trail, "Buffalo." The trail aircraft responded back to lead, "Roger, Buffalo." Buffalo is the unit's brevity codeword for slowing down to mission profile. There were no other communications between aircraft for the remainder of the flight. The lead aircraft then assumed mission profile at 100 feet AGL and 70 KIAs in zone. Over the next 3 minutes lead conducted two successive standard "S" turns. While flying in a southerly direction, the lead aircraft then conducted a 360 degree right-hand turn and slowed down to 35 knots.

26 Seconds later...

After turning 285 degrees, the trail aircraft's main rotor blades struck lead's vertical fin and tail rotor components. After colliding, both aircraft lost control and impacted the ground. Both aircraft were totally destroyed. The lead aircraft pilots received minor injuries and the trail aircraft pilots suffered fatal injuries.

Why?

Why did the collision occur? What could both flight crews have done to prevent this accident? The Centralized Accident Investigation board suspects the trail aircraft lost sight of lead's aircraft sometime during the 3 to 4 minute period following the "Buffalo" radio call. During this period, trail never made a radio call to inform lead that they no longer had them

in sight. Additionally, during the execution of the reconnaissance, the lead aircraft conducted an unannounced 360-degree right turn. **BOTTOM LINE: There was no radio communications between the two flight crews**.

All Army Aviation rotary-wing aircraft deployed to Operations Iraqi Freedom (OIF) and Enduring Freedom (OEF) fly in multi-ship formations. The critical aircrew coordination element is positive communications between crewmembers within each aircraft *and* within the flight. The qualities, elements, and objectives of aircrew coordination training apply to *both* aircraft in a flight.

Mid-air collisions between rotary-wing aircraft can happen anywhere. Some historical examples include aircraft operating within a flight running into each other, aircraft operating in and around a forward arming refueling point (FARP), or between aircraft conducting recon or attack operations in the same airspace operating zone that other transient aircraft must fly through to reach their destination.

Due to "near miss" mid-air collisions in OIF and OEF between dissimilar transient aircraft, appropriate mitigation measures have been instituted. For example, better communications between approach control, tower, ground, radio, common traffic advisory frequency, and the implementation of altitude restrictions have successfully reduced the number of near misses and prevented mid-air collisions between transient aircraft and other aircraft operating in the same airspace.

Positive communications between aircraft within a flight is the best way to mitigate the risk of a mid-air collision during a mission. Inter-cockpit communications or radio calls between aircraft for situational awareness is critical.

Misinterpretation

Through numerous interviews, aviators stationed throughout Iraq have confirmed they have experienced, at one time or another, the visual illusion called ground light misinterpretation. When ground lights are confused with other aircraft night vision goggle (NVG) position lights, aviators might adjust their attitude incorrectly based on relative position of misinterpreted ground lights.

Air mission briefings

Lost visual and linkup procedures should be briefed at every aircrew mission briefing (AMB) just as inadvertent instrument meteorological condition procedures are briefed as appropriate for the forecasted weather conditions. When a trail aircraft loses sight of lead, an immediate radio call must be made and stated as such. A link-up procedure can then be executed utilizing a technique based on the tactical situation. Likewise, when the lead aircraft makes turns that are not standard during a mission, the turn direction should be called back to trail. By using positive communications, situational awareness is increased and accidents are less likely.

Aircrew training manuals

The fundamentals of aircrew coordination should be applied. Aircrew training manuals (ATMs) describe basic aircrew coordination fundamentals as they pertain to aircraft crewmembers. However, current ATMs do not directly relate these fundamentals to inter-cockpit coordination. Even though there is not a separate section emphasizing aircrew coordination training (ACT) between aircraft, pilots should apply all fundamentals to aircraft within a flight.

A final note

Units should always incorporate positive communications whenever situational awareness is lost. Aerial link-up procedures should be developed and briefed during the AMB. The board has recommended that inter-cockpit communications and lost visual contact procedures be added to the Flight School XXI program of instruction and included in the Aircrew Coordination Training Enhanced (ACTE), successor to ACT, exportable package.♦

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Is ACTE the Cure?

CW3 Kenneth R. Czarnecki
DES, Fort Rucker

We have all been through academic and flight training to enhance aircraft crew coordination, but accident investigators at the Safety Center continue to find cases where lapses in crew coordination directly contribute to serious accidents.

Recent accident investigations reveal crew coordination errors are a main causal factor in aviation accidents. For example, an AH-64 two-man crew was conducting a regimental Deep Attack. The pilot (PI) had only 300 hours in the AH-64, but was aware that his instructor pilot (IP) had over 2,000 hours of flight time and was highly respected. The PI was on the controls while they were en route. The IP, while he was busy using the TADS, asked the PI to make a radio call. The PI assumed the IP wanted to take the controls, as the radio frequency was not preset. The PI released the controls and focused his attention on the radio, which left *no one* flying the aircraft. The aircraft descended into the trees at 90 KTS. The IP was fatally injured and the $12M aircraft was destroyed.

The results of the Centralized Accident Investigation board were conclusive. Crew coordination error, specifically on the part of the IP, was the direct cause of accident. The IP lost situational awareness because he assumed the PI could continue to control the aircraft while attempting to change radio frequencies. But there was a deeper, more disturbing element present as well. Assumptions not spoken can often result in failures … even worse, tragic losses. (For more information on this accident, see January 2003 *Flightfax*.)

Current issues and trends

Lack of effective aircrew coordination continues to be cited as a contributing factor in flight accidents, and is a factor limiting attainment of full-mission effectiveness. The Director of Army Safety reported in the December 1999 *Flightfax* that FY99 produced Army Aviation's worst safety performance since Desert Shield/Desert Storm. Five years later, Army Aviation continues to suffer crew coordination error-related deaths. Roughly 45 percent of all aviation accidents are still attributed to crew coordination errors.

ACT defined

The Army defines aircrew coordination as a set of principles, attitudes, procedures, and techniques that transforms individuals into an effective crew. The stated objective of aircrew coordination training (ACT) is to provide aircrews with the knowledge, skills, and attitudes necessary to increase mission effectiveness while decreasing errors that lead to accidents.

Research is moving into measuring actual performance of crews while employing

crew coordination behaviors. In addition to incorporating correct behaviors in the cockpit, involvement of the entire crew is being researched from not only a flight safety perspective, but a security one as well. Human factors and crew coordination are being re-looked in modern aircraft designs, as full-glass cockpits such as the AH-64Ds mandate a pilot's attention inside the aircraft for a considerable period of time. While conducting tactical flight operations, remaining inside the aircraft for 2-3 minutes at a time can have a significant impact on mission success.

Aircrew Coordination Training Enhanced (ACTE) is essential in our modern aircraft with their respective complexities. To ensure aircrews properly understand the principles and techniques of ACTE, a training program has surfaced to help the aviator. The U.S. Army Aviation Center (USAAVNC) has teamed with the U.S. Army Safety Center (USASC) to attack the problem of ineffective aircrew coordination. The Directorate of Evaluation and Standardization (DES) has the charter to train ACTE in the field and is ready to deploy a mobile training team (MTT) and provide commanders with ACTE "train the trainer" solutions aimed directly at improving aircrew, team, and leader coordination.

ACTE is web-based, interactive courseware with the capability to develop and field vibrant training support packages (TSPs) tailored to integrate the aircrew coordination challenges distinctive to a specific aircraft. The heart of ACTE is the introduction of mission/design/series TSPs which supplement the core instruction and provide measurable feedback systems adapted to each. Ideally, when the program is fully implemented, USAAVNC will develop and annually update each TSP with current and relevant aircrew coordination trends. Directorate of Training and Doctrine (DOTD), DES, USASC, and the field user will collectively provide input to TSP development. Additionally, to ensure TSP lessons learned during unit operational or training missions do not go unheeded, instructors can confirm unit aircrews do, in fact, identify, apply and assimilate such lessons learned into future missions. It cannot be overemphasized that each crewmember is vital to the successful implementation of the overall ACTE program, and his input in improving the TSPs is critical to the success of ACTE.

Crewmembers must be highly proficient in all ACT behaviors and skills, and be able to apply and evaluate them in the organization's mission environment. To assist in achieving this objective, ACTE relates the ACT crew coordination objectives (CCOs), basic qualities (BQs), and crew coordination elements to the Army risk management process and demonstrates their use as control measures to mitigate risk. To evaluate the effectiveness in mitigating risk, ACTE contains the ACT performance evaluation process utilizing the criterion-referenced behaviorally anchored rating system (BARS). Inherent to the ACTE performance evaluation process is the ability to identify and apply the CCOs, BQs, and elements to operational and simulated mission settings and apply individual experience and knowledge to the ACTE course of instruction.

This training requires well-developed observational and evaluative skills. It is imperative it be conducted and disseminated Armywide because of its great potential to help conserve vital Army resources—both in terms of lives and equipment. Recognizing this responsibility, every opportunity will be taken to provide all crewmembers with the behaviors and skills needed to train and evaluate unit aircrews, and to mitigate the risks faced on a daily basis in this hazardous operational environment.

ACTE will contribute to aircrew training and understanding of the risk management process and measurably reduce ineffective aircrew coordination and resulting accidents. With implementation of the ACTE courseware, development of dynamic TSPs, and growing cadre of ACTE trainers and ACTE-trained crewmembers, the Army can expect to see a reduction of accidents attributed to ineffective aircrew coordination. ♦

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Aviation and Compo

MAJ Ron Jackson
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With increased OPTEMPO and an ever-changing environment, mission planning becomes a vital link to ensuring mission accomplishment. However, often overlooked is the identification and understanding of composite risk.

Risk management has been, for some time, an integral part of mission planning at all levels. As part of the planning process, leaders and staff sections continuously try to identify hazards. Historical accident data provide planners with the tools to assist in identifying hazards and implementing controls to mitigate those risks. But what about *tactical* hazards? Does tactical risk outweigh accidental risk? Or is there a composite of both tactical and historical hazards that can better prepare aircrews for mission execution?

Composite risk can best be defined as the integration of historical accident data with the tactical mission. How can identifying composite risk aid aircrews during mission execution? First, you must understand hazard-based risks versus threat-based risks. For example, hazard-based altitudes are those flight levels where the predominant risks to aircraft are natural or man-made obstacles. Analysis of historical accident information indicates wire hazards and bird strikes are the primary threat to aircraft operating at terrain flight altitudes. Although these hazards are common at all levels of terrain flight, they are more prevalent at terrain flight altitudes below 100 feet AGL. Threat-based altitudes are those flight levels that make aircraft more susceptible to surface-to-air fires (SAF) and generally increase as altitude increases. In essence, hazard-based and threat-based altitudes are inversely related in that as altitude increases, the risk of man-made and natural flight hazards decreases, but the threat of SAF increases.

Hazard-based and threat-based risks can be categorized as high, medium and low,

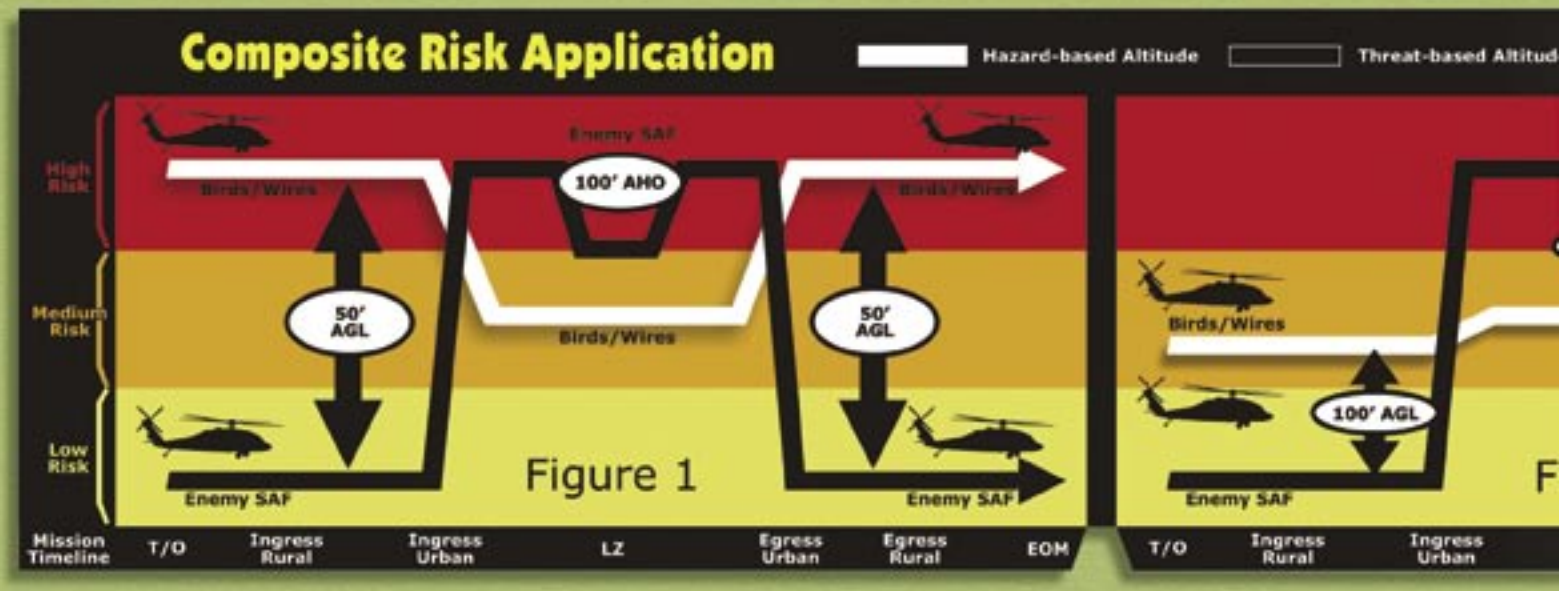

Figure 1

osite Risk Management

where each category represents a composite risk factor. A high risk-based altitude would indicate a mission is conducted in a flight profile that historical and threat data indicate aircrews must be cognizant of man-made hazards, natural hazards, and/or threat capability. For example (Figure 1), a 2-hour mission conducted continually in a high hazard-based altitude could indicate the aircrew is operating at 50 feet AGL, an altitude that makes him more prone to wire strikes and bird strikes, as compared to the threat capability. However, the primary risk to the aircrew is not the threat-based hazard but the man-made and natural hazards. Conversely, as the altitude increases, the threat-based hazard increases while the hazard-based risk decreases.

What does this mean?

The previous graphic depicts aircrews that are continually operating at a high risk-based altitude. This increases the pilot's workload because he not only must be concerned with the enemy threat, but he must also maintain situational awareness of the man-made and natural hazards.

By analyzing the hazard-based risks and the threat-based risks, we can determine that a modest increase in altitude reduces the risk of the natural and man-made hazards with no discernable difference in the threat-based risk (Figure 2).

By analyzing composite risk, we can combine the hazard-based and threat-based altitudes to identify a risk-based altitude (Figure 3). As a result of combining these two elements, only a small portion or no portion of the mission might have to be actually flown at a high risk-based altitude. This means the pilot's workload can be reduced by eliminating or mitigating threat or flight hazard risks.

Knowing and understanding composite risk assists leaders and planners in establishing risk-based altitudes, which not only provides adequate safety from the threat environment, but minimizes the impact of man-made obstacles and natural hazards to flight. Combining these elements enable leaders to analyze flight profiles and ultimately aid in reducing the pilot's workload as it pertains to flight hazards and prevents aviators from continually operating in the high risk-based altitudes during mission execution. ♦

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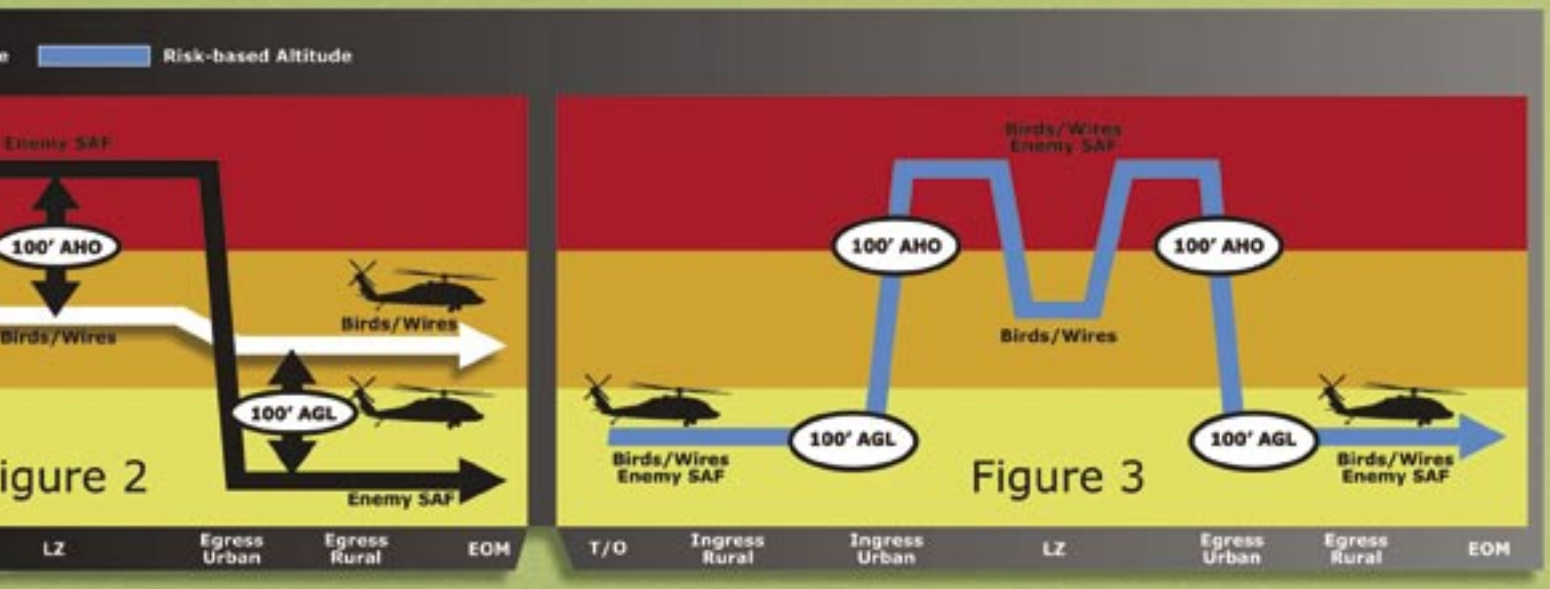

Figure 2

Figure 3

ALSE Advice FROM USAARL

Important information on aviation life support equipment.

LTC Mark Adams, CW4 Dennis Bergstrazer, and Joe Licina
USAARL, Fort Rucker, AL

Wear It Right

(This is Part 1 of a 3-part series. Other topics concerning ALSE will be published in succeeding issues of *Flightfax*.)

ALSE has performance limits just like your aircraft. If you don't wear it or look after it correctly, it will not function correctly. The U.S. Army Aeromedical Research Laboratory (USAARL) doesn't always get the design absolutely right for every type and shape of aviator; that's why we depend on your feedback to tell us when equipment is uncomfortable or doesn't do its job. Hundreds of thousands of dollars are spent to produce the best ALSE possible to give you the best chance of survival in the event of a mishap.

Helmets

Helmets have developed from the early days of providing limited impact protection into sophisticated systems for improved head impact protection, face and eye protection, hearing protection, communications, and mounts for night vision and sighting systems. All helmet designs undergo rigorous trials to ensure they adhere to the standards for protection, retention, and noise attenuation. Several companies market kits to improve comfort, protection, and noise attenuation; however few of these products have ever undergone validation trials, and those that have been tested, tend to produce inferior results when compared to the original design. Just because it feels more comfortable doesn't make it safe. If your helmet is uncomfortable, ask to be referred to the Problem Fit Program at USAARL.

Let's look at specific concerns about helmets and we will explain the importance of "wearing it right."

■ **General condition**. Your aviator helmet is not like a football helmet. It is designed to protect against major impacts only once, not repeatedly. Your helmet is one use only. A drop from a chair to the floor renders your helmet permanently unserviceable from the crashworthiness point of view. Look after it.

(1) **Outer shell**. The outer shell is strong, but an impact, even one that leaves no visible damage, can cause a hidden fracture, delamination and weakness, thereby reducing its effectiveness.

(2) **Energy attenuating liner (EAL)**. The white polystyrene EAL inside the shell provides 90 percent of the impact protection. Minor impacts may result in permanent compression or even fracture of the liner, which will not perform adequately if it takes an impact in the same place a second time. You should not try to reduce hot spots by pressing your thumbs or a spoon over the surface to

make your helmet more comfortable. This will reduce the effectiveness of the helmet and might make the difference between no head injury in an accident and incapacitation. If you are incapacitated you will not be able to egress safely in the event of fire or ditching.

■ **Size**. When it comes to helmets, size matters! A helmet that is too large may feel more comfortable, but it will be more difficult to secure and will be more likely to come off your head in an accident. Even if it doesn't come off your head, it is likely to rotate forward on impact leaving the back of your head unprotected. Also, you will need more counterweight for night vision goggles (NVGs) if your helmet is loose. This adds to the strain on the neck, causing fatigue and reduced mission effectiveness. Apache pilots should check the number of "shims" inside their helmets. More than FOUR shims front and rear means that your helmet is too large and you should get it changed. Bottom line: Keep it tight!

■ **Chin and nape straps**. Keep these straps tight to make sure the helmet stays on your head in an accident. There are many examples of pilots being killed by head injuries after their helmets came off, when they otherwise would have lived. Don't become a statistic—keep them tight.

■ **Thermoplastic Liner (TPL)**. This is the only liner currently cleared for use in the HGU-56/P. No other liners have passed the acceptance standards, and they do not have airworthiness certification. You may be reducing the ability of your helmet to stay on your head and protect you if you add illegal and untested liners. We are aware, however, of comfort issues and many of you have heard of the ZetaLiner™ as a replacement for the TPL. The ZetaLiner™ is not currently cleared for general use. However, it has recently undergone testing here at USAARL and we will have comprehensive advice for you soon.

■ **Ear cups**. The ear cups issued with the helmet are the only ones currently cleared for use. The only cleared modification is the use of Communications Earplugs (CEPs), which markedly enhance hearing protection, speech intelligibility, and thus, mission effectiveness. No other ear cup modifications or kits are acceptable. Bear in mind that uncleared kits may provide less protection against side impacts and noise. Don't forget—if you lose your hearing, you will lose your flight status.

■ **Visor**. Polycarbonate visors will protect your upper face, eyes, and forehead from large objects like birds or fractured windshields. The dark visor also will help protect against harmful ultraviolet radiation. Keep them clean and keep one of them down when you fly.

The Army strives continually to provide you with the best helicopter helmets in the world. Why make your own modifications and turn them into something less?

Remember the bottom line: ***Wear It Right and Keep It Tight!*** ♦

—For more information contact LTC Adams, CW4 Bergstrazer, or Mr. Licina at the Aviation Life Support Retrieval Program, USAARL, Fort Rucker, AL. All can be contacted by calling DSN 558-6893/6815 (334-255-6893/6815) or e-mail Joe.Licina@se.amedd.army.mil.

Do—
- **Keep it in good condition.**
- **Wear the correct size.**
- **Tighten chin and nape straps.**

Don't—
- **Treat your helmet like a football helmet.**
- **Fly with chin or nape straps loose.**
- **Change the ear cups.**
- **Carry out illegal modifications.**

Talk Into My Goo

"I Caaaan't Hearrrrr Youuuuu!"

Gary D. Braman
CAS, Inc.
Huntsville, AL

When speaking to a colleague, have they ever responded to you by saying, "Talk into my good ear!" or "Huh?" I can't count the number of times I've heard those remarks. Most times, the sayings are coming from older pilots and mechanics. They may have even yelled their response to you. Aviation is a noisy business and your hearing is something you should not take for granted. You can never get it back once it's gone.

Exposure to high-intensity noise PERMANENTLY injures the hearing mechanism. The effects of steady-state (helicopter running) and impact noise (machine gun firing) on hearing differ between each of us. The effect of steady-state noise depends on frequency and intensity, intermittent or continuous exposure, exposure duration, and individual susceptibility. The effect of impulse noise depends on peak pressure, duration of individual impulses, number of impulses per exposure period, frequency content, angle of incidence, rise time of impulse, and individual susceptibility. Noise is one of the most common health hazards we face in the environment

od Ear

in which we operate, which includes both the training and combat environments. The most dangerous occupational noise is from weapons firing. Remember, the Black Hawk operator's manual requires double hearing protection when window guns are firing.

Exposure to high-intensity noise may cause hearing loss that can adversely affect your combat readiness. This includes the communications between the crewmembers during a helicopter flight in a combat zone. Noise-induced hearing loss can cause a breakdown in aircrew communications by requiring commands to be repeated or result in them not being heard at all. Proper aircrew communications is essential to the safe operation of today's modern aircraft. And though improbable, a breakdown in aircrew communications (due to a noise-induced hearing loss) may eventually result in an aircraft accident.

A recent survey from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) showed that 274 (22.6%) of the 1,212 15Ts and 67Ts tested in 2003 have a significant threshold shift (STS). This means a hearing loss. Normally, you will lose your hearing first at the higher frequencies (4,000 Hz). This is detected when normal conversations require you to ask someone to repeat what they just said.

Over the years, the aviation community has been provided with excellent hearing protection devices to include the aviator helmet, earmuffs, earplugs, and the Communications Earplug (CEP). Today's Army flight helmet, the HGU-56/P, provides roughly twice the hearing protection as compared to the earlier SPH-4 series helmet. SPH-4 stands for Sound Protection Helmet No. 4, and in its day, it provided significant improvements to hearing protection as compared to its predecessor, the APH-5 flight helmet. It should be noted that even with a properly fitted, modern HGU-56/P helmet, the simple act of wearing either a pair of eyeglasses or a chemical/biological mask hood will break the seal of the helmet's ear cups, which will degrade both the helmet's hearing protection and speech intelligibility characteristics by allowing a path for noise to enter the ear. In these cases, you should wear additional ear protection in the form of either a standard earplug, or preferable the CEP.

You can protect your hearing by doing a few easy things: wear proper and serviceable hearing protection in all noise hazard areas; ensure your helmet is properly fitted; ensure the ear cups in your helmet and earmuffs are serviceable; ensure your earplugs are clean and serviceable; and most importantly ensure your hearing is checked annually.

You can protect your hearing by doing a few easy things: wear proper and serviceable hearing protection in all noise hazard areas; ensure your helmet is properly fitted; ensure the ear cups in your helmet and earmuffs are serviceable; ensure your earplugs are clean and serviceable; and most importantly ensure your hearing is checked annually. Additionally, wear double hearing protection if you're required to wear eyeglasses or the chemical/biological mask hood.

Remember, noise-induced hearing loss is painless, progressive, permanent, and preventable. ♦

—Mr. Braman is a Senior System Safety Analyst for CAS, Inc. He supports the Utility Helicopters Project Management Office in Huntsville, AL.

We Don't Need No Stinkin' Checklists!

Cdr. Stephen McInerney
U.S. Navy

It took 15 years in the cockpit, but I have become a born-again believer in the importance of checklists and procedures. I once followed them religiously, but over the years as I became a skilled pilot, I no longer needed them … or I thought!

I've been back in the fleet for 2 weeks after an absence of 2 years. I've been flying every day and relearning tactics and my aircraft. There I was … hanging onto the vertical stab—wind rushing through my hair and the scream of the engines (as well as my electronic countermeasures officer) ringing in my ears. I am befuddled! How did I forget to perform another mission critical item? How did I get so far behind the aircraft? As I sit alone in my room, I think back to a night long ago....

It was during a recovery that was winning high marks for buffoonery. The room was very quiet as the Commander Air Group (CAG) muttered and swore. Finally, as the recovery was completed, CAG turned slowly to the assembled group of COs, XOs, and department heads and growled, "The most dangerous SOB on that flight deck is a new XO." We all nodded sagely. I had no idea what he was talking about.

Now I understand. A brand new nugget may be green, but he knows enough to ask questions and follow a checklist. Someone who remembers having been there and done that needs to have a large risk management bull's-eye painted on his helmet. Managing high expectations, numerous distractions, and low proficiency is no way to go through a line period. There was no great epiphany. I should have expected it. When I left the cockpit 2 years ago, I was a seasoned aviator, current in my warfare specialty and proficient. I could juggle and compartmentalize the responsibilities of a strike leader, instructor, and department head. While I was confident, I was not complacent. Now back in the cockpit without the proficiency, the situational awareness, or the confidence of 2 years ago, I have made two important discoveries. I depend on the habit patterns I have developed over the years … and I have forgotten many of them.

This is where my renewed faith in checklists and procedures comes in. Good habit patterns can be used as a template to overlay on a mission. They prioritize and order tasks. They serve as an internal master caution panel. Break a habit pattern and a series of intuitive warnings sound: the nagging, vague uneasiness of having forgotten something; the butterflies in the gut; the hair standing at attention on the back of your neck. When based on checklists, procedures, system knowledge, and situational awareness they can point to something unsafe or adverse to the mission.

However, this ability is perishable. Time out of the cockpit or away from certain missions and these indicators are no longer reliable; for example, forgetting that the fuel dumps are on, failing to complete combat checks as the strike pushes, or starting the descent out of the marshal stack with the incorrect radios or navaids selected. All these incidents demonstrate the danger of relying on habit rather than checklists. Habit patterns take time and discipline to develop. When these habit patterns are lost or corrupted, you often don't realize it until it's too late. They have their place in the development of experienced aviators. Tactical aviation is a complex and dynamic environment. Anything that can increase one's ability to process data and maintain situational awareness should be embraced. In our profession, the intuitive answer is not necessarily the correct answer and often there's enough pressure to shrink the largest brain to the size of a peanut. It's an environment made manageable by the adherence to checklists and procedures. ♦

—Reprinted with permission of Cdr. Stephen McInerney and the Navy Safety Center Web site.

The Automation Edge

Mr. Lawrence Adams
and
Mr. Vincent Carman
LMR, Inc.

Commanders, logisticians, and maintenance managers now are relying on automation to give them an edge on the battlefield. The ability to view assets and unit readiness is an important tool commanders have that enables them to utilize their assets effectively. Problems arise when the systems used provide just as much erroneous information as correct information.

The Unit Level Logistics System-Aviation (ULLS-A) automates supply, maintenance, and aircraft readiness reporting. It also maintains aircraft historical, maintenance, and operational records required by aviation units to manage their logistics needs. The system has evolved from a cumbersome DOS-based program to its current Windows 2000® configuration. Many improvements have made it user friendly, and most of the old problems related to inaccurate readiness reporting have been addressed. However, as we all know, software problems will still occur at the most inopportune time. Compounding those problems are operator error and hardware failures. Add pressure from the commander, and you have a frustrated operator who would rather go back to pencil and paper.

Similar to flight training, the first important step in streamlining ULLS-A operations is proper ULLS-A operator training. Operator training is as important to ULLS-A operations as instrument training is to the flight crew operating in inclement weather. The need to understand aviation maintenance and Army supply procedures is critical to ULLS-A operations. Not understanding maintenance concepts is a contributing factor to the problems and frustrations encountered by operators. Proper ULLS-A system training will include elements from both the basic manual procedures of aviation maintenance and proper execution of processes within the system, to include the built-in quirks. Unlike other standard Army management information systems, ULLS-A relies on the input of everyone involved with aviation maintenance, from the flight crew to the maintenance and supply personnel.

Incomplete installation of aircraft, components, and weapons systems, along with incorrectly installed maintenance master data file updates and Aviation and Missile Command (AMCOM) changes, can cripple the ULLS-A system. Experienced system administrators know which processes must be run after an AMCOM change is installed and make corrections as needed. Conversely, incorrect information entered by flight crew or maintenance personnel will have unfortunate consequences. Many system administrators and operators are not always properly trained on these and other essential tasks.

ULLS-A training has an impact on readiness and safety. With a thorough understanding of the ULLS-A system, personnel will be able to avert potential problems such as over-flying inspections, and also identify systematic problems with their aircraft through trend analysis. Similar to the combination of systems that enable an aircraft to fly, data in the ULLS-A system is the sum of the information provided by its many users. ♦

—Mr. Adams is a Functional Analyst with Logistics Management Resources, Inc. He may be reached at (804) 415-1501 or by e-mail at ladams@lmr-inc.com. Mr. Carman also is a Functional Analyst with LMR, Inc. He may be reached at (804) 415-1587 or by e-mail at vcarman@lmr-inc.com.

Plan Smart! Fly

The aviation world has changed since 11 September 2001, as if you somehow missed it. But before you yawn and flip the page, think about the Federal Aviation Administration (FAA) calling you about a flight violation, maybe due to busting into a temporary flight restriction (TFR) area or some other special-use airspace. The fact is that Armywide there has been a dramatic increase in pilot deviations, or flight violations, especially in the Washington, D.C., Air Defense Identification Zones (ADIZs).

Control of airspace in the National Airspace System (NAS) has reached new levels. TFRs have been used extensively since the 11 September attacks in an effort to protect locations vital to national security from potential threats. TFRs are being reviewed gradually and, if justified, translated into some form of special-use airspace. Pilot deviations are particularly serious matters in this era and are treated as such by both the DOD and the FAA.

Suppose you are flying in the NAS. The air traffic controller advises you that a flight deviation has occurred and asks you to please call by telephone to discuss the deviation when you land. Such an event strikes fear in the heart of every Army Aviator, especially those who hold FAA civilian flight certificates.

Some examples of recent military pilot deviations include:

- Unauthorized flight into a presidential TFR.
- Flying over an area protected by a TFR without ATC authority.
- Flying to and landing at an airport (Class E surface area without a control tower) without ATC authority while operating under special visual flight rules (VFR) conditions.
- Taxiing onto an active runway without proper clearance.

Information Army Aviators should NOT provide

First and foremost, DO NOT, repeat, DO NOT provide any FAA representative with your name and/or Social Security number over the radio or telephone. This also applies for all crewmembers on the flight, including crew chiefs and flight engineers. No names are to be given out.

Why, you ask? Army Regulation (AR) 95-1, *Flight Regulations*, paragraph 2-13.d, states: "Names of crewmembers of military aircraft involved in actual or alleged violations will be treated as restricted information and not be released to the public or any agency outside the DOD except by proper authority. Any person receiving requests for names of crewmembers of Army aircraft should direct such inquires to the Commander, U.S. Army Aeronautical Services Agency (USAASA)." USAASA headquarters (ATAS-ZA) can be contacted at DSN 656-4865/4863, fax 656-4409 (703-806-4865/4863, fax 703-806-4409).

Revealing your name and/or Social Security number could result in FAA enforcement procedures against you, such as suspending your FAA civilian flight certificate(s) for a short period of time, or even permanently, before you have an opportunity to rebut the allegations.

Information you should provide

Provide the FAA representative with your unit's name and address. Do not give your commander's name or telephone number. Remember that all telephonic inquiries are to be routed through USAASA. If your unit is contacted, the provisions of AR 95-1, paragraph 2-13, apply to

y Smart! (Again)

whoever answers the phone. If the FAA persists in requesting crewmember names, refer them to USAASA.

The purpose of these actions is not to be uncooperative or devious with the FAA. Army Aviators are held accountable to their commander—not the FAA—for violations of either FAA or Army regulations. Again, Army commanders—not the FAA—are responsible for conducting investigations, which are done under AR 15-6, *Procedures for Investigating Officers and Boards of Officers*, or Chapter 4 of AR 600-105, *Aviation Service of Rated Army Officers*. AR 95-1 provides a timeframe for submitting the results of the investigation to HQ USAASA. Commanders are also responsible for taking action, which may include appropriate administrative, judicial, or non-judicial action.

Aviators who are performing authorized, briefed missions are not held in double jeopardy by FAA enforcement procedures and Army enforcement procedures per Federal Aviation Regulation (FAR) 13.21.

Routing of pilot deviation reports

Military pilot deviation reports and other alleged violations involving Army aircraft are forwarded from the FAA facility involved through the FAA regional headquarters to HQ USAASA. The deviation investigation report is then forwarded to the aviator's commander through the MACOM-, ARNG-, or USAR-level chain of command. The FAA normally establishes a suspense of 90 days for the reply to be returned to the FAA regional office.

The Department of the Army Regional Representative (DARR) to the FAA regional headquarters and HQ USAASA each receive a preliminary report from the FAA of the alleged deviation shortly after the event. The DARR informs HQ USAASA, the MACOM, ARNG, or USAR air traffic and airspace officer, and aviation safety officer that a military pilot deviation report has been received and a formal report may be pending.

The advance warning affords the unit commander the opportunity to obtain crewmember statements and explanations while memories are still fresh and, if necessary, implement individual or unit training to correct the problem. The official FAA deviation investigation request can sometimes take a great deal of time, 6 months or more, to reach the commander.

Fly safe

The bottom line is FLY SAFE, but do not knowingly violate the FARs. FARs have the weight of public law, and violation of FARs are serious. Protect your rights as an Army Aviator by:

- Complying with AR 95-1, paragraph 2-13, and not divulging restricted personal information.
- Informing your commander immediately if ATC informs you a flight deviation has occurred or you suspect one has occurred. Your commander should then contact the DARR in your region for further instructions. The DARR phone number may be found in either the Flight Information Bulletin or Table 6-1 of AR 95-2, *Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigation Aids*.
- Doing thorough flight planning, including checking for and understanding the provisions of the TFRs and special-use airspace on and near your route of flight.
- Flying by the rules!

Points of contact are Mr. Paul Gillick, USAASA, Fort Belvoir, VA, DSN 656-4865/4863, (703) 806-4865 and Mr. Chet Spangler, USAASA, Fort Belvoir, VA, DSN 656-4865/4863, (703) 806-4863. ♦

—Originally published as *Plan Smart! Fly Smart!* in *Flightfax*, March 1995. Content edited and updated by LTC David Walker, USAASA.

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class A (Two AH-64 Fatalities)**: The UH-60A crew was performing an NVG logistics and passenger transport mission with an AH-64A under NVS providing security. Just as the UH-60A was touching down on the taxiway leading to the FARP, the AH-64A's tail section impacted the UH-60A's main rotor system from above. Both aircraft were destroyed in a postcrash fire. See story inside this issue.

■ **Class C**: The flight crew received a mission change with a request to locate and attempt to recover a downed UAV. Aircraft entered brownout conditions and impacted the ground. This information was reported from a late accident report.

■ **Class C**: While conducting hot refuel operations, the aircraft fire guard attempted to get the fuel point shut-off guard's attention. The aircraft fire guard picked up a large rock and threw it at the fuel point shut-off guard. The rock struck one main rotor blade and tore off approximately 12 inches of the rear portion of the blade.

■ **Class C**: During a multi-ship flight at 200 feet AGL, trail aircraft impacted a flock of birds. CPG front windshield was struck by a bird and shards of glass fell onto the dashboard. Aircraft decelerated to 90 knots and returned to base. Aircraft was shut down without further incident. Post-flight inspection revealed multiple birds struck the aircraft including the Hellfire missile launchers (HMLs), nose gearbox covers, PNVS/TADS, 30mm gun, static mast, two main rotor blades, CPG front windscreen, and No. 1 engine. ECOD and engine inspections were completed. One main rotor blade and CPG windscreen were replaced and aircraft returned to FMC status. This information was reported from a late accident report.

■ **Class E**: During a backup control system (BUCS) test, the BUCS FAIL WARNING light illuminated and maintenance personnel reset the system. The second BUCS test also failed, illuminating the BUCS FAIL WARNING light as well as the BUCS ON CAUTION light, followed by OIL LOW PRI HYD caution light and primary hydraulic pressure dropping to zero. Aircrew shut down aircraft and found the primary hydraulics manifold empty and the pressure hard line to the tail rotor hydraulic servo had fractured at the lower elbow fitting. This information was reported from a late accident report.

D Model

■ **Class B**: During a third approach into the landing zone, the pilot overcorrected (applied aft cyclic and decelerated to avoid a flock of ducks), when the LOW ROTOR WARNING activated. The crew landed immediately. The maintenance data recorder (MDR) showed dual engine overtorque of 260 percent. One engine had 160 percent and the other had 146 percent, for a combined total of 306 percent. Preliminary ECOD is $940,320. Damaged components include transmission, gearboxes, and drive shafts. This information was reported from a late accident report.

CH-47

D Model

■ **Class E**: While conducting a postflight inspection, it was discovered that the green blade root liner at the blade retaining pin had slipped due to bonding material failure. The green blade was found resting on the bottom of the yoke, not floating as required. The crew had no indication during the flight. Fair wear and tear appears to be the cause. A new blade was installed and coordination is being made with Boeing on the repair of the root liner. This information was reported from a late accident report.

■ **Class E**: The FE informed the crew that the temp on the No. 1 flight hydraulics was on the rise. The temperature went from 55°C to 80°C within 15 minutes. The aircraft landed and shut down without further incident. Maintenance found the No. 1 flight hydraulic cooler fan operational check was completed IAW TM 55-1520-240-T and replaced the No. 1 flight control hydraulics temp indicator. Aircraft was released for flight.

E Model

■ **Class A (Fatality):** Aircrew landed on a narrow road in a steep ravine to offload U.S. Soldiers. The Soldiers remained at the rear of

the aircraft to wait for the aircraft to depart. The Afghan interpreter broke away from the group and started up the right slope and was struck by an aft main rotor blade.

OH-58

D Model

■ **Class A (Damage):** An OH-58D crew was conducting a combat recon mission when their .50 Cal machine gun malfunctioned. Both aircrew members began troubleshooting the weapon system while still in flight and lost situational awareness. The PC in the right seat realized he was too close to the ground and attempted to recover the aircraft before impacting the ground. The aircraft hit on the left skid first, bounced, and then slid an additional 159 feet before coming to rest on its left side. The PC egressed unassisted and nearby Soldiers lifted the aircraft wreckage to free the PI's left arm which was pinned by the wreckage. Medical attention was provided on site by fire crew and medics. The crew was evacuated by UH-60L back to airfield and aircraft wreckage was later recovered to airfield as well.

■ **Class B (Damage):** During the landing phase of gunnery training, the IP was flying two students and noticed a hole in the left door of aircraft. Postflight inspection discovered numerous damaged parts on aircraft. Cause of damage is undetermined at this time.

■ **Class C:** A Raven UAV struck an OH-58 aircraft during flight at approximately 190 feet AGL. The UAV is reported to have experienced remote control problems and traveled outside of its restricted operational zone when it collided with the OH-58D aircraft in flight. Initial inspection deemed the ECOD among both aircraft at the Class D level, but subsequent developments raised damage to the Class C level. Local investigation is in progress.

HH-60

L Model

■ **Class B:** Postflight inspection revealed that the forward-looking infrared (FLIR) turret had separated from the aircraft, presumably in flight. No in-flight anomalies were reported by the crew; mean sea level (MSL) was 4,000 feet AGL. Initial inspection revealed that the turret separated from the 'gimble-assembly' point; the mounting remained attached to the aircraft and the aircraft reportedly sustained no collateral damage. Local board has convened to investigate. ECOD: $382K (Cost of FLIR turret).

UH-60

A Model

■ **Class A (Two AH-64 Fatalities):** The UH-60A crew was performing an NVG logistics and passenger transport mission with an AH-64A under NVS providing security. Just as the UH-60A was touching down on the taxiway leading to the FARP, the AH-64A's tail section impacted the UH-60A's main rotor system from above. Both aircraft were destroyed in a postcrash fire. See story inside this issue.

■ **Class C (Non-injury):** A flight of two ships was performing false insertion of Infantry troops into a landing zone. During landing, the pilot in the lead aircraft extended the approach using the collective to extend past a furrow. Crew noted nothing unusual on touchdown. Postflight inspection revealed damage to tail boom and stabilizer. Suspect aircraft struck protruding object in the grass.

■ **Class C (Damage):** Crew suspected a hard landing in snow conditions following confined area training. Postflight inspection revealed damage.

■ **Class C (Damage):** To avoid construction equipment, the aircraft air taxied to reposition on the airfield. The pilot made abrupt flight control inputs, causing the nose of the aircraft to pitch up/tail down. On visual inspection, the stabilator sustained damage from striking the ground. ECOD is $22,000.

■ **Class D**: While preparing for external load training, crew completed a cargo hook check. The cargo hook manual release switch was sticking but hook still passed check. Crew positioned over the load and hook failed to engage on first try. On second attempt, hook engaged and crew picked up load from the ground. At 50 feet AGL the hook slipped open, dropping the load and the blivit burst open resulting in damage to the blivit only. This was the first use of a cargo hook on this aircraft in over 8 months and aircraft had not gone through reset after desert deployment. Dirt in the cargo hook assembly caused hook to not latch properly and hook released under weight of the load. This information was reported from a late accident report.

■ **Class D (Damage):** Upon shutdown, the crew chief heard an unusual noise. After rotors stopped turning, a visual inspection of aircraft revealed that one T/R de-ice cable had pulled out at hub with remaining cable attached at canon plug on blade root. The structural wires had coiled around the conductors and had uncoiled during flight, extending past T/R tips and striking M/R tip caps. Two M/R caps showed significant damage. No indications of damage were manifested during flight. This information was reported from a late accident report.

■ **Class E:** The No. 1 engine went to idle during cruise flight. Aircraft was slowed to 80 knots and placed in lockout and landed at airport without incident. Materiel failure was the cause and a product quality deficiency report (PQDR) for the ECU is being done. This information was reported from a late accident report.

■ **Class F (Bird Strike):** Aircraft struck bird which resulted in engine damage. Aircraft

and four crewmembers made a safe return to base.

L Model

■ **Class A (Fatality):** A crew of three was performing a VFR cross-country mission with four VIPs on board. Crew was attempting to re-file to an IFR flight plan when it struck a 1,700-foot guy wire on a television transmission tower at approximately 80 knots. Aircraft broke up in flight and crashed inverted in an open field. Over 50 percent of the aircraft was consumed by a postcrash fire. Aircraft was destroyed resulting in seven fatalities.

■ **Class A:** While flying on an OPBAT/NVG training mission as a flight of two, the crew encountered and continued flight into deteriorating weather. As the lead aircraft initiated IIMC procedures the pilot experienced spatial disorientation. The aircraft decelerated and descended into the trees at near zero airspeed. Chalk 2 initiated and completed IIMC procedures without declaring an emergency and continued to destination. All injured crewmembers were evacuated.

■ **Class B:** The PC was attempting to overfly an observation post on the perimeter of the camp when the rotor blades contacted the top of a HMMWV which was collocated with the observation post. The PC leveled the aircraft and safely landed. Shutdown was completed with no further damage.

■ **Class E:** During NVG multi-ship operations, the PI noticed a change in engine sound and looked inside to analyze the problem. Both engine Np and rotor Nr were at 130 percent. The PC reached up and retarded the No. 1 engine power control lever (PCL). Neither the engine nor the rotor responded. The No. 1 engine PCL was placed back into "fly" position and the No. 2 engine PCL was retarded with no response from either the engine or rotor. The PC informed the PI to initiate a descent and land the aircraft. The aircraft landed safely with a No. 1 high side failure. The aircraft was recovered without further incident. This information was reported from a late accident report.

■ **Class E:** Aircraft was taxiing into parking and went too far forward, allowing main rotor blade to strike a 2"x4" board sticking up out of a drum. Damage resulted to three main rotor blades approximately 4 inches inboard of the tip caps.

C-12

F Model

■ **Class E**: During VMC climbout, the pilot on controls noticed a 30 KIAS difference in airspeed indicators with the non-flying pilot's airspeed indicator appearing to be in error. After leveling off the climb at 7,000 feet MSL, the pilot on control's airspeed indicator showed airspeed of 40 to 50 KIAS faster than non-flying pilot's airspeed indicator. Aircrew returned to home station and landed without further incident. Upon engines shutdown, the pilot's airspeed indicator was stuck on 50 KIAS. Aircraft was placed on RED X condition. Replacement of the pilot's airspeed indicator and MOC was completed. Aircraft has been released for flight. This information was reported from a late accident report.

RC-7B

■ **Class E:** During cruise flight, the No. 3 engine oil temperature rose to 100 degrees Fahrenheit, (104 degrees being the maximum transient limit). The crew shut down the No. 3 engine in flight. Aircraft returned to airfield with no further incidents. This information was reported from a late accident report.

RQ-7

Shadow Model

■ **Class B (Damage):** The UAV was approximately 50 feet above the ground on its approach into the UAV launch and recovery site when it dipped to the left and impacted the ground. The fuselage of the UAV broke in half as a result of the impact. The UAV was under the control of the tactical automated landing system (TALS). Weather conditions at the time were within tolerance for air operations. The initial assessment is an engine failure.

■ **Class B:** The UAV went into emergency glide mode, displayed an IGNITION FAIL, GENERATOR FAIL, and BATTERY FAIL. The chute deployed. UAV has been recovered.

Raven Model

■ **Class C:** A Raven UAV struck an OH-58 aircraft during flight at approximately 190 feet AGL. The UAV is reported to have experienced remote control problems and traveled outside of its restricted operational zone when it collided with the OH-58D aircraft in flight. Initial inspection deemed the ECOD among both aircraft at the Class D level, but subsequent developments raised damage to the Class C level. Local investigation is in progress.

■ **Class C (Non-injury):** The UAV was returning to station when a dual engine failure occurred approximately 40 kilometers north of airfield. Recovery chute was deployed and the crash plan was activated. The UAV came to rest in a remote area, although ground and aviation units in area secured the site. A CH-47 was dispatched with recovery crew and successfully recovered the UAV. Front engine was experiencing a 1,000 to 2,000 ROM fluctuation and the AV was low on fuel at the time of dual engine failure. Investigation is underway.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

We Want to Hear From You

Because the cost of accidents is paid in lives, dollars, and readiness, we cannot afford to learn every lesson firsthand. Instead, we must learn from each others' experience whenever we can and share what we know.

Our number one request from *Flightfax* readers is for more first-person and lessons-learned articles. And that's the idea behind "War Stories," a recurring feature in *Flightfax*. The purpose of this column is to provide a forum for the entire Army Aviation community to learn from each others' experiences and to share how risk management works in real-world Army Aviation operations.

"Crew Commo," another recurring feature in *Flightfax,* gives aircrews and other aviation personnel an informal forum in which to communicate with each other. We hope to hear from all of you on a variety of topics, including maintenance personnel issues regarding safety and risk management in Army Aviation.

We make it easy to contribute. Here are a few notes so everybody understands the deal:

■ Space in *Flightfax* is limited, so please be as brief and to the point as possible.

■ We won't publish items that are submitted anonymously, but we will keep your identity confidential if you ask. It's the lesson, after all, that's important.

■ If we edit your story for length or clarity, we'll get your approval before publishing the revised version.

That's pretty much it. You can mail your story to:

Commander
U.S. Army Safety Center
ATTN: Flightfax
Bldg. 4905, 5th Ave.
Fort Rucker, AL 36362

You may also fax your story to DSN 558-3003 (334-255-3003), but the best way to get your story published is to e-mail **flightfax@safetycenter.army.mil**.

Please let us know how we can serve you better—we truly want to know! And we look forward to working with you as you contribute to Army Aviation safety through *Flightfax*.

—Paula Allman, Flightfax Managing Editor, DSN 558-9855 (334-255-9855), e-mail paula.allman@safetycenter.army.mil.

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ARMY AVIATION RISK-MANAGEMENT INFORMATION

FEBRUARY 2005 ✦ VOL 33 ✦ NO 2

The NEW COMBAT READINESS CENTER is Headed Your Way!

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U.S. ARMY COMBAT READINESS CENTER

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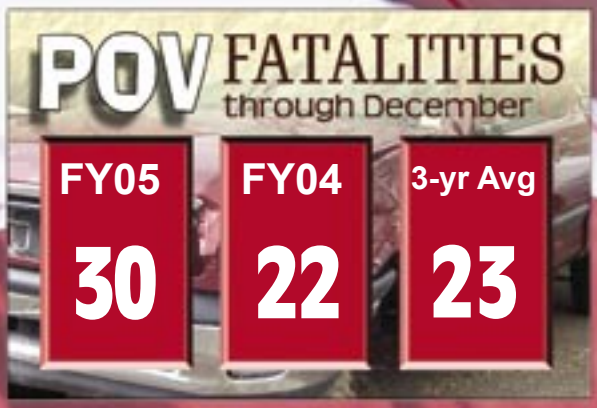
Poster: "We are Losing a Soldier Every 9 Hours!" 20



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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DEPARTMENT OF THE ARMY
WASHINGTON

31 JAN 2005

MEMORANDUM FOR Commanding General, United States Army Safety Center, Fort Rucker, Alabama 36362-5363

SUBJECT: Transformation of United States Army Safety Center

1. Personnel and equipment losses adversely affect the combat readiness of our Army. The loss of even one member of the Army Team -- Soldier, civilian, or supporting contractor -- is unacceptable.

2. Transformation is a multi-dimensional process that requires significant organizational, technological, and cultural changes to keep the Army relevant and effective for the future. As we adapt new technologies to war-fighting and business operations, we must also develop better joint operating concepts and business processes that use these technologies. We must integrate our functional initiatives and shape relevant information and trends into actionable knowledge that will preserve combat readiness.

3. To these ends, we are directing the United States Army Safety Center to transform and redesignate itself as the United States Army Combat Readiness Center (CRC) to advance the principles, understanding, and practice of Composite Risk Management (CRM). CRM will focus on sustaining readiness and managing all risks – those posed by the enemy, the environment, materiel and systems, and human error – logically shifting from accident-centric to Soldier-centric.

4. As with the United States Army Safety Center, the CRC will function as a Field Operating Agency of the Chief of Staff, Army. The Army Safety Office will continue to exist but will expand its responsibilities in Washington, DC, focusing on compliance, policy, and field liaison with Headquarters, Department of the Army. The Commander of the CRC will also retain the role of Director of Army Safety, reporting to the Director of the Army Staff. The CRC will be the Army's focal point for analyzing accident, serious incident, and combat loss reports, identifying lessons learned and tactics, techniques, and procedures (TTPs) to mitigate and prevent future losses. Accident investigation processes remain unchanged. The CRC will establish new processes leveraging information from Army organizations to collect, distill, and distribute knowledge about losses that affect our combat readiness. The prerogative of commanders to investigate losses and other incidents remains unchanged. The CRC mission will include:

a. Primary responsibility for investigation of Army accidents, subject to command, criminal, and other investigatory functions;

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SUBJECT: Transformation of United States Army Safety Center

b. Coordination on selected combat loss investigations;

c. Focal point for instigating the necessary cultural changes and developing the processes, structure, and training necessary to implement CRM Army-wide;

d. Support to Functional Proponents to develop policy and doctrine for loss prevention through CRM;

e. Development, coordination, and facilitation of a single-entry, multiple use automated reporting system for processing loss reports;

f. Development of predictive trend analysis using digital technology and data mining (with due regard to protecting private and privileged information) in order to identify loss trends and preventive measures;

g. Analysis and prompt dissemination of situation reports to the Army leadership;

h. Interaction with other military services; federal, state, and local agencies; and industry to identify best practices and loss prevention strategies.

5. The expanded scope of the new Combat Readiness Center and safety transformation will enable our Army to preserve combat power and enhance combat readiness with cutting edge effectiveness.

Peter J. Schoomaker
General, US Army
Chief of Staff

Francis J. Harvey
Secretary of the Army

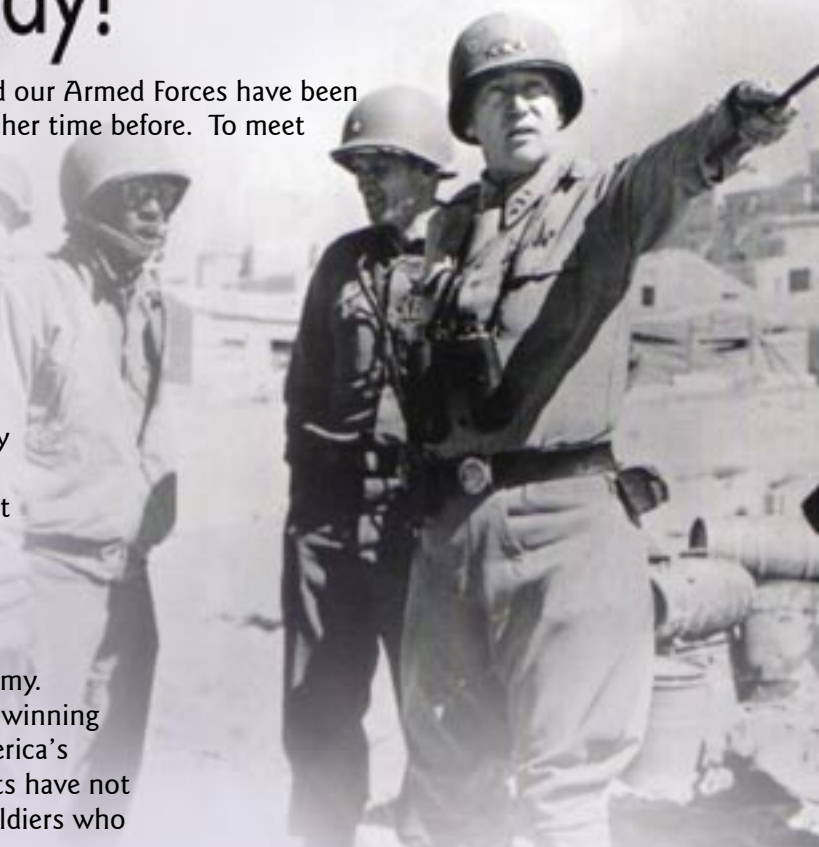
CF:
The Director of Army Staff
Assistant Secretary of the Army (Installation and Environment)

Flightfax

DASAF's Corner
FROM THE DIRECTOR OF ARMY SAFETY

The NEW Army Combat Readiness Center is Headed Your Way!

Since 9/11 our country, the American people, and our Armed Forces have been challenged by world events more so than any other time before. To meet this challenge, our Nation has had to change the way it conducts business. This change has not only affected our Nation and the American people, but also our Armed Forces. No longer can we plan on facing a well-organized enemy force using tactics from the Cold War. The enemy has become more elusive and bolder, harder to spot, and able to strike anytime and anywhere. Times have changed and so must the Army. We've become a new force, a force that not only defends the Nation militarily but also takes on new, nontraditional missions. Much of the time, we conduct operations as part of a joint and combined force. We continue to be a CONUS-based, contingency-force-oriented, crisis-response Army that reacts to threats anywhere in the world. In addition, we function as a forward-deployed, forward-defense, major-land-war Army. In the years since 9/11, the Army has devoted itself to winning the global war on terrorism and training to defend America's interests here at home and abroad. These commitments have not diminished, nor have they been without sacrifice by Soldiers who have gone into harm's way on our behalf.



"Take calculated risks. That is quite different from being rash ... No bastard ever won a war by dying for his country. He won it by making the other poor dumb bastard die for his country."
—GEN George S. Patton

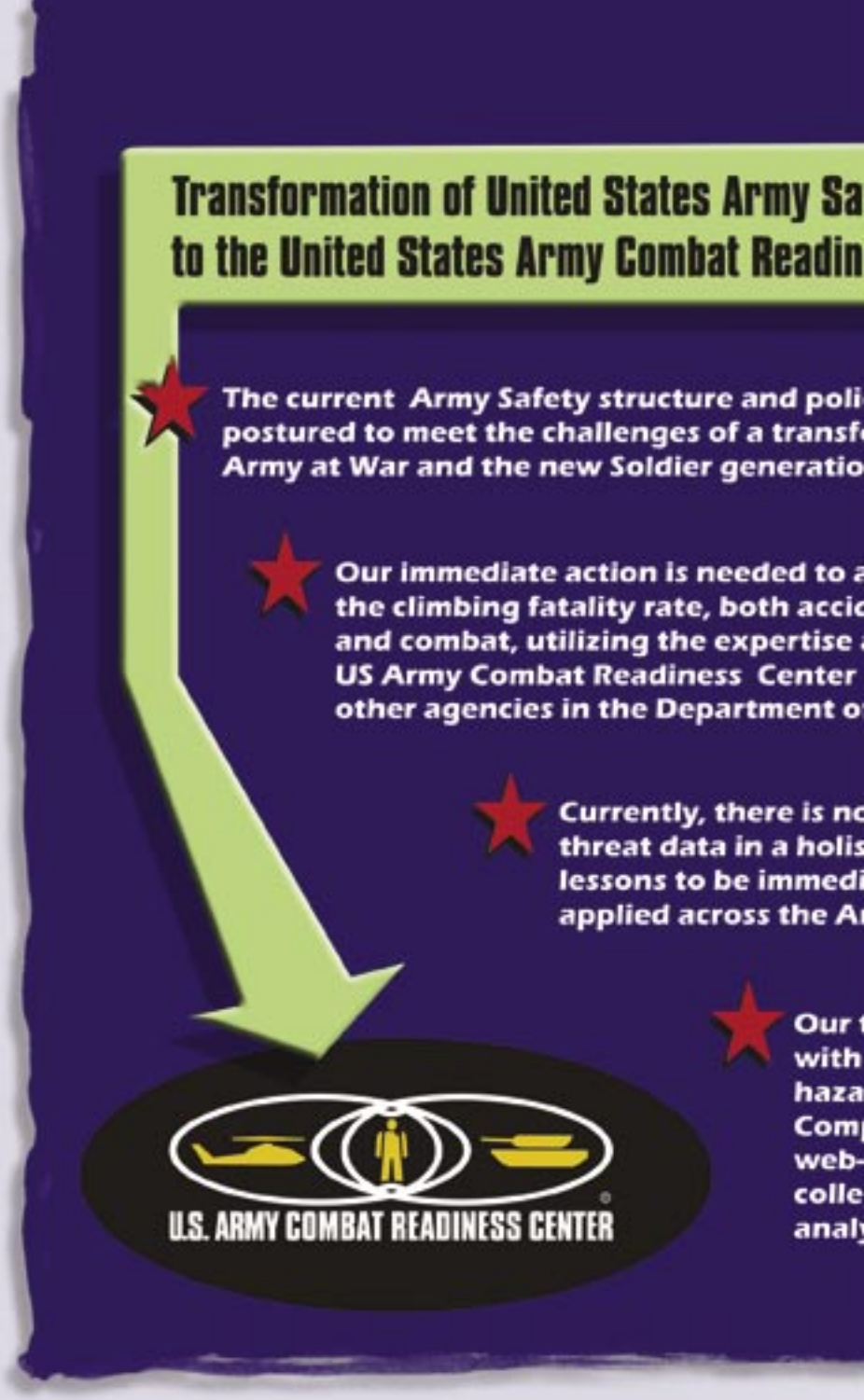
Thanks for your service to our Nation! We are a team, all working to get the job done—military, civilian, and contractor—in theater and at home. Each and every one of you is an important part of our combat power. High tempo and limited resources make it very difficult to replace you. We simply cannot afford the loss of you or your buddies, because it impacts our combat readiness.

One of the greatest leaders of World War II, GEN Patton was rough around the edges. But he fully understood the importance of protecting combat power to fight our Nation's wars. His words have more meaning when

you consider our recent statistics. Since the beginning of FY04, we've lost a Soldier every 9 hours—nearly a squad each week, a platoon each month, a company each quarter, or a battalion each year! That's combat power we cannot afford to lose. Think of the energy expended to recruit, train, and retain a battalion. We must find a way to "connect the dots" on all these losses (accident + enemy + illness + suicide, + other) and preserve our combat readiness. It will require aggressive change in our thinking, processes, and culture.

To enable this expanded approach, The Honorable Francis J. Harvey, Secretary of the Army, and GEN Peter J. Schoomaker, Chief of Staff, Army, signed a mandate directing the Army Safety Center to recast as the Army Combat Readiness Center (CRC) almost immediately. The new focus is on sustaining readiness and managing ***all*** risks—those posed by the enemy, the environment, materiel and systems, and human error. This broader focus is a logical shift from being accident-centric to Soldier-centric. The Army Safety Office (ASO) will remain in Washington, DC, and support the accident and safety aspects of the CRC.

Composite Risk Management (CRM) is the fundamental element of the CRC. Safety Sends #11, published in the January 2005 Countermeasure ("What It's About: Composite Risk Management"), explains how training this concept is vital to keeping our forces ready and winning our Nation's wars. We plan to improve and expand our interactive Web-based tools, give you more "There I was" stories through our magazines and Web site, and develop predictive analyses through data mining with other DA agencies and "close call" reporting. Within 48 hours of a reported loss, the CRC will share with the Army the five "Ws," as well as the trends, tactics, techniques, and procedures, and lessons learned. In short, we will connect the dots to help keep you and your team alive at home and in the fight.



Our Army needs your help. We need a cultural shift for the CRC to be successful. The Safety Center's mobile focus groups and the recent Inspector General's report confirmed the message must change to one that counteracts the negative stigma the word "safety" now invokes. These studies emphasize that safety has become a four-letter word in many circles because it does not mesh well with the level of risk or exposure. A captain in combat told me, "The first thing that goes in combat is admin, immediately followed by safety." We want that captain and others like him to shift from compliance to aggressive CRM—to stop thinking of safety as a constraint and use CRM as a combat multiplier. Our leaders must focus on teamwork, unity, mission, risk management for readiness, and proactive planning to preserve combat power … CRM. This change will allow our junior leaders to say, "I know Soldiers depend on me, and I'm not going to let the unit down."

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Why Are We Changing?

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transformation will allow focus on sustaining readiness
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yses through data mining.

The Army is fortunate to have a wealth of expertise within the Improvised Explosive Device Task Force, the Army Shootdown Assessment Team, the Center for Army Lessons Learned, and various other DA agencies. However, we can no longer afford to categorize loss by individual areas such as combat, accident, and medical. The next logical step is to matrix the Army's knowledge and attack hazards at home, during training, ***and*** in combat. This nested information through new processes will facilitate a more comprehensive look at threats, hazards, and controls, as well as provide empirical data to support investment strategies, doctrine, and digital tools. The CRC's real mission is gaining knowledge and sharing that information. Our goal is for the Army to have a single voice when it comes to the loss of a Soldier. The CRC will consider a loss as a loss, no matter what the cause. Regardless of whether that loss was in combat or by accident, we will find out why. These new processes will require extensive teamwork and provide commanders with significantly more information about the combination of circumstances that surround our ever-mounting losses.

Tomorrow's mission depends on the readiness of our Army today. GEN Schoomaker has explained that our Army at war will fail without transformation. Accelerating future force capabilities and viewing Army losses holistically will enhance the current force and transform safety culture. The CRC will play a critical role in total Army transformation and will continue to support all of you—our warfighting units, our installation flagships, and our civilian workforce.

The Army Combat Readiness Center—transforming safety processes to improve combat readiness and preserve combat power, one boot print at a time!

BG Joe Smith
Director of Army Safety
CG, CRC

Safety Sends #13: E

The U.S. Army Safety Center has transformed to the U.S. Army Combat Readiness Center (CRC). The CRC is a knowledge center that "connects the dots" on all information that pertains to the loss of a Soldier … our combat power!

Knowledge is power. This simple truism is echoed in our adoption of Composite Risk Management (CRM), because the more you know about the total hazards you face, the more effectively you can manage the risk. Real power comes from sharing actionable knowledge from the top to the bottom of your formation.

CRM recognizes that a loss is a loss—no matter where it happens—and every loss degrades combat power. During FY04, our Army lost a Soldier every 32 hours to an accident. FY04 was our worst year for accidental fatalities in the last 10 years. You can see from the red in the FY05 chart on the next page that we are outpacing last year in almost every category.

This clearly is a big challenge for our Army. Former President Dwight D. Eisenhower said that if you can't solve a problem, enlarge it. In our case, enlarging the problem translates to viewing accidental and other losses in a larger context … ALL Army losses. We are developing the capabilities to take a more holistic look at how and why we are losing Soldiers. To date, no single agency collects, analyzes, and reports such holistic data to allow commanders to apply CRM and reduce or prevent losses. In recognition of this void, the CSA and SECARMY expanded our mission and redesignated us as the Combat Readiness Center on 31 January 2005.

When we look at ALL losses—accident, combat, medical, and criminal—the true impact on our readiness emerges: We are losing a Soldier every 9 hours! Not only do we lose a precious life and comrade, but we also lose combat power and are required to recruit and train a replacement. This adds to the challenge of an Army at War that is transforming.

This name change signifies our role in enhancing combat readiness and, to be frank, frees us from the negative connotation the word "safety" holds for young Soldiers—those who are at highest risk. We will retain all our core competencies in safety, but our emphasis on CRM and readiness will increase. This strategy will be effective since all generations understand the importance of a fully functioning unit and strive toward that goal.

What does this mean to you? We are taking a more holistic look at loss and providing you with a greater awareness of its overall impact on readiness. We also are accelerating our reports to you on what we know after a loss occurs. We are gearing up as your knowledge broker and data warehouse. By collecting loss information from disparate sources to distill and pass on, and along with our data-mining efforts, we will have the capabilities to report actionable knowledge back to you. Our goal is to be fast, holistic, digital, preventive, and predictive. Knowledge is power, but sharing this knowledge is what makes it actionable and powerful.

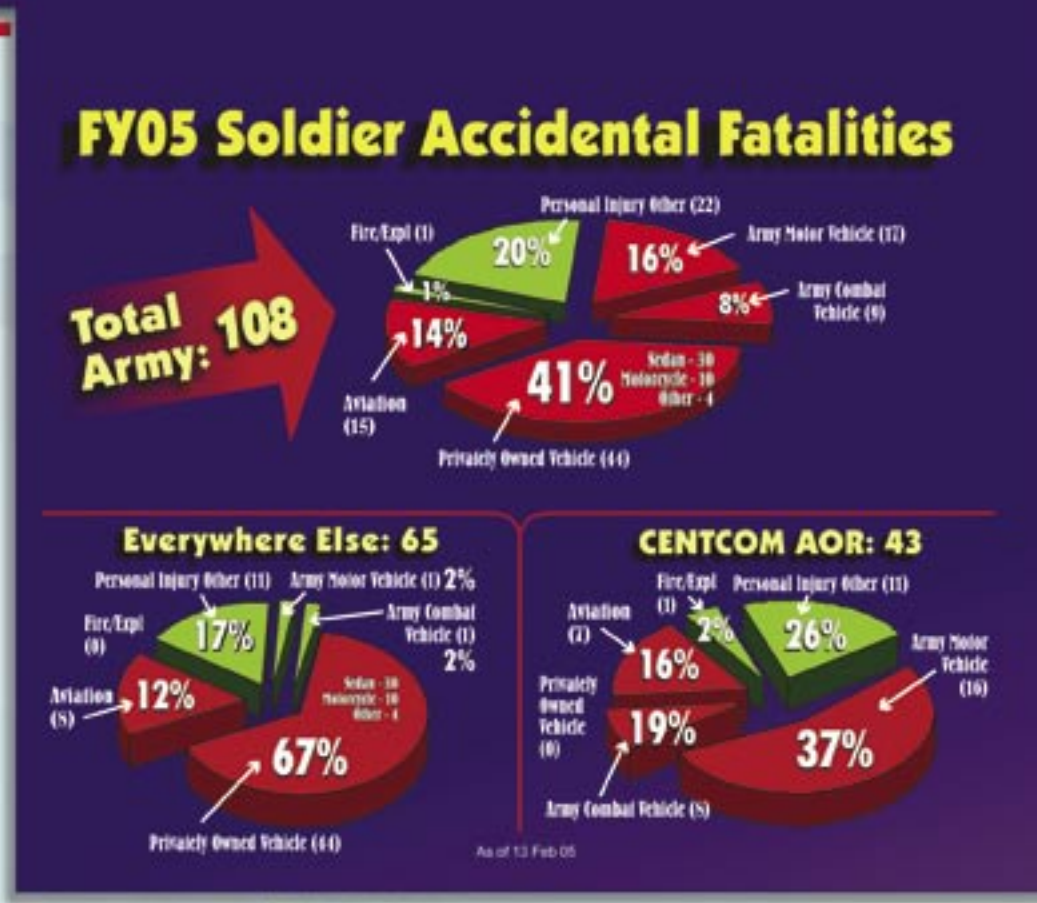
We will gather data on all losses, but our primary attention will be on accidental and selected combat situations where the specific cause or reason for the loss is unknown. The Combat Readiness Center will apply its own assets and leverage the capabilities of other relevant

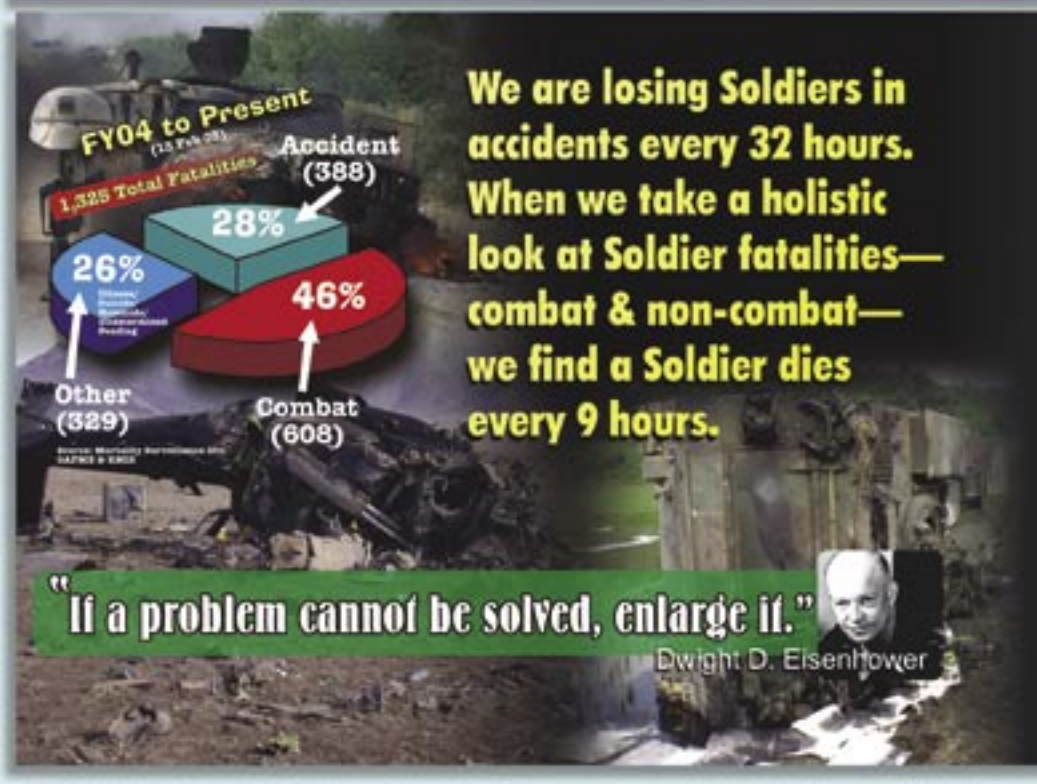
nhancing Combat Readiness

organizations to provide you with the trends, lessons learned, applications for TTPs, and tools for your use. Two items of note: We are not throwing the baby out with the bath water—safety is still a strong component of what we do. We also are collaborating with other organizations to connect the dots, not own them or do their jobs.

Shortly, we will go hot on a new program of quick-turn SITREPs. These Preliminary Loss Reports (PLRs) will contain brief reports on losses and near real-time synopsis of what we know so you are aware of the issue quickly. Whenever possible, we will alert you to trends as well. This service is in its infancy, and I look forward to your feedback as we refine it. We have ambitious plans in the coming weeks and months to look at those things beyond fatalities that lead to lost workdays for both our Soldiers and DA civilians.

We continue to evolve to meet the needs of our transforming Army. When asked "What can you do to enhance readiness?," we want to be there with the knowledge and tools to help. Knowledge IS power … combat power! ♦





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

MAJ Steven Van Riper
U.S. Army Combat Readiness Center

...and then we'll go to the FARP

Many of our missions culminate with a stop at a forward arming and refueling point (FARP) to refuel and in some cases re-arm. The seemingly benign procedures involved in entering the FARP can be hazardous. Flights made up of dissimilar aircraft attempting to enter a FARP can further increase risk. Whenever flights of dissimilar aircraft are employed, knowledge of individual capabilities, FARP procedures, and aircraft equipment must be used to mitigate risk.

Although this type of thinking may sound overcautious, the fact remains that whenever dissimilar aircraft are in a flight and transition through a FARP or any other landing zone, hazards can be greatly amplified. Each aircrew must be acutely aware of each other's individual capabilities, be familiar with the FARP or landing zone procedures, and each aircrew must understand the limitations of each other's equipment; i.e., night vision devices and aircraft lighting. This level of understanding is not easy to attain. It requires command emphasis and individual discipline. The events surrounding a recent accident illustrate the importance of treating *routine* or *simple* tasks, like going to the FARP, as important mission tasks that require pre-mission planning and detailed rehearsal.

The mission was to conduct logistics and passenger transport. The flight of two, one UH-60A and one AH-64A, departed the forward operating base (FOB) at 1810 en route to another FOB with several intermediate stops. At approximately 1901, the flight departed their final intermediate stop en route to a FARP located on an airfield 2.6 kilometers to the east. The UH-60A climbed to approximately 100 feet and approached the runway from the west on a heading of approximately 90 degrees. Once the UH-60A intersected the runway, it turned right and flew a heading of 150 degrees down the runway toward the taxiway leading to the FARP.

As the UH-60A's tail wheel touched down and the main landing gear was approximately 1 foot off the ground, the AH-64A's tail section impacted the UH-60A's main rotor system from above. The AH-64A and the UH-60A were destroyed in a postcrash fire. Both AH-64A pilots received fatal injuries. The UH-60A pilot occupying the left seat received minor injuries.

The Centralized Accident Investigation Board suspects this accident was a result of the AH-64A aircrew's failure to adequately scan while conducting a night visual meteorological conditions approach using the Apache's night vision systems. Although the Board suspects the AH-64A crew's failure to adequately scan did result in the loss of visual contact with the lead aircraft, the Board could not determine when or why the AH-64A crewmembers lost visual contact with the lead aircraft. Likewise, the Board could not determine what their actions were prior to or after losing visual contact with the UH-60A aircraft due to the extensive damage to the aircraft, fatal injuries suffered by both of the AH-64A crewmembers, and the absence of crash survivable digital source collection equipment; i.e., a maintenance data recorder or flight data recorder.

Keep in mind that although this accident occurred while the flight was approaching the FARP, the same events could have occurred during any approach to a landing zone with dissimilar aircraft.

OK. . . what does this have to do with individual capabilities, FARP procedures, or aircraft equipment?

You might be thinking the crew failed to scan; therefore, we all need to remember to use the proper scan techniques, and you are right. But, do you think every aircrew uses perfect scanning techniques during every flight? The answer is NO, we are humans and humans cannot behave like machines. Unfortunately, mistakes are going to be made. As humans, we continuously use back-up systems to compensate for our mistakes. A simple example is the speedometer in our vehicles. Very few humans can perfectly judge their speed when driving. We compensate by periodically looking at the speedometer and adjusting our speed as required. A few ways an aircrew can compensate for scanning mistakes is by knowing individual capabilities, memorizing FARP procedures, and properly employing aircraft equipment.

Individual capabilities

What are your individual capabilities? Do you take the time to personally assess your strengths and weaknesses? Now here is the hard one… Do you reveal your weaknesses to others? Are you honest with your fellow crewmembers about your aircraft knowledge, air sense, and tactical expertise? Do you know how to back-up your fellow crewmember?

Of course in the ideal situation, we would all behave like computers programmed to expertly fly our assigned aircraft with a detailed database of tactical knowledge and a complete understanding of aircraft systems. In the real world aircrews coordinate their actions, offsetting any unintentional errors and taking advantage of the synergistic effect derived from teamwork. The only way to achieve this type of coordination and teamwork, not only in your aircraft but in entire flights, is to know individual capabilities. Not only do we have to display the personal discipline to continually refine our aviation specific skills, but we must also have the courage to discuss our individual capabilities with peers.

FARP procedures

Does your pre-mission planning include review of the FARP layout and all tasks associated with using the FARP? Pre-mission planning sets the conditions for a successful mission. Is your unit, more importantly your aircrew, really dedicating enough time and effort to pre-mission planning?

You and your crews must study the unit standing operating procedures (SOPs), known man-made hazards to flight, and operational rules and requirements. Always brief actions required if visual contact is lost with other aircraft while maneuvering into the FARP. Never overlook the possibility that non-meteorological environmental conditions (surface conditions or pad lighting) might have changed the degree-of-difficulty associated with the FARP. If you are the air mission commander (AMC), take time to brief FARP procedures. If you are one of the pilots in the flight and your AMC "glosses" over actions at the FARP, ask him some questions about the FARP with the goal of guiding him to discuss the FARP in detail.

Aircraft equipment

Are you familiar with the night vision or mission equipment employed by the dissimilar aircraft in the flight? Have you talked to your fellow aircrews about how to deal with night vision device limitations and incompatibilities; i.e., forward-looking infrared (FLIR) versus image intensification (I^2)? Have you discussed the optimum aircraft lighting configurations for the different phases of the flight, including approaching the FARP? Lastly, have you discussed or briefed specific actions required due to mission equipment installed on one or all aircraft in the flight?

Address each of these areas with your unit's mission, tactical situation, and experience levels in mind. One size does not fit all. Once procedures are developed, formalize them in an addendum or appendix to your SOP and revise them as required.

Conclusions

Think about how Composite Risk Management (CRM) might have influenced the events surrounding this accident. Remember, CRM is the process of blending hazard-based risk and tactical-based risk to achieve an accurate representation of overall risk. This accurate representation of the overall risk can then be mitigated through relevant and effective control measures.

In this accident, the tactical portion (threat-based risk) of the mission was well defined and briefed. For example, the crews discussed en route flight formations and tactical separation during pre-mission planning. Hazard-based risks were not addressed in detail. Individual capabilities, FARP procedures, and aircraft equipment can be categorized as hazard-based risks. It is unknown if CRM would have prevented this accident, but inclusion of CRM would have alerted the crews to potential hazards and set in motion mitigation procedures.

Include CRM in your pre-mission planning. Don't let yourself, your crew, or other members of your flight think they have mitigated all applicable risks just because they have addressed the *traditional* risk areas.

—MAJ Steven Van Riper is the Chief of Attack/Scout Branch, Accident Investigation Division, at the U.S. Army Combat Readiness Center. He may be contacted by calling DSN 558-2131 (334-255-2131) or e-mail steven.vanriper@us.army.mil.

Investigators' Forum

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

MAJ Steven Van Riper
U.S. Army Combat Readiness Center

This Flight Is Boring... Let's Spice It Up!

Sure, many of our missions get a little monotonous and some seem downright boring. Go ahead, have a great time and perform some wild maneuvers ... take the aircraft to its limits. The events surrounding a recent accident illustrate this alarming trend and reveal a lack of aircrew coordination and pre-mission planning.

Although this type of thinking may sound crazy to many of you, some of our aircrews are not only thinking this way but are actually following through and putting these thoughts into practice. Recent months have shown a trend of aircrews performing *unnecessary flight maneuvers*. This is the technical term for what is commonly called "hot dogging." We are not addressing bona fide evasive maneuvers to deal with hostile fire or evade potential threats. These maneuvers are not necessary and are far outside the flight tasks included in our aircrew training manuals.

The flight, consisting of two UH-60As, was flying at 115 KIAS and 50 to 60 feet AGL when the pilot in command (PC) of Chalk 2 unexpectedly initiated an aggressive 50 to 60-degree uncoordinated, decelerating left turn to look at some sand dunes to break up the monotony of a boring flight. The aircraft turned approximately 270 degrees and decelerated to 0 KIAS in 5 to 10 seconds. This maneuver resulted in a high bank angle and rapid deceleration, causing the aircraft to descend vertically and impact the ground. Both the PC and pilot (PI) had over 2,000 flight hours each. There was no hostile fire or any other form of threat. The aircraft was severely damaged and the crew and passengers sustained minor injuries.

Wait a second; we're good at this...

Interviews conducted in the course of this investigation revealed the existence of an attitude that aggressive maneuvering is not only acceptable, but also preferable due to the combat environment. Several interviewees expressed admiration for the skill with which the pilots of the accident aircraft "flew the aircraft as it was meant to be flown," or took the aircraft past the "cushiony limits." Conversely, there were opinions critical of Vietnam-era pilots for flying too conservatively, as though every flight were an instrument flight or flying back home.

The investigation board determined this attitude toward overly aggressive flying stems from flight practices used by cavalier pilots widely acknowledged as the most experienced and capable in the unit. In general, reactions from interviewees ranged from tacit approval of aggressive flight to open admiration for it. The battalion standardization pilot (SP) had counseled the company SP (acting as the PI in the accident aircraft) on at least one occasion for his attitude regarding aggressive flying. The company

commander, widely described as the best company commander in the battalion and perhaps the task force, seems to have been unaware of the degree to which this attitude was ingrained in some of the company's crewmembers. The unit platoon leaders seemed aware of the aggressive flying, but because of their inexperience, in comparison to pilots who were flying aggressively, they failed to recognize it as inappropriate.

Think about it...

Think about what this crew did. Is this what aircrews are trained to do? Is it OK because the unit is in combat? Let's look at two lessons we can learn from this accident: the importance of aircrew coordination and pre-mission planning.

Aircrew coordination

The PC took the controls just prior to initiating the left turn that resulted in the accident without clearly alerting the crew of his maneuver. Performing evasive maneuvers is often a necessity, but every effort should be made by the pilot flying the aircraft to communicate his intentions before or during the maneuver. During interviews following the accident, none of the other crewmembers were entirely clear about why they were turning. During the turn, G forces and wind coming in the right door of the aircraft interfered with the intercommunications system (ICS) to the degree that none of the other crewmembers were clear about what the PC was trying to communicate over the ICS, though all agreed it was something about power. There was so much wind coming in the right cockpit door that the PI said his ICS microphone was rendered useless.

Since the rest of the crew did not understand the degree of or purpose for the maneuver, effective aircrew coordination was impossible. Adding to the confusion, one of the crew chiefs thought the PI was the PC of the accident aircraft. A review of flight records revealed that none of the crewmembers had received mandatory aircrew coordination refresher training. Receipt of the required training is no guarantee that the accident could have been prevented; however, it does indicate the unit placed insufficient emphasis on aircrew coordination.

Pre-mission planning

Aviation operations require extreme situational awareness and a full understanding of how to effectively employ your crew and aircraft. Pre-mission planning sets the conditions for a successful mission. Is your unit, more importantly your aircrew, really dedicating enough time and effort to pre-mission planning? Have you and your crew studied the expected threat? Do you know your aircraft's limitations given the expected environmental conditions (PPC)? Remember, you and your crew should be well prepared for the majority of missions you are required to perform. The crews must study the expected threat, known man-made hazards to flight, unit standing operating procedures, operational rules and requirements, and become intimately familiar with their areas of operation. Complete knowledge of these subjects, coupled with a clear and executable mission statement, constitutes satisfactory pre-mission planning. By identifying the accidental hazards (man-made hazards including wires, towers, etc., and environmental conditions) and the tactical risk (expected threat and operational requirements), proper pre-mission planning allows crews to implement Composite Risk Management. (For more information on Composite Risk Management, see the DASAF's Corner in the December 2004 issue of *Flightfax*, as well as MAJ Ron Jackson's article in January 2005).

So what does aircrew coordination and pre-mission planning have to do with aggressive flying?

Simply put, aircrew coordination and pre-mission planning injects discipline and flexibility into our aviation operations. When you and your crew properly coordinate your actions and conduct detailed planning, you will see there is no time or need to perform "hot dog" maneuvers but you will be ready to respond to threats as the situation dictates. If you don't believe this, talk to the "old" guys in your unit and ask them about successful missions where things went well even when the weather didn't cooperate or the threat didn't work as planned. The common denominators will always be aircrew coordination and pre-mission planning.

Conclusions

It is your responsibility to prepare yourself and your crew for missions. This preparation includes a clear understanding of crew duties and responsibilities as described in aircrew coordination standards and proper pre-mission planning. Yes, combat operations are different from peacetime training missions but no SP, IP, PI, or any other crewmember has the right to endanger property or lives by disregarding aircrew coordination or ignoring pre-mission planning requirements. ♦

—MAJ Steven Van Riper is the Chief of Attack/Scout Branch, Accident Investigation Division, at the U.S. Army Combat Readiness Center. He may be contacted by calling DSN 558-2131 (334-255-2131) or e-mail steven.vanriper@us.army.mil.

A Practical Appl

Brett Blount
U.S. Army Combat Readiness Center

The Army is experiencing an alarming trend of increased combat and accidental fatalities. Since FY04, accidents and non-combat losses caused 54 percent of all Army fatalities, while combat-related activities accounted for the remaining 46 percent. Soldiers and Army civilians understand combat loss is a potential outcome during war. Accidental fatalities are a different matter altogether. We must consider accidental loss of life as preventable without purpose or merit. The Army experiences a decrease in combat readiness whenever a Soldier or civilian is killed or injured, regardless of whether the loss is

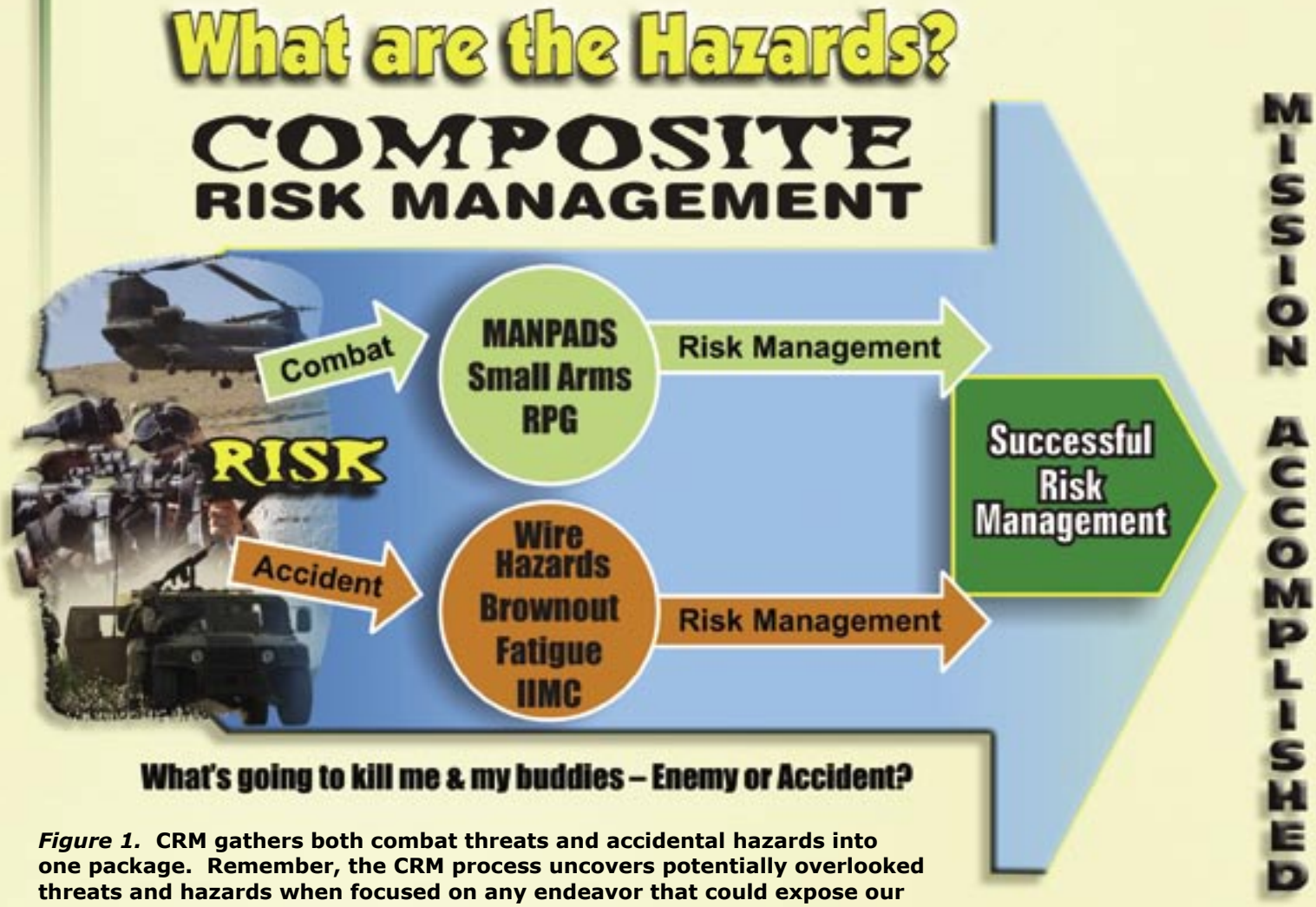


Figure 1. **CRM gathers both combat threats and accidental hazards into one package. Remember, the CRM process uncovers potentially overlooked threats and hazards when focused on any endeavor that could expose our Soldiers and civilians to risk.**

lication of CRM

due to accident or combat. Does it matter if the death or injury was the result of combat or an accident? No, we only see the turmoil that accompanies the loss.

Composite Risk Management (CRM), if used, can protect our readiness. CRM gathers all hazards into one package and enhances combat power by enabling leaders and individuals to identify risk in *all* endeavors that could cause injury or death. The Army adopted the 5-step risk management program years ago and incorporated this process into our warfighting curriculum. This process produces excellent results and serves us well. However, we must emphasize the need to assess all risks associated with any given mission. CRM does that and builds upon the risk management process by including combat threats with accidental hazards as illustrated in Figure 1.

Composite Risk Management (CRM), if used, can protect our readiness. CRM gathers all hazards into one package and enhances combat power by enabling leaders and individuals to identify risk in all endeavors that could cause injury or death.

How can identifying composite risk aid our aviation unit leaders during mission execution? Let's look at a combat scenario involving a UH-60 troop insertion (Figure 2). The timeline shows the air mission commander (AMC) conducts pre-mission planning, leads the formation flight to the objective, conducts the troop insertion, and continues to the destination. The AMC and unit leadership may choose to assess only the combat threats, such as Man-Portable Air Defense Systems (MANPADS) and small arms fire, while failing to assess accidental hazards such as wire strikes, inadvertent instrument meteorological conditions (IIMC), or brownouts. Mitigating existing hazards is not possible if they are not first identified. Soldiers are a vital part of this process. CRM presents the question: "What's going to kill me and my buddies—the enemy or an accident?"

CRM allows the AMC to choose another course of action when faced with excessive composite risk. The essential element of the mission is troop insertion, where the flight may encounter small arms fire (combat threat) during the descent to the objective and brownout conditions (accidental hazard) when rotor wash from the aircraft begins to disturb loose sand and dirt. The AMC may choose to alter the route to the objective to avoid areas of reported small arms fire, thus reducing the combat threat. If the mission demands insertion at a particular area conducive to brownout, the AMC can mitigate the accidental hazard by altering crew mix to ensure maximum use of pilots experienced in those conditions.

A core concept of CRM allows the AMC to focus attention on mission conduct following actions at the objective. In this case, the AMC discovers a deadly combination of combat and accidental risks toward the end of the mission timeline. He can either select another landing area free from loose dirt and sand, reducing the likelihood of brownout; or if friendly forces control the landing area, unit operations could pour water on the surface to reduce the consequences of aircraft rotor wash.

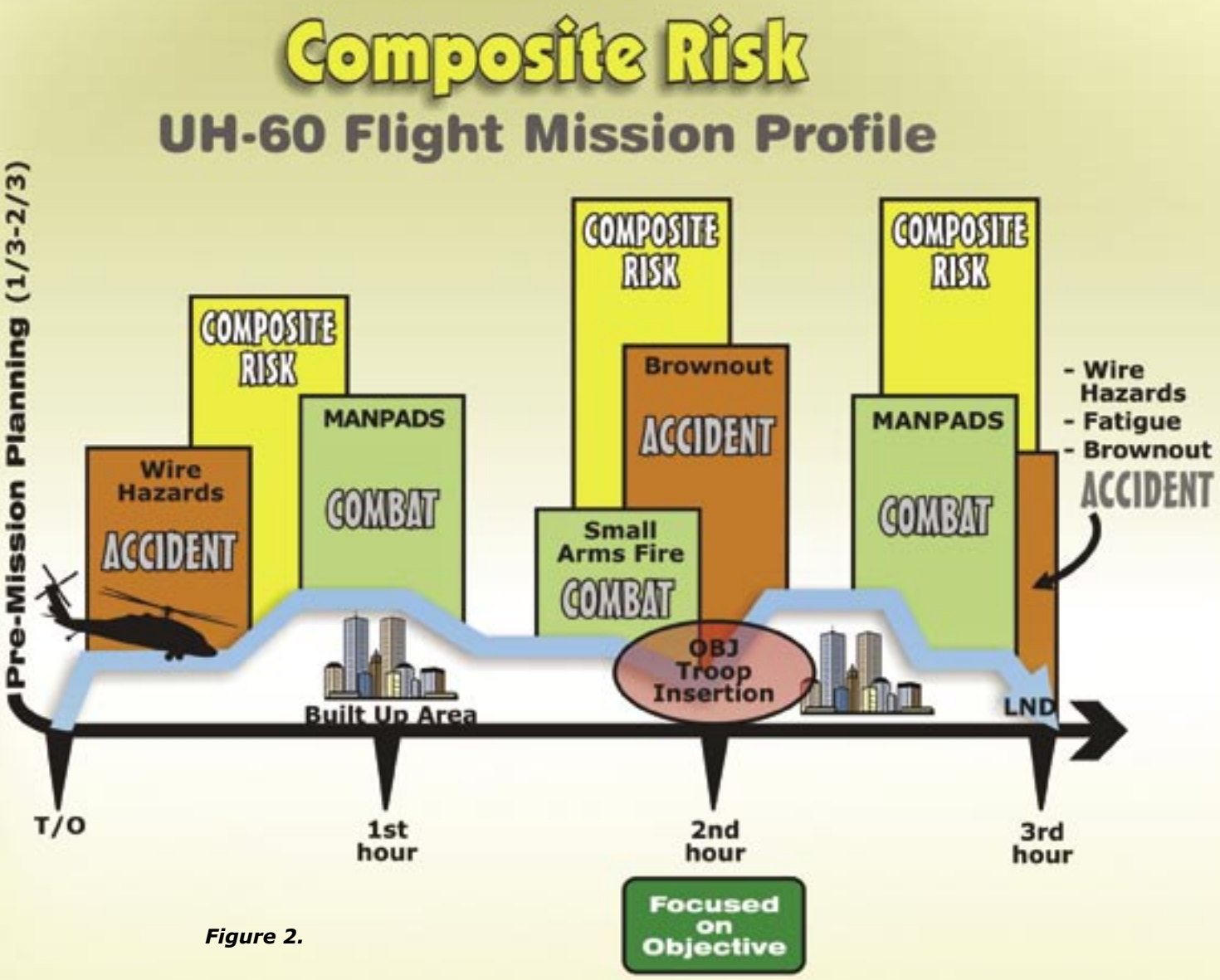


Figure 2.

When a MANPADS threat exists that outweighs the hazards presented by power lines, the AMC could alter the route to approach the landing area at a much lower altitude, avoiding the combat threat. In this case, the AMC addresses the presence of wire hazards but chooses to focus the larger share of the mitigation process on the MANPADS threat. CRM is instrumental in the mission planning process by exposing both threats and hazards. This gives leaders the ability to concentrate more on risks perceived to be the most dangerous, while still addressing residual risks existing elsewhere during the mission profile.

Leaders should not limit CRM in only the workplace. Off-duty hazards produce death and injury every bit as catastrophic as those occurring on the job. Off duty, CRM can identify and mitigate previously unexamined hazards that exist apart from our more hazardous on-duty endeavors, thus preserving and protecting the force.

CRM is a combat readiness tool that enables leaders to have a better overall picture of risks involved in any tactical or non-tactical operation. By aggressively applying CRM to all risks (combat and accidental), we will preserve our combat readiness! ♦

—Mr. Blount may be contacted by calling DSN 558-2681 (334-255-2681) or e-mail brett.blount@safetycenter.army.mil.

ALSE Advice FROM USAARL

Important information on aviation life support equipment

LTC Mark Adams,
CW4 Dennis Bergstrazer,
and Joe Licina
USAARL

Wear It Right

This is Part 2 of a 3-part series. Other topics concerning ALSE will be published in succeeding issues of *Flightfax*.

ALSE has performance limits just like your aircraft. If you don't wear it or look after it correctly, it will not function correctly. The U.S. Army Aeromedical Research Laboratory (USAARL) doesn't always get the design absolutely right for every type and shape of aviator; that's why we depend on your feedback to tell us when equipment is uncomfortable or doesn't do its job. Hundreds of thousands of dollars are spent to produce the best ALSE possible to give you the best chance of survival in the event of a mishap.

Seat Harness

Seat harness systems are designed to retain the occupant in his or her seat, to minimize flail envelopes, and to spread accident forces widely over the body. You have the greatest chances of survival in an accident if you are properly restrained. Most military aircraft have 4- or 5-point harness systems, as opposed to the 3-point system commonly used in personal motor vehicles. Correctly fitting harnesses can distribute accident forces over the pelvis and upper torso and can produce remarkable results. It used to be believed that the limit of human tolerance to forward deceleration was 80–100 G. However, the value of a high-quality restraint system has been shown in motorsport, where drivers have survived accident deceleration forces exceeding 200 G. Army helicopter restraint webbing is capable of surviving loads of 6,000 pounds, four times greater than Federal Aviation Administration (FAA) requirements. But the harness systems only work well if they are worn correctly.

Let's look at specific concerns about seat harnesses, and we will explain the importance of "wearing it right."

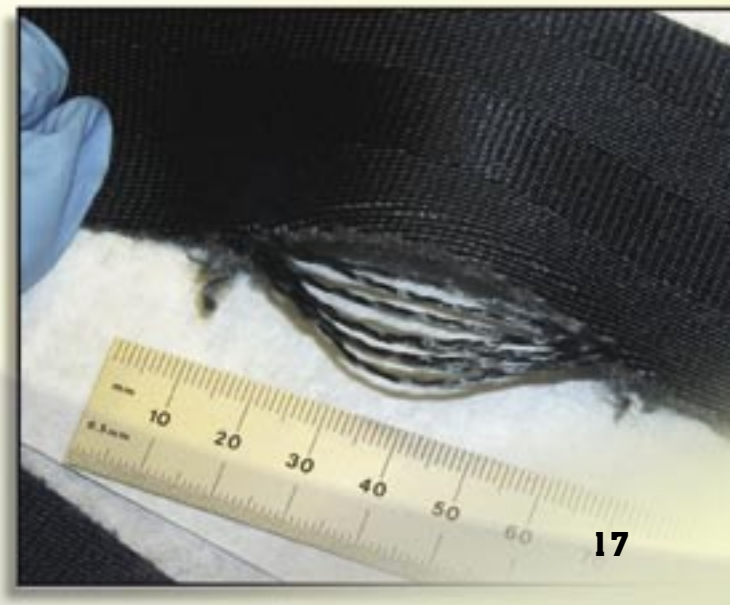


Figure 1. **Frayed shoulder harness.**

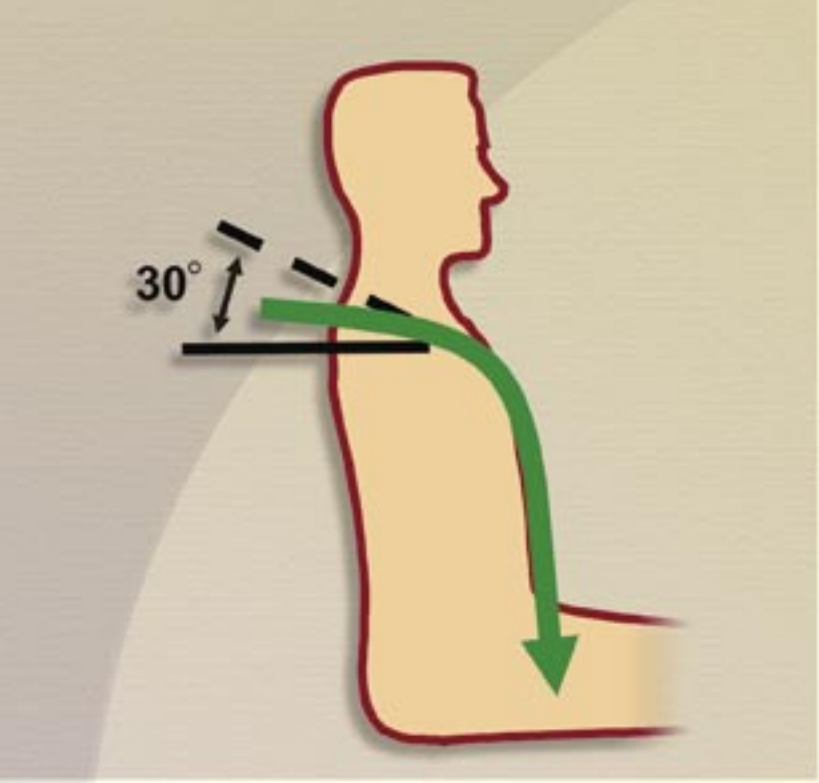


Figure 2. **Correct shoulder harness positioning.**

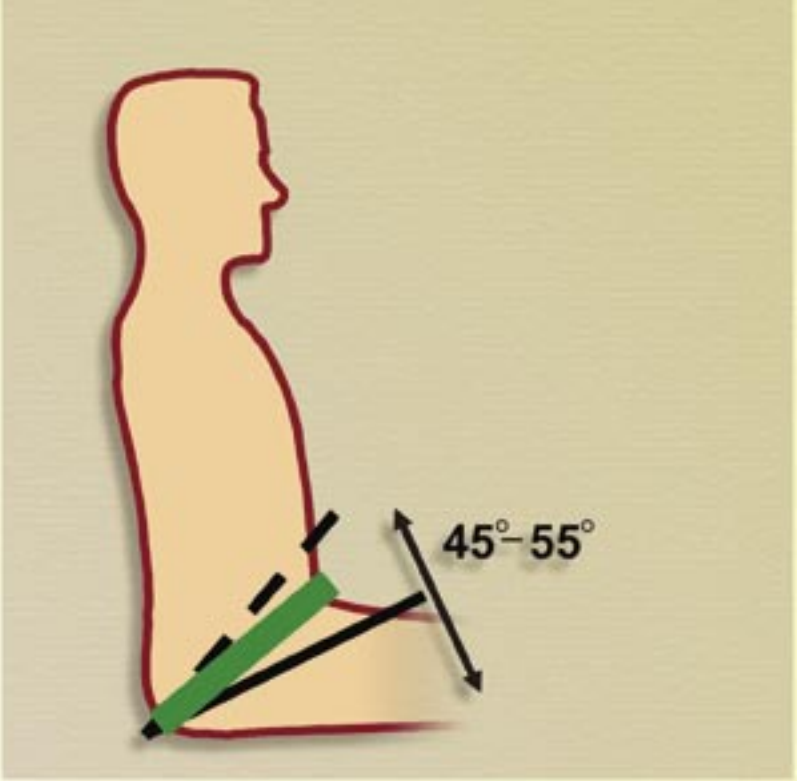


Figure 3. **Correct lap belt positioning.**

■ **General condition**. Frayed, cut, or pinched webbing is not serviceable, as it may fail at a much lower load than designed. Such a failure would allow you to flail excessively in an accident or even to be thrown out of your seat. Figure 1 on the previous page shows a section of shoulder harness from an actual aircraft that was signed off as serviceable. Would you fly with a harness in this condition? USAARL would advise you to say "No."

■ **Positioning**. Seat harnesses will only work correctly if they are positioned correctly. In other words, they have design limitations just like your aircraft.

(1) Shoulder harness. The shoulder harness should lie horizontal or up to 30 degrees above the horizontal in order to provide best restraint and to minimize downward loading of the spine (Figure 2). The green line represents the line of the shoulder harness.

(2) Seat harness. The lap belt of the seat harness should be placed low over the pelvis and, ideally, the angle in relation to the seat pan should be 45-55 degrees (Figure 3). This ensures that accident forces are directed through a strong part of the body, not into the soft parts of the lower abdomen. Also, this limits the possibility of submarining under the belt.

■ **Tightness**. A harness will only work well if it is worn tight. Firstly, if it is too loose, you will flail excessively and may be injured by contact with other cockpit and aircraft structures. Secondly, if worn loose, you run a higher risk of injury because your body will be exposed to greater G loads than if you are strapped in tight. The reason for this is quite simple. In an accident, the aircraft and your seat decelerate from the impact velocity to zero in a specific time, dissipating a certain amount of energy, which will be felt as a G load on the body. If you are strapped in tightly, you will decelerate with your seat (Line A in Figure 4). If your harness is loose, you

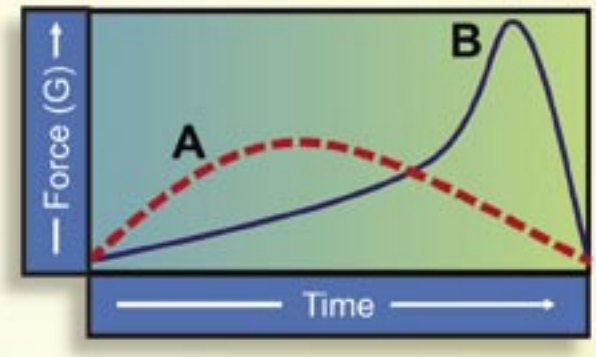


Figure 4. **Dynamic overshoot.**

will still be moving as the seat slows down until you hit the harness. Then, over a much shorter time, you will decelerate to zero, dissipating the same amount of energy in that shorter time. The end result is a much higher peak G force and greater risk of serious internal injury (Line B in Figure 4). This concept is called dynamic overshoot.

■ **Adjustment buckles**. A word of caution about lap belt adjusters. Some seats have a new lower profile adjuster which can get flipped over as seen in the photographs (Figure 5). In some seats, it can be trapped in this position between your thigh and the seat. The adjuster will still appear to work correctly when you buckle up, but it will slip when under load. In an accident, this would mean that you would not be adequately restrained, increasing your risk of injury.

Remember the bottom line: ***Wear It Right and Keep It Tight!*** ♦

—For more information contact LTC Adams, CW4 Bergstrazer, or Mr. Licina at the Aviation Life Support Retrieval Program, USAARL, Fort Rucker, AL. All can be contacted by calling DSN 558-6893/6815 (334-255-6893/6815) or e-mail Joe.Licina@se.amedd.army.mil.

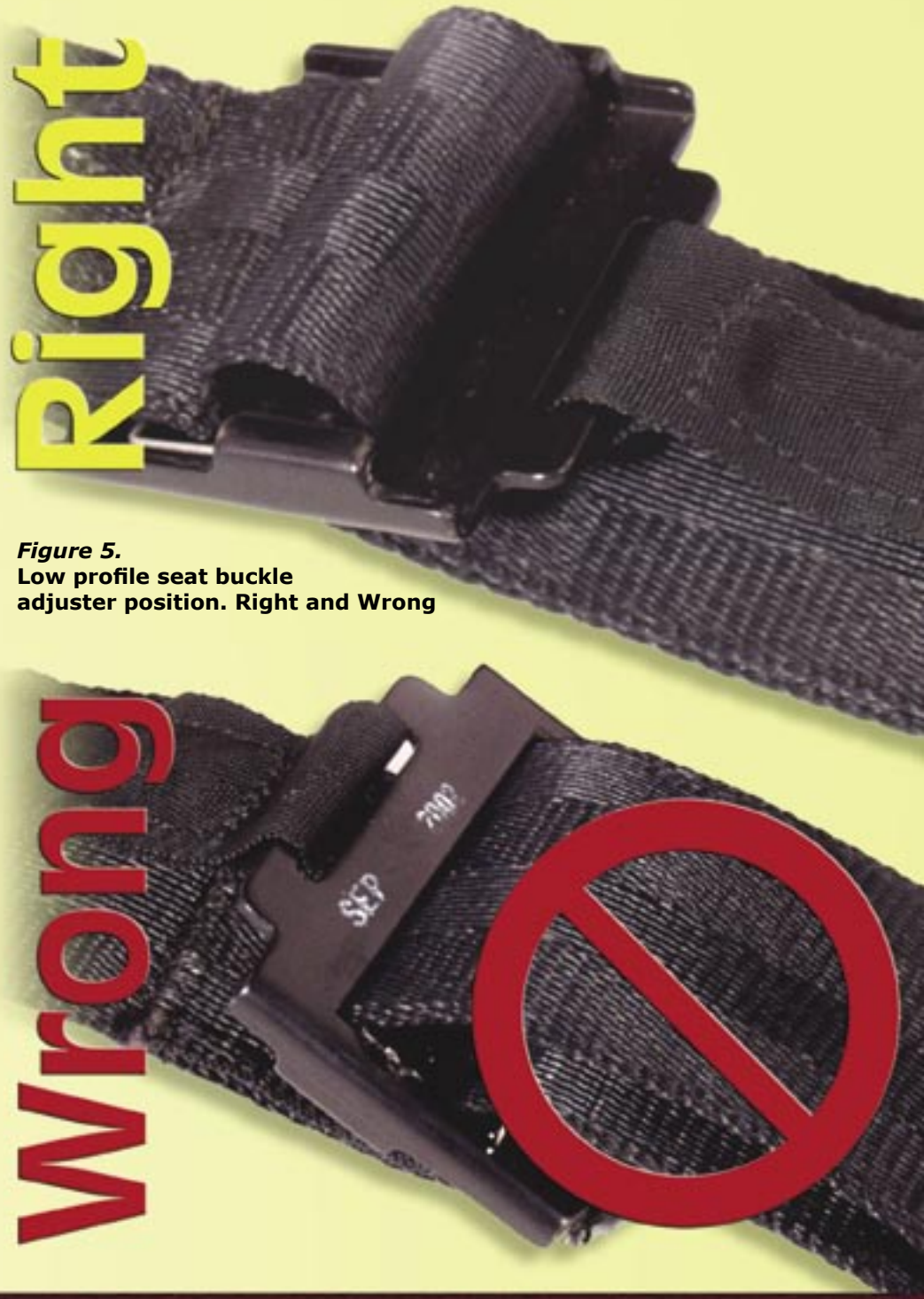


Figure 5.
Low profile seat buckle adjuster position. Right and Wrong

Seat Harness Do's and Don'ts

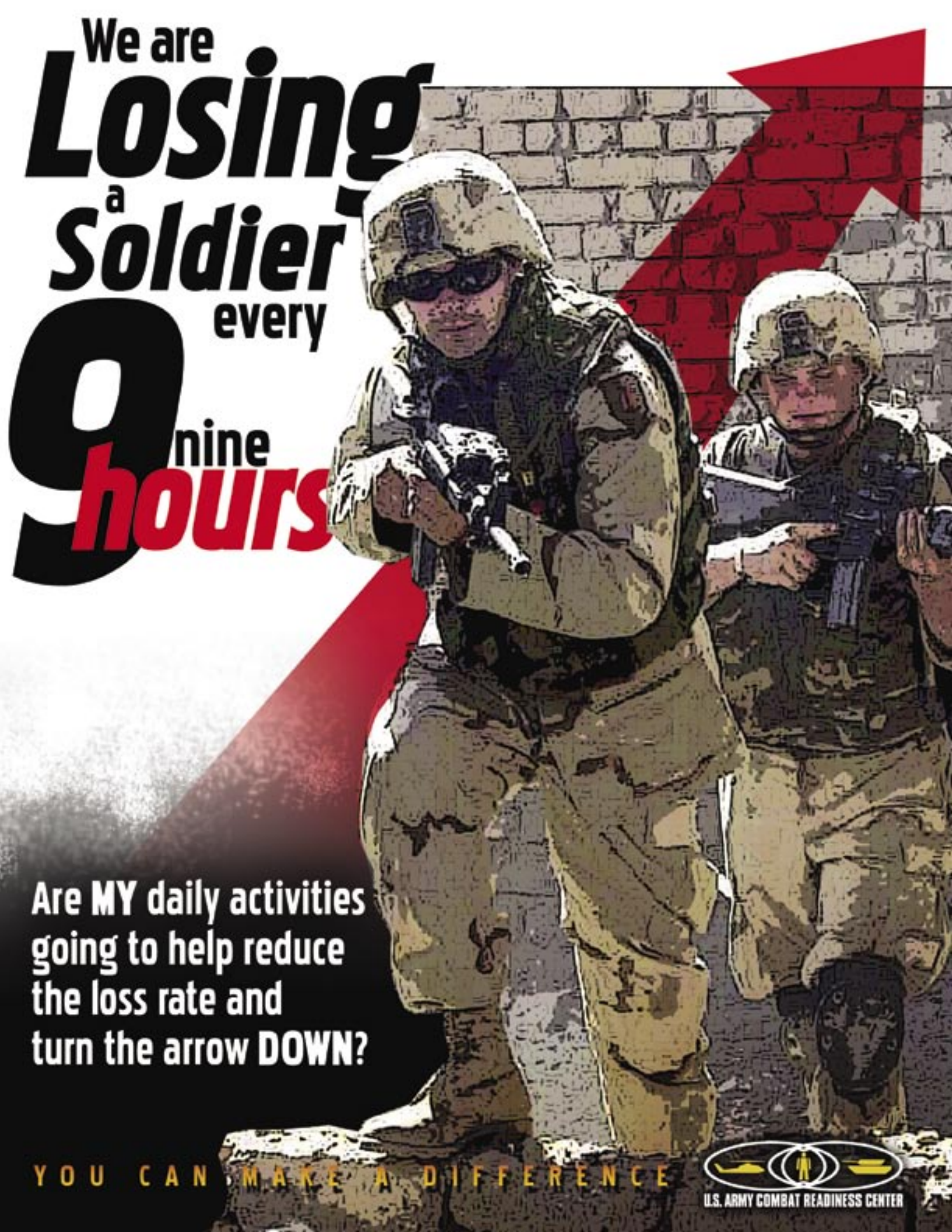
Do

- Check for cuts, frays, and pinches.
- Position the straps correctly.
- Wear straps tight.
- Check the lap belt adjusters.

Don't

- Fly with damaged webbing.
- Fly with loose straps.

We are Losing a Soldier every 9 nine hours



Are MY daily activities going to help reduce the loss rate and turn the arrow DOWN?

YOU CAN MAKE A DIFFERENCE

U.S. ARMY COMBAT READINESS CENTER

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

MARCH 2005 ✦ VOL 33 ✦ NO 3

Thunderstorms

one of Aviation's Most Hazardous Phenomena

Flightfax

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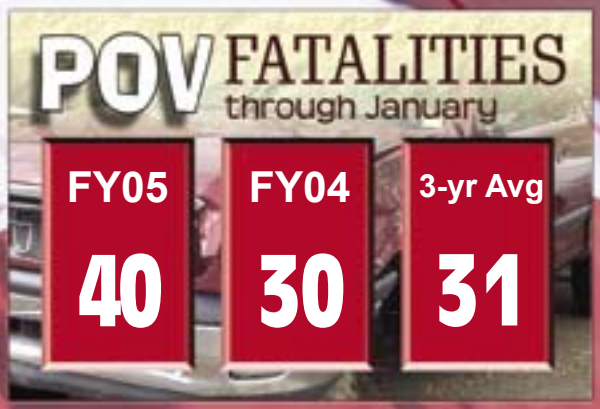

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

Thunderstorms

One of Aviation's Most Hazardous Phenomena

LT COL Bruce A. Lambert (USAF)
HQ DA, G-2 Staff Weather Officer

I know pilots receive training on the dangers of thunderstorms, as well as I know weather forecasters and briefers pass on the necessary hazards forecast for the pilots' risk management assessment. Yet, some pilots still think they can safely fly through thunderstorms or use their radars to navigate their way through thunderstorms. Being in Air Force (AF) weather, I have seen my share of e-mail pictures with hail damage to aircraft in which the pilots decided to fly through a thunderstorm. All of this left me wondering how I could get people to read this article and take thunderstorm safety seriously. I think I've found a way.

Introduction to thunderstorms

There is, on average, at least one aviator who has looked squarely at a thunderstorm on radar or out the window of the aircraft while flying. Almost every second, on average, a lightning strike between the ground and a cloud occurs in the United States. Over 100 lightning strikes take place every second above Earth where over 44,000 thunderstorms are occurring at any given moment, which presents a significant hazard to aviation and ground operations. Therefore, there is a very good chance you'll encounter a thunderstorm within the next month or two. During that encounter, you will face the many and powerful hazards of a thunderstorm, including strong winds and windshears, heavy precipitation, lightning, hail, and tornadoes. Are you ready?

The weatherman's definition of a thunderstorm is pretty basic, yet misunderstood by many. A thunderstorm is any local storm with lightning and thunder produced by a cumulonimbus cloud, usually producing gusty winds, heavy rain, and sometimes hail. However, the only official criterion a weather observer uses to identify a thunderstorm is thunder. That's all, just thunder, according to the handbook published for observers.

Cumulonimbus clouds are vertical columns of cloud mass with rain descending from them, which could potentially be thunderstorms. But technically, until the first thunder is heard, it is not a thunderstorm.

Weather manuals were recently changed to allow observers to report thunderstorms when the airport environment's regular noise would hamper the detection of thunder. Weather observers can now use the presence of lightning in the immediate vicinity (5 NM) or hail to identify when a thunderstorm is impacting an airfield. The weather observation will stop reporting thunderstorms 15 minutes after the last reporting criteria are observed.

This, however, begs one of aviation's biggest questions. How do the newly automated weather-observing systems found on civilian airports sense thunderstorms? The answer is that unless a human is augmenting the system, it doesn't. For this reason, the AF policy is not to use these systems at airfields unless augmented by an observer.

For the sake of space and to not overwhelm the reader with the scientific descriptions of how a thunderstorm develops and all the associated hazards within the thunderstorms, this information is readily available in AF Handbook 11-203, Vol 1, *Weather for Aircrews*, Col Tim Minor's article in the June 1998 *Flying Safety Magazine*, "Thunderstorms – Up (Too) Close and Personal," and other weather handbooks. I will address thunderstorm avoidance

using some material from the National Weather Association.

Avoiding the thunderstorm in flight

Thunderstorms are laden with a myriad of unacceptable environmental hazards to aviation. In simpler terms, avoid thunderstorms while flying your aircraft.

How do you do that? The first technique is the old "see and avoid" concept. Look out of the cockpit for signs of convective activity. This is a small list of things to look for that give evidence of convective turbulence, lightning, hail, downbursts, microbursts, and severe windshears—

- Anvil cloud form approaching.
- Darkened color to clouds.
- Churning vertical clouds.
- Vertical clouds that are growing.

The next step is to use the weather radar (if you have one) available to you while airborne. Not every weather hazard in a thunderstorm is visible on weather radar. Since the radar is dependent on the return of reflected electromagnetic radiation, the ability of a particular hazard to reflect the beam will have a direct impact on what we can sense. See the Federal Aviation Administration's guideline for aircraft reflectivity below.

Radar will not sense the following: small cloud droplets, fog, ice crystals, or small dry hail or graupel (granular snow pellets). This list is significant for three reasons. First, if you are using your weather radar to scan your flightpath for weather that is out of visual range (150 to 200 NM), you may paint a group of individual cells and conclude you could visually circumnavigate them when, in reality, you may be facing a wall of clouds with embedded thunderstorms. Second, the low reflectivity of the surrounding clouds may not show up on the radar, creating the false impression that there is a "hole" in the clouds. Finally, the anvil portion of a thunderstorm does not appear on radar since it consists primarily of ice crystals.

Since radar is our primary method of sensing thunderstorms, it is important to know how each type of precipitation affects what the radar displays. The chart of reflectivity from least-reflective precipitation to the most-reflective precipitation shows us that "bigger and wetter" is more reflective than "smaller and drier." (See chart on next page.)

Depending on the precipitation type and its movement, recognizable thunderstorm patterns will show where the hazards are. It's important to know what to avoid on our radar screens.

- Avoid a target with a dry intrusion (drier air being sucked into the thunderstorm) giving it a V or U shape. There are several reasons for this. Severe thunderstorms have dry air mixing in the middle altitudes which can create an intrusion. Hail rising and descending in a thunderstorm would also appear as a missing area cutout from the storm.
- Avoid a target with a hook or bow shape. Hook shapes are indicative of rotations taking place within severe thunderstorms. This is a strong clue to ground weather observers that hail and tornadoes are possible.
- Avoid a target with protruding "fingers." Like a hook, a finger shows strong possibilities for tornadoes and hail.
- Avoid a target with an asymmetric coloring and shape. Remember, severe storms created by windshears aloft will tilt to one side. This gives shapes and colorings that are not even or concentric.
- Avoid a target with an "arrow shape." Again, this is indicative of a storm with tilt and the possibility of severe hazardous weather.
- Avoid a target with scalloped edges. Scalloped edges show turbulent motions taking place within the cloud. There is a good chance for hail here also.
- Avoid a target with changing shapes. Rapidly growing shape show rapid motions taking place within the cloud. Turbulence will almost always take place under these conditions.
- Avoid a target storm with a few VIP Level 1 dots showing nearby. Hail falls many times outside of the thunderstorm. Checking the winds at altitude and correlating it to the side of the storm that hail will fall should help identify that potential hazard.

Flying techniques to remember

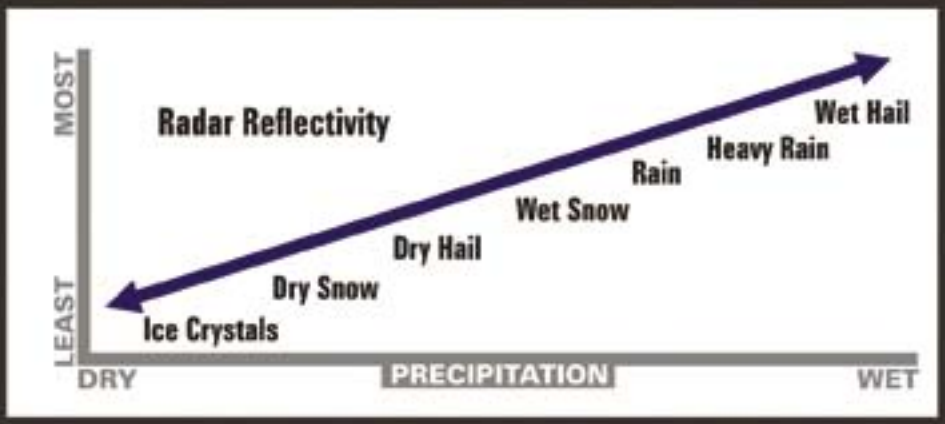
Publications from the FAA and USAF give aviators numerous tips and techniques to help with that occasional encounter

Federal Aviation Administration's Guideline for Aircraft Reflectivity

from FAA Advisory Circular 0045C

VIP Level*	Echo Intensity	Precipitation Intensity	Rain rate (in/hr) in stratiform clouds	Rain rate (in/hr) in convective clouds
1 green	Weak	Light	less than 0.1	less than 0.2
2 yellow	Moderate	Moderate	0.1 - 0.5	0.2 - 1.1
3 red	Strong	Heavy	0.5 - 1.0	1.1 - 2.2
4 red	Very Strong	Very Heavy	1.0 - 2.0	2.2 - 4.5
5 red	Intense	Intense	2.0 - 5.0	4.5 - 7.1
6 red	Extreme	Extreme	more than 5.0	more than 7.1

*VIP Level refers to the Video Integration Processor which interprets the reflected energy and provides a location and color to the return for display on the monitor.



with a thunderstorm. Some, of which, are important enough to repeat again.

■ Don't fly over thunderstorms. Storms can grow rapidly through your altitude, producing severe turbulence. Also, hail can shoot through the top of the thunderstorm in clear air above and fall downwind.

■ Don't fly under the anvil where hail damage and lightning can occur.

■ Don't fly into virga where turbulence is likely.

■ Avoid all thunderstorms by 20 miles or more since lightning and hail have been known to extend that far from the clouds.

■ Weather warnings are for thunderstorms defined as "severe." These storms produce ¾-inch hail, tornadoes, or 50-knot wind gusts. There's a lot of damage that can occur in thunderstorms that are not flagged by warnings or a SIGMET (significant meteorological report).

If you have to penetrate:

■ Go straight. Don't turn around.

■ Avoid the altitudes with temperatures of plus/minus 8 degrees Celsius.

■ Don't chase altitude. Hold your attitude and watch airspeed.

■ Use all anti-icing equipment.

■ Turn all lights in the cockpit on full and lock shoulder harnesses.

Conclusions

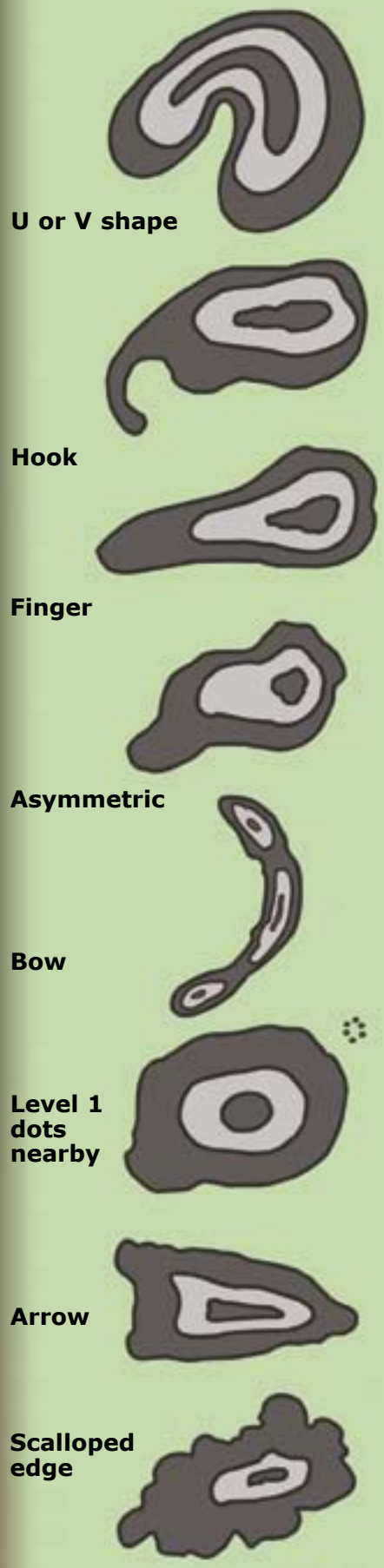
Thunderstorms are one of aviation's most hazardous phenomena. They can impact aviation from windshears, lightning, heavy precipitation, tornadoes, and severe turbulence to hail. Knowing how to recognize and avoid thunderstorms and their hazards is one of the most important lessons of aviation weather training.

I promised you at the beginning of the article to state my idea to make you take thunderstorm safety seriously. Read the "Tempting Fate" article on page 6, which is a condensed version of the September 2001 *Flightfax* article. Now imagine one of two scenarios.

1. You are one of the investigators and you knew the flight crew.
2. You were one of the flight crew and your loved ones (parents, spouse, or children) are clipping the article to include in a scrapbook they have created since your funeral.

Think safety and fly safe. ♦

—LT COL Lambert is the HQ DA G-2 Staff Weather Officer. You may contact him by calling DSN 225-2726 (703-695-2726) or e-mail bruce.lambert@hqda.army.mil.



There are no new accidents. The following accident happened several years ago. A C-23 aircraft was destroyed and 21 fellow servicemen died. It's easy to learn from mistakes, but that often means somebody had to pay the price for our re-education. I hope that as you read the account of this flight you are able to see what can happen when you don't stay on the ground, land early and take cover, or stay well clear of severe weather.

The flight

The mission was to transport 18 Air Force National Guardsmen (AFNG) from their training site to their home station. A C-23B+ Sherpa from the Army National Guard flew the mission. The commander briefed the mission and rated it as low risk. The crew departed home station and flew to the AFNG's training site to remain overnight prior to the mission.

The flight crew arrived at base operations approximately 1 hour before the scheduled takeoff time on the day of the mission. About 40 minutes before takeoff, the crew received a weather briefing. The forecaster identified an area of thunderstorms along the crew's filed route of flight with 16 to 45-percent coverage and maximum tops at 50,000 feet. He told the crew to fly as far east as possible before turning north to avoid the weather. The crew did not ask the forecaster any questions.

The crew filed an instrument flight rules (IFR) flight plan to fly a northeasterly route along a series of VOR airways to their destination. They requested a cruising altitude of 9,000 feet mean sea level and estimated their time en route as 3+ hours, with 5+ hours of fuel onboard. A passenger manifest listing 18 AFNG passengers was attached to the flight plan. The flight engineer loaded the aircraft with the passengers and baggage as the crew readied the aircraft. He computed the weight and balance for the flight prior to departing home station.

The crew departed the training site and, a few minutes later, air traffic control (ATC) had the aircraft under positive radar control at 9,000 feet. ATC then advised their traffic of Convective SIGMET 11E, which implies severe to extreme turbulence, severe icing, and the potential for microburst and windshear. The advisory stated there was a line of severe thunderstorms moving from 280 degrees at 30 knots with tops at 40,000 feet. Hail to 1 inch and wind gusts to 60 knots were also possible.

Traffic was further instructed by ATC to contact flight service or monitor Hazardous Weather In-flight Advisory Service (HIWAS) for the advisory details. The C-23 crew did not contact any flight service station for more information on Convective SIGMET 11E. (It is not known if the crew monitored HIWAS on any VOR in their vicinity.)

The crew continued to stay on their filed route of flight, avoiding buildups with small flight deviations. One approach control assisted them in avoiding some heavy thunderstorms (levels 3 and 4, and some level 5). The crew informed ATC their C-23 was equipped with weather radar and a Stormscope.

The Sherpa crew never deviated to the east farther than a heading of 063 degrees. They maintained their northeasterly heading throughout the entire flight with only short deviations for weather as each air traffic facility advised them of the line of severe weather.

Approximately 45 minutes after takeoff, the crew checked in with their last ATC facility. The crew was given the current altimeter setting, which they read back. ATC received a good transponder code from the aircraft that showed them at their assigned altitude. Soon thereafter, their altitude began to drop for no apparent reason; then, 10 minutes after checking in with this controller, the C-23 disappeared from the radar screen. The controller did not hear a Mayday call, nor did he receive a 7700 emergency transponder code. The controller made numerous attempts to contact the crew, but received no replies.

Lessons re-learned

The crew had encountered extreme turbulence and upper-level windshear in the vicinity of a severe and violently developing level 4 to 5 thunderstorm. The crew lost control of the aircraft, which experienced loads beyond its design limits. It broke apart in flight before impacting the ground. Everyone on board was killed.

For more than 3 months, the accident investigation board—which included expert meteorologists, structural and stress engineers, and members from other accident investigating agencies within DOD—toiled over every minute piece of information available from this accident. They didn't find any new accident causation factors; they simply re-learned what every aviator already knows. Thunderstorms can be deadly, and flying into them or near them is simply tempting fate. When the weather is bad, the safest place for an aircraft is on the ground. ♦

—Adapted from "Flying in Bad Weather is High Risk" in the September 2001 Flightfax. Mr. Gary D. Braman wrote this article when he was an aviation accident investigator at the former U.S. Army Safety Center. He is currently a System Safety Analyst for CAS in Huntsville, AL, and can be contacted at DSN 746-4177 (256-876-4177), or e-mail gary.braman@uh.redstone.army.mil.

Staying on top of the weather is a continuing challenge, but it's one all of us must recognize. Since no aircraft can withstand the full impact of the tornadic forces often generated by thunderstorms, avoidance is the best policy. One of the best protections against encountering thunderstorms in flight is being forewarned of their existence. If available weather information hints at thunderstorm possibilities, if your weather forecaster confirms their existence, and if those clouds in the distance begin to look boiling, think again before making the "go" decision. When in doubt, turn about!

Ask Yourself...

Even if it's legal to go, how prudent is it?
What happens if it's right at the limit—just good enough to take off? What if you take off and then it turns to soup 15 minutes into the mission? What are you going to do now? Can you land where you are and wait it out? What are you going to do if you can't?

Do you have a plan?
What if it gets so bad that you decide to turn around and you bump into the clouds? What are you going to do now? Do you have enough fuel? Are you prepared to deal with IMC?

Am I truly prepared to deal with IMC?
Do you have excellent proficiency? Are you totally prepared? Do you have a plan that you've coordinated with the rest of the aircrew? Have you briefed it? Is the aircraft properly equipped? Do you have NAVAIDS and are instrument approaches available? Do you have a coordinated plan to reduce the effects of spatial disorientation should it strike you or another crewmember in inadvertent IMC?

How bad does it have to get before I say no?
If you are routinely flying in the worst weather that's legal to fly in, it's only a matter of time until you find yourself inadvertent IMC. And if you're not ready—not fully prepared—this could be where the statistics catch up with you and you have an accident. And please remember that accidents resulting from inadvertent IMC situations are very rarely minor accidents.

Is this mission worth doing in this weather?
Maybe your unit should establish some weather criteria of its own. How much experience does the unit have? Are you a bunch of old-timers who have a lot of IFR time and are well prepared to deal with IMC? Or are most of you rookies who haven't been inside a cloud since you were with your IP in flight school? Or are you somewhere in between? Maybe you should have different unit minimums that consider not just crew experience but mission criticality as well. And what if you establish ahead of time the level at which go-no-go decisions are made—that if the weather is here, then the decision must be made at this level. In other words, what if you elevate the decision to a level that's consistent with the level of risk?

Sound familiar? Good! That's using good sense ... and basic risk management.

You know the airspace, but do you know the airspace you're in?

Arthur Estrada
USAARL

Sometimes a little self-reflection is good in order to identify and improve weaknesses. Are leaders, who are responsible for the training and proficiency of aviators, doing everything they can to ensure every pilot is prepared to safely operate Army aircraft? An area that could use more attention deals with airspace knowledge and inadvertent instrument meteorological conditions (IIMC).

Every aviator who has been around for a while knows the dangers of IIMC. It's extremely difficult to go from an orientation with outside visual references to one of flight instruments only. The results are sometimes catastrophic. During the last fiscal year, the Army experienced three non-combat mishaps due to IIMC: one Class E and two Class As. We lost three precious lives and two UH-60Ls. There is no way to know how many close calls were never reported.

So what's the problem? Why do we keep flying into weather we have no business in? Are we negligent? Are we irresponsible? Or are we a bunch of risk takers? My guess is our aviators get into trouble because they have a sincere desire to accomplish the mission, but they are inadequately trained in visual-spatial skills as they relate to airspace.

What are visual-spatial skills? Visual-spatial skills allow you to look at a two-dimensional visual flight rules (VFR) sectional map and visualize it in three dimensions, and then project it into the invisible airspace in front of you. This skill is critical to apply the appropriate flight rules to the appropriate airspace. Clearly stated: You cannot apply the appropriate rules if you don't know what class of airspace you're in. For example, if you're operating in Class E airspace (and don't know it) with only ½-mile visibility, you're setting yourself up for IIMC. Just because you can see the ground doesn't mean you're in compliance with VFR.

My 18 years as an instructor pilot (IP) have demonstrated clearly that Army pilots, in general, have command of the airspace rules during the oral examination at the table, but are very weak at applying these rules during the planning phase and especially during actual flights. (Recent interviews with many

senior IPs corroborate this assessment.) All graduates of flight school remember the airspace class in which we were provided the dimensions (lateral and vertical) of the different classes of airspace and the flight rules (visual and instrument) associated with each. We know each class of airspace has its own set of rules which include the minimum visibility, minimum cloud clearances, and the aircraft equipment required in order to legally operate within that airspace. These rules keep you safe, especially on VFR flights. Before graduating from flight school, students had to pass written and oral exams regarding their knowledge of these rules. But what is not tested very well is the ability to apply and correlate these rules during actual flight. Many seasoned aviators know that it might take years to develop this ability.

How can IPs help?

Regardless of flight altitude, helicopter pilots tend to relate to the ground for orientation and awareness rather than to the airspace they are planning to fly through or actually flying in. How can you help change this intuitive perspective into one that includes the invisible air above the terrain?

Develop visual-spatial skills

IPs must ensure pilots, especially those with limited experience, develop visual-spatial skills. Make certain they are able to incorporate the vertical dimensions of airspace during the mission planning phase, and not just plan to "fly around" the lines printed on the VFR sectional to remain clear of a given airspace. Some pilots appear to intuitively visualize the printed lines as being on the ground and extending upward to infinity. Ensure pilots know that they might travel beneath or above the printed lines and still maintain that particular class of airspace through which they desire to fly.

Test application of flight rules during actual flights

This is key in developing pilots' visual-spatial skills. The goal of every IP is to assure the progression of learning to the highest levels: application and correlation. These "tests" need not be formal evaluations. During the conduct of a mission, IPs could quiz pilot(s) and the flight-leads of their formations as to the class or classes of airspace through which they are flying to ensure the maintenance of this important component of aviation situational awareness. If clouds are present, ask frequently about the maintenance of cloud clearances. This quizzing will reinforce situational awareness, test the proficiency of airspace knowledge, and better prepare aviators to recognize and take action at any signs of deteriorating weather.

Teach what to do when encountering deteriorating weather

Pilots know their IIMC procedures, but do everything in their power to keep from executing them, including running into trees and terrain. What they need to know is how to decide what to do before they HAVE to actually execute the procedures. First, they must be able to recognize when the weather conditions are becoming close to minimums by correlating the airspace they're in with the appropriate rules. Then, they must decide on a good strategy: land the aircraft (if possible), turn back or alter course/altitude to an area or class of airspace where VFR (the rules) or Special VFR can be maintained, or ask for and receive an IFR clearance. Bottom-line: **DON'T CONTINUE TO FLY VISUALLY IF YOU ARE NOT MAINTAINING THE RULES FOR THE AIRSPACE YOU'RE IN.**

Teach techniques to judge visibility

The ability to judge visibility is a critical skill that is not taught in any formal aviation course of instruction. Instead, we rely on experience, mentorship, and trial and error to develop a skill that is fundamental to the maintenance of flight rules. Pilots must be able to know

what one statute mile of visibility looks like. (The mental image of a mile may be quite different to someone from Montana than it is to someone raised in the Bronx, NY.) Teach techniques such as using relative distances, map cross-referencing, and speed vs. ground-covered computations. Without the fundamental ability to judge visibility, pilots cannot be expected to maintain flight rules.

What can be done by the Army?

As alluded to earlier, the Army has continued to teach airspace in the same way it has for decades, by lecture method. Perhaps it's time for some innovative training methods to augment the lectures. A suggestion is to provide computer software and stations where pilots (especially student pilots) can fly "virtually" through airspace classes that are depicted in areas of differently shaded colors. In other words, after the necessary lecture, the student could reinforce all that was disseminated via a visual representation of how airspace is structured from a cockpit perspective. This would surely result in better visualization and comprehension, as well as be used to develop important decision-making skills.

The Army's flight simulation capabilities have improved exponentially and are very impressive. However, the visual emphasis has been on better representation of the terrain and of enemy forces. Just as threat ranges are depicted in volume-metric domes, the same technology could be used to represent the airspace structure as described above for the computer software. Imagine the usefulness of this feature during initial and refresher training and its importance as a tool for the development of pilot visual-spatial skills.

Conclusions

The Army continues to experience costly IIMC mishaps. Maybe it's time to look at the fundamental reasons for these events. Yes, the weather at times is quite unpredictable. Let's help our pilots develop the visual-spatial skills necessary to deal with it effectively and safely. Let's do this early in their careers before they become pilots-in-command. And then, let's continue to reinforce these skills throughout their careers. Let's ensure they progress beyond rote knowledge and understanding to application and correlation. Let's teach them what to do *before* they get into trouble, not just concentrate on what to do after they get in trouble. Last, but not least, let's help pilots by ensuring they know their airspace—and more importantly, at all times, they know what airspace they're in. ♦

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Investigators' Forum

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

MAJ Steven Van Riper
U.S. Army Combat Readiness Center

You Asked For It!

Aircrews are sometimes asked to give their passengers a memorable ride. Performing unnecessary maneuvers to satisfy passenger request, or for any other purpose, introduces unanticipated risks into well-planned missions.

The mission, consisting of two Army UH-60Ls and two Marine Corps AH-1Ws, was to provide a daytime quick reaction force capabilities demonstration at a forward operating base for visiting VIPs. The flight departed at 0930 and laagered south of their demonstration site awaiting their time-on-target. The accident aircraft was a UH-60L and Chalk 2 in the flight, with the AH-1Ws in the Chalk 3 and 4 positions and the other UH-60L was Chalk 1.

After 10 minutes of holding at the laager site, the flight was informed the demonstration would be delayed 10 to 15 minutes. Chalk 1 made a request to fly to the south and visually check some known Points of Origin (POOs) of recent rocket attacks. The USMC flight lead (Chalk 3) did not deny the request, so the flight departed the laager area and proceeded southeast to the known POOs.

En route to the POOs, the UH-60Ls transitioned to terrain flight while the AH-1Ws remained at attitude in the Chalk 3 and 4 positions. The flight had been briefed for terrain flight, although specific mention of visual reconnaissance of POOs was not included in the pre-mission briefing. After reaching one of the southeastern most POOs, the flight turned west and proceeded through the foothills back toward the flat terrain around the demonstration site. As the flight turned more northwesterly, the Chalk 2 PC transmitted "Taking room to maneuver" over the flight's internal radio frequency.

The copilot of Chalk 3 observed Chalk 2 decelerate and increase the separation between Chalks 1 and 2. As the separation increased, Chalk 2 was rapidly ascending and descending over the small hills in the area. After ascending over a hill and then descending, Chalk 2 impacted the ground in a near level attitude, heading 240 degrees, skidded 67 feet, bounced once, and continued skidding for 330 feet until hitting a manmade rock wall. The aircraft then pivoted vertically about its nose, yawed right 90 degrees, and rolled 270 degrees before coming to rest inverted. One crewmember suffered fatal injuries.

Unwarranted request and unnecessary flight maneuvers

An interview with a passenger in Chalk 2 indicates a request was made to the crew by one of the passengers before takeoff to "Fly hard." The request was relayed to the PC by one of the CEs. The request was denied by the PC based on the anticipated presence of senior officers at the capabilities demonstration. As the flight turned back toward the demonstration site, Chalk 2 transmitted "Taking room to maneuver" on the flight's internal frequency. Chalk 2 increased separation from Chalk 1 to approximately 10 rotor disk

diameters and began terrain flight over 400- to 500-foot-high hills. Just prior to this, a passenger sitting in the center forward-facing troop seat and wearing a communications headset, heard one of the CEs ask again to "Fly hard" and then heard a response from an unknown source say, "You asked for it."

The aircraft then negotiated one hill using a cyclic climb followed by a rapid, nose-low descent. The PC of the accident aircraft then used another cyclic climb to crest a second 400-foot hill. The board determined, from witness interviews with the PI, PC, and statements from other eyewitnesses, as the aircraft flew over the top of the hill, the PC placed the aircraft in a 30-degree nose down descent by moving the cyclic forward and lowering the collective to the full down position. This maneuver caused the passengers and crew to experience a period of weightlessness. Witness interviews revealed several unsecured items in the aircraft were floating. One passenger witnessed a wheel chock float between the cockpit and crew chief stations, and then into the cockpit area during the maneuver. The PC attempted to recover from the maneuver by applying aft cyclic and moving the collective upward. He found the cyclic moved freely but the collective could not be moved upward.

Preliminary results of the investigation revealed an unsecured wheel chock floated up and forward while the aircraft was experiencing negative G forces during the descent after cresting the hill, and came to rest between the right pilot seat and center console. The position of the wheel chock severely limited collective movement and prevented the PC from arresting the aircraft's rate of descent prior to the aircraft impacting the ground. The Accident Investigation Board determined the PC believed he needed to perform unnecessary flight maneuvers in response to requests by passengers to "fly hard."

Lesson learned and conclusions

Leaders must anticipate internal and external pressures placed on the aircrews and properly prepare them to deal with these situations. Professionalism must overcome pride and discipline must override showmanship. Every aircrew member must recognize and denounce unwarranted requests from passengers or fellow crewmembers and avoid the risk associated with unnecessary maneuvering. ♦

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ALSE Advice FROM USAARL

LTC Mark Adams,
CW4 Dennis Bergstrazer,
and Joe Licina
USAARL

Wear It Right

This is Part 3 of a 3-part series. Other topics concerning ALSE will be published in succeeding issues of *Flightfax*.

ALSE has performance limits just like your aircraft. If you don't wear it or look after it correctly, it will not function correctly. The U.S. Army Aeromedical Research Laboratory (USAARL) doesn't always get the design absolutely right for every type and shape of aviator; that's why we depend on your feedback to tell us when equipment is uncomfortable or doesn't do its job. Hundreds of thousands of dollars are spent to produce the best ALSE possible to give you the best chance of survival in the event of a mishap.

Flight Gloves

In a fire-related mishap the alloys, composites, and plastics of the airframe may rapidly become too hot to touch during an emergency egress event. When a contact surface is too hot, the body's defense system keeps you from holding onto it; the natural reaction is to let go. This will delay your escape or prevent you from assisting someone else. Gloves protect you from this thermal hazard and allow immediate egress when seconds count.

Your flight gloves can lose their fire-resistant properties if they have grease, oil, fuel or other contaminants on them. Figure 1 shows a glove that is worn out, has holes, and is covered in petroleum, oil, and lubricant (POL) residue.

Figure 2 shows a glove that is also worn out. When the glove was exposed to a fire, the seams failed, no longer providing the protection needed. This resulted in the pilot receiving multiple permanent partial, disabling injuries.

The Army ALSE School at Fort Rucker, AL, has set the standard by instructing you to wear your gloves tucked inside your flight suit sleeve. But what if you need to look at your watch? Of course it's convenient to wear your watch on the inside of your flight suit sleeve, but then you have to pull the glove down and expose your wrist to look at it. If you do anticipate this need, consider securing your watch outside your glove or sleeve.

So what do we recommend?

■ Keep your gloves clean. The POL, body oil, dirt, or an accumulation of various contaminants can be cleaned easily by just using a mild dishwashing liquid or even a liquid hand soap and water. Put your gloves on and wash your hands. Rinse your gloves and be amazed at how dirty your gloves were. If you need to repeat the cycle, do it. Do not put them in a dryer. Wear them and let them dry or just let them dry naturally. Do not add anything like fabric softener, hand creams, or other coatings to keep the leather supple.

■ If there is a hole in your gloves, turn them in. End of discussion.

■ If you wear a watch, consider wearing it on the outside or use that clock on the instrument panel that is specifically designed for your needs while in the air.

■ Wear your gloves tucked inside your flight suit sleeve.

Remember the bottom line: ***Wear It Right and Keep It Tight!*** ♦

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Figure 1.
Flight glove with holes and POL staining.

Figure 2.
Fire-damaged glove.

Display Fixation

CW4 (Ret) Sean Morrill
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Cockpits today are more modernized than ever, and technology continues to enhance the amount and quality of information displayed. However, I've experienced display fixation in flight—and I'm sure I'm not alone—caused by these new gadgets. I found that I'm most vulnerable at night, and especially so under night vision goggles (NVGs) when I'm the pilot not flying. Over the years I've had to remind myself constantly to keep scanning outside to assist the other pilot.

Today's glass cockpit demands total focus in working multi-function displays to manage multiple software pages effectively. Programming weapons systems, radios, and navigation data in flight consumes a lot of time and attention. I hate to admit it, but sometimes assisting the pilot on the controls with obstacle avoidance unintentionally goes on the back burner for me.

This phenomenon is not new, however. I've experienced these challenges in aircraft with analog "steam gauges" too. I found out early in my career that focusing too long on anything, inside or out, is not good. I can vividly remember the time when the pilot on the controls and I both fixated on an inoperative landing gear light in an RC-12. That mistake almost caused a re-enactment of a well-known airliner crash in the Everglades!

Maintaining situational awareness is a constant challenge, especially as cockpits and aircraft improve. As an instructor pilot, unit trainer, and aviation safety officer in both fixed- and rotary-wing aircraft, I've come up with a few personal rules that help keep me from fixating inside the cockpit.

Know your software (or displays). The better you know the display pages, the less time you spend fumbling around inside for the buttons. When I transitioned to a new aircraft, I learned as much about the aircraft as fast as I could. I found that even going out and practicing during some downtime with a ground power unit was time well spent that paid off in flight. The better you know your systems, the less likelihood of the pilot on the controls having to come inside to help you. Two pilots looking inside is never good for long.

Program the aircraft system as much as possible on the ground before flight. Use the Aviation Mission Planning System (AMPS) and program your data cartridge, then load and verify your data before flight—especially at night! RC-12s have a finicky, DOS-based AMPS, but I always made a point to use it. This practice helped us immensely during Operations Enduring Freedom and Iraqi Freedom and enabled us to focus on the myriad of other things our flights demanded.

Study software regularly. Most pilots are good about staying in chapters "5 and 9" of the operators manual, but software pages are not something I like to study. I made it a point to try and look at some of them in the –10 whenever I was studying something else. I tried to learn quickly, but that doesn't mean I would always remember it. Staying proficient through regular use and regular study of software is a necessity for me.

Learn to recognize when you become fixated. Know when and where you're more likely to become fixated during a mission profile (e.g., weapons engagements under NVGs) and talk about it during the crew brief before flight. Keep this thought in the back of your mind and make it a point to increase your outside scan rate. Also learn to say something when the other pilot is inside looking at the displays with you, especially if they're on the controls. It's very easy to get lured in while you're the one flying, and even more so if you're instructing.

These few simple, personal rules helped me over the years, and though they aren't a total answer, I hope they assist you in developing your own. It's good for all of us to be focused on the mission—just don't let all the focus be "inside." The aircraft still must be flown, whether we want to look outside or not. ♦

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2004 AAAA Award Winners

The Army Aviation Association of America (AAAA) recently presented the annual aviation awards honoring achievements of individuals and aviation units throughout the Army during 2004. The award recipients are as follows:

Paula Allman
Managing Editor

■ **Army Avn. Trainer of the Year: CW3 David A. Fallon, A Co., 2nd Bn., 160th Special Operations Avn. Regt., Fort Campbell, KY.** *CW3 Fallon was recognized for creating an MH-47E instructor pilot course.*

■ **Army Avn. Medicine: LTC John A. Smyrski III, MD, HHC 25th Avn. Bde., Joint Task Force (JTF) Wings, APO AE 09354.** *LTC Smyrski distinguished himself as the JTF Wings Flight Surgeon of Combined/JTF 76 in support of OIF-5.*

■ **Outstanding USMA Avn. Cadet of the Year: 2LT Michael A. Powell.**

■ **Outstanding ROTC Avn. Cadet of the Year: 2LT Julie A. Perry.**

■ **Army Avn. Fixed-Wing Unit of the Year: CPT Mark Johnson, I Co., 185th Avn. Regt., Gulfport, MS.** *I Co. was the first C-23 Sherpa unit to be deployed to OIF and was the first Army fixed-wing cargo plane to be utilized in a combat zone. While in theater, I Co. transported over 1,420,000 pounds of cargo, 3,120 passengers, and accumulated over 2,500 combat flight hours without major incident or injury.*

■ **Army Avn. Air/Sea Rescue: Crew of Dustoff 56, 68th Med. Co. (Air Ambulance), Bagram, Afghanistan (MAJ David Spero, 1SG Louis Gholston, CW2 Jason Rayburn, SSG Robert Ramirez, and SSG David Hernandez).** *The crew of Dustoff 56 performed a lifesaving mission in hostile territory near the Pakistani border in northeastern Afghanistan. The 6-hour mission involved several hoist operations due to steep, rugged mountainous terrain and necessitated multiple trips to the pick-up site and were performed under day, night, and NVG conditions at over 5,000 feet in elevation.*

■ **Army Avn. Air Traffic Control (ATC) Co. of the Year: C Co., 1st Bn., 58th Avn. Regt., Fort Campbell, KY.** *The Soldiers of C Co. have proven themselves worthy of recognition, providing air traffic services in some of the most remote and barren locations while operating under hostile and austere conditions in the unforgiving Iraqi desert.*

■ **Army Avn. ATC Facility of the Year: B Co., 1st Bn., 58th Avn. Regt., The All-American Tower, Simmons Army Airfield, Fort Bragg, NC.** *The Soldiers of B Co., 1-58th, consistently displayed expertise, professionalism, personal pride and skill during their combat tour of duty in support of Task Force Pegasus during OIF-1.*

■ **Army Avn. ATC Maintenance Technician of the Year: SGT Curt P. Krenning, A Co., 3rd Bn., 58th Avn. Regt., APO AE 09165.** *While deployed to OIF, SGT Krenning was the primary electrician for A Co., 3-58th, TOC and life support area. He was also the maintainer of the only FAA IFR-certified ground controlled approach radar in Iraq, two AN/TSW-7A tactical towers, two AN/TSC-198 tactical towers, and one AN/TRN-30V1 beacon at Balad Army Airfield tower.*

■ **Army Avn. ATC Manager of the Year: SFC William A. Wrancher, B Co., 1st Bn., 58th Avn. Regt., (82nd Airborne), Fort Bragg, NC.** *SFC Wrancher displayed extraordinary drive as the senior ATC tower manager, tactical airspace integration system specialist, and served as one of two fully-qualified ATC examiners within the entire 82nd Airborne Div. While operating in the most hazardous airspace in Iraq, he was directly responsible for responding to five of the first nine aircraft shot down during the war. His outstanding leadership and direction directly aided in saving more than 20 Soldiers while playing a pivotal role in the rescue coordination of a CH-47 shootdown near Fallujah.*

■ **Army Avn. ATC of the Year: SGT Terry M. Horner, B Co., 3rd Bn., 58th Avn. Regt., APO AE 09250.** *SGT Horner was instrumental in assisting his unit in accomplishing their missions while deployed in Germany, Kosovo, and in the joint USA-USAF Balad tower. SGT Horner holds a rating on the AN-TSQ 198, the AN-TSW 7A ATC central, and facility ratings at Steel Tower, Camp Bondsteel, Kosovo, and was the first controller in B Co. to achieve a facility rating in Balad Tower.*

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Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class C**: While conducting NVG/NVS training, the crew heard a loud roar from the rear of the aircraft. During the approach, the shaft driven compressor caution light illuminated. The crew performed an emergency landing and an emergency engine shutdown and eggressed the aircraft. Inspection of the transmission area revealed the auxiliary power unit (APU) shaft had severed at the APU connection and became disconnected from the accessory gear box. *This report was received late*.

■ **Class C:** Aircraft was started with rotor brake activated. Upon noting burning smell and an orange glow from the transmission deck area, the crew initiated fire extinguisher system and shut down and evacuated the aircraft. The main transmission and all rotor brake components sustained damage and required replacement.

D Model

■ **Class A (Fatality)**: Aircraft impacted the ground during gunnery training. Both crewmembers sustained injuries, one fatal. The aircraft was destroyed.

■ **Class A (Damage):** The aircrew was conducting a two-ship mission traveling at 200 foot AGL and 100 knots, and heard a loud bang followed by severe vibrations. The crew attempted to conduct an emergency landing to a field. During landing, as power was applied, the crew reported an uncontrolled yaw. The aircraft landed in a ditch and the aircraft rolled on its right side. There were no injuries to either crewmember.

■ **Class C**: Crew reported N_P overspeed of the No. 1 engine (130 percent for 4 seconds, peaking at 136 percent) during flight.

CH-47

D Model

■ **Class B:** On approach to an unimproved landing strip, aircraft landed hard. Damage to front left landing gear and sheet metal under nose. ECOD: $200,000.

■ **Class C:** Aircraft was ground-taxiing into parking when it experienced failure of right rear landing gear strut during a right turn. This was the second reported right rear strut failure for this aircraft. Unit has been instructed to submit a QDR.

■ **Class C:** Aircraft experienced separation of the right rear landing gear when it contacted a snow-covered rock during approach to land. ECOD: $20,000.

HH-60

■ **Class C:** A MEDEVAC aircraft attempted to park between two parked aircraft in a confined area. One of the parked aircraft was parked with engines shut down, but the rotors were still slowly turning. While taxiing, the MEDEVAC aircraft main rotor blades meshed with the parked aircraft main rotor blades. This resulted in main rotor blade tip cap damage to both aircraft.

OH-58

D Model

OH-58D(R)

■ **Class A:** While conducting a mission, an OH-58DR struck wires, went inverted, crashed and burned. Sister aircraft did not report any hostile fire/activity associated with event. Both crewmembers were fatally injured.

■ **Class C:** During termination of a standard auto rotation, excessive main rotor flapping resulted in two main rotor blades contacting the tail boom causing extensive damage to two main rotor blades, tail rotor drive shaft, tail boom, driveshaft cover, GPS mount and GPS antenna.

OH58D(I)

■ **Class C:** During termination of a standard auto rotation, the crew heard a slapping noise outside the aircraft. Ground personnel saw the M/R blades contact the fuselage and signaled the crew to shut down the aircraft. Postflight inspection revealed damage to two main rotor blades, tail rotor driveshaft, driveshaft cover, GPS mount and GPS antenna.

UH-60

A Model

■ **Class B:** An aircraft sustained main rotor blade damage during flight while transporting a main rotor blade as an internal load. The blade container had been secured crosswise inside the aircraft with cargo straps. Shortly after takeoff, both ends of the container lid came loose and bent upward, contacting the main rotor blades. The crew landed the aircraft immediately without further incident. Postflight inspection revealed damage to all four main rotor blades, both engine cowlings, and the APU door.

■ **Class C:** A MEDEVAC aircraft attempted to park between two parked aircraft in a confined area. One of the parked aircraft was parked with engines shut down, but the rotors were still slowly turning. While taxiing, the MEDEVAC aircraft main rotor blades meshed with the parked aircraft main rotor blades. This resulted in

main rotor blade tip cap damage to both aircraft.

■ **Class C**: Aircraft stabilator contacted the ground during approach to land at a helipad, damaging the tail wheel lock pin as well as the trailing edge of the stabilator.

■ **Class C**: Aircraft stabilator contacted the ground during approach, damage incurred by tail wheel lock pin, as well as trailing edge of the stabilator.

■ **Class C**: While ground taxiing from their parking pad, the blades of one Black Hawk contacted the blades of another that was parked in its assigned parking pad. After blade contact, the crew repositioned the aircraft onto the shoulder of the taxiway and performed an emergency engine shutdown. Inspection revealed that one aircraft sustained damage to one blade and three tip caps and the other aircraft sustained damage to one blade.

■ **Class C:** Aircraft stabilator contacted the ground during terrain flight.

■ **Class E:** While passing through 15,000 feet MSL on climbout to 3,000 feet MSL, the stabilator failed in the AUTO mode. Subsequent reset resulted in another failure. The aircrew performed the appropriate emergency procedure, asked ATC for a clearance to return to base, and performed an IFR approach back to the airfield.

L Model

■ **Class E:** After takeoff, the CHIP INT XMSN segment light and MASTER CAUTION lights illuminated. The aircraft was immediately returned for landing and the engines shut down. Maintenance determined that the intermediate gear box was unserviceable and replaced the unit.

■ **Class E:** Before second leg of mission, the No. 2 engine failed to reach operating Ng, and TGT reached abort limits causing the crew to abort the start. Another start sequence was attempted after one minute with the same results. The No. 2 engine HMU was replaced.

C-12

D Model

■ **Class B:** Landing gear failed to extend. Crew initiated emergency landing procedures. Minimal damage to engines reported, but props were destroyed.

C-26

B Model

■ **Class E:** On takeoff roll, prior to Vr, N2 engine speed decreased from 100 percent to 98 percent. Takeoff aborted.

CAS-212

■ **Class B:** During climbout, left engine torque climbed from 100 psi to 115 psi. Power was immediately reduced and the aircraft was landed.

RQ-7

Shadow Model

■ **Class B (Total Loss):** Air vehicle experienced an auto-pilot failure during transition operations from the forward site back to the launch/recovery site. Air vehicle entered uncontrolled flight, crashed, and was totally destroyed.

■ **Class B (Total Loss):** Air vehicle was being flown for a training mission when the controller reported a spike in the aircraft's RPM, followed by an auto-pilot failure. Ground control station's primary and secondary control links were lost as well. Air vehicle and mission package were destroyed.

■ **Class C:** Air vehicle experienced generator failure during flight, followed by engine failure. The air vehicle was commanded to an FOB and became inverted prior to ground contact.

■ **Class C:** Air vehicle experienced engine failure during climbout. Engine-out procedures were executed and the air vehicle landed hard.

■ **Class C:** Air vehicle experienced engine failure and began losing altitude. Approximately 4.6 hours into flight, the aerial vehicle operator (AVO) noticed an engine failure warning. Within seconds, the air vehicle's engine stopped and the voltage reading dropped to 18, which is the lowest voltage for a parachute to deploy. The parachute deployed at 2,200 feet. Air vehicle was recovered and handed over to the BCT who secured it and moved it back to the launch and recovery site. The air vehicle appeared to have minimal damage.

■ **Class C:** While in cruise flight at 9,000 feet AGL and 93 knots, the air vehicle experienced an engine failure. The air vehicle was remotely turned back towards the originating airfield and the parachute recovery system was deployed. Postflight inspection revealed substantial damage to the nose area, fuselage, payload, and the left wing tip.

■ **Class C:** Air vehicle was launched for a reconnaissance mission. Approximately 3.5 hours into the mission, the rotor air temperature rose dramatically. The aircraft was turned back to base to be recovered. Minutes later the RPM fell from 5,750 to 4,250 and the AVO tried to level the aircraft off to cool the engine and regain RPM. The aircraft continued to descend and the RPM would not respond. The parachute deployed successfully at 1,000 feet and the air vehicle was recovered with minimal damage.

■ **Class C:** Air vehicle experienced engine failure during climbout. Engine-out procedures were executed by the AVO and the recovery chute deployed, and the aircraft landed hard.

RQ-5

Hunter Model

■ **Class C:** Air vehicle was returning to station when a dual engine failure occurred approximately 40 kilometers north of airfield. The recovery chute deployed and the crash plan was activated. Air vehicle came to rest in a remote area. Front engine experienced a 1,000 to 2,000 RPM fluctuation and the aircraft was low on fuel at the time of dual engine failure.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

When in Doubt, Turn About!

• The safest course is away from the thunderstorm area. Go a few miles out of your way or land and wait it out if the shortest and most direct route is through the storm area.

• Lowering ceiling and rain showers may indicate thunderstorm activity.

• Don't be fooled by gentle winds and rain; you could be flying into the teeth of a thunderstorm.

• Excessive radio static is a sure sign of a thunderstorm in the area.

• Don't land or take off in the face of an approaching thunderstorm. A sudden gust front and associated low-level turbulence and wind shear could cause loss of control.

• Don't attempt to fly under a thunderstorm even if you can see through to the other side. Turbulence and wind shear under the storm could be disastrous.

• Destructive hail can be tossed from thunderstorms into adjacent clear areas. Bear this in mind if you're ever tempted to sneak between thunderstorms.

• Don't trust appearance to be a reliable indicator of the degree of turbulence inside thunderstorm.

• Avoid by at least 20 miles any thunderstorm identified as severe.

Editor's note: The months having the highest frequency of storms—June, July, and August—will be here before we know it. So it's not too early to give summertime flying some thought and review what we know about thunderstorms.

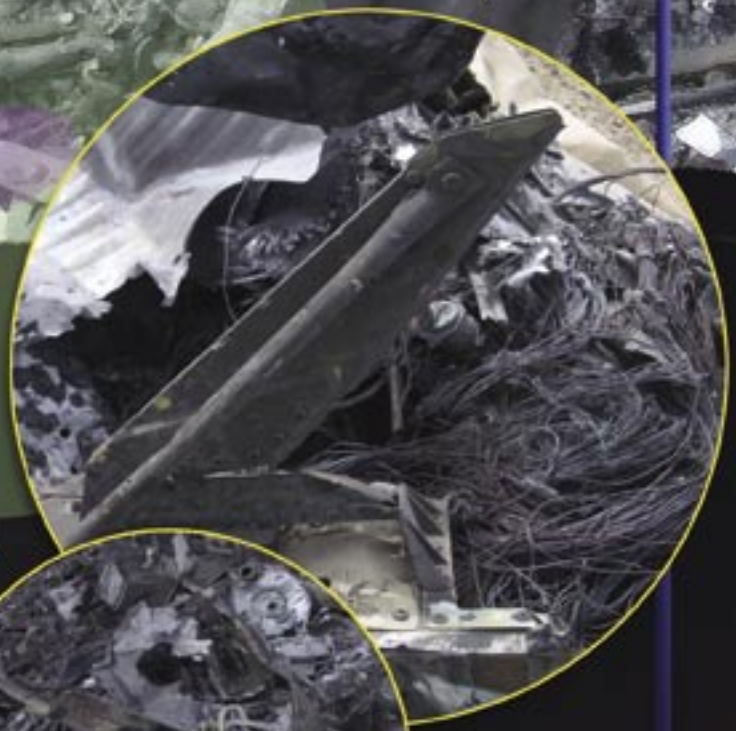
Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

APRIL 2005 ✦ VOL 33 ✦ NO 4

Situational Awareness?

This is what happens when you're not totally focused on flying.



Flightfax

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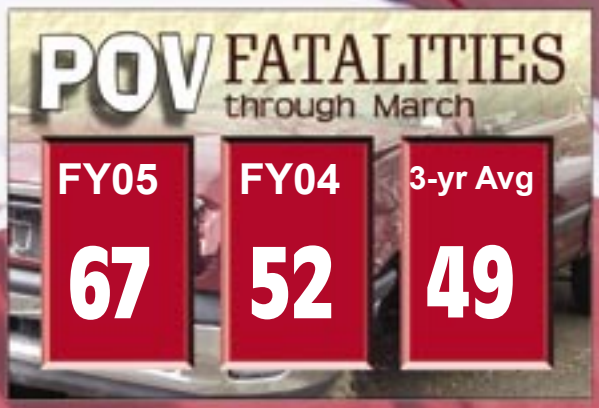

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

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

Situational Awareness: What is it?

Nearly every Soldier who has ever gone on a tour of duty—long tour, short tour, or just a field training exercise—has had lapses in concentration. The ones I'm talking about could be thoughts of upcoming assignments, thoughts of going home, or maybe even that brand-new car you want to buy. The problems with lapses in concentration depend on when and where these moments occur. All Army Aviators—willing to tell the truth—have had these moments and were probably flying an Army aircraft at the time. There is nothing wrong with these mini-mental vacations … except when the situation requires you to be totally focused on flying and surviving.

This accident involved a flight of two OH-58D aircraft conducting a night vision goggle (NVG) reconnaissance and security mission. The complexity of this type mission is readily apparent, however both aircraft crews were very experienced in the area of operation, having flown 8 months and several hundred hours conducting like missions.

On this particular night, the flight of two had completed one mission, received a follow-on mission, and was receiving a FRAGO for another mission when the

accident occurred, destroying the lead aircraft and killing both pilots.

The original mission was thoroughly briefed, the weather was clear with light winds, and both crews were well rested. Standing operating procedures for night/NVG operations included an altitude restriction of 100 feet AGL minimum.

As the two aircraft departed the first mission location and were en route to the second mission, escort security and route reconnaissance, they then received a FRAGO for a third mission. The crews positively identified the supported unit for the second mission and were beginning the route reconnaissance while confirming the instructions for the third mission. The lead aircraft established communications with the moving ground element, descending to approximately 80 feet AGL, while the trail aircraft coordinated the third mission at approximately 200 feet AGL and 800 meters to the rear of lead.

Since the crew was familiar with the area of operation, the trail aircraft was not alarmed when lead descended to the lower altitude to do the route recon. Both flight crews knew the proximity of high-tension power lines that crossed their intended route of flight. In addition, current TTPs for this unit assigned obstacle clearance and avoidance procedures to the lead aircraft.

As the PC of the trail aircraft was completing a frequency change and beginning a left turn to follow the lead aircraft, he saw sparks from the lead aircraft as it struck the second wire of the top two ridge wires.

Although the accident crew was well trained and totally capable of conducting this mission safely, a brief lapse in situational awareness caused this crew to descend to an unsafe altitude in close proximity to a known wire hazard. The PC of the trail aircraft noted the wire hazard on the aircraft Rotorcraft Mapping System and thought lead had the wires insight.

The Combat Readiness Center (CRC) has investigated many recent accidents that have been caused by momentary lapses in concentration and losses of situational awareness—killing Soldiers, destroying equipment, and decreasing combat power. My point is when you strap into that aircraft, you should maintain a professional cockpit, crew coordinate constantly, and be vigilant of your surroundings no matter how much experience you have in the area of performing the mission. It could save your life. ♦

—Comments regarding this accident may be directed to the Accident Investigation Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

Editor's note: The CRC has recently experienced a number of accidents, making us painfully aware of the increased risks associated with our business. These accidents should serve as "red flags," a warning signal to all who have the responsibility of caring for Soldiers. There is no denying that certain risk factors have increased, especially with the operational pace at an all-time high. We urge all commanders, noncommissioned officers, and great young Soldiers to make a renewed commitment to increased safety awareness, more rigorous use of risk assessments, and improved adherence to SOPs and training policies, which are designed to minimize the risks associated with the way we train and fight. YOU are our most valuable resource, and your safety and well being is our most important mission.

Visual Illusions of the Desert

Dusting off what we learned in the 90s, here's a revisit to some aviation lessons learned concerning how the eye reacts to desert environments, especially under night vision devices. These are the most common visual illusions encountered in Southwest Asia.

False horizon or lack of horizon. Light colored areas of sand surrounding a dark area—for example, sand dunes bordering a dry lakebed blending with the night sky can create a false horizon. Sand, dust, haze, or fog may also obscure the horizon.

Height perception illusion. This sensation of being higher or lower than you actually are is due to poor contrast and lack of visual references. It may result in a tendency to inadvertently descend to acquire visual cues.

Ground light misinterpretation. This illusion can occur when ground lights are confused with stars or other aircraft. An aviator who confuses ground lights with stars will unknowingly position the aircraft in unusual attitudes, to keep what he perceives as stars above the aircraft. When ground lights are confused with other aircraft, aviators tend to adjust attitude incorrectly based on the relative position of misinterpreted ground light.

Fixation. When an aviator fixes attention on high-interest targets/objects and stops scanning—the result may be an aircraft flown into the ground.

Crater illusion. Viewing the periphery of the IR band-pass filter (pink light) or IR searchlight gives the illusion that flat terrain, such as that found in a dry lakebed, tends to slope upward. Viewing another aircraft landing using these lights can give the illusion that the observed aircraft is descending into a crater, when in fact it is actually in straight and level flight over a flat terrain.

Lack of motion perception (motion parallax). At low-level flight altitudes, and relatively slow airspeeds, the lack of discernible terrain features may make the pilot think his aircraft is at near-zero groundspeed, when it is actually moving forward. ♦

—Sources: FM 1-301 Aeromedical Training for Flight Personnel and TC 1-201, Night Flight Techniques and Procedures.

WAR Stories

There I was...

CW4 Edward J. McIntyre
Camp Murray, Washington

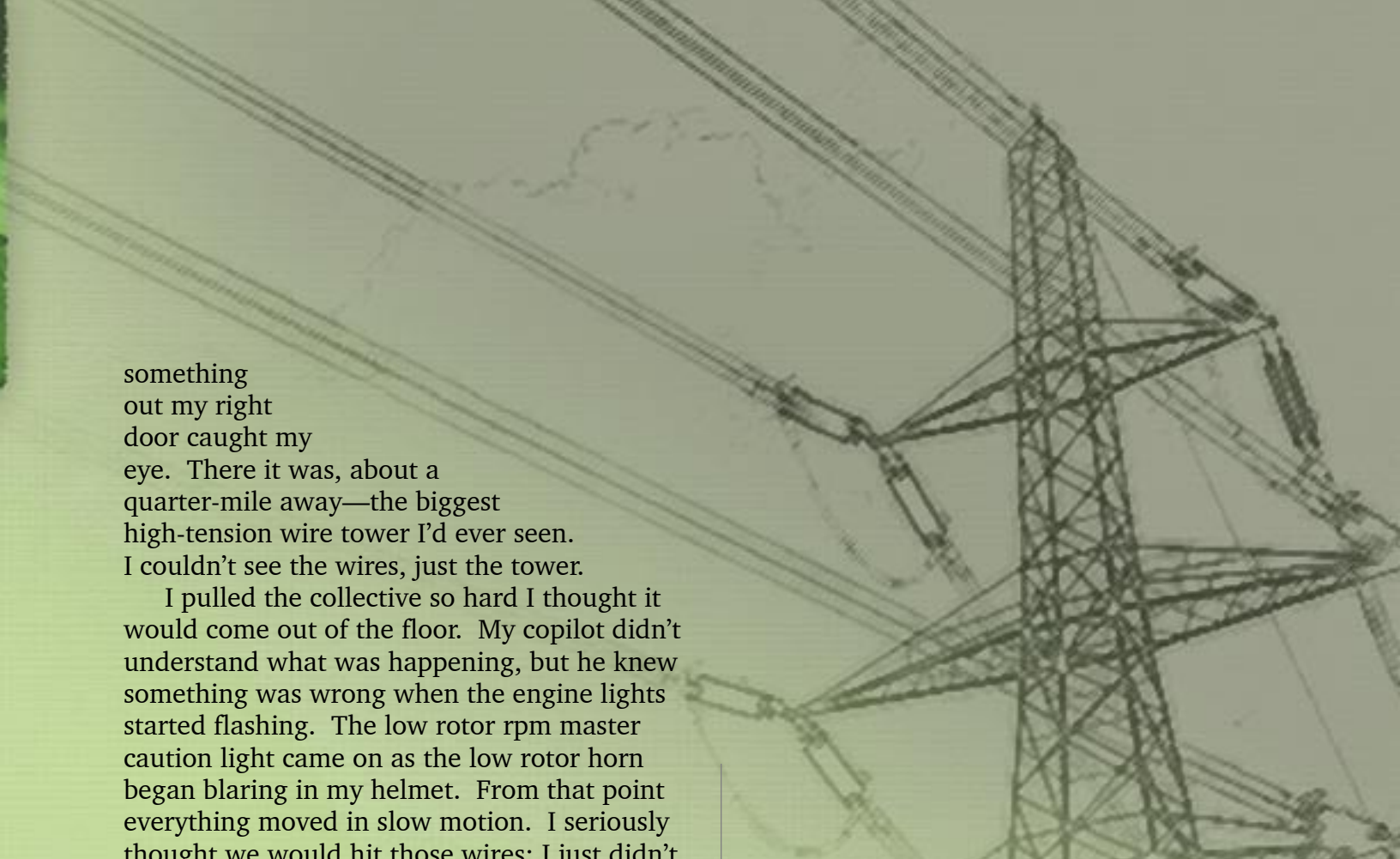
Tallest Wires I've Ever Seen

In early August 1990, I reported to my new commanding officer for my first stateside tour. I wouldn't be stateside long, however. He told me to get my stuff, because we were leaving for Kuwait. The war had been over for about a week when we arrived in country. My unit had received L-model Black Hawks just before we left for Kuwait, and we spent our days flying demolition teams around. Finally, it was time to go home, which meant a stop in Saudi Arabia.

Just after we arrived in Saudi, the unit received orders for one UH-60 to fly an advance party to the port. There was no shortage of volunteers for this mission, because the prospect of running water, a bed, maybe a phone, and real food—or at least no MREs—delighted everyone. As luck would have it, my aircraft was selected for the mission.

It was getting late by the time we started the mission, and the moon wouldn't rise until after midnight. But the weather was clear, there were no clouds, and the visibility was excellent, so we didn't think the dark would be a problem. Of course, the weather *could* change, but we were willing to do anything to get out of the sand. We'd been in the desert for almost 7 months without running water, good food, or even a real bed. My copilot and I were looking forward to sleeping in anything but the helicopter, which had been our home for the previous 3 months.

I was night vision goggle (NVG) qualified and current, but my copilot wasn't, so we weren't issued any for the trip. However, as we approached the port city, it became apparent that a severe dark front had moved in. I climbed to 250 feet, and the port's bright lights were stunning at that altitude. We were a little uneasy because we'd rarely flown above 75 feet in several months, but the view was spectacular. We were to land on a soccer field in a mobile home village the Saudis had built for foreign workers. I'd been there once before for a day's R&R, so I had an idea of where it was. We found the village and as we descended and turned right toward the landing area,



something out my right door caught my eye. There it was, about a quarter-mile away—the biggest high-tension wire tower I'd ever seen. I couldn't see the wires, just the tower.

I pulled the collective so hard I thought it would come out of the floor. My copilot didn't understand what was happening, but he knew something was wrong when the engine lights started flashing. The low rotor rpm master caution light came on as the low rotor horn began blaring in my helmet. From that point everything moved in slow motion. I seriously thought we would hit those wires; I just didn't know when. We were was about to die because of those two words I hate most—pilot error!

Apparently someone had other plans for me, because the engines suddenly came to life with a vengeance. The rpm went from low rotor to almost overspeed in just a few seconds. We missed the wires, but to this day I don't know by how much. Upon our memorable landing, I discovered that one of the passengers had seen the towers and assumed I saw them too. Not that this fact mattered much, because he didn't have a headset. The next day I realized I was right on one point—those towers probably *were* the tallest I'd ever seen! We overflew them on our way back and discovered they were at least 250 feet high.

This whole fiasco started because we wanted to go someplace with lights and running water. The whole mission was a bad call from the start. An NVG crew should've been flying it because you literally can't see your hand in front of your face—let alone wires—on a moonless night in the desert. We were just excited to be going anywhere other than where we were, and that excitement almost cost us our lives.

I've often wondered what I could've done to prevent what almost happened. Really, there's only one answer: I should've done what I was trained to do! The first step to landing at an unfamiliar place is performing a high recon of the area, especially one in the middle of a city on a dark night. I'd like to blame my error on the long day and the excitement of getting picked for "the mission" everyone else wanted. But the bottom line is I didn't follow my training, and I almost killed myself and everyone else in my bird. Learn from my classic example of "get-there-itis." Believe me, a hot shower just isn't worth the risk. ♦

—CW4 McIntyre is a member of the HHC, 1-168th Avn at Camp Murray, Tacoma, WA. He wrote this article while attending the ASO Course at Fort Rucker, AL. He may be contacted by e-mail at edward.mcintyre@us.army.mil.

Have We Forgotten About Scanning?

William (Bill) Ramsey
U.S. Army Combat Readiness Center

The Aircrew Training Manual (ATM) Attack Helicopter, AH-64D, Training Circular (TC) 1-251, standardizes aircrew training programs and flight evaluation procedures. The ATM provides guidelines for executing AH-64D aircrew training, encompasses individual and collective training, and establishes crewmember qualification, refresher, mission, and continuation training and evaluation requirements.

Chapter 4 of TC 1-251 addresses crewmember tasks and explains each one's responsibility for successful completion of the maneuver. A description of crew actions, along with training and evaluation requirements, also is listed in this ATM. Under Task Content you can find the task number, task title, task conditions, task standard, and task description. However, I would like to focus on the following specific task descriptions.

Task 1408: Perform Terrain Flight

"The pilot on the controls will remain focused outside the aircraft and will acknowledge all navigational and obstacle clearance instructions given by the pilot not on the controls." It further states, "He (the pilot on the controls) will announce the intended direction of flight and any deviation from instructions given by the pilot not on the controls. The pilot not on the controls will provide adequate warning to avoid obstacles detected in the flight path or identified on the map and will announce to the pilot on the controls that his attention is focused inside the cockpit."

Case 1

An AH-64D crew had just completed an ATM training flight under the night system and was preparing to return to the airfield. The PC made a radio call to range control and departed the confined area he was working. Range control informed the AH-64D crew they had traffic; a CH-47 was transitioning to exit the range. The AH-64D crew informed range control they would follow the CH-47 off the range.

Shortly after takeoff from the confined area, the AH-64D's PC became disoriented as to his location and, after a few minutes,

he was able to re-orient and locate the CH-47. What the AH-64D crew failed to realize was they were looking at an MH-47 aircraft that was transitioning onto the range and not the CH-47 they were supposed to be following off the range. As the MH-47 made a turn in front of the AH-64D, the crew became confused as to what the MH-47 was doing, thinking they were still looking at the CH-47. The AH-64D crew became focused on what the MH-47 was doing and not fully focusing on what their aircraft was doing.

During this time a comment was made about the AH-64 altitude being a little high, so the aircraft was put into a slow descent to bring it back to the appropriate transition altitude. As the AH-64D crew continued to watch and discuss where the MH-47 was going, the AH-64D continued a gradual descent until the aircraft struck tree tops. The tree strike completely surprised the crew, which eventually led to a loss of aircraft control followed by the aircraft crashing. The two pilots were killed, and the aircraft was destroyed.

Operating under night or night vision device (NVD) considerations includes always using proper scanning techniques to detect traffic or obstacles and avoid spatial disorientation. (Not listed as a consideration under this task.)

Task 1422: Perform Firing Techniques

"**The crewmember not engaging with a weapon system will focus his attention outside the aircraft to assist with obstacle avoidance**."

Case 2

The mission was for AH-64Ds to fly out to the range and conduct Table VI day gunnery and also to harmonize and boresight the aircraft 30mm chain gun. It was the unit's last day on the range to harmonize all its aircraft and the crews were told they needed to focus on harmonizing the guns on the remaining aircraft.

After the AH-64D aircrew successfully harmonized the 30mm chain gun, they made one dry running fire at the target area for familiarization. Each of the next two passes included two rocket engagements and egress 30mm suppression with three bursts. As the second pass was initiated, the AH-64D banked right to egress the target area while suppressing the target area with 30mm fire. The third and final pass was initiated, and after engaging the targets with rockets, the aircraft again egressed with a right bank and 30mm fire was used for suppression. The weapons system was safed by the pilot on the controls while banking the aircraft to the right when, approximately two seconds later, the AH-64D impacted the ground. The aircraft was destroyed, with one fatality and one serious injury.

In each of these two cases, the crew failed at some point to fly their aircraft. The crew failed to maintain their scan of what was going on around them. The crew in Case 1 stopped scanning and fixated on what another aircraft was doing and did not notice their aircraft was in a slight descent. This descent eventually led to the tree strike that resulted in the aircraft crashing and the death of both crewmembers. In Case 2, the pilot on the controls fixated inside the aircraft and failed to maintain a scan outside the aircraft during a right bank, resulting in the aircraft striking the ground and the death of a pilot and severe injury to the other.

Remember that task descriptions are written into each ATM task for a reason. They are there to remind you to focus on flying your aircraft. It takes only a second to become distracted from scanning to place your aircraft and crew in harm's way. If you take nothing else from this article, remember inches and seconds separate you from coming home safely or ending up as a statistic in *Flightfax*. ♦

—William (Bill) Ramsey, MS, CSHO, System Safety Manager, U.S. Army Combat Readiness Center, DSN 558-2932 (334-255-2932), e-mail ramseyw@safetycenter.army.mil.

"GAMBLING ON T

CW4 Gary Graham
Fort Stewart, GA

The year was 1989, and I had just completed my first year as an Army Aviator in Alaska. Life was great! I was no longer the new guy and was starting to gain confidence around the aircraft and in the unit's mission. The week before, I had been part of a crew that navigated poor weather at less than 100 feet over water for more than 80 miles to rescue eight U.S. Marines with severe frostbite.

The mission was to fly a routine night vision goggle (NVG) training mission in the mountains 30 miles west of Anchorage. The aircraft was a 1969 UH-1H Huey equipped to execute nondirectional radio beacon (NDB) and VHF omnidirectional range (VOR) approaches only. The crew consisted of the pilot in command (PC) with 1,500 hours total time, 300 hours NVGs, and 80 hours actual instruments; the pilot (PI) with 350 hours total time, 75 hours NVGs, and 12 hours of actual instruments; and two crew chiefs in the rear of the aircraft. The weather was forecast to be predominantly visual flight rules (VFR) with intermittent conditions of marginal VFR and 1 mile visibility with snow showers.

The execution was flawless for the first hour. The crew interaction and navigation were excellent, and the weather was as forecast. As the evening continued, the ceilings decreased and the snow showers increased with visibility less than a half-mile. The poor visibility resulted in the PC becoming disoriented during the navigation. The PI was given instructions to orbit around a small island in a lake at 700 feet above ground level until the PC could establish their position. A conversation within the crew ensued as to whether they should contact Elmendorf AFB approach control for vectors and an instrument approach or continue VFR. They decided to continue VFR.

The PC continued to study the map as five right orbits were made over the island. On the sixth orbit, the PC assumed the flight controls and executed a left turn. The aircraft immediately entered a cloud, and the PC became spatially disoriented. The aircraft entered a 40-degree nose up, 70-degree right bank attitude. The aircraft's airspeed deteriorated to zero, and the aircraft was falling backwards. Within seconds the PI took the flight controls, leveled the aircraft attitude, and established a forward airspeed. The Huey had fallen almost 300 feet backwards and descended below the clouds. Directly below was a set of high-tension power lines, which the aircraft missed by only a few inches. The crew landed the aircraft at a nearby field and walked away unhurt. The aircraft required recovery by a maintenance team due to possible structural damage.

Every year incidents like this occur in the aviation industry, but not all of the participants are as fortunate to walk away. In the U.S., pilots attempting continued VFR flight in clouds and low visibility account for 51 percent of fixed-wing retractable gear accident fatalities. From January 1974 through August 2002, the U.S. Army experienced 60 rotary-wing accidents as the result of inadvertent instrument meteorological conditions (IIMC).

HE WEATHER!!!

Author's note: For the unqualified pilot, the sudden loss of visual reference is similar to sudden loss of eyesight. Emotional pressures surge, and you lose your orientation in less than 20 seconds. From there, you could start the infamous aerobatics manuever known as the "graveyard spiral" and not even know it.

Prevention measures and techniques

What can be done to prevent or eliminate these deadly, serious incidents? The solution requires action from several locations: the individual pilot, instructors, and flight examiners.

Individual pilots should—

■ Have the discipline to avoid deteriorating weather if they're not instrument qualified.

■ Maintain "very good" instrument flight proficiency.

■ Practice instrument flight until they're confident in their abilities.

■ Be familiar with all instrument approach procedures in their area of operation.

■ Practice instruments during day and night conditions.

■ Maintain situational awareness with regards to decreasing flight visibility and ceilings.

■ Be willing to turn around when the weather begins to deteriorate.

■ Never attempt to re-establish VMC after entering IMC conditions.

Instructors and examiners should—

■ Conduct instrument training in the aircraft at night.

■ Practice inadvertent IMC scenarios.

■ Teach pilots to make flight visibility estimates.

■ Brief past incidents or accidents to increase situational awareness.

Many pilots find themselves in the same scenario mentioned earlier. I was the pilot on that Huey in 1989, and my crew and I are very fortunate to be alive today. The PC experienced spatial disorientation from having his head down studying the map during multiple right orbits and then executing a left turn. My crew was complacent because of the simplicity of the mission; consequently, we failed to identify a contingency for deteriorating weather. We were also overconfident in our crew's ability to continue VFR flight in IMC conditions, having recently conducted several successful missions in poor weather.

Many mistakes were made that night, but the one that almost killed us was the decision to keep flying VFR in IMC conditions. I've passed my experience on to you in hopes you don't learn the hard way like I did. Take my word: DON'T GAMBLE ON THE WEATHER! ♦

—CW4 Graham is a battalion safety officer with the 1-351st Aviation Battalion (TS) at Fort Stewart, GA. He may be contacted by calling DSN 870-0738 (912-767-0738) or e-mail gary.graham@us.army.mil.

Close Calls and Near-Miss Accident Info Needed

Paula Allman
U.S. Army Combat Readiness Center

This is one of those good news, bad news stories. The good news is that the Army Combat Readiness Center is working hard to drive the accident rate down. That means saving precious Soldiers' lives and protecting equipment that only a few years ago would have been lost. The bad news is it is becoming harder for us to discover trends and develop proactive programs to prevent further losses of people and equipment. The trends of the past just aren't there anymore. At times, we find ourselves trying to perform a trend analysis based on one or two accidents. Needless to say, this does not provide an effective database from which to draw conclusions and implement prevention programs.

In our analysis of current accidents we are still being reactive. We are not spotting problems and correcting them before they become an accident. By no means are we advocating that we need more accidents to develop lessons learned and implement prevention programs. Information is readily available; we just have not capitalized on it.

Academic studies have shown that for each serious accident, 59 minor accidents and 600 near-misses occur. Imagine the benefit that could be gained from the lessons learned in those 600 near-misses.

Sharing lessons learned

Other services, for example the Navy, have means for their pilots to share lessons learned from their missions that almost went wrong. Navy pilots write to *Approach* magazine and tell their "there I was" or "this happened to me" stories so other people can benefit from them.

From comments, it appears that pilots everywhere like to read about those death-defying events. Probably a lot of Army Aviators can even relate to some of those precarious situations. They, on the other hand, may not have shared their experiences because of concern about repercussions or just simple pride.

In the Profession of Arms, we all are charged with the responsibility to mentor subordinates. Young members of the aviation team listen when the older aviators speak. They realize they have not experienced every situation and probably will not get the chance to during their aviation career. Granted, aviators learn through hands-on experience and repetition; however, with dwindling resources, "there I was" talks may be the only experience upon which to base a decision.

We all have heard the saying, "There are old aviators and there are bold aviators, but there are no old, bold aviators." This may stem from the fact the old aviators lived through enough close calls to develop respect for the profession and the

ability to recognize their individual limitations. "There I was" stories could help fellow aviators vicariously experience difficult situations without the risk of injury.

Accident prevention—the next level

The time has come to take accident prevention to the next level. We are trying to capture those valuable lessons from near accidents and share them with others so they, too, can learn from the close calls or near-misses occurring in our daily operations. However, when I recently addressed students in an Aviation Safety Officer Course, there was some concern about repercussions. We need and intend to do this in a way that pilots and crews will feel secure enough to tell their stories without fear of reprimand or self-incrimination.

Ways of capturing needed info

■ **Operational hazard reports (OHRs)**. There are already successful reporting programs out there such as the OHRs. We don't want to increase the official reporting burden, but we do encourage you to continue using the already-established process and submit OHRs. However, two problems are readily apparent with using the OHR system to report close calls and near-misses.

The OHR program is set up to be handled at the lowest level of command that can correct the identified hazard. As a result, the rest of Army Aviation does not benefit from the information contained in the OHR. One course of action could be to forward the completed OHR to the Combat Readiness Center where a data base could be established, especially when there are Armywide implications.

The other problem area centers around the fact that crews are often reluctant to submit a formal report such as the OHR if the close call or near-miss was a result of their own error. Sometimes the prevailing attitude is that we didn't have an accident, so why tell on ourselves and risk any repercussions?

■ **Near-miss reporting**. In an effort to capture lessons learned, the Combat Readiness Center has established a "Near Miss" forum on our Web site, **https://crc.army.mil**. The purpose of this site is to help us understand safety problems and make corrective changes before an accident takes place. The site is designed to collect information for analysis and the development of controls to lessen the likelihood of accidents. This system is voluntary and completely anonymous. You can submit aviation, ground, or driving/POV reports.

■ ***Flightfax***. We are also establishing a "Near Miss" (real name to be determined) column in *Flightfax* similar to the one used in the Navy's *Approach* magazine. The purpose of the stories is not to incriminate you or question "Why did you do that?" or "Why didn't you do this instead?" Second-guessing your actions is up to you. By sharing your experiences—the what, when, where, why, and how of the accident that almost happened but didn't—you can assist others who might find themselves in similar situations. We just want other members of the aviation team to benefit from the lessons you learned the hard way.

Do you have a near-miss story to tell? If so, we would like to hear from you. The June 2005 issue of *Flightfax* will be dedicated to near-misses and close calls. Don't worry about the grammar, style, punctuation, and so forth. We'll help you. Just send us your story, along with your name, telephone number, and e-mail address so we can reach you if we have any questions about your story.

If you've had a close call, but you don't want your name associated with it, we understand. If you want anonymity, just tell us so. We'll respect your request and withhold your name from the article. However, be sure to include your name, phone number, and e-mail address so we can contact you if we have any questions and to give you the opportunity to proof the story before publishing.

Close calls and near-miss scenarios can take us to the next level of accident prevention. The effectiveness of this program will depend upon the level of participation by the aviation community. We are even looking for your feedback on how to get those close calls and near-miss stories, videos, and so forth coming in. Help us help you!

If you, too, want to be proactive in accident prevention, send your stories and ideas to me via e-mail. If you prefer to talk one-on-one about your story before writing and submitting it, please call me at DSN 558-9855 (334-255-9855). ♦

—Ms. Allman is the Flightfax managing editor. She may be contacted at DSN 558-9855 (334-255-9855) or e-mail paula.allman@safetycenter.army.mil or Flightfax@safetycenter.army.mil .

Protect Your "Squash!"

COL Joseph F. McKeon
U.S. Army Combat Readiness Center

Here we go again, another heat article. I'll bet if this were a "Jeopardy" category you'd wager the whole pot. "Heat injury for $500, Alex!" What can I tell you that you don't already know? Drink more water. Avoid exertion during the hottest part of the day. Gradually acclimatize yourself. Eat your vegetables. Floss. Okay, you get the point.

What is hot, anyway? I guess it depends on your point of view. What my teenage daughter considers hot, I consider criminal. What a guy from Michigan considers hot, a bubba from Alabama considers sweater weather. And compared to July in the Sandbox, a sweltering summer day in the Deep South would seem like a spring morning. Obviously, hot is relative, so here's the point: Heat can kill, and it can also adversely affect your mental performance long before becoming deadly. Soldiers ill prepared for the heat tend to perform more poorly, and today's Army is no place for poor performance … especially in the cockpit. You need to do everything you can to protect your "squash!"

Mental performance

Have you ever noticed how hard it is to stay awake in an afternoon class when the room's hot, the instructor's boring, and you've just had lunch? Part of the problem is the boring instructor; but he was also boring this morning and you stayed awake! Another issue is eating lunch. All that blood flow is going to your gut to digest that super-sized value meal! And another factor is what we call the circadian trough, which is the time of day when *everyone's* sleepy. Yaaaawn!!! But the hot, stuffy room is a big piece of the puzzle. We just don't perform as well mentally when we're in a hot environment. It's no wonder so much of the world takes a siesta on hot, nonproductive afternoons. Many of us don't have that luxury; we must perform complex tasks in that greenhouse otherwise known as a cockpit.

The upper limit of heat exposure for unimpaired mental performance is about 85°F wet bulb globe temperature (WBGT) for an individual working 2 hours or longer. (A WBGT of 85°F is at the bottom of the "yellow" range, and is a relatively modest heat threat). This means that even with appropriate work/rest cycles and proper hydration, Soldiers in hot environments will still suffer mental performance degradation that could ultimately affect the mission.

Continuous, repetitive, boring tasks tend to be affected most by degraded mental performance. I can still remember dozing off during flight school while flying straight and level on a summer afternoon under the hood. With the hazards that exist from the man, machine and environment interface, operating an aircraft (or a wheeled vehicle for that matter) isn't the best time for your mental performance to

lapse. Leaders must take these factors into consideration when planning operations in hot conditions. As much as it is possible, train in conditions similar to those you will have to operate in. Practice like you're going to play!

Vigilance

Vigilance, like keen eyesight and devastating good looks, are requisite skills for an aviator (well, they used to be—I think they have recently given out a few "good looks" waivers). Commentary aside, flying is arguably a bit more technically demanding than driving an automobile, requiring the operator to be constantly alert to his surroundings, his displays, and his crew. Vigilance can be adversely affected by heat, which can be catastrophic. Fortunately, flying's inherent stimulation usually overcomes the monotony that sometimes afflicts the operators of more mundane vehicles. The margin of error requires constant vigilance, and the decrements brought about by heat must be mitigated. In addition, many other military activities require Soldiers to be watchful and alert for extended periods of time. Performing sentry duty, surveillance, fire guard, monitoring instruments, and driving a HMMWV all require the individual to be vigilant.

Temperatures higher than 85°F with 63 percent relative humidity adversely affect Soldiers' vigilance, even those well-acclimatized to the heat. Add an Air Warrior ensemble, some body armor, and an electric hat—that equals HOT! It is important that commanders recognize this limitation and take necessary steps to ensure their Soldiers get adequate breaks from extended duties. An extra set of eyes will also help mitigate the adverse effects of heat. Don't set your Soldiers up for failure!

Changes in sleep behavior

Sleep, like food and water, is necessary for health. Humans can go for short periods of time without sleep, but eventually a sleep debt will build up and must be paid. A restful night's sleep lets the brain restore itself, thereby allowing the Soldier to perform at his maximum ability. That is the crux of the fighter management program that all aviation units employ. Everyone reading this article probably realizes that sleeping in a hot environment adversely affects their sleep. Soldiers who acclimatize to the physical effects of heat stress can increase their ability to perform physically. Do you remember the summer football practices, and how much tougher you were once the season started? Sleep patterns, however, don't improve over time in a hot environment because sleep quality and effectiveness are reduced at high temperatures. In fact, studies have shown that heat is more disruptive to sleep than noise! In hot environments you don't wake up as rested as you should, and your performance suffers as a consequence. Leaders must do everything in their power to provide a cool, protected environment for their Soldiers. When that's not possible, leaders should plan ahead for possible lapses in performance due to fatigue and mental exhaustion. The unit's risk assessment should also reflect the increased hazard of fatigue on aviator performance.

Conclusion

There you have it. Heat cramps, heat exhaustion, and heat stroke have been described in this magazine and other publications in the past, but the adverse effects on cognitive abilities aren't often discussed. Living and working in a hot environment has a significant impact on sleep patterns, work ability, and cognitive function. Simply put, you have trouble sleeping and paying attention, and oh-by-the-way, you aren't as smart as you usually are. We've all seen those zombies in the TOC who aren't getting the sleep they need. The Army needs every Soldier every day, so take care of your body. After all, where else are you going to live? ♦

—COL McKeon currently is assigned as the Command Surgeon for the U.S. Army Combat Readiness Center. He may be contacted at DSN 558-2763 (334-255-2763) or e-mail joseph.mckeon@safetycenter.army.mil.

Confused About Collaterals?

LTC Cynthia Gleisberg
U.S. Army Combat Readiness Center

As the Command Judge Advocate of the Combat Readiness Center, I read the accident reports and am briefed regarding the findings of all Class A safety investigations. I've also, on occasion, been briefed on the findings of high profile collateral investigations. I've noticed that the investigators do not always share the same knowledge of the facts surrounding the accident. Sometimes, such variations are due to restrictions in the applicable regulations; but more often it's simply due to the collateral investigators' failure to ask for the factual portions of the safety investigation report. I urge commanders and collateral investigating officers to understand the rules for interface of the two primary accident investigations. I've summarized them here for you…

After a unit has an accident, several investigations are required. The safety NCO or officer for the unit must conduct an investigation under provisions of (UP) AR 385-40. For Class A or B accidents, the safety investigation team must be appointed by the General Court-Martial Convening Authority for the unit and may include personnel from the Army Combat Readiness Center as Board President and Recorder. In addition to the safety investigation, a collateral investigation may be required. AR 385-40 mandates conducting a collateral investigation for all Class A accidents, when needed for claims UP AR 27-20, where there is a potential claim or litigation for or against the government or a government contractor, and for accidents with a high degree of public interest or anticipated disciplinary or adverse administrative action. A collateral investigation may be conducted on any other accident at the direction of the commander whose personnel, equipment, or operations were involved in the accident.

Criminal Investigation Division (CID) will investigate any on-duty fatality to determine if it resulted from homicide, suicide, or terrorist activity. A line-of-duty investigation is required for Soldier injuries and a report of survey is necessary whenever Army property is damaged. Each of these investigations serves a specific purpose.

In this article I want to focus on the interface between collateral and safety investigations. Although nonprivileged information acquired by a safety accident investigator can be made available to the collateral investigation, the latter is conducted independently and apart from other types of accident investigations. The dual investigation requirement was not intended to cause additional work in gathering information. All purely factual information should be shared between the investigation teams. The only prohibitions in sharing information relate to the content of witness statements and to the boards' findings, analysis, and recommendations.

Collateral investigations are used to obtain and preserve all available evidence for use in litigation, claims, disciplinary action, or adverse administrative actions. The procedures used were developed to ensure protection of Soldiers' and civilian employees' rights. Article 31 of the UCMJ applies when questioning a service member suspected of a crime. Statements made to safety investigators cannot be used for any purpose within DOD except accident prevention; thus the rights' warning does not apply in a safety investigation. Additionally, the contents of witness statements cannot be provided to the collateral investigating officer or board.

The standard of proof required for collateral investigations is higher than that of the safety investigation. The safety investigation team is not required to have a preponderance of the evidence to support its findings. With this difference in evidentiary requirements, the findings of the two boards can, and often will, be different.

Collateral investigations are the basis by which commanders can hold their Soldiers and civilians accountable for the accidents they cause. To initiate actions such as Article 15 or relief for cause, the collateral investigation must pass legal review. Good facts are the key to good findings. Commanders and investigating officers must know what they can and should share between the various investigations. Only the witness interviews and board deliberations must remain separate. All else should be shared.

For questions relating to AR 385-40 and the interface of collateral and safety investigations, please contact me at DSN 558-2924. ♦

—LTC Gleisberg is the Command Judge Advocate at the U.S. Army Combat Readiness Center. She may be contacted at DSN 558-2924 (334-255-2924) or e-mail Cynthia.Gleisberg@safetycenter.army.mil.

NEWS & notes

ALSE 05-01
ZetaLiner Warning

Test results have revealed a safety hazard for aircrews that have replaced the standard issue HGU-56/P TPL liner with the aftermarket Oregon Aero ZetaLiner. Impact testing to the HGU-56/P helmets modified with the ZetaLiner has resulted in head decelerations significantly in excess of the 175 G safety limit. Impacts at these levels increase the risk of head injury which could result in a severe concussion and a loss of consciousness.

Those individuals who received Oregon Aero ZetaLiners through the U.S. Army Aeromedical Research Laboratory (USAARL) Problem Helmet Fit Program should contact USAARL, Fort Rucker, AL, for further guidance. The USAARL POC for this action is SGT Michael Christie, DSN 558-6849 (334-255-6849).

The Army has never approved the Oregon Aero ZetaLiner for general use or issue for Army aircrews; however it has come to our attention that many users have installed the unauthorized ZetaLiner into their HGU-56/P helmet. Those users who did not receive the ZetaLiner as a result of being fitted through the USAARL Problem Helmet Fit Program are not authorized to use that liner, and are to remove it and replace it with the authorized TPL liner.

We continue to explore alternate liners that will provide an improved fit without degrading the protection levels provided by the HGU-56/P helmet. ♦

—For more information, contact John Jolly, the Air Warrior POC. He may be contacted at DSN 746-6538 (256-876-6538) or e-mail John.jolly@peoavn.redstone.army.mil. The Air Warrior Website is https://airwarrior.redstone.army.mil.

Approval of Non-Leather Boots for Army Aviation Use

On 22 Feb 05, BG E.J. Sinclair, Aviation Branch Commanding General, waives the requirement in AR 95-1, paragraph 8-9c(1), that requires the wear of leather boots when performing crew duties. Of course, as stated in AR 95-1, all leather boots are authorized, however no other *non-leather* boot is approved for wear except the following:

- Army Combat Boot (ACB) Temperate Weather (TW), NSN series 8430-01-516-1506.
- Air Force Tan Flyers Boot, NSN series 8430-01-483-9445.
- U.S. Army Infantry Combat Boot-Type 1 (Black), NSN series 8430-01-502-0975.

These boots have passed the required safety criteria for aviation use and provide better protection than the current all-leather boots. The three prime contractors producing the ACB TW are Belleville, Addison, and Wellco. Each manufacturer has a unique commercial name, but this item, in particular, has been referred to as the Belleville 790 boot. This item will provide Aviation warfighters a tan boot to be worn during flight operations with the tan aviation battle dress uniform in desert locations. ♦

—For more information, contact John Popovich at the Directorate of Combat Developments, Fort Rucker, AL. He may be contacted at DSN 558-9130 (334-255-9130) or email john.popovich@rucker.army.mil.

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class C**: While conducting a 30mm weapons harmonization, the gun failed during firing. The crew returned to the airfield for maintenance. Maintenance found a damaged gun receiver caused by the failure of the 30mm casing to eject properly. It was determined that the case jammed in the breech and only the aft part of the casing was ejected, leaving the remainder of the case in the breech. This failure during ejection caused a second round to be forced into the damaged casing. The round could not be properly chambered into the breech and the firing procedure caused the 30mm to explode, resulting in damage to the gun receiver. The gun assembly was replaced and the aircraft was returned to FMC status. (Late Report)

■ **Class C**: No. 5 tail rotor drive shaft cover separated in flight, resulting in damage to the No. 4 tail rotor blade, main rotor blade, and sheet metal damage. ECOD: $90K.

■ **Class E**: BUCS test failed several times. Aircraft was shut down and returned back to maintenance. (Late Report)

D Model

■ **Class A**: Aircraft impacted rising terrain during training support for a BCT FTX. Both crewmembers were fatally injured. Investigation is ongoing.

■ **Class A (Damage):** Crew reported a loud bang during flight, followed by severe vibrations. Crew executed an immediate descent to land and, as power was applied, reported an uncontrolled yaw. Aircraft landed in drainage ditch and overturned onto its right side, causing damage to the main rotor system, tail boom, and tail rotor. Investigation is ongoing.

■ **Class A (Damage)**: Aircraft crashed in trees, resulting in damage to main rotor system, tail boom, and tail rotor.

■ **Class B**: During shutdown, the PI attempted to reduce power to idle before full activation of the APU. APU was not at 100 percent before complete reduction of engine power, resulting in NP increase to 117 percent and NR increase to 121 percent.

■ **Class C**: Aircraft experienced 136 percent torque reading during engine run-up for flight. ECOD: $183K.

■ **Class C**: No. 2 engine was still at idle on takeoff from refuel. Over-torque condition reported.

■ **Class C**: While conducting a post phase maintenance test flight, the MTP failed to place the No. 1 engine power lever to fly after completing a baseline HIT check on the No. 2 engine. When the MTP brought the aircraft to a hover, the No. 2 engine torque parameters of 125 percent for 6 seconds were exceeded when the torque reached 134 percent for 19.4 seconds. The aircraft landed and the No. 1 power control lever was placed in the fly position. The aircraft taxied to parking without further incident. (Late Report)

CH-47

D Model

■ **Class C**: Aircraft experienced separation of the aft right landing gear upon liftoff to a hover. Cushioning was provided and aircraft was repositioned and landed without further incident. Landing gear will be submitted to CCAD for analysis.

■ **Class C**: Aircraft experienced damage to the ramp tongue during offloading of supply pallets. ECOD: $39K.

■ **Class E**: On preflight inspection, the No. 2 power control module accumulator would not hold a pre-charge. Maintenance serviced the accumulator twice and it went to 0 psi both times in 15 minutes. Terminated scheduled flight and replaced accumulator gauge. MOC okay.

OH-58

A Model

■ **Class E**: At 1,500 feet, 100 knots, and 8 SM from airport, the transmission oil hot light illuminated. The pilot on the controls landed as soon as possible in a small open field. On short final the light went out and stayed out. NOTE: The test pilot could not duplicate the light during run-up at the landing site. The thermostatic switch was removed and it was noted that a small chip was missing from the switch. The switch was replaced before returning to base.

UH-60

A Model

■ **Class A (Damage)**: During an approach to landing, the crew experienced whiteout conditions and drifted into trees damaging main rotor blades, tail rotor blades, stabilator, and upper engine deck.

■ **Class A (Damage)**: Aircraft struck a radio tower and wires during low-level flight and sub-

sequently crashed into a nearby field. Aircraft sustained significant damage and is being assessed as a total loss. The crew sustained no injuries.

■ **Class E**: The APU failed to start on three attempts. Flight was cancelled. Inspection revealed that the fuel was not igniting. Maintenance replaced the start fuel nozzle and the igniter plug.

■ **Class E**: The left main landing gear brake system stuck while attempting to taxi from parking ramp. The brake system would not release. Crew hover-taxied aircraft to parking. Findings: System was bled and cleaned. MOC performed and aircraft was returned to service.

L Model

■ **Class B**: Crew picked up aircraft to a 30-foot hover when they received a No. 2 engine compressor stall indication. Aircraft landed and post-flight inspection revealed both engine inlet covers were still in place, but damage was made to the No. 2 engine. Both engines were shipped to CONUS for teardown and bore-scoping.

■ **Class D**: Following hot refuel of aircraft, the refuel team member tossed the grounding cable while standing under the rotor disk. The grounding cable entered the rotor disk; the clip on the end of the cable contacted the red main rotor tip cap. The contact resulted in a 3-inch gash in the top of the tip cap. The tip cap was replaced and the aircraft was released for flight. An NDI will be conducted on the main rotor blade weight attachment point to determine if the blade structure was damaged. (Late Report)

C-12

U Model

■ **Class C**: No. 2 engine surged out of the reverse position during landing rollout. Aircraft proceeded off the runway in a left yaw and impacted a snow bank.

CAS-212

■ **Class B**: During climbout, left engine torque climbed from 100 psi to 115 psi. Power was immediately reduced and the aircraft landed.

RQ-7

Shadow Model

■ **Class B**: Launch crew experienced a generator failure warning while aerial vehicle (AV) was flying at 1,000 feet AGL. Recovery chute deployed, but AV crashed as a result of a reported engine failure.

■ **Class B**: The AV had a generator failure, followed by an engine shutdown while in flight and subsequently crashed.

■ **Class B**: Controller reported parachute deployment in addition to RPM loss and subsequent engine failure. Aircraft was recovered.

■ **Class C**: AV had engine failure while in level flight at 4,000 feet AGL. AV operator activated the chute recovery system and aircraft descended into 50-foot trees and sustained wing and tail damage.

■ **Class C**: The AV had a generator failure. In turn, the AV operator turned the craft toward home base. The RQ-7A then had an ignition failure, followed by an engine failure. With the craft over FOB and just above 2,000 feet MSL, the AV operator attempted to deploy the chute, but the chute never deployed. The AV glided away from the FOB and crashed in a marshy area north. *(Late Report)*

■ **Class C**: AO experienced a general engine failure and the recovery chute deployed at 2,000 feet AGL. Aircraft impacted the ground with damage.

■ **Class C**: The AV operator received a generator failure, then an engine failure when the AV was 11 km from the FOB landing strip. The operator turned off all non-essential power and closely monitored the battery power and altitude. The AV was at 4,000 feet AGL with an airspeed of 82 knots. Once the craft was still 5 km from FOB, it descended below 1,500 feet AGL. The operator made the decision to deploy the parachute to avoid a catastrophic crash. The chute deployed and the AV crashed. *(Late Report)*

■ **Class C**: AV descended to contact with the ground from 400 feet AGL while en route back to home base. The AVO received no instrumentation warnings. AV has not been located to date; hostile action has not been ruled out.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

"Twas a Dark and Stormy Night . . .

We want to capture your valuable lessons from near-miss accidents and share them with others so that they, too, can learn from the close calls or near-misses occurring in our daily operations. Share your near-miss stories by—

- ✓ OHRs
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Flightfax
ARMY AVIATION RISK MANAGEMENT INFORMATION
MAY 2005 ✦ VOL 33 ✦ NO 5

POWER MANAGEMENT...

Why is it still an issue?

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY COMBAT READINESS CENTER

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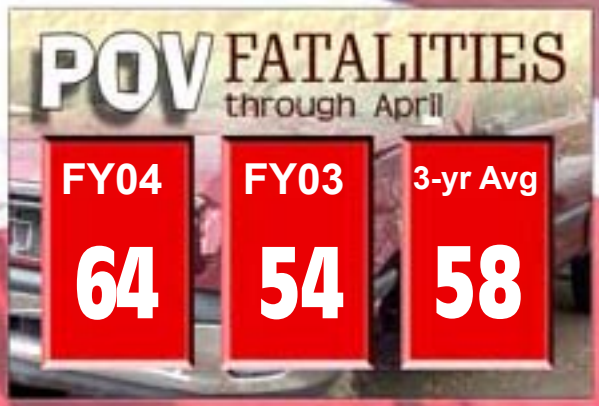

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

POWER MANAGEMENT...

Why is it still an issue?

CW4 Dennis Fox
Donald Fox
McDougal
CW4

Time and time again, we read an article in *Flightfax* about aircraft accidents that involve lack of sufficient power to complete a maneuver. With today's complex, modern, and dual engine aircraft, you would think this would not be an issue. However, with demanding operational environments such as Afghanistan and Iraq, our aircraft and aircrews are being pushed to the limit.

To address the issue of power management, we must understand how we got here. During the Vietnam era, all Army aircraft were single engine and operated at or near maximum gross weight. Pilots had to learn to adapt to complete the mission and return the aircraft and crew home safely. This operational environment gave individuals an increased awareness of their abilities and their aircraft in relation to operational requirements.

As aviation technology evolved, newer, bigger, and stronger airframes like the UH-60 and AH-64 were developed. We now have the ability to carry more weight, fly farther and faster, all the while maintaining a more comfortable power margin than we previously had known. Even with improvements in engines in all our advanced aircraft, aviators continue to crash aircraft due to not understanding power issues. Why?

Current missions place aircraft in an operational environment where the margin between power required and power available is narrowed to the point that sometimes the mission cannot be accomplished. This is where a failure in training becomes an issue. It is not a mystery why aircraft are not staying airborne, that is simply a law of physics and gravity. It is the pilot's failure to recognize, understand, or manage the power that *is* available.

With modern aircraft, the gap between power required to accomplish a training mission and power available has become an ever-increasing margin. Instead of a few percent of torque, we regularly have as much as 30 to 40 percent between power required and power available. This has allowed us to become complacent during training where power is concerned. As a result of this complacency, we have accepted a standard of using this extra power to give us a false sense of security. "What's an extra 5 to 10 percent, among friends, as long as I landed in the general

area?" When was the last time you predicted the amount of power you were going to use on an approach to a specific point, actually used that power, and landed at that exact point? When was the last time you critiqued your performance as a crew after completing this approach? Did you shoot the approach at, below, or above the predicted power required? Why?

A "post-task analysis," a term coined by the High-Altitude Aviation Training Site (HAATS) in Eagle, CO, can answer these questions and assist you in changing your behavior toward more efficient performance. By adopting the HAATS power management system, failures to perform to a higher standard are identified from the perspective of situational awareness. This gives us the ability to effect positive change in the cockpit and save aircraft and lives.

What is situational awareness? Multiple thoughts on the definition exist in the aviation community. HAATS has defined it as "the ability to accurately predict." (See HAATS' article in this issue of *Flightfax*.) In the case of power, we need to be able to "predict" how much is available, how much is required, when it is required, and how much time is required for a particular amount to be effective. This will increase our situational awareness about power and what affects power. Combining situational awareness and power management allows us the ability to predict how much power we will use for takeoff, landing, in-ground effect and out-of-ground effect hover, crosswind or downwind flight conditions, climbs, turns, etc. This increase in situational awareness provides us the ability to continue risk mitigation during the mission.

We all understand that our operational environments will be extreme. Further, we have to understand that we will always have a demand for carrying larger loads and more ammunition, thereby increasing our risk. How do we allow ourselves the ability to mitigate these risks from the cockpit?

First, we have to address how we train. We have all heard the phrase "train as you fight." Training involves the use of tools; one of these tools is the torque gauge. HAATS developed power management training and the use of the four-torque reference system (*Flightfax* June 2003). In this system, the torque gauge becomes an objective standard for all maneuvers. Because few units have the option of loading an aircraft up to max gross weight for training flights, another method becomes necessary. Thanks to the Power Management Training System, we can simulate this maximum gross weight condition by using predicted power as our power limit to conduct all maneuvers. If we are cognizant of power during all aspects of training, then it will not be an issue when power actually is limited. This method of training will be most effective only if we incorporate these ideas and techniques in Flight School XXI (the schoolhouse environment) up through the most senior aviators and leaders. Junior aviators must embrace this training not only because they are going to continue to see combat in a short time after completion of flight school, but because this method will continue to save lives and prevent aircraft accidents in peacetime.

In as much as warrant officers are the technical experts, we must influence changes of how we train and enforce a higher standard in how we do business. Because of the non-linear operational environment and continuously changing conditions, we must develop the ability to analyze and mitigate risk on short notice from the cockpit. Knowledge of the aircraft, the pilot, and the ever-changing environment gives us an advantage in identifying hazards. With increased situational awareness through power management, we will have the ability to perform cockpit risk management while in the mission profile. The time is now for change in the Army Aviation community, and we can make it happen. After all, the life you save could be your own. ♦

—This article was written by CW5 Fox, CW5 Lindgren, CW5 McDougall, CW4 Banks, CW4 Coates, and CW4 Wojtala as a class project while attending Warrant Officer Senior Staff Course 05-03 at Fort Rucker, AL.

HAATS

HIGH-ALTITUDE ARMY AVIATION TRAINING SITE

The Case For Precision In Training

CW5 Michael A. Moore
HAATS, COARNG

For nearly 20 years, the High-altitude Army Aviation Training Site (HAATS) has been an advocate of a unique training program known as power management. Essentially, this program uses power to quantify maneuvers, the environment, aircraft requirements and capabilities, as well as to evaluate pilot awareness and understanding. Our power management techniques provide the ability to conduct comparative analysis of maneuvers, pilot opinions, and control inputs using the torque indicating system. The student is able to observe the realities of his understanding and beliefs as well as aircraft capabilities in an objective and safe manner. Profound insights are gained in an objective, efficient, yet controlled method. Gone are the days when these insights had to be gained through surviving an unforeseen, hazardous event where chance is often the judge of the result. This program, HAATS Power Management Mountain Training, revolves around the idea of *precision*—precise perceptions, thought, speech, and actions—and promotes its usage throughout aviation but particularly training.

In the final analysis, power and controllability are all that really matter to a helicopter pilot. When they are available in excessive amounts, as they are in most habit-forming training flights at sea level with light aircraft weights, the need for high levels of pilot awareness, insights, and finesse are nearly irrelevant. An empty helicopter is akin to the old joke inquiring as to where an 800-pound gorilla can sit … a pilot can do almost anything in a light aircraft without consequence. This reality has insidious consequences upon deployment. It is insidious in that the habit-forming, day-to-day routine of training at low weights and altitudes forms and reinforces the psychology, awareness, and finesse of our *own* 800-pound gorilla. The substantial consequences of this type of training are written in the history of our deployments. As a matter of course, our deployments have demanded high-gross weight operations in extreme environmental conditions as the norm rather than the exception. The number of aircraft lost or damaged in a given theatre of operations, particularly in the first months, is evidence of the lack of the pertinent pilot awareness levels and skills when confronting requirements that are *known to exist* in typical deployments. The obvious solution to this issue is to determine the composition of a quality training program that addresses *deployment* needs, compare the findings to current training, amend as necessary, and execute it. A good place to start is in looking at the issue of habit formation.

To ignore the lessons of our experiences is, as we know, to continue to invite repeated failures.

The imperatives of combat, enemy threat, high multi-tasking, and high, hot, and heavy

aircraft operations create a stress level that has a significant impact on our perceptive field. As time available to assess and execute diminishes, our perceptive field narrows, cognitive functions diminish, and responses become more reflexive, with the resultant behavior, decisions, actions, and consequences reflecting the quality of our training experience. This is one of the great truths in all human educational experiences. To ignore the lessons of our experiences is, as we know, to continue to invite repeated failures. If high-weight demands and extreme environmental conditions are a fundamental reality upon deployment, it is imperative that we identify what awareness levels and execution skills are necessary for operating an aircraft routinely with little or no margin of error and make them part of our everyday, habit-forming existence. How can our training regimens reflect the known need? First and foremost is to demand precise, quantifiable standards in the execution of flight maneuvers. This can be accomplished, as you might have guessed, through the use of power as the standard. The following diagram (Fig. 1) conceptualizes a precision approach. The relationship of airspeed to power is seen to require a continuous proration throughout the approach—as airspeed decreases, power increases proportionately or the angle will change. It is understood that the aircraft will be in the same continuous rate of deceleration from the moment the angle is intercepted regardless of the speed at which interception occurs. The references to loss of main and tail rotor effective translational lift, transverse flow shudder, and pitch-up of the fuselage are intended to acknowledge aerodynamic events that will occur during the approach for which anticipation and compensation by the pilot is required to maintain angle and heading. If executing to a pinnacle or ridge (as depicted in Fig. 1) using a rifle sight to maintain the angle, under or over arcing is detected instantaneously. However regardless of the type of approach, at detection of under or over arcing, the pilot should note airspeed, power, and *distance remaining*—one or both of speed and power is incorrect for the distance remaining. Subsequent approaches will determine what the correct combination should be. *The most important external visual reference to be refined in this approach (or any other) is the distance remaining to termination.* This is particularly critical as so many of our operational environments have missing or offer

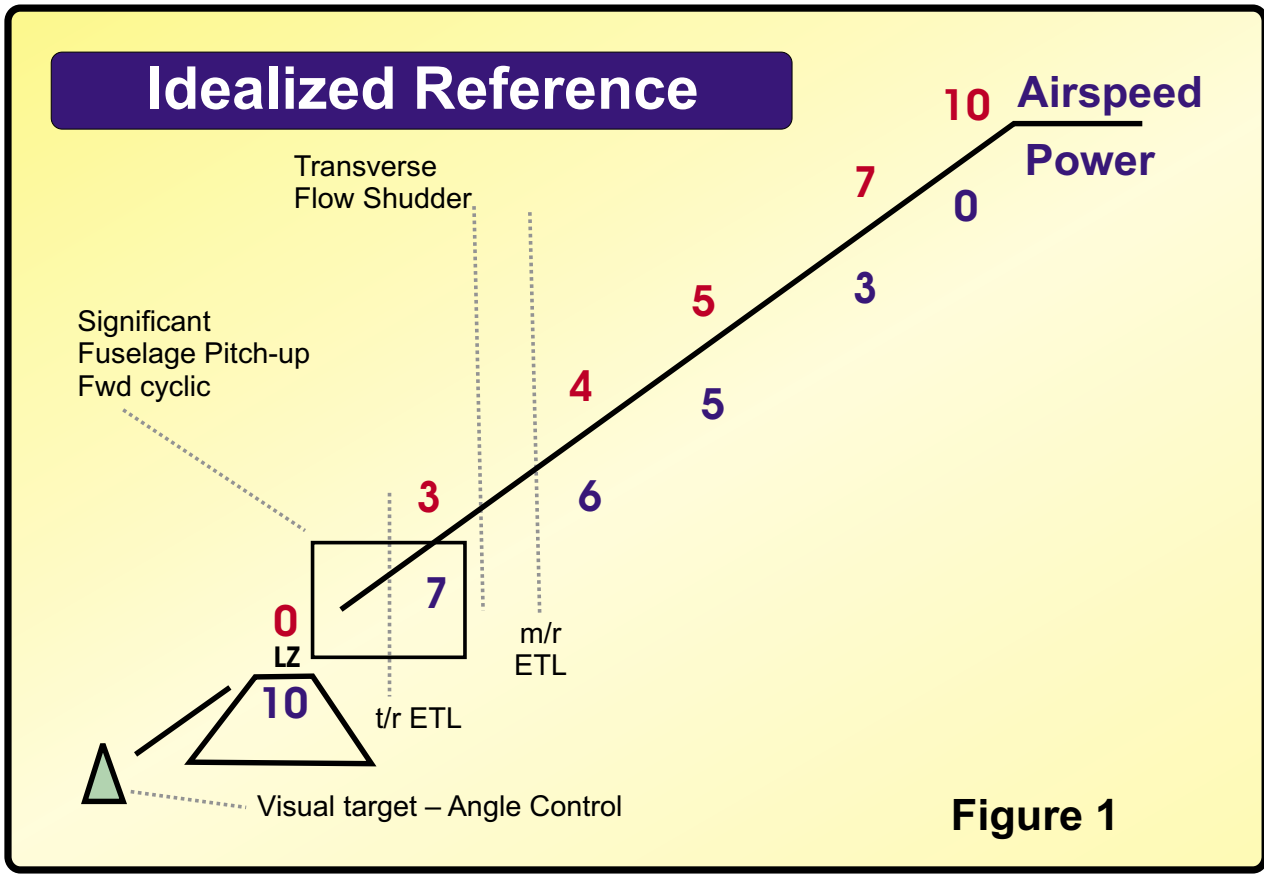

Figure 1

distorted vertical and lateral cues. The ATM tells us *when* to go around but does not tell us upon *what* the decision should be based. The above process provides the answer to that question—in the distance remaining I can or cannot arrest the vertical or horizontal speed applied with the power available. The correct combinations of airspeed and power as well as the location of each aerodynamic event are to be retained in the pilot's memory for future reference. Understanding the components of a precision approach, coupled with knowing the power required, allows the pilot to conduct an efficient and effective analysis of his understanding and execution of the maneuver upon termination.

A pilot should not only know how much power is available for a maneuver but also *how much* is required, *when* it is required, and how much *time* must be available for a *limited* amount of power to accomplish a given end. A pilot should be able to accurately *predict* the necessary power, control, and timing required to land, takeoff, accelerate, decelerate, climb, descend, and turn. This isn't an exercise conducted prior to takeoff such as a performance planning card (PPC), but rather a determination and prediction preceding *every* maneuver. When *every* maneuver is followed by either a formal or informal analysis of the results *vis-a-vis* power, the above questions can be answered. Comparing both power *predicted* and power *expended* to what is actually *required* provides the necessary insights to environmental and execution issues. Execution errors fall in the following categories: horizontal speed too fast or slow, vertical speed too fast, power applied too late, or the aerodynamic issues in Fig. 1 were not anticipated requiring reactive overcontrolling. Focusing on power in every maneuver breeds the necessary habits and awareness required for the current deployments and those to come.

Let's analyze an ordinary task, VMC Approach, taken from TC 1-237 *UH-60A/L ATM*, as an example of how one could dramatically improve the relevant learning experience using more precise standards simply by adding a few words. The second standard requires the crew to "ensure that sufficient power is available for the type of approach/landing desired." This standard could be significantly improved by also demanding that the crew correctly predict the *required* power as well. As noted, in order to accurately predict the required power, one must possess substantial awareness of those things that affect power (DA, weight, wind, surface issues, aerodynamics, control inputs, control timing—variables going well beyond a PPC), as well as the *degree* to which they affect power. Power management techniques accomplish these goals quickly.

The seventh standard, "Perform a smooth and controlled termination to a hover or touchdown to the surface," evaluates the termination phase of the approach but is actually counterproductive. This standard truly belongs in the category of "unintended consequences." It has been our observation that the vast majority of pilots achieve this standard by slowing horizontal speed early and using power indiscriminately. When power and control are limited, horizontal speed control is critical. Possessing the above *habit* is deadly. When the desired angle is maintained, the correct amount of power is used (typically that power required to hover at a desired height or smoothly contact the surface without rolling), and the correct power is used at the correct *time* (action, sequence, and timing), "a smooth controlled termination" is a *by-product* of the more precise standards. Having a single standard for termination rather than four (correct power, correct timing, constant angle, full-stop) is the equivalent of conducting GPS navigation while only receiving one satellite. Slowing down early and/or using power indiscriminately to achieve the current standard has established incorrect ground speed cues for the actual required speed demanded by precision execution. When precision execution is demanded due to limited power and control, limited space, adverse environmental conditions, or abrupt changes in conditions, all previous landings at lower standards have left most pilots ill prepared. It is easy to see, when power is critical, how a pilot might slow to his usual speed, fall through, droop the rotor, and crash short of his destination. Accident synopses are rife with this scenario and its variants. They needn't be. It is our obligation to provide aircrews training *equal* to the demands we know they will face. Quantifiable, precise standards are an essential starting point. ♦

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BROWNOUT ON THE BATTLEFIELD

CW3 Patrick Quinton (Team Leader), CW4 Christopher Suddarth, CW4 Ui Chong,
CW3 Stephen Bandeira, CW3 John S. Carlson, and CW3 Guillermo Soto
WOSC 05-04/05

We were on a typical mission in Afghanistan; however, the conditions were not favorable. Moon illumination was zero, and it stayed that way the rest of the night. In that part of the world, it's dark! Everything was going as briefed with the reconnaissance party inbound mirroring what we saw during planning. We could barely make out the landing zone (LZ), but fortunately we identified our objective and started the approach. At about 30 feet above ground level (AGL), we browned out. One of the crew chiefs said, "Hold your down!" I had already transitioned inside the cockpit to my hover instrumentation and was able to hold a steady hover around 10 feet until the dust cleared. There wasn't much room for error in this particular LZ, with compounds on the right and higher terrain to the left. We landed the aircraft after repositioning and completed the mission without fouling the entire objective area. This success was possible only because of the equipment installed on the aircraft—namely, hover symbology.

Deliberate air assault missions are challenging entire crews during operational rotations in Afghanistan and in Iraq, with dust landings being the norm. Unlike resupply missions to established firebases, deliberate air assaults have LZs in unimproved areas. It is not uncommon to land on dirt roads, open dry areas, or on dusty mountain peaks. It is also not unusual to find yourself flying *without* the benefit of hover symbology specific equipment, such as the Brownout Situational Awareness Upgrade (BSAU) system profiled in the October 2004 issue of *Flightfax*. Unlike the situation in the introductory paragraph, most pilots must rely upon improvised tactics, techniques, and procedures (TTPs) to minimize the potentially catastrophic results of landings made under brownout conditions.

In the past 5 years, there have been 11 Class A, B, and C aviation accidents involving Chinook aircraft with brownouts being the trigger event. These mishaps have resulted in 16 non-fatal injuries and equipment damage costs in excess of $37 million. Ten of the eleven aircraft were not equipped with a symbology system usable during brownout conditions. The current aviation equipment upgrade policy relies on

pilot-specialized training and experience levels, coupled with lessons-learned improvisation, to minimize the potential negative consequences of landing in brownout conditions.

The successful outcome of any maneuver is predicated upon aircraft control. That control is enhanced through visual cues. The preferred method is to keep the dust cloud behind the pilot's door before landing so the pilot always has a clear view of the LZ, thus maintaining aircraft control. A roll-on landing can accomplish this and is the current preferred course of action. Environmental factors such as wind and surface conditions, along with aircraft gross weight, approach angle, aircraft formations, and enemy situation, are factors to be considered when selecting the airspeed and rate of descent to maintain aircraft control.

A control measure to minimize brownout accidents is vigorous roll-on landing training. Standardization and instructor pilots of units rotating out are heavily involved in the process of training up their incoming counterparts in theater. Another control measure is to "stack the deck" on goggle flights. During day air assault missions, use a door gunner from another platoon in the company and, at night, always use non-rated crewmembers in the back to aid in clearing the aircraft and man the guns.

You will encounter dust

in the CENTCOM areas of operation. While the majority of takeoffs and landings are in hard-surface areas, there will be many occasions when you will have to take off and land on unimproved areas. This trend undoubtedly will continue and expand as the Global War on Terrorism progresses over the coming years, predominantly in Third World areas like Africa and Southwest Asia with topographical and climatic conditions that cause brownout.

When landing at areas other than hard-surface airfields or familiar areas, we can accomplish roll-on landings using TTPs to keep the dust cloud behind us. However, this will not always be the case. If the tactical situation or the ground commander requires it, and the current intelligence supports landing to a narrowly specific area—we must be prepared to plan accordingly.

The Chinook is being used in the assault role more and more, which means possibly landing in smaller LZs. The objective also could have a vast area to put multiple helicopters in, but the terrain might not allow a roll-on landing. Prepare to "stick" a landing because you do not want the ground force to cover more terrain than they must. If you are in a dust cloud at 30 feet AGL, do you continue or go around? This will be a sporty maneuver, but you should have a plan to help this approach end successfully. Hover symbology is not a crutch; it is a tool to help mitigate risk during a dust landing. A properly trained pilot will transition inside to the hover page only when he can no longer maintain visual reference.

Integration of the hover flight symbology in the BSAU should not be limited to only brownout. BSAU will enable flight crews to fly a precise hover not only in brownout and whiteout conditions, but also in situations where pilots have limited references. Examples would be hovering in fog and over terrain such as water or a pinnacle where the pilots have no reference because the terrain drops off abruptly behind the crew's field of view. Reducing the workload in any aspect of flight will enable the flight crew to concentrate on and more readily react to unexpected situations, including emergencies or enemy engagement.

The Army has aircraft in their inventory that have BSAU-type technology that provides flight symbology to the aircrew, but the MH-47D and E are the only Chinook models currently configured. All aircraft will kick up dust, but the Chinook produces the largest dust because of the size of its rotor system and its weight. The Chinook is not only the workhorse of the fleet, but it is often the platform of choice due to its size and lift capability, as well as its ability to operate at higher altitudes. If any aircraft could benefit from having hover symbology to assist in a tight situation, it would be the Chinook. The cost is estimated at approximately $100,000 per aircraft.

The aforementioned policy of relying upon TTPs and experience while fulfilling a short-term requirement to expeditiously address a serious problem, nevertheless, possesses inherent risks that include the following: periodic structural damage and long-term wear on aircraft attributable to frequent roll-on landings; the possible consequences of landings in soft, rocky, or wadi-infested terrain using a roll-on; tactical considerations of small or channelized LZs; and the consequences of the constant drain of roll-on experienced senior aviators from the force over the coming years. The Army's needs and requirements must be, and always are, delicately balanced against funding and resource availability. It is our hope that an objective quantitative analysis of the facts outlined above will lead to the decision to fund and integrate the BSAU during the next fiscal year. ♦

—This article was written by CW4 Suddarth, CW4 Chong, CW3 Quinton, CW3 Bandeira, CW3 Carlson, and CW3 Soto as a class project while attending Warrant Officer Staff Course 05-04/05 at Fort Rucker, AL.

Valuable Lesson in Power Management

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Every person who flies Army aircraft will at some point ask himself, "Do I have what it takes to deal with that 'Ahhhh sh@#$!' situation when it happens?" Some people might go their whole flying career without answering that question; but most will have a "There I was" story to share with our fellow aviators. Sometimes these stories are in the spotlight for all to see; other times you'll only hear about them when you buy that old guy the next round. But they all have two things in common: they are all tales of how a crew came together to handle a critical situation and lived to fly again, and they all have lessons that can be passed on. In keeping with Army tradition, here is one of those stories.

There I was, left seat in the Cobra, inverted, Air Medals dangling in my face. We were pulling so many G's that we were now in the H's! Seriously, I was flying a Huey on what turned out to be the last REFORGER in Germany. We were Chalk 4 in a 6-ship mission. Every aircraft in the formation was loaded to the gills, max gross weight for the environmental conditions.

As we departed the landing zone (LZ) in our pre-briefed, straight trail formation, my copilot (on the controls) did not stay at the desired altitude with the aircraft directly in front of us. We began settling with power shortly after we went through effective translational lift (ETL). We were heading for the tree line about ¼ mile in front of our flight path at about 40 knots indicated airspeed. I failed to maintain situational awareness, trusting the sandbag in the other seat could handle the takeoff.

Suddenly I heard a call from the aircraft behind us on our family FM frequency, "What are you guys doing?" As I looked up outside the aircraft and saw us approaching the trees, I grabbed the controls and immediately turned left to exit the downwash of Chalk 3. Simultaneously, I adjusted collective to max torque available and we gained just enough altitude to clear the treetops. Later, in the mission after-action review, several aircrew members in the flight commented they knew they were witnessing an accident. I admit my "pucker factor" was a little bit high initially, but through the excellent training provided by my previous IPs, I knew how to react to the situation. I feel the other members of my crew learned a valuable lesson in power management that day also.

Considering most of my flight time has been in single engine aircraft, I have a lot of respect for power management. I still find myself doing minimum power maneuvers in the UH-60. Knowing I have additional power available is a good thing, but if I don't need it I don't use it. Unfortunately, I have more stories related to the topic, but I'll save them for a different time. ♦

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Investigators' Forum

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

Three Seconds to Disaster

Situational awareness is fundamental to maintaining aircraft control. However, sometimes an event, activity, object, or person inside or outside the aircraft takes our attention away from flying the aircraft. We may become distracted from flying in response to a lower priority demand such as answering radio traffic, moving an object, adjusting a control, or by fixating on a target. To maintain situational awareness, we must rely on continuous scanning and good cockpit teamwork.

On a clear, calm, and sunny day, the AH-64D crew's mission appeared simple, straightforward and routine. As part of their preparation for deployment into the area of operations, the crew was to conduct daytime practice running fire attacks and complete functions checks on the 30mm chain gun and aerial rocket systems.

After validating the gun, the crew proceeded to conduct three similar running attack fire engagements. The first was a dry-fire engagement for range familiarization and the next two were live-fire engagements. The crew began each run by flying off-axis to the targets. Before crossing the range start-fire line the pilot in command (PC), who was occupying the back seat, initiated a turning cyclic climb or "bump" to gain altitude, lose airspeed, and then orient the target. With the aircraft inbound to the target area, the copilot gunner (CPG) acquired the target with the target acquisition and designation system (TADS) and the PC fired two salvos of rockets. To complete the attack, the CPG suppressed the target area with three 10-round bursts of 30mm to cover the aircraft as the PC executed an egress turn.

On the third and final run, the PC bled off more airspeed on the "bump" than he had on the previous runs. Consequently the aircraft closed faster on the targets, giving the crew less time to shoot and safe the armament systems before their egress turn. The PC entered the final egress turn to the right at 370 feet above ground level (AGL) and 104 knots, faster than the two previous turns, and entered at 77 and 96 knots, respectively. The turn lasted 7 seconds before the aircraft impacted the ground.

What happened?

Mission data recorder information revealed during the first two seconds of the turn, the

PC's head was oriented to the right and in the direction of turn. During the next 3 seconds, the PC turned his head to the left to observe and actuate the ARM/SAFE button to safe the armament system.

With neither crewmember monitoring the flight profile, the aircraft entered a 15-degree dive at a 2,500-foot per minute (FPM) rate of descent, increasing the bank angle from 30 to 60 degrees. Two seconds before impact, the PC turned his head back to the right in the direction of the turn and announced to the CPG, "You're safe," referring to the ARM/SAFE button. One second before impact the aircraft's audio warning system announced "ALTITUDE LOW," which signaled a descent below 100 feet, the minimum warning altitude set by the crew.

Unfortunately, the warning came too late because their rate of decent was now 3,900 FPM. The PC reacted to the impending ground impact by pulling the cyclic aft, but he failed to increase collective to arrest the decent. The accident investigation board suspects the PC was unable to make a collective application because his left hand had not returned from the ARM/SAFE button to the collective. The aircraft impacted the ground at 134 knots in a nose-down, 26-degree right bank. The CPG suffered fatal injuries, the PC experienced critical injuries, and the aircraft was totally destroyed.

The accident investigation board determined this accident was a result of inadequate scanning, failure to properly direct attention outside the aircraft, and improper application of aircrew coordination elements and basic qualities.

Lessons learned

Crew coordination qualities and principles, as stated in our aircrew training manuals, could have prevented this accident. The PC could have *directly assisted* the PI to action the ARM/SAFE switch or he could have transferred the flight controls. He also could have *announced his actions* to the PI by using the standard phrase "I'm inside." The PI, recognizing the turn, could have ensured the workload was equitably distributed by *offering assistance* to assume aircraft controls, clear the aircraft's turn, or direct his attention outside the aircraft. With the PC's attention focused on the aircraft controls, the PI could have assisted him by providing aircraft control and obstacle advisories regarding airspeed, altitude, or obstacle avoidance.

Conclusion

The AH-64D is arguably one of the most demanding cockpit workload intensive aircraft in the Army's inventory. The proliferation of new technologies and complex missions and systems will continue to inundate us with potential distractions. However, we must not redirect our attention and make the distractions a priority. It's okay to miss a radio call or delay resetting the transponder. When flying, maintain situational awareness by ensuring proper crew coordination and scanning. As demonstrated in this accident, it took just 3 short seconds to lose situational awareness.

Digitized aircraft and demanding flight environments require crew members to continually process and analyze an increasing load of competing mission tasks. As we attempt to juggle these tasks, we can be lured into taking shortcuts or do more than we are capable. Crew members must *always* identify and prioritize competing mission tasks and never ignore flight safety and other high–priority tasks. The bottom line is **we need to hold to the standards and give priority to those tasks that are essential to safe flight**.

—Comments regarding this accident may be directed to the Accident Investigation Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

Using Peripheral Vision Restricting Devices for Instrument Training

Arthur Estrada
USAARL

For decades, civilian and military flight instructors have used peripheral vision restricting devices (PVRDs) to enhance instrument flight training being performed during periods of visual meteorological conditions (VMC). In fact, most Army fixed- and rotary-wing aircrew training manuals (excluding those of the Apache and Kiowa aircraft) specifically require the use of a PVRD when performing an instrument task in VMC as a condition of the flight task. If you're like most pilots, wearing a PVRD is not very popular.

In addition to limiting a pilot's view only to the primary flight instruments, PVRDs also cause the artificial exclusion of the full cockpit environment; i.e., overhead switches and gauges, and those on the center and opposite-pilot side of the instrument panel. If a pilot wishes to view the center console or instruments in the center of the instrument panel, the limited PVRD field of view requires turning the head, which then blocks the view of the flight instruments. These restrictions and loss of peripheral information and spatial orientation can, and do, cause adverse physiological and psychological effects on some pilots. An informal survey of 121 Army helicopter pilots by the U.S. Army Aeromedical Research Laboratory (USAARL) discovered that 51 percent (62 out of 121) reported at least one adverse effect (table below). Some reported multiple effects.

Instructor pilots teach the basic fundamentals that learning is strengthened when accompanied by a pleasant or satisfying experience, and that learning is weakened when associated with an unpleasant feeling (the Law of Effect). A consequence of such adverse effects may be the triggering of defense mechanisms which hinder effective training and can result in poor flight performance.

According to the results of the informal survey, there is no *standard* device used by Army Aviators, although five devices were identified as being used (two types of hoods, a visor sticker, Foggles®, and a DA Form 2408-12). Visits to pilot-supply stores and an internet search for PVRDs indicate that the devices (minus the paper form) identified in the survey were representative of those commercially available (manufacturer variations were minor). Basically, there are hoods, which extend outward from the forehead or helmet; partially frosted glasses, which are worn on the face; and a plastic sheet, which is attached onto a helmet visor.

Note that the USAARL does not recommend the use of a DA Form 2408-12. The fields of view are dependent on how far the card is pushed up into the visor protector.

USAARL PVRD Study

In an effort to identify the most preferred PVRD (presumably, because it minimizes the adverse effects and serves as the best training aid relative to the others) among those devices reportedly used by the survey population, USAARL conducted a study during which participants performed instrument flight tasks while wearing three different types of PVRDs: the hood, Foggles®, and a visor sticker, and then rated each.

Uneasiness	Despair	Distraction	Nausea	Claustrophobia	Loss of Situational Awareness	Spatial Disorientation	Miscellaneous Negative Effects	No Negative Effects	Did not answer
18	6	10	7	9	16	35	9	48	11
15%	5%	8%	6%	7%	13%	29%	7%	40%	9%

Figure 1. Hood

Figure 2. Foggles®

Figure 3. Visor sticker

Figure 4. Novel Hood (note the "side window")

The hood that was used (Figure 1) is the one that's available through the government supply system (National Stock Number 8415-01-394-8453). It is made by the Gentex Corporation and snaps onto the HGU-56/P helmet.

The Foggles® used (Figure 2) were those used locally. Although available in different colors, white shading with clear lenses was selected for the study.

The visor sticker used during the study (Figure 3) was the device used by 61 percent of the surveyed population.

Study results

The hood was easily identifiable as the least favored overall. It received generally poor performance appraisals and caused a relatively sizeable number of reported adverse effects, including loss of situational awareness and spatial disorientation. At a cost per unit of $52.40, it is hard to justify its continued procurement and use.

The Foggles® received "worst" ratings in both the field-of-view and comfort categories. Additionally, the Foggles® produced a noteworthy number of adverse effects including four reports of considerable distraction. Selected as the last choice by one-third of the participants, the Foggles® have a tendency to break the helmet ear seals of those wearing them. They run approximately $20 dollars a pair.

The results of the study indicated that the most preferred device among those readily available for use by aviators appears to be the visor sticker. The device received "best" ratings in comfort and ease of use/application and second place in field-of-view. Its cost of about $3 per device adds to its favorability. USAARL suggests using a visor sticker that is at least 2 inches wide from top to bottom.

USAARL has explored new PVRD options, such as adding side "windows" to the standard hood allowing cockpit-side peripheral vision (Figure 4). In other words, a pilot seated on the left side of the aircraft and viewing his/her flight instruments can open the right "window" allowing a scan of aircraft system instruments and/or the center console. Opening this area for viewing decreased some of the reported negative effects such as claustrophobia.

Until other options become available, USAARL recommends the visor sticker as the best current choice for use during instrument training. The complete technical report, *"A Comparison Study of Peripheral Vision-Restricting Devices Used for Instrument Training,"* USAARL Technical Report No. 2005-06, is available at the USAARL Science Information Center or online at **http://www.usaarl.army.mil/** under *Technical Reports*. ♦

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CORROSION
Prevention and Control

In 2002, the Center for Army Analysis published the results of a study on corrosion and its effect on Army readiness. This study revealed that corrosion has the greatest impact on the airframe, rotor system, and ground support equipment. During 1998-2004, Army Aviation averaged $45 million annually to repair damage from corrosion. This cost does not reflect the man hours expended to effect these repairs.

Corrosion repairs fall into the category of "unscheduled maintenance" which directly affects mission readiness. It is estimated that 40-60 percent of corrosion is preventable; taking the time up front for good corrosion prevention practices, like proper preservation of steel hardware attached to magnesium components when performing maintenance will save man hours and component replacement costs in the long run.

Bad Preservation

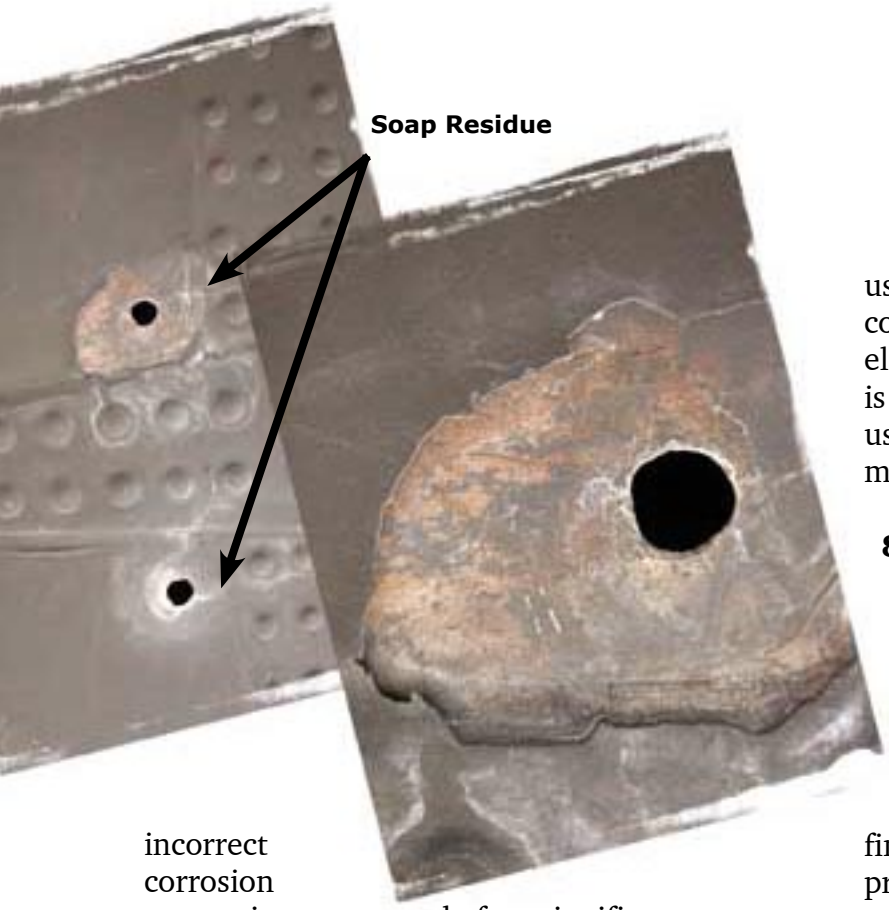
Good Preservation

What is corrosion?

Simply stated it's the metal's reaction to the environment, causing it to breakdown to its basic elements. On steel it's commonly known as red oxide or **RUST**. On aluminum and magnesium it's seen as white to grey powdery deposits.

How can corrosion be minimized?

Keeping the aircraft and equipment clean is a vital step. Scheduled aircraft washes remove sand, grime, and other contaminants. When the aircraft are washed it is very important to ensure all the soap is rinsed away. Dried soap can be very damaging to protective paint systems. The moisture in the air and overnight dew will reactivate the soap which begins to attack the paint, softening it and exposing the base metal. Performing detailed corrosion inspections to identify



incorrect corrosion prevention measures before significant corrosion occurs is a very important element of prevention. The time it takes to touch up damaged paint or replace seals and sealant is small in comparison to the time it takes to change a main transmission or replace corroded fasteners.

Because most corrosion begins on the surface, maintaining paint finishes on aircraft skin and hardware is vital to achieving the maximum service life from our aircraft. (A break in the paint coating is similar to a wound on your skin. If it's ignored, the metal surface is left open to attack.) Application of corrosion preventive compounds (CPCs) provides a temporary barrier between the base metal and contaminants. Their effectiveness cannot be overemphasized. They are simple to apply and widely available in the supply system.

MIL-C-81309 Type II: Displaces water; provides short-term corrosion protection of painted or unpainted metal surfaces during shipment, storage, and in-service use; corrosion protection of moving parts where some lubrication is required, such as hinge areas, bomb racks, and sliding parts. Can also be used as a waterless cleaner.

MIL-C-81309 Type III: All the same uses as Type II with the additional benefit of corrosion protection for avionic equipment, electrical connector plugs, and contact pins. It is the only authorized compound that can be used inside cannon plugs to clean and provide a measure of protection.

MIL-DTL-85054 (Formerly MIL-C-85054): Corrosion protection and water displacement for nonmoving parts, such as skin seams, installed fastener heads, access panel edges, and areas with damaged paint.

Corrosion preventive efforts in a sandy/desert environment present some specific problems. While dry environments are generally not conducive to corrosion; loose, fine sand, particularly with high sodium content presents not only abrasive (erosion) issues, but sets up equipment for future corrosion damage. Foamers are an excellent addition to the arsenal of cleaning tools available. They use less soap to create a foaming solution (much like the scrubby bubble bathroom cleaners) capable of clinging to vertical surfaces to soften and dislodge soils. They are preferred to pressure washers. Many are available commercially through various approved vendors and are listed in appendix B of TM 1-1500-344-23 *Aircraft Weapons Systems Cleaning And Corrosion Control Manual*.

Aircraft maintenance procedures can be tailored to the operational environment. In the absence of specific maintenance instructions, common sense must prevail. Any specific questions or concerns regarding corrosion issues should be referred to the Corrosion Prevention and Control Center of Excellence.

Editor's note: This article does not replace guidance in the specific technical manuals (TM) or standard operating procedures (SOP). Always check the TM and SOP prior to conducting maintenance for any changes. ♦

—Robert Sloane, Systems Engineer, AGSE Corrosion Prevention and Control Center of Excellence, Titan-Contractor, DSN 746-9030 (256-876-9030), e-mail robert.sloane@peoavn.redstone.army.mil.

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class A (Damage)**: While initiating a left turn, the crew allowed the airspeed to decrease to zero. The aircraft leveled prior to descent into soft terrain.

■ **Class C**: During gunnery the crew experienced a suspected low-order detonation of a round in the bore of the 30mm gun during running fire.

■ **Class C**: Aircraft experienced a No. 1 engine overspeed on takeoff from a refuel point.

CH-47

D Model

■ **Class A**: Aircraft crashed when it reportedly encountered sand/dust conditions. No survivors were reported.

■ **Class C**: Damage (crack) was discovered on the trailing edge of an aft rotor blade while the aircraft was parked and moored. Maintenance assumed the damage happened during flight.

■ **Class E**: After a normal engine start sequence, aircraft was in the process of running up to flight idle speed when the No. 2 REV light came on. Both engines were shut down, but during the shutdown sequence the No. 2 engine PTIT increased to 400 degrees C. The No. 2 engine was motored until PTIT dropped below 200 degrees C. When the start switch was released, PTIT again climbed to 400 degrees. Again the engine was motored until PTIT was below 200 degrees. Again the PTIT began to rise, so the No. 2 fire pull handle was pulled and the FE confirmed the fuel valve was shut off. The engine was again motored to below 200 degrees C. This time there was no increase in PTIT. Late report.

■ **Class E**: No. 1 engine fire light illuminated during cruise flight. The FE confirmed there was no fire. The crew cancelled IFR, descended, and landed at the airport without further incident. Inspection revealed a broken fire detector sensing element on the No. 1 engine. Maintenance replaced the element and released the aircraft for flight. Late report.

■ **Class E**: The crew had performed several dust landings in the vicinity of the range and returned to home base. While taxiing, the pilot felt something dragging and dispatched a crewmember to take a look. The crewmember could not find anything wrong with the aircraft. After taxi and shutdown, another crewmember discovered the front outboard wheel was broken and the tire was busted. The commander and maintenance personnel were notified immediately. The aircraft was repaired and returned to service. Late report.

■ **Class E**: Loud whining and grinding noises were heard coming from the forward transmission area during flight. The aircraft was landed and shut down. The No. 1 flight hydraulic pump failed. DART was launched with parts, and the aircraft was repaired and flown back to home base. Late report.

■ **Class E**: When the pilot actioned the gun and rockets, the OIL BYP UTIL HYD caution light illuminated. The crew broke formation and returned to the airfield, where the crew chief reset the impending bypass button on the filter. Aircraft took off again and, after 2.0 hours of flight, the pilot actioned the gun and rockets and the light illuminated again. The crew flew back to the airfield and exchanged aircraft. The hydraulic pump was replaced. Late report.

EH-60

A Model

■ **Class C**: While conducting a hovering turn during a 15-foot AGL hover, the crew felt a vibration coming from the rear of the aircraft. The crew hovered the aircraft approximately 60 meters away from its original hovering location. When they turned to look at the area where they had been hovering, they realized they had struck a tree. The aircraft landed and was shut down without further damage. Inspection revealed damage to all tail rotor blades and the stabilator. Late report.

OH-58

A Model

■ **Class C**: Aircraft struck wires in flight. The WSPS functioned as designed, but the wire struck and damaged the windshield and frame. The pilot suffered a small laceration and was treated and released.

DR Model

■ **Class A (Damage)**: The crew was on a single-ship training mission conducting RL progression. The aircraft landed hard during straight-in autorotation with power recovery. An installation accident investigation is ongoing.

■ **Class C**: During termination of a manual throttle run on landing approach, the engine experienced an NP overspeed of 119.32 for 3 sec. This was the third event for this engine, which will require a

turbine section replacement. The crew (SP/IP) was conducting refresher training IAW the troop SOP. Late report.

UH-60

A Model

■ **Class A (Damage)**: While at a 30-foot hover, the aircraft began to yaw and spin around the vertical axis. Aircraft impacted the ground in an upright position.

■ **Class C**: Aircraft was Chalk 2 in a flight of three conducting VMC approach. Aircraft settled with power and landed hard. The lower WSPS broke, and the right M/L/G was slightly deformed.

■ **Class C**: Aircraft experienced tail rotor gearbox damage when it was started with low gearbox oil pressure.

L Model

■ **Class C**: Aircraft was participating in air assault training and landed hard. Post-flight inspection revealed damage to the FLIR turret ball.

■ **Class E**: After engine start, the PC advanced the PCL to fly and observed the No. 2 engine TGT indicating 69 degrees C at flat pitch. The engine indication was significantly higher than the No. 1 engine. The aircraft was shut down without further incident. The signal data converter was replaced, and the aircraft was released for flight. Late report.

C-12

T Model

■ **Class E**: A vibration was felt in the pedals on rollout after landing. Upon shutdown, the crew found the front tire was flat. Late report.

U Model

■ **Class B**: Aircraft was climbing to 10,000 feet in IMC conditions and experienced a lightning strike. Damage to the radome ARC-210 was found upon landing.

EO-5B

■ **Class C**: Aircraft suffered a suspected lightning strike during flight. Residual problems with the instrumentation were reported.

RQ-11A

Raven Model

■ **Class C**: Aerial vehicle (AV) experienced a GPS failure, and remote control was lost. AV has not been recovered.

■ **Class C**: AV reportedly lost altitude in flight and failed to respond to control input. AV crash-landed on major roadway.

RQ-1L

■ **Class A**: AV was airborne at 6,000 to 7,000 feet AGL when data link with the ground control station was lost. AV entered an inverted spin and impacted the ground. AV was destroyed by post-crash fire.

RQ-5A

■ **Class C**: AV experienced dual engine failure during controller shift due to suspected improper control box configuration.

RQ-7A

■ **Class B**: Shortly after launch, electrical voltage dropped below the required 24 volts. AV initiated return to launch/recovery site, but all communications with the AV were lost.

■ **Class B**: AV deployment chute did not deploy. AV subsequently crashed during recovery descent. AV has not been recovered.

■ **Class C**: AV experienced loss of engine power 5 minutes into flight. The launch crew experienced no prior indications of engine start or run irregularities.

■ **Class C**: AV crashed approximately 25 feet after the launch sequence.

■ **Class C**: AV veered off the runway on touchdown for landing. The main landing gear separated when the AV contacted the ground.

RQ-7B

■ **Class B**: AV experienced generator failure and engine shutdown while in flight and subsequently crashed.

■ **Class C**: The recovery controller reported engine failure following handoff from the forward controller. The recovery chute was launched, but the AV landed inverted.

■ **Class C**: AV experienced uncommanded deployment of the recovery chute during flight and was damaged upon landing.

■ **Class C**: AV demonstrated uncommanded flight attitude, altitude, and airspeed during flight. The operator deployed the recovery chute.

■ **Class C**: AV operator reported engine failure while the AV was in level flight. AV descended into trees and suffered wing and tail damage.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

WORKING AROUND

AIRCRAFT REQUIRES EXTRA CARE

The plane had been taxied to the ramp where the wings overhung the taxiway. While preflighting the aircraft the FO had to walk into a ditch, and as he was coming back up he walked into the wing. The static wick (on Citation jets, they're a solid, straight metal-type) penetrated his eye socket 3-1/4 inches, but luckily broke off the aircraft before going any further. When they X-rayed his skull, the wick was found to be only ¼-inch from his brain. They extracted the static wick with no damage to the eye itself. The lesson learned is: Don't allow yourself to be distracted around aircraft.

—CW4 Dirk Markestein, ASO, 6th Battalion, 52nd Aviation Regiment, Los Alamitos, CA, DSN 972-1089 (562-795-1089)

Photos compliments of SARGENT.MEANS@ANDREWS.AF.MIL

Note: These pictures were posted by the pilot on his company's Web site in hopes of helping to prevent another accident.

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

JUNE 2005 ✦ VOL 33 ✦ NO 6

War Stories, Close Calls, and Near Misses

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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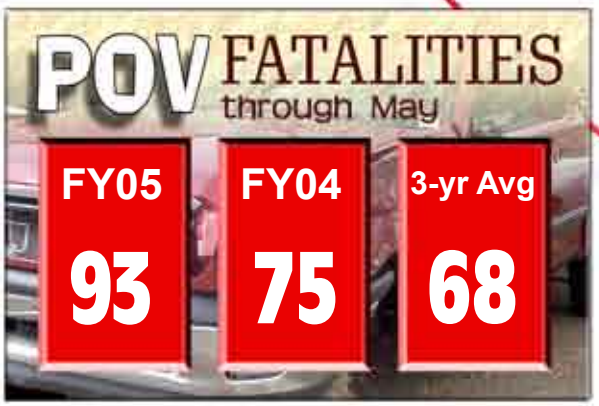

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

War Stories, Close Calls, and Near Misses

Paula Allman
Flightfax Editor

Ever wonder what makes a good war story? Most combat stories come about because someone is shooting back, which is expected. But what about Soldiers who are training in a controlled environment? Not much shooting is going on then, at least with real bullets. We need to hear those stories—your close calls and near misses.

Aviators are the best storytellers! "Did you hear what happened to old 'ACE-IP' today? Boy, he was lucky…." So the story begins. Aviators often relearn the lessons of those who came before them. This experience often comes with a high level of pucker factor, solidifying these lessons for a lifetime. Sometimes these stories are in the spotlight for all to see; other times you'll only hear about them in the club when you buy your buddy a beer.

There's an old saying that there's a fine line between an "Aw SH--!" and an "Attaboy." Some days, everything goes perfect: You brush that line and come out smelling like a rose with a good war story. Then other days everything isn't quite perfect: That fine line is crossed and someone is looking to rip your lips off.

So, where is that fine line? That's a hard question to answer. It's fluid, much like mercury used in thermometers. You ever try to pick that stuff up? It's elusive. The line moves because it depends on individual experience, capability, and the conditions at the time it's approached.

That's all well and good; but if I can't define it nor get a hold of it, then what good is it, and how can I prevent crossing it? The best answer I can offer is experience. We either learn from personal experience to develop a sixth sense to know when we are approaching that magical line, or we can learn from the experience of others.

Either way, war stories, close calls, and near misses have two things in common, they're all tales of how a crew came together to handle a critical situation and lived to fly again, and they all have lessons that can be passed on. This issue of *Flightfax* is dedicated to all aircrew members who are deployed and fighting the War on Terror, and those training to go to war when called. Thank you for what you do every day for our country.

Mission First, Safety Always! ♦

—Contact the author at DSN 558-9855 (334-255-9855) or e-mail paula.allman@safetycenter.army.mil.

Close calls and near miss scenarios can take us to the next level of accident prevention. Help us help you! Go to https://crc.army.mil and tell us your story. This system is completely anonymous.

The Essence of Mentorship

CW5 Clay Pope, CW5 Ross Steadman,
CW4 Bruce Blackstone, CW4 Mark Grapin,
CW4 Bob Markert, and CW4 John Metcalf
WOSSC 05-03

As our Army transforms its warfighting equipment to meet the needs of a 21st Century battlefield, so must our Soldiers implement the tactics necessary to wage war on an asymmetrical scale. As our personnel adapt, so must the styles of leadership in those charged with commanding, influencing, and executing the battle—particularly in our aviation community.

Over the last several decades, we have experienced certain changes to the culture of Army Aviation. Many of us remember a zero-defect mentality of the not too distant past that was the natural byproduct of ever-shrinking budgets. And, some experienced heavy professional tolls for having adversely affected the accident record of a command—regardless of the mitigating factors in the chain of events leading to the accident. This tended to create aviators who were less than willing to share their knowledge and experience. As we learned *this* lesson well, we came to apply it to our individual cockpits and companies. Rarely now do we seem to gather and share lessons learned from the *"school of hard knocks"*; that is, until the mission is labeled as *high risk* or the stakes of success or failure are too high.

We are a Nation at war. One that is waged in several 360-degree theaters with no defined fronts, and none of which seems to fit the mold of what we learned early in our careers. When we add the dynamics of a digital battlefield, we have become an Army rich in real-time data, of real-time gains and losses. An axiom rooted in

Special Operations is just as true for the Army as a whole, *"The planning for the next mission begins with the debrief from the last mission."* More to the point, the luxury of ignorance of the lessons learned—even from the mission just flown—is simply one we can no longer afford.

On the larger scale of Armywide lessons learned, nothing short of a shift in our underlying culture will bear fruit from our mountains of data. The commercial airline industry has made this leap, as have the Federal Aviation Administration and National Transportation Safety Board. Each has created programs that allow crews to self-disclose inadvertent violations or close calls without fear of retribution. The caveat being the act was not a willful violation of policy, procedure, or regulation—rather, the result of an honest mistake. Our sister services have learned to refocus their aviation cultures to see beyond the potential for knee-jerk retribution for *balling up another one*. Consider how many of us have thumbed through a Navy or Air Force magazine, and wondered, *"Gosh, I wish we could be that honest and open. Aw, it'll never happen in the Army—that'd be just calling artillery in on our own position!"*

The U.S. Army Training and Doctrine Command has enabled fundamental changes in the way we train our aviators, crewmembers, maintainers, and leaders. In many places, training shifts focus from technical competence to Soldier skills. In this shift, leaders must now weigh how to teach and enhance technical skills. For the first time in nearly two generations, a graduating Initial Entry aviator may arrive in combat in as little as 14 days after completion of flight school! But deeper than doctrine, tactics and techniques, lies the challenge in developing a culture—one that underpins how we transform our Army into that which embraces each mistake as an opportunity for growth, without forsaking personal accountability. Perhaps *Hangar Flying* may be a lost art—one that has been played in countless ready rooms.

In a recent poll of standardization pilots (SPs) at the Warrant Officer Senior Staff Course, many claim they no longer see junior warrants sitting around just talking about flying—the complaint being there is simply not enough time; or worse, woe be to the pilot who shows his weaknesses and airs his mistakes to others. The fundamentals of this lost art remain: A seasoned Soldier, spinning a yarn of how they faced overwhelming odds, and tapped their deepest reservoir of knowledge and innovation to win the day. Or, how a mistake put the aircraft or mission at risk and how they recovered from that mistake. The goal in the telling of these stories wasn't to make an Army of heroes and legends. Rather, to build an Army of well-trained, well-led, and effectively mentored warriors who enjoy the support of their chain of command and their peers in the application of each lesson brought back. Perhaps the more truly valuable lessons that were taught in this *"hand-flying university"* weren't by those senior pilots who demonstrated superior airmanship, so much as those more ordinary and less-seasoned pilots who shared their pie-eyed tales of having nearly killed themselves! Surely, few would argue these lessons—mentorship at its best—to be often more valuable than any classroom teachings.

Perhaps the more truly valuable lessons that were taught in this "hand-flying university" weren't by those senior pilots who demonstrated superior airmanship, so much as those more ordinary and less-seasoned pilots who shared their pie-eyed tales of having nearly killed themselves! Surely, few would argue these lessons—mentorship at its best—to be often more valuable than any classroom teachings.

We have all seen the diagram showing for every catastrophic accident, we actually experience hundreds of near misses. While engine history and flight data recorders help us to more accurately report genuine mishaps, it is that huge body of experience of *the one that almost got away from us* that now deserves our focus. While databases are developed

Mistakes must be seen as learning opportunities to be shared, and not cause for swift ridicule in an environment spring-loaded to the guillotine position.

that may be used to capture, warehouse, and refine such data, we must first sow the seeds of a culture that welcomes such sharing.

■ **Mentorship is a tool that can be immediately employed**. Whether it's a platoon sergeant passing along to a new mechanic how an avoidable maintenance error cost the use of an aircraft for a mission; or a pilot sharing with another how a sloppy instrument scan caused a go-around in poor weather with low fuel. There are countless Internet Web sites for the posting of lessons learned. Mentorship transcends the stroke of a key or the click of a mouse, and requires a Soldier's touch in how another Soldier was affected. It demands we have the comfort in our own flight suits to candidly discuss shortcomings or a lack of knowledge with mentors, leaders, friends, and other pilots-in-command (PCs).

■ **Commanders at all levels must be willing to set aside time to make the after-action review (AAR) process a genuine one**. AARs must be open to the participation of each member of the mission, and conducted in a retribution-safe environment—regardless of how candid or animated they may become.

■ **Our days should be flexible enough to enable *"SP's time"* as a sort of re-institutionalization of the time-honored ritual of aircrews convening in a ready room**. In addition, *"Mechanic's time"* would see maintenance teams gathered around a workbench, or hovering over a tool chest or test stand.

■ **PCs must set an atmosphere that tolerates mistakes, but not incompetence**. They must set the tone that acknowledges the potential for human error is inherent in aviation; yet our policies, SOPs—and even *Hangar Flying*—give us the tools with which to operate safely. As PCs, each must remember that if you're unwilling to *tolerate* a mistake, you had better never *make* a mistake.

■ **Each member of the team must understand they have a stake in their SOP and every doctrinal reference cited in it, and each bears the responsibility to suggest improvements**. Each must also be willing to ask a more experienced member (or even a respected source outside their team) how better to perform a procedure within the framework of the published requirement.

■ **Each organization within the Army must see the warfighter as the customer of everything they produce—be it munitions, manuals, or meals**. Each warfighter must come to know that each member of, or contractor to, the service is there to support them.

■ **Most importantly, personal accountability is a constant in our commitment to one another**. Mistakes must be seen as learning opportunities to be shared, and not cause for swift ridicule in an environment spring-loaded to the guillotine position.

In the 1970s and '80s, we benefited from the experience of a large pool of Vietnam veterans sharing tactics, techniques and procedures honed in combat. With the recent experience gained during Operations Enduring Freedom and Iraqi Freedom, we have a fresh window of opportunity to pass along these lessons to our newest members. And, while no article in a magazine can hope to change the culture of an Army, perhaps these few paragraphs may be seen as a first step in exploring how better to embrace our errors and learn from our close calls—in closing with a challenge for more candor in sharing the tale of a near miss, and taking ownership for transforming our Army Aviation culture. ♦

—This article was written by CW5 Pope, CW5 Steadman, CW4 Blackstone, CW4 Grapin (team leader), CW4 Markert, and CW4 Metcalf as a class project while attending Warrant Officer Senior Staff Course 05-03 at Fort Rucker, AL.

Don't Carry the Load Alone

CW2 Brian Fields
TNARNG

As a former Naval Aviator, I gleaned many lessons from the Navy's safety magazine* Approach*. Lessons learned from other's mistakes are often some of the best lessons in our profession. Now as an Army Aviator, I'm glad to see more of the "war stories" are making the pages of* Flightfax*. With that in mind, I will spill my guts and share a story in the hope that some lessons are learned from my mistakes.

My National Guard detachment of UH-60Q medical evacuation helicopters were on a yearlong deployment in support of the 6th RTB stationed at Eglin AFB. I was the first-up crew for the last mission of our last rotation in Florida. The mission was to support the Rangers on their island assault and it required us to reposition to Santa Rosa Island near sunset and stay overnight.

The weather began to close in at the camp, a short 15-minute flight from the island. The command proceeded with the movement and we repositioned. We completed our preflight checks and as we prepared for takeoff, I noticed the weather had deteriorated below visual flight rules (VFR) conditions. I certainly didn't want to be the one to cancel the mission and end our deployment under those circumstances, so I decided to take off, stay at the field, and see what the weather conditions were.

After takeoff, the weather

was no more than a 500-foot ceiling with 1 to 2 miles visibility. I could have gotten a special VFR clearance, but I didn't really feel comfortable with that. I called approach and asked for the weather at Hulbert Field, located on the coast and just a few clicks down the shore from our destination. It was a 2,000-foot ceiling with 5 miles visibility. The already pre-positioned Rangers gave the "it looks beautiful here," weather report from their location.

My mind raced and I asked for a ground-controlled approach (GCA) to runway 18. There was one and the approach controller gladly offered it to me. I had a comfortable feeling that we could break out as the weather minimums were well below the reported weather. The controller gave us a squawk, our first heading and an altitude, and I put the approach plates down and started to backup my copilot at the controls. Just a few seconds after he initiated the climb, we were in the goo. It was solid all the way up to and including our altitude.

After a couple of turns and a slight delay from air traffic control (ATC), our controller came back with some bad news. The GCA final controller wasn't on duty today because it was Saturday. I asked about the instrument landing system (ILS), but it wasn't available due to a military exercise over the Gulf. The seat cushion felt a little bit closer to me at this time. What about tactical air navigation (TACAN)? The controller said he could definitely give me a TACAN approach. I quickly flipped through the approach plates to the appropriate page and watched as my copilot responded to the controller's new heading. Radar vectors to a TACAN approach—not as easy, but still with weather minimums well below the reported.

Being a good pilot, I quickly switched the frequency and pushed the numerous buttons required by the Q model to bring the TACAN to life. The needle didn't respond. I double- and triple-checked. Everything looked right. Then I heard the controller in a very apologetic tone tell me that the TACAN was down. I now had full insertion of the seat cushion!

Thoughts ran quickly through my mind as to my options. I asked about Eglin AFB. Weather was about 1,500 and 2. Was ILS available? It was. "I'll take it" was my response. At this point the mission was out of my mind—finding a place to land was paramount. The controller was feeling bad about the position I was in. I glanced at the approach plate, set it up for my copilot, and told the controller that we were a helicopter and didn't need the 20-some odd mile final that the approach called for. He obliged and turned us to final in an expeditious manner.

Once on final, I got that funny feeling again in my gut. The needles didn't look right and I thought for sure we were above glide path. No, it couldn't be, you just haven't done many of these recently and the controller wouldn't have done that, I thought. I asked my copilot and he confirmed that everything looked fine.

We continued the approach. Only a few seconds had lapsed and I couldn't get it out of my mind that something wasn't right. I cross-referenced our position on the global positioning system and found we were just a few clicks from the airport and still at about 2,500 feet. I called the controller to ask where we were and he confirmed my worst fear. We were well above glide slope and only an autorotation would get us to the approach end.

The controller apologized for the lack of a lower altitude with the early turn-in. This time he would get it right, I thought. However, as we tooled downwind and I admired how well my copilot seemed to be adjusting to the actual instrument conditions, the unspeakable happened. As I looked straight ahead while backing up my copilot with a good instrument scan, I caught a glimpse of the fire

light illuminate. "You've got to be (expletive deleted) me!" I yelled. I scanned the upper console to see the auxiliary power unit (APU) fire light illuminated. But the APU wasn't on. I asked my copilot to turn the aircraft left and then right, and asked the crew chief and medic to use the bubble windows and look for signs of fire. No such luck, however, as we were in the clouds.

In my mind I read the front-page headlines in the next day's paper: "Helicopter Crashes as Pilot Fails to Use Fire-Extinguishing Equipment!" It was possible that the APU compartment was on fire without it on. What if there were a fuel leak and it ignited due to a spark? I made the decision to fire the bottles and announced it to the crew. I pulled the T-Handle and manipulated the switch to the main position. No response. Reserve. No response. Not even a sound as if the bottles fired.

I took the controls, told the controller of my dilemma and asked for an immediate turn to final. Was I declaring an emergency? I thought about it. I had never declared one before. Yes, I am! I'll do whatever it takes to get me to the ground as soon as possible. This time the controller put me right on glide slope but now well to the right. So far the needles weren't registering. I didn't care at this point. There was nothing going to make me wave off this approach. I put a sharp correction in and reversed it as I saw the needles center up. We broke out at about 800 to 900 feet AGL and found, what appeared to be, every fire truck on Eglin AFB at the end of the runway. I turned to the left and without even asking, the medic confirmed we were not on fire. As I began my descent, the No. 1 and No. 2 fire light illuminated and at that point reinforced the fact that it had to be some kind of indication problem.

We completed a normal shutdown and found there was a leak above the upper console and during our flight in the goo, water had collected and run down the power control lever linkages and had dripped onto the solenoid for the fire detection test switch, shorting the circuit and illuminating the lights. We also found the directional control valve was bad and failed to move, which in turn did not allow the fire bottle to blow. Had there been a real fire, we would have been—for lack of a better word—toast.

What lessons did I learn from this? First, training is training and the attitude of doing whatever is necessary to get the mission done can be just as deadly as "get-home'itis." I was probably too focused on doing whatever was necessary to get the mission done that I wasn't properly looking at the risks involved.

Second, I was very confident in my instrument skills, but never asked how my crew felt about the situation. This was a major change of mission profile and I never asked my crew how they felt. As a matter of fact, in the one hour flight or so, with all the decisions that had to be made, I never asked the crew for advice. In an open discussion about it later, I found out that they all had confidence in what I was doing, but that changed quickly after we had a hard time getting an approach. I really kicked myself in the rear for not including them in the decisions.

Finally, I learned to not trust the word of ATC as the gospel until I knew we had a viable plan. Our system for checking NOTAMs and accurate and timely weather briefs was almost nonexistent where we were. ATC was my best source but I trusted them too explicitly and should have asked the questions seeing that it was a Saturday and I was on a military reservation. The fact that the range control wasn't open should have been a good clue.

Don't push a bad situation when it comes to weather, don't dominate the cockpit, and don't be scared to call it quits. ♦

—CW2 Brian Fields is a member of N Troop, 4/278th ACR, Tennessee Army National Guard and is currently deployed to Iraq. He was formerly a Navy Seahawk pilot. He may be contacted at brian.e.fields@us.army.mil.

Our Descent Into Hell

CW3 Theo Galzerano
ALARNG

I was deployed to Kuwait during Operation Iraqi Freedom in 2003 when hostilities just began. Our aviation intermediate maintenance (AVIM) company was telephonically notified at noon one day and ordered to duty the next morning at 0800. I was told to pack for 2 years. Holy sh—!, I thought, even the 82nd doesn't go this quick! It was real. Our descent into hell began from there.

The Composite Risk Management process was used "on the fly" from then on. Our Vietnam veteran safety officer was the unit's father with his gentle but poignant talks about "this is your brother and sister" and survival in a combat zone. We prepared the best we could with our elephant of a unit—equipment heavy and experience shy.

After arrival in theater, I was ordered to supervise a team of 20 CH-47 mechanics to work under the 1109th AVCRAD, Connecticut ARNG, at Camp Arifjan, Kuwait. After being told we had no work there, an abrupt policy shift caused my team to be the lead CH-47 phase maintenance effort in Kuwait. I quickly realized my largest hurdle was to oversee these 20 young men through their night maintenance

mission and other duties without injury. I held myself personally responsible to their families for this.

Danger lurked at every turn. We endured hazardous living conditions, unbearable heat, and filth and disease. Performing nighttime aircraft maintenance in a hostile environment was no piece of cake either. We had poor lighting, noise hazards, theft of equipment by another unit, discipline issues, and psychological deterioration due to "the no end in sight" duration of the mission. My largest worry was that one of my men would fall off the top of a Chinook during night maintenance. I would walk around the base, as if to catch someone if they fell. These guys were heroes in their efforts of returning battle-damaged airframes to service in record time. The debris of live grenades and spent shell casings littered these aircraft. It was a mess.

On one occasion, we received word that a member of our platoon had been killed in Balad, Iraq, and a sergeant had had both arms blown off in a Black Hawk tire explosion. I had to tell my boys. They were silent as they dug out photos of their friends. I vowed to prevent this from happening to my team. I had the best maintenance NCOIC I ever met in 23 years of service. He epitomizes the image of an aircraft maintenance supervisor. I gave him one directive: Keep them alive! If he would do that, then I would support his decisions. And I did.

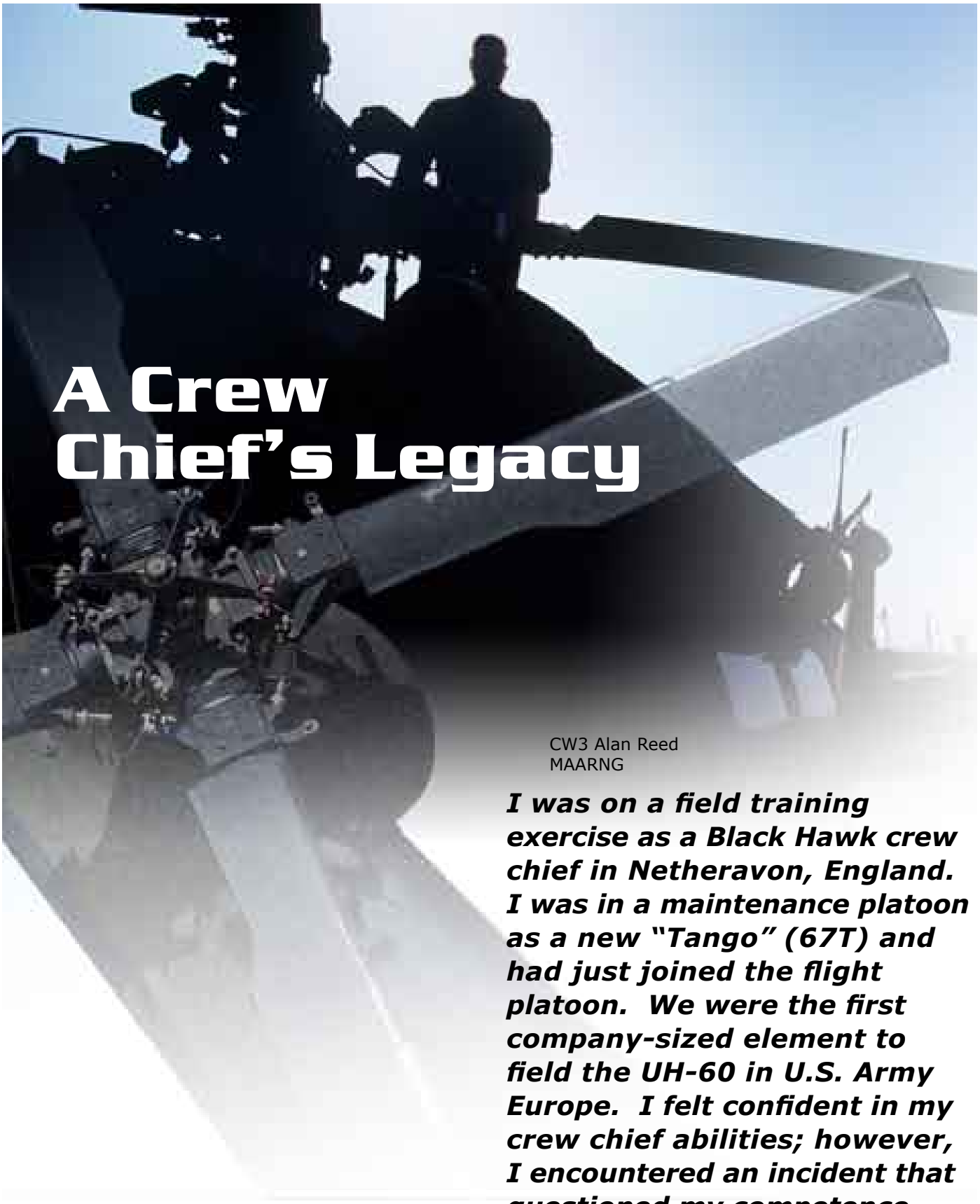
When an accident occurs, it happens lightning quick. I was walking at night with one of my NCOs in a parking area to turn off an accessory buzzer in another unit's 2½-ton truck when he cut me off, saying "I got it!" Suddenly he disappeared right in front of me. I heard a thud and froze in place, looking for him. I realized he had fallen into an exposed concrete culvert, landing on his chest, and was immobile. I helped him out. As he rolled to his back, it was clear he was going into shock and had difficulty breathing. I checked him for compound fractures and made sure his airway was clear, reassuring him all along. I knew I had to do something fast. I flagged one of my men and told him to get an ambulance NOW. He did. My NCO recovered in the hospital and returned to us weeks later, bruised but okay. These days he's fighting numbness and dangerous blood clotting resulting from his injury.

My safety officer became ill and was evacuated to the States. He was diagnosed with lung cancer and died before our return home. Our "father" and friend was gone. We will always miss him. Not only was he a true friend, but an accomplished aviator and attorney, a friend to all.

Many of our Soldiers received minor injuries or became ill, some with heart problems or other issues. I personally had a mysterious respiratory illness that progressed into chronic bronchitis and fever, which never was explained by medical authorities there or here in Alabama.

Our efforts were small but significant. These great guys left an indelible impression on me. In life you can choose to watch history or help make it, like our team. Think about it. My lessons learned are to trust your instincts, remain clean, and work smart. Always keep your head on a swivel. Even so, disaster will strike. When people say "The Army will," remember, WE ARE THE ARMY. We make it happen. There is no magical Army that does anything for you. Keep your weapons, ammo, water, and food readily available and guarded. Finally and most importantly, take care of your Soldiers. ♦

—CW3 Galzerano is a member of the Alabama Army National Guard, AASF #2, Birmingham, AL. He wrote this article while attending Aviation Officer Safety Course 05-003 at Ft. Rucker, AL.



A Crew Chief's Legacy

CW3 Alan Reed
MAARNG

I was on a field training exercise as a Black Hawk crew chief in Netheravon, England. I was in a maintenance platoon as a new "Tango" (67T) and had just joined the flight platoon. We were the first company-sized element to field the UH-60 in U.S. Army Europe. I felt confident in my crew chief abilities; however, I encountered an incident that questioned my competence—one I will never forget.

As most Black Hawk crew chiefs know, one of the required aircraft inspections consists of taking oil samples from the intermediate and tail rotor gearboxes and getting them to a lab to conduct an analysis of wear and particles therein. We also take a sample of the auxiliary power unit (APU) oil.

One evening after a flight across the dark countryside, we landed on the dark, grassy flight line without incident. Oil samples were due upon landing after our night vision goggle flight. I had a headache and was tired, but knew I had the next day to rest up, so I pushed on with taking the samples with a flashlight after the pilots departed for their hooch.

Typically, this process doesn't take more than 20 or 30 minutes. However, as Murphy would have it, I discovered the sump was a bit low while taking the APU oil sample. I took care of it immediately and filled the sump using a funnel borrowed from another crew chief. The red plastic funnel was attached to a 10-inch tube with a 3-inch flared end at the opposite end of the funnel. As the flared end of the tube disappeared into the dark, oil-filled sump, I innocently poured the oil into the funnel and then pulled the entire assembly out, only to discover that the flared end didn't come out with the tube!

Crap! I frantically took my flashlight and pointed it into the dark sump. With my tired eyes now wide open, I saw the missing piece floating in the oil! This assembly was actually three pieces, not two!

I spent the next hour trying to fish the piece out with my fingers to no avail. Frustrated and worried about how I was going to get this thing out, I retired to my bunk and collapsed. I'd attempt this feat again first thing in the morning.

I woke up and immediately headed back to my aircraft to continue my "fishing" expedition. Luckily my aircraft wasn't scheduled to fly, so I had time to try a number of ways to retrieve the broken plastic. As a "wannabe" true member of the flight platoon, I was worried about the impact this incident would have on my future as a crew chief. I worried for several hours while I tried every possible tactic and special tool to get the funnel piece out. Embarrassed and defeated, I broke down and told my squad leader of my dilemma.

Through the unsuccessful efforts of my squad leader and platoon sergeant to fish the darned piece of plastic out, the first sergeant recognized we needed assistance from the "Brits." The APU had to be pulled out of the helicopter and drained. We spent the next 2 days waiting for the Brits to secure a wrecker with an arm long enough to lift the APU from its compartment, tip it upside down, and drain the oil and subsequent piece of plastic.

The Black Hawk was down for 3 days, but my first sergeant told me that accidents happen and he was glad I reported it quickly. We learned a lot about the APU and other maintenance "tools" in this process. This was the first time an APU was removed from a Black Hawk in a field environment. Most importantly both our armies benefited from this incident as well; a bond was formed that can only come from adversity. ♦

—CW3 Reed is currently a battalion aviation safety officer (ASO) for HHC, 3-126th Aviation, Massachusetts ARNG. He was a Specialist 4 with the 48th Aviation Company at Nelligen Barracks, FRG, when this incident occurred. CW3 Reed wrote this article as a class project while attending ASO Course 05-003.

Wait It Out

CW2 Terry G. Weber
C Co., 3/229th

We were about to leave a forward operating base (FOB) in Afghanistan. We had been there for more than 3 weeks and were ready to leave for Bagram Airbase. The time was 1700, and the weather was about to get worse in another hour and drop below our minimum requirements. We left as a flight of three, two AH-64s and one UH-60, with the AH-64s taking lead.

This mission was to support ground troops and would take only 15 minutes. Before we could take off, a dust storm kicked up. However, visibility was still 3 miles and the ceiling was around 800 feet AGL.

We took off and headed to the ground troops. Once we got to the mountains the visibility and ceiling decreased, but the flight felt comfortable so we continued on to the site. We picked up the ground troops and relayed back to base that they were fine and en route to the base.

As we headed for Bagram Airbase, the weather was the same but the lead aircraft crew felt uncomfortable. Instead of heading back to base, I decided to change chalks and pick up lead duties. The rest of the flight agreed, and I took over lead. I proceeded down the mountain pass to pick up our route home.

By this time the weather had dropped to about ½-mile visibility and the ceiling was 700 feet AGL. The UH-60 crew felt fine with going on, but the AH-64 crew did not like the fact that the weather was deteriorating. I stayed on the map and told my copilot to turn to specific headings to get us out of the weather. Everything would be fine after our flight crossed over this one mountain and we picked up the low ground.

I told my backseater to climb over the mountain, which was 10,400 feet mean sea level (MSL). The weather hadn't changed and it looked like everything was fine, so I looked out to help him clear obstacles. Without warning, I noticed we were going very slowly, but I thought my perception was skewed because of the visibility.

We had only 500 feet to go, but I still had a nagging feeling that we were going too slow. I then looked inside, and my backseater said we couldn't make it over the mountain. He was right. We were at about 40 knots, 10,000 feet MSL, 98 percent torque, and our rotor was drooping.

I called the other chalks and told them we could not make it and must turn around. We lost the ground once we turned around, but fortunately we had Chalks 2 and 3 in sight. We were in a valley, so we lowered the collective until we finally broke out of the clouds. The flight decided to return to the FOB until the weather blew over. However, we suddenly noticed another AH-64 and UH-60 flying toward us. We had to make another turn in the valley to avoid them.

We finally made it back and debriefed. We discovered the crew that was replacing us at the FOB also had gone through the pass to support the ground troops. The lesson learned here is to always make the most conservative decision; in this case, we should have waited out the weather and left safely the next day. ♦

—CW2 Weber wrote this article while attending the Aviation Safety Officer Course 04-004 at Ft. Rucker, AL. He may be contacted at terry.g.weber@us.army.mil.

Preflight Pragmatism

CW3 Mark Mestre
B Company, 2/2 Aviation Regiment

Our unit was on a 9-day field exercise to familiarize the new pilots with air assault planning and execution. The field exercise incorporated 2 days of air assault multi-ship missions, followed by a night vision goggle (NVG) multi-ship mission. The flight crews were not battle-rostered since our unit had a deficiency of available pilots in command (PCs). Each PC maintained his own aircraft as well as his crew chiefs, with pilots (PIs) rotating from one aircraft to the next. This allowed new pilots to experience a wide range of experience by flying with more than one PC during the exercise.

We were trained and prepared for dusty conditions at the landing zone (LZ) and there were numerous landings in daylight and night conditions to verify the suitability of the proposed site for the field exercise. The day before the exercise, a snowstorm blanketed the entire LZ with 6 to 9 inches of snow. By the time we arrived at the site, the snow had formed a hard layer eliminating the dusty conditions; however, we were not prepared for the snow conditions at the site. The thing we were most concerned with was whiteout. The aircraft blew a considerable amount of snow around at a hover. It became imperative during hovering operations that flight crews expedited their maneuvering to reduce the amount of blowing snow.

On the fifth day of the exercise, we conducted a four-ship air assault in daylight conditions. The mission

was briefed and rehearsed; formations were thoroughly discussed to include closing speeds to form up in flight since the conditions at the field site would not allow for the aircraft to take off as a flight. For this flight, a new WO1 was assigned as my PI. He had 240 hours total time and this was his first tour. I was assigned Chalk 2 on this mission. During the mission briefing, the new W01 insisted on briefing our assigned topics. Despite his inexperience, I let him brief and thought it was a good learning experience for him. His motivation was good, but it was clear he had difficulty briefing items he should already be familiar with.

After preflight, I conducted an aircrew brief. As we were getting ready to go, I once again briefed our calls to the lead aircraft and explained how we would depart the LZ since we weren't parked in chalk order. During the preflight, we noticed spools of concertina wire were stacked up 40 feet from our 2 o'clock position. This was right in the middle of our intended hovering path out of parking and over-flight of the wire would be unavoidable.

As we brought the engine power control levers to fly, I noticed the wire was swaying, but not moving. I explained to the PI that I would take off and establish our position in the formation. He became quite upset with this and insisted he was capable of doing so. I told him that I understood he could do it, but I would do this myself because of the wire. My reasoning was that if the wire should be blown over or cause damage, I wanted to be the one on the controls when or if that occurred.

We took off without incident and linked up with the lead aircraft as briefed. After linkup was complete, I transferred the flight controls to the PI and allowed him to fly the aircraft for the remainder of the mission. I noticed he had difficulty keeping the aircraft's position stable as well as maintaining our briefed rotor separation. I explained that since we were Chalk 2, all of our movements were compounded rearward through the flight and if he felt he was over his head to let me know. On the postflight brief, I pointed out that it was my option to take off and linkup with the flight. I also mentioned his difficulty in keeping up with the lead aircraft. He became argumentative and defensive over this. I just told him to review the multi-ship tasks and be more careful the next time he flew formation flight.

On day seven of the exercise, the unit began preparations for the NVG multi-ship mission. Again, the mission was briefed and formations discussed. I was assigned as trail for this mission and was again assigned the WO1 that I had flown with on the previous air assault. I was asked to be the backup air mission commander (AMC) for the flight since I was the senior PC in the flight.

After our preflight, I briefed the crew again and requested we show up a little earlier to the aircraft to give ourselves a little more time to get ready because this mission would also be a live-fire mission. After going through the cockpit checks, I took a few minutes to explain to my PI that, in my opinion, we were about to do the most dangerous thing that any aviator can do—multi-ship, NVG, air assault mission into a confined LZ with five aircraft.

He instantly disagreed with me and proceeded to explain that "in his experience" I shouldn't be so concerned about flying a night multi-ship mission. Since I was the most experienced pilot, my plan was to take off and close on the formation before giving the controls to the PI. He immediately became angry with me and once again insisted he was quite capable of doing these tasks. I explained that I trusted him, but wanted him to see how closure under goggles looked so he could learn. He could then fly the entire flight himself.

At take off, I positioned the aircraft over the taxiway and took off, climbing and accelerating to our linkup

speed with the formation (we took off with one minute separation between takeoffs). Before I reached our linkup speed, the AMC called and asked if I would turn on my HF radio to monitor the events and be prepared to make calls for the flight in case he was unable to make the calls himself. Use of the HF radio had not been briefed, and the unit had not been trained on its use, but I had received HF training in my previous unit, so it wasn't any problem for me to do so.

I transferred the flight controls to my PI and announced that I would be focused inside the aircraft to get the HF radio tuned-up and ready. I reminded him to watch his rate of closure with the flight, positioned his ICS selector so he could make our beacon call, and started on the HF radio.

I looked up every 10 seconds or so to monitor his progress. I asked him if he could see Chalk 4 and he replied that he could. I again mentioned that he watch his rate of closure on the formation. I continued working with the HF radio and again looked up but this time looked at our airspeed. He had accelerated to 110 knots (our briefing closing speed was 80 knots). I told him to watch his airspeed and he replied that he was and that he had intentionally accelerated to 110 knots. I looked up and told him to watch his rate of closure on Chalk 4 again and to slow down, to which he replied, "Roger."

As I was finishing up with the HF radio, my attention was drawn to my chin bubble, where I saw what looked like the slime light. I quickly looked up and saw we were less than one rotor disc away and 30 feet higher than Chalk 4. I immediately announced that I had the controls and began to decelerate and turn the aircraft away from Chalk 4. We were above Chalk 4 before our deceleration brought us under the formation speed. I then positioned the aircraft in its proper place within the formation. The remainder of the flight proceeded without incident. Unfortunately, the WO1 was argumentative and defensive again on postflight when I mentioned how close we came to having a midair collision with Chalk 4. Had I not looked up when I did, the outcome of the flight might have been very different!

As I was finishing up with the HF radio, my attention was drawn to my chin bubble, where I saw what looked like the slime light. I quickly looked up and saw we were less than one rotor disc away and 30 feet higher than Chalk 4.

Lesson learned

If you fly with another pilot, regardless of his or her experience level, make sure it is understood that each pilot has veto authority over the flight. If your aeronautical cohort is unwilling to recognize yours, it's best to find a new partner. Remember, as a pilot, you are only as good as the decision you make right now—and the decisions you make are only as good as the options they provide. ♦

Editor's note: These matters are further complicated when they involve two rated pilots, each of whom has drawn different conclusions from a given set of facts. Because all pilots will eventually share the cockpit with another pilot, it is important to consider how best to resolve differences in aeronautical decision-making PRIOR to every flight.

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Stick to the Plan

Anonymous

Several years ago, I was a staff aviator at an air show. It was an undesirable weekend mission, so the junior pilot in command (PC) and the staff aviator drew the mission. The fly-in and static display went fine. I answered all the typical questions, got the typical sunburn on my head and face, and told the typical kid to take his dripping candy apple out of the crew chief's communications station.

The weekend was finally over, and the 3-day mission was almost at an end. It was now time to work on the egress from the crowded airfield. The air show director asked if we could put on a demonstration as the Air Force had. We declined. Then the director said he could push our aircraft out ahead of the myriad of other planes if we would go around the pattern once or twice. The PC asked the crew's opinion. The crew chief (CE) and I both told the PC that we had some reservations, but we would go along with the crew. When I asked if we were briefed for flying patterns, he said we would not be doing anything different than what we normally do at an airport, so it was okay.

Since we were all ready to get home, we agreed to do it. Plus, we wanted to show off to the civilians at the show! We couldn't let the Air Force get the best of the Army! The first problem arose in getting the Black Hawk past the fixed-wing aircraft in parking. So what did we do? We pushed our aircraft out to the apron, fired it up, and took off.

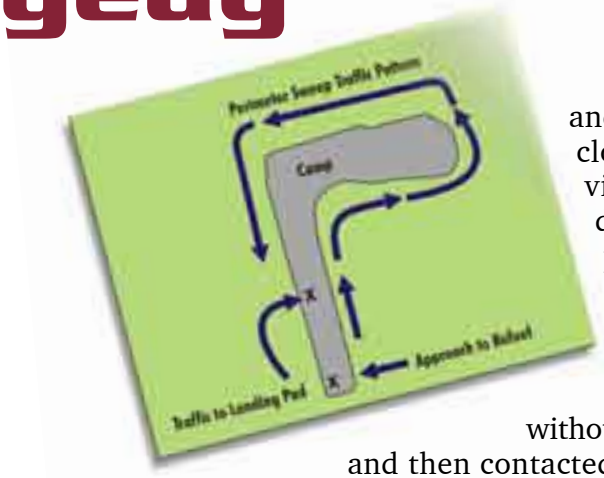
We did a couple of patterns including a hover demonstration, roll-on, and a landing to the sod. Woohoo! We really stuck that landing! We then went on our merry way and returned to station. All was well until 2 weeks later when the town was so happy and proud of our air show demonstration that they sent my commander a copy of the local newspaper describing our "acrobatic air show demonstration."

So there I was … in the colonel's office, getting my butt chewed! Our crew deserved the punishment because we never should have agreed to perform anything different than what was briefed. We easily could have wrecked our aircraft and injured or killed hundreds of spectators or ourselves! We were just lucky—stick to the plan! ♦

--The author's name was withheld by request. If you would like to publish a story anonymously in *Flightfax*, please call Ms. Paula Allman, Managing Editor, at DSN 558-9855 (334-255-9855) or e-mail paula.allman@safetycenter.army.mil.

Almost a TOA (transfer of authority) Tragedy

MAJ Steve Fritz
VAARNG



I was a division staff officer on flight status. That meant I was low priority when it came to flight time. However as our deployment was winding down, the line pilots allowed staff pukes, like me, to climb into the cockpit. My first flight with an instructor pilot (IP) was an area orientation flight that included some night unaided training.

As we headed back to base, we completed a perimeter sweep of the compound per the unit SOP. The base was shaped like an upside down L (see diagram above) with the refuel point at the very end of the long part of the L. The traffic pattern around the base ran counterclockwise so once we completed the perimeter sweep, we rounded the long end of the L and continued our turn into hot gas. By the time we rolled into hot gas, it was completely dark.

We completed our pre-refuel procedures; e.g., doors and windows closed, visors down, and position lights steady. We refueled without incident and then contacted tower for takeoff from hot refuel to the landing pad. We took off and immediately turned right 90 degrees towards the flight line landing pad. We climbed to traffic pattern altitude and began flying at about 50 knots to about half up the L before we had to turn right 90 degrees about midway up the length of the L to the landing pad.

In the distance at the top of the L, we could see an OH-58D position lights flashing and heading our way. It appeared we had plenty of room to turn towards the landing pad before the OH-58D got close. I knew from the call to ATC that the other aircraft was from one of the incoming units completing their orientation flights.

The IP was on the controls and I was sitting in the right seat looking towards the landing pad scanning to clear the aircraft for the impending right turn. Suddenly the aircraft banked hard right and dropped altitude. The IP asked, "Did you see that?" as he recovered to level flight and made our approach to the pad. I replied, "What the hell was it?" He said that it was an OH–58D completely blacked-out and he didn't see it until it was right over the top of us. We landed and then ground taxied to our parking pad.

So how did this near miss happen? First of all, the traffic pattern had converging traffic from the hot refuel point to the flight line landing pad. The aircraft that was blacked-out was under goggles, so there was aided and unaided traffic in the pattern. What about ATC, why didn't they deconflict the aircraft? We found out later that the two OH-58Ds were both on a goggle orientation flying together. The first aircraft remained under goggles while they completed the perimeter sweep at the end of their mission, while the other aircraft de-goggled. So when they made radio calls to tower, they made them as a flight and the first aided aircraft got well ahead of the unaided wingman. Finally, after completing refuel, we failed to turn our position lights on flash so the pilots in the other aircraft said we blended in with the ground vehicle lights along the road that paralleled the traffic pattern. ♦

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Applying CRM to the Skies Over Baghdad

Brett Blount
U.S. Army Combat Readiness Center

Composite Risk Management (CRM) expands traditional risk management to assess all situations—tactical or non-tactical, garrison or field—that expose our Soldiers and civilians to risk. For instance, the CRM process can help us identify hazards that exist both at work or while engaged in an off-duty activity. In Operation Iraqi Freedom, it is also a real-world tool that allows leadership to focus on accidental hazards as well as the enemy threat, thereby reducing loss and promoting readiness. The essence of CRM in a combat zone is knowing when to shift our attention from mitigating the enemy threat to focusing on an existing accidental hazard, thereby examining all risks holistically. The following is an example of how we can preserve our combat power by applying CRM when both tactical threats and accidental hazards threaten our aircrews' lives.

A high volume of aviation assets operate continuously over Baghdad. Multi-National Division-Baghdad (MND-B) controls that airspace, 1,000 feet AGL and below. Aircraft sharing this limited airspace include Army and Air Force helicopters, fixed-wing aircraft, and unmanned aerial vehicles (UAV), plus commercial aviation and private contractors. Aircraft deconfliction and flight-following procedures in this combat area are in effect; however, informal near-miss reports provide some evidence that failure to follow established procedures create the potential for a midair collision. In fact, aviators interviewed in theater are as concerned about midair collisions as they are about enemy contact.

The Baghdad area hosts a busy civilian airfield and many helicopter landing areas. Baghdad International Airport (BIAP) borders the southwest perimeter of the city of Baghdad and has a relatively sophisticated air traffic control program. Run by Iraqi nationals and assisted by the Federal Aviation Administration and the U.S. Air Force, BIAP tower controls all traffic using the airport's runways. Aircraft operations to and from several other landing areas within the MND-B area offer the greatest aircraft deconfliction challenges.

Several systems allowing aircrews to communicate with and therefore avoid each other exist in this area. One method that enhances aircraft deconfliction is Baghdad Radio. This airspace information center promotes situational awareness by providing traffic advisories 24 hours a day to participating pilots. Baghdad Radio provides updates that positively influence aviation combat operations, such as changes to restricted operating zones (ROZ) and recent enemy man portable anti-aircraft defense (MANPAD) activity. At one of the helicopter landing areas, air traffic services (ATS) personnel facilitate aircrew communications by operating a tower, providing positive control to aircraft operating within its boundaries. For deconfliction purposes, aircrews operating to and from another Baghdad helicopter pad broadcast their position and intentions on a discrete radio frequency assigned to that particular landing area, commonly referred to as a common traffic advisory frequency. Baghdad Radio is also available to aircrews when conducting flight operations from other landing areas that have no control tower or dedicated radio frequency.

Aircrews benefit from many flight procedures that facilitate safe aircraft separation. One procedure assigns different altitudes to aircraft conducting dissimilar combat missions. For example, missions flown to provide convoy protection have a lower hard deck and ceiling than aircraft flying personnel transport missions. Another procedure takes place during mission briefings when aviators learn the time and location (ROZ) of UAV operations, allowing them to stay clear of the difficult-to-see unmanned vehicles. Even with these flight, communications and avoidance procedures in place, aircrews still experience near-miss episodes while conducting operations in the congested airspace over Baghdad. This situation illustrates how the accidental hazard of a midair collision can be of greater concern to aircrews than even the threat of hostile contact.

Flight procedures mean nothing when some aircrews refuse to follow them. Many reports submitted by ATS

personnel contain instances of aircrew refusal to comply with established deconfliction procedures. Reports from ATS personnel working at the towered helicopter landing area include aircraft landing without ever having contacted the tower or even Baghdad Radio. Failure to report the aircraft's position and pilot's intentions create a mid-air hazard to other participating aircraft. Other reports involve aircrew noncompliance with hard deck altitudes established to provide aircraft separation. Granted, there are situations when observance of assigned altitudes, or deviation from the proper altitude, is the result of possible enemy contact. For example, aircraft working low over the city providing convoy cover and other force protection duties may have to avoid enemy contact by climbing to a higher altitude, thus impinging on airspace protected for other missions. A near-miss episode under these conditions is perhaps an unavoidable eventuality of combat; however, aircrews refusing to follow established communications and deconfliction procedures developed for a contingency-based environment pose an unacceptable risk to other aircraft. A midair caused by failure to follow procedures, especially procedures that do not expose aircrews to greater enemy threat, is a ***preventable*** accident.

Aircrews must focus on many tasks and procedures during even normal flight operations. Not surprisingly, an Army Aviator's workload increases greatly when enemy threat becomes a major focus of a mission. In the vicinity of Baghdad, aircrews must now assess both the enemy threat (small arms fire, MANPADs) and the accidental hazard of potential midair collisions to create a composite risk level for each mission. Aviators successfully create and employ tactics, techniques and procedures (TTPs) to mitigate the threat of an adaptive and determined enemy. Although the enemy is by no means eliminated, these successful TTPs allow aircrews to consider both the tactical threat ***and*** accidental hazards ***holistically***, assessing all risks all the time. This Composite Risk Management process can assist our aviation leadership in developing a composite, and therefore more comprehensive, risk level for each mission.

The burden to prevent catastrophic midair collisions must not rest on the shoulders of aircrews alone. The responsibility to apply the Composite Risk Management process to the midair accidental hazard must include elements outside the aircraft, such as the Army's ATS personnel who have the responsibility to develop the procedures that aircrews use to operate efficiently in the airspace (below 3,000 feet) over Iraq. Any improvement of the existing airspace structure should enhance aircraft deconfliction efforts without restricting the effectiveness of aviation combat power. To properly assess the situation and determine proper courses of action, a theater ATS unit hosted an Army airspace command and control plan (A2C2) working group at LSA Anaconda. The agenda of the working group included:

- Area (Iraq) ATS overview.
- An overview of Phoenix Radio (future theater-wide airspace information center).
- Baghdad Radio procedures.
- Conduct an analysis of the theater A2C2 plan.
- Develop solutions.

To ensure all users had a voice in the process, the A2C2 working group invited representatives from many areas of aviation and airspace managers, to include an Infantry division G3 air, an aviation brigade executive officer, an MNC-I C3 air and plans representative, a tactical ATS expert from ATSCOM, an aviation safety representative from the U.S. Army Combat Readiness Center, and several aviation safety, standardization, and tactical operations officers currently involved in theater flight operations.

The results of the working group were encouraging. The A2C2 working group agreed that aircrews must comply with reasonable rules applied to a fluid, combat environment. Army Aviation leadership must employ sound airspace management techniques to mitigate the existing midair potential. One solution offered by the working group involved the implementation of a theater airspace plan (Phoenix Radio). This plan offers a flexible, combat compatible corridor system that provides aircraft separation procedures appropriate for this phase of Operation Iraqi Freedom.

Another part of an eventual fix requires airspace management leadership to collect TTPs used by ATS personnel in theater that facilitate safe and efficient flight operations. A formal, written version of the acceptable TTPs could then become a part of the Annex O (A2C2 Plan) of the MNC-I operations order. Other efforts to promote airspace deconfliction involved the "see-and-be-seen" aspect of nighttime tactical aircraft lighting during the en route phase of a mission. Of course, these efforts mean nothing if aircrews do not understand the potentially fatal consequences of neglecting established procedures. When aircrews operate in an environment where the composite risk level is high, adherence to these procedures will prevent loss and therefore preserve combat power.

Aircrews contend with both an aggressive enemy and the prospect of a midair collision when operating in the congested skies over Baghdad. ATS personnel, along with other aviation specialists, understood this and applied the concepts of CRM to the problem. This process developed solutions that will enhance already established procedures to preserve our aviation assets. Do your part to promote readiness: follow the communications and flight procedures created for operations in a combat environment. ♦

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Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class A**: The crew was conducting nap-of-the-earth (NOE) training on an approved route when the aircraft struck several strands of high-tension wires extending over a major river. The aircraft crashed in the river and both crewmembers received fatal injuries.

D Model

■ **Class E**: During brownout training, the crew performed eight VMC approaches, one of which was a tail low landing. Upon postflight inspection, the crew noticed the tail wheel strut had collapsed and the stabilator had a dent in the aft center portion where it had contacted the tail wheel. The crew did not experience any hard landings and an NDI was conducted with no damage detected. The aircraft was repaired and returned to service. *Late report*.

CH-47

D Model

■ **Class A**: The aircraft experienced a single engine failure, in which the crew had to conduct an emergency landing. The aircraft incurred extensive damage from the hard landing.

■ **Class D**: As the PC made a right-hand turn during a four-wheel taxi, the crew felt and heard a loud bang. The PC stopped the aircraft and set the brakes as crewmembers stepped out to investigate. The crewmembers discovered that the forward left inboard tire had blown a 10-foot long and 2-foot deep section of rim along its outer circumference. The rest of the rim was still in place and the tire was not damaged. The crew terminated the mission and returned to base.

■ **Class E**: Approximately 9 minutes into flight, the PC informed the crew that he heard an unusual noise originating from the forward transmission pylon. The CE investigated the area and found evidence of abnormal vibrations on the No. 1 flight control hydraulic pump return line. The FE, monitoring the maintenance panel, noted the hydraulic pressure from the No. 1 system dropped from 2,900 PSI to 2,500 PSI. The PC initiated an approach to land in a large open field. During the approach, the hydraulic pump failed, allowing hydraulic fluid to drain into the troop commander's seat compartment. The aircraft landed without further incident. Maintenance replaced the hydraulic pump. *Late report*.

MI-17

D Model

■ **Class B**: The crew reported dual engine failure during flight and executed an autorotation into an adjacent field. The tail boom separated due to the hard landing.

OH-58

C Model

■ **Class C**: While conducting a 180-degree autorotation with turn, the Nr momentarily attained 113 percent (as read from sensitive digital NR gauge). The aircraft landed without further incident.

DI Model

■ **Class E**: While on final approach at 60 KIAS and 50 feet AGL, the crew observed a hot battery caution light. The crew conducted an emergency landing at the local airport without any further damage or injury. The battery was replaced and the aircraft was released for flight. *Late report*.

DR Model

■ **Class C**: The aircraft experienced an overtorque condition during a power recovery from an autorotation demonstration.

■ **Class E**: The hot battery No. 1 caution light illuminated on short final to airfield. The aircrew turned the battery switch off. Shortly thereafter, the hot battery No. 1 caution light illuminated again and would not extinguish. The aircraft was immediately flown to a parking area and emergency shutdown procedures were conducted IAW the -10. The maintenance test pilot suspects the hot battery was caused by successive aircraft battery starts over a short period of time. The aircraft was released for flight. *Late report*.

UH-60

A Model

■ **Class D**: The IP was conducting readiness level progressive training in the traffic pattern at the local airport. The aircraft was on short final approach for a run-on landing when the CE noticed a "Y"-shaped crack in the lower one-third of the pilot-side windshield. The aircraft landed, taxied to the ramp, and was shut down. Inspection revealed a small, BB-size impact had occurred in the center of the crack. Damage was most likely caused by a small pebble on the runway that had ricocheted into the windshield by the rotor system. A runway inspection was conducted by local airport authorities with negative results. The windshield was replaced and the aircraft was returned to service.

■ **Class E**: While in flight, the crew chief attempted to place an ammunition belt into a machine gun and the feed tray separated from the weapon. A break occurred at the hinge where the feed tray is attached to the machine gun. *Late report*.

L Model

■ **Class E**: During final approach with full fuel (16,100 lbs.) and flying approximately 20 KIAS, the aircraft was Chalk 3 in a flight of three, slingloading an HMMWV (5,200 lbs.), when the aircraft encountered a situation where power demanded exceeded power available. This caused the aircraft to descend below intended altitude and the crew jettisoned the load from approximately 30 feet. The load impacted the ground and suffered significant damage. The aircraft experienced no damage after the load was jettisoned, and returned to controlled flight, landing about 100 yards away. The crew suffered no injuries and performed a standard aircraft shutdown. *Late report*.

C-12

T Model

■ **Class E**: During cruise flight at FL280 and OAT of -36 degrees Celsius, a loud bang was heard in front of the left-seat pilot. The crew noticed the left windshield had crystallized for no apparent reason. The crew began an immediate descent and donned the crew masks with 100 percent oxygen. The PI declared an emergency and requested direct destination and priority handling at the destination airfield. Cabin pressurization was reduced to zero PSID and descended to 7,000 feet MSL. The PC in the right seat landed the aircraft without further incident, and then taxied to parking and shut down. The windshield was replaced and aircraft was returned to service. *Late report*.

RC-12

H Model

■ **Class E**: The aircraft was 10 feet from leveling out at FL250 when the inner pane of the left-side windshield shattered. The windshield heat was turned on at FL100 as per the operator's manual. The pilot's defrost vent was closed. The crew descended the aircraft to FL220 and 4.0 PSID cabin pressure, and then continued to their destination without further incident. *Late report*.

RQ-11A

■ **Class C**: Aerial vehicle (AV) crash-landed in high wind conditions.

RQ-7A

■ **Class C**: During a recon, the AV lost GPS link, therefore losing operator control. AV has not been recovered.

RQ-7B

■ **Class B**: The tactical automatic landing system (TALS) issued an automatic waveoff to the AV, which did not climb as it should. The AVO issued a climb command, but AV still did not respond. At 200 feet MSL, the AVO initiated chute deployment. The AV has been recovered.

■ **Class B**: The AV got caught on launcher and subsequently broke up before descending to the ground. Failure to remove launch pin is suspected. The AV is a total loss.

■ **Class B**: While returning from a routine training mission, initial indication ignition failure followed by engine stoppage. The AV landed on a downhill slope with damage.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

Near Miss

While performing a daily check on the hoist, an 80 to 100 pound counterweight separated from the crane and fell 30 feet to the floor, barely missing the operator by 5 feet.

Recommendations (at user level):

- Stand clear of hoist during operations.
- Wear a hard hat while operating hoist.
- Inspect lifting devices monthly.
- Add chain lanyard to the counterweight.

footprint
½" deep

—Submitted by Larry W. Anderson, Installation Safety Officer, Ft. Bragg, NC, DSN 236-6605 (910-396-6605), larry.william.anderson@us.army.mil.

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

JULY 2005 ✦ VOL 33 ✦ NO 7

Crew Coordination Special Issue

U.S.ARMY

DASAF Corner

Why the CRC and What's Next?

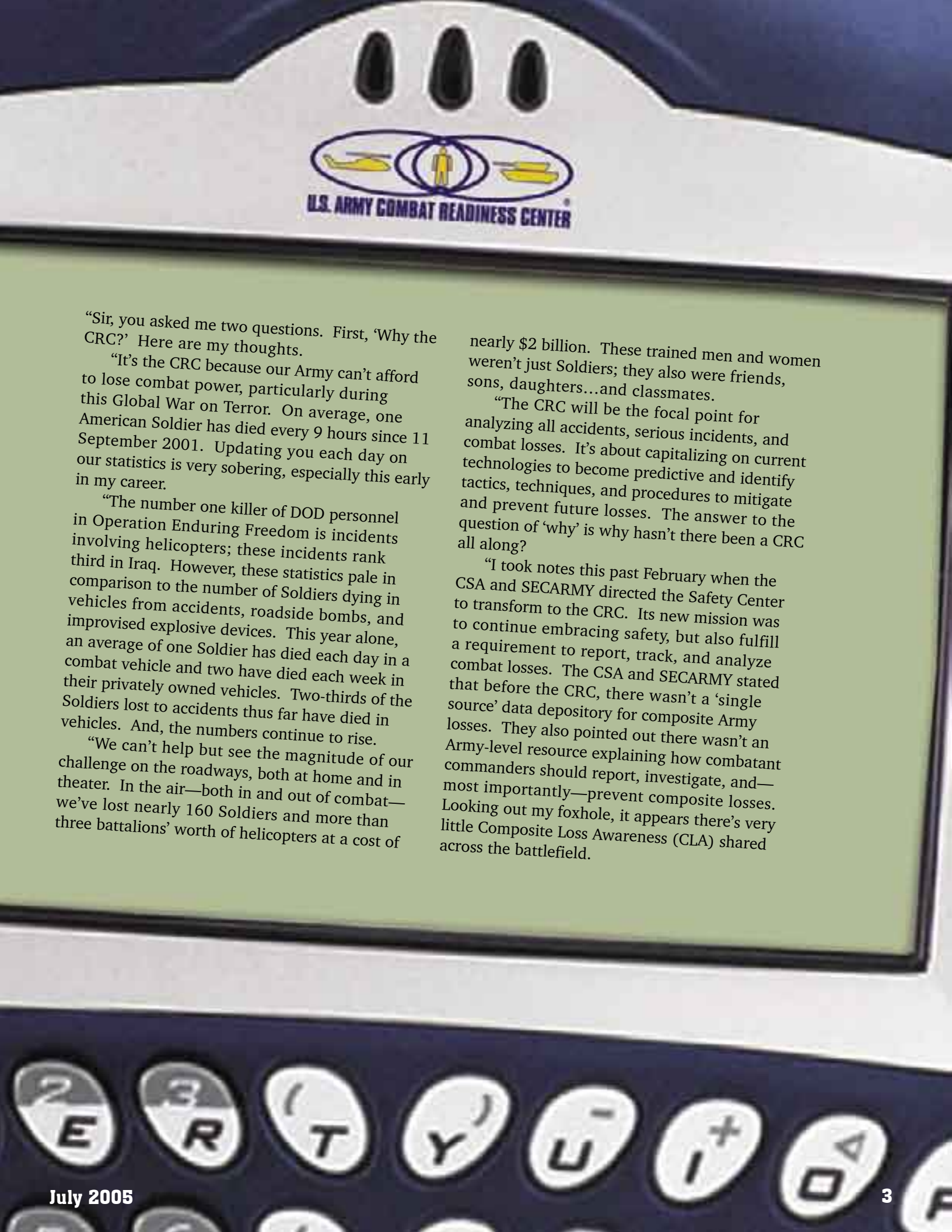
The Army Safety Center recently transformed to the Combat Readiness Center (CRC). Once an organization that focused solely on accidental losses, we're now looking at all losses of combat power. This holistic view is quickly providing a new capability for our Army to understand loss and become more effective through control measures and predictive analysis. So, what's next for the CRC? How will the Army operationalize this new knowledge to better support the combatant?

Guidance from the Chief of Staff, Army (CSA) and Secretary of the Army (SECARMY) is clear. In their words, we must "manage risk where the rubber meets the road, not be risk averse, and aggressively take the fight to the enemy by better understanding the risk and the required control measures." However, we can't meet this requirement unless the knowledge is relevant and in the hands of the user.

More than 300,000 American Soldiers currently are serving in 120 countries across the globe. Our Army's junior leaders are gaining a wealth of knowledge on combat operations, both on the ground and in the air. They have a lot to say, and it's important that senior leadership listen as we move forward in our transformation. This point became clear to me as I was preparing my thoughts for this article and dialoging with my aide-de-camp.

My aide is a combat veteran, like many of our young leaders. In his brief career he's served tours in Korea, Afghanistan, and Iraq. I've dragged him around the world with me; he's participated in more than 120 briefings and been closely involved in countless Army-level investigations. So I asked him, "Why the CRC and not the Safety Center?" He quickly responded, "Sir, just last night I placed the twenty-third red tab in my West Point yearbook. Each red tab marks a peer of mine who's died...we need the CRC."

Losing friends is personal. His response was moving, so I decided to dig a little deeper and asked, "From your foxhole, what should be next for the CRC?" Early the next morning I found the following e-mail on my BlackBerry:



"Sir, you asked me two questions. First, 'Why the CRC?' Here are my thoughts.

"It's the CRC because our Army can't afford to lose combat power, particularly during this Global War on Terror. On average, one American Soldier has died every 9 hours since 11 September 2001. Updating you each day on our statistics is very sobering, especially this early in my career.

"The number one killer of DOD personnel in Operation Enduring Freedom is incidents involving helicopters; these incidents rank third in Iraq. However, these statistics pale in comparison to the number of Soldiers dying in vehicles from accidents, roadside bombs, and improvised explosive devices. This year alone, an average of one Soldier has died each day in a combat vehicle and two have died each week in their privately owned vehicles. Two-thirds of the Soldiers lost to accidents thus far have died in vehicles. And, the numbers continue to rise.

"We can't help but see the magnitude of our challenge on the roadways, both at home and in theater. In the air—both in and out of combat—we've lost nearly 160 Soldiers and more than three battalions' worth of helicopters at a cost of nearly $2 billion. These trained men and women weren't just Soldiers; they also were friends, sons, daughters…and classmates.

"The CRC will be the focal point for analyzing all accidents, serious incidents, and combat losses. It's about capitalizing on current technologies to become predictive and identify tactics, techniques, and procedures to mitigate and prevent future losses. The answer to the question of 'why' is why hasn't there been a CRC all along?

"I took notes this past February when the CSA and SECARMY directed the Safety Center to transform to the CRC. Its new mission was to continue embracing safety, but also fulfill a requirement to report, track, and analyze combat losses. The CSA and SECARMY stated that before the CRC, there wasn't a 'single source' data depository for composite Army losses. They also pointed out there wasn't an Army-level resource explaining how combatant commanders should report, investigate, and—most importantly—prevent composite losses. Looking out my foxhole, it appears there's very little Composite Loss Awareness (CLA) shared across the battlefield.

"Your second question was, 'What's next for the CRC?' Clearly, we must enhance CLA where the rubber meets the road. From my perspective, CLA is defined best as providing and sharing holistic loss data so Soldiers can understand each mission's unique characteristics, similarities, and relevance to previous incidents. For nearly 2 years, senior leaders knew seatbelts weren't being worn in vehicles; aircraft were flying too low and too fast in certain conditions; and hazards often were overlooked in anticipation of enemy engagement. Regardless of the number of policy letters written, every unit relief in place or transfer of authority resulted in learning the lessons anew. How do we become more aware and not repeat our mistakes? How can the CRC provide CLA?

"CLA works only if everyone in the formation understands what can take them out of the fight, regardless of the cause. This understanding exists in the tactical and non-tactical environment when Soldiers know and manage the risks. Composite Risk Management (CRM) insists that all players know the dangers, understand the trends, and comprehend the particular environment in which they operate, combat or not. Therefore, acquiring CLA is essential to managing composite risk. Leaders then can make the right decisions rapidly and without lengthy, calculated, and metric-based computations ('old safety'). Digital warriors already are familiar with the concept of CLA, and the CRC will enable them in combat. Here's how.

"There's a grid coordinate location associated with every incident report the Army sends and receives, whether the report is generated through the in-theater SIGACTS, ArmyWatch, Joint IED Task Force, Army Shootdown Assessment Team (ASDAT), serious incident reports, or CRC accident reports. The intelligence community has known for many years the value of populating a map with enemy movement and reports. Why hasn't the safety community grasped this same concept? Safety isn't operationalized by doctrine and, therefore, often isn't seen as a composite part of the fight.

"Imagine the Force Battle Command, Brigade-and-Below (FBCB2) or BlueForce Tracker (BFT) overlay on the M1114 HMMWV. These screens look a lot like the interactive moving maps displayed on any navigation system in a newer-model car. The route is planned, the briefings are conducted, and the patrol begins. Using these existing systems, the CRC should live up to its potential and provide our Soldiers with relevant, interactive, and worthwhile information. This same concept applies to the young aviator planning his mission on the Aviation Mission Planning System (AMPS) and op cell monitoring on BFT. The maps generated by these current Army systems should include an overlay of composite loss data.

"Since the CRC will maintain a centralized loss database, it has the capability to plot on these maps a color-coded dot (orange) for every accident occurring in Iraq since the first movement. Additionally, the CRC should receive real-time reports from the IED Task Force and ASDAT or SIGACTS. Those incidents can be plotted easily with another color (red) to indicate enemy activity. Interactively overlaying this information with two basic choices—length of time (30, 60, or 90 days or 6 or 12 months) and the type of loss (air or ground)—will justify its relevance to the user.

"When a cursor drops over any particular dot, the specifics of the incident will display in a small pop-up window (e.g., 'M1114

Rollover/Speed' or 'OH-58D Shootdown/SA16'). If the user wants more information, a simple double-click immediately will link him to the loss or accident report for that particular incident. The tool's value is that it will remain a single-entry requirement from current databases across the Army. Multiple venues and users will engage simultaneously on the SIPRNET as a software program from current technologies (AMPS and BFT).

"If these maps were printed and posted at every ALOC convoy sign-out location, in the commander's office, or beside every flight operations hazard map, the Army's junior leaders could visualize the importance of not speeding, wearing seatbelts, and rehearsing rollover drills. A majority of orange dots undoubtedly would convince a young convoy commander. For aviators, these orange dots sometimes would justify altitude restrictions, airspeed, or airspace constraints, which often are overlooked.

"What if this information was interactive and with the user at all times? Step back into that M1114 HMMWV and sit at the BFT screen. Along the route, imagine the TC or company commander is scrolling the menus and happens to see on his 10-meter imagery a series of orange or red dots 5 miles ahead. A closer look reveals this road historically has more IED attacks than accidents, or that the orange dots are rollovers caused by excessive speed in oversized vehicles. In seconds he can pick up the radio and tell the other vehicles to reduce their speed for the next 2 miles. Single entry, multiple use, and relevant to the combatant—a real-time, interactive CLA overlay providing the necessary situational awareness and rapid risk mitigating decision skills necessary to cut all types of Army losses.

"One step further would allow unit adaptation. The CRC manages the minimal Army data and map-populated points. However, the software allows catered modifications for any deployed unit that wishes to annotate additional near-miss information or collect close-call data (missed enemy engagements or near mid-air collisions). The CRC will work closely with the software and rapidly modify it to fit the unit's request.

"We've lost the equivalent of three brigades since 9/11, and nearly half these losses weren't in combat. For often unforgiving and preventable reasons, many superb Army leaders are no longer in the fight. We're the best Army in the world and we can do better—our Nation deserves it. Understanding and learning from composite losses is the fastest way our combatant commanders can make the appropriate decisions to prevent the loss of combat power. CLA through digital technology will save lives and enable CRM—it's the way ahead for the CRC and the key to helping our combatant leaders.

"Very Respectfully,
Travis"

So, why the CRC and what's next?
Hmm…I couldn't have said it better myself!

Joe Smith

BG Joe Smith

Flightfax

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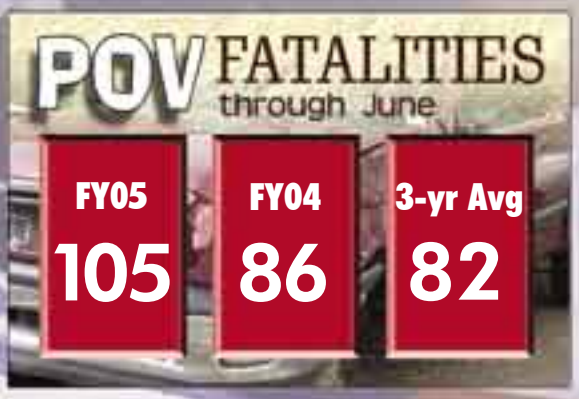

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These three words can mean many things to many different people. What do they mean to you as a pilot, crew chief, or flight engineer? Let's put it in context to make it easier. You're doing 100 knots in a racetrack close combat attack pattern and about to turn inbound. You also just requested a target grid coordinate from your sister ship and initiated a transfer of the flight controls. You hear "I got it." Any idea what your crewmember is trying to tell you?

The mission called for a team of two AH-64Ds to conduct close combat attacks (CCAs) in support of the division field training exercise. The flight arrived at the training area and immediately occupied preplanned attack-by-fire positions (ABFs) in support of their assigned infantry battalion. After approximately 50 minutes of using the ABFs, the team began conducting CCAs in support of the infantry battalion. Each circuit was flown at airspeeds between 60 and 120 knots and altitudes between 50 and 200 feet.

As the accident crew prepared to turn inbound, the other aircrew in the team asked if they wanted a target grid coordinate. The accident aircraft's front-seat pilot instructed the other aircrew to send grid coordinates and immediately said to the backseat pilot, "You have the controls." Fifteen one-hundredths of a second later, the backseat pilot said, "I got it." Eleven seconds later the aircraft, in a 12-degree nose-

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

down, 13-degree left bank, impacted a 44-degree upsloping hillside with its nose. Both cockpits received severe structural damage during the initial impact. After the initial impact, the aircraft rebounded skyward and developed an extremely nose-low attitude. The aircraft then fell nearly straight down on its nose and impacted the ground a second time. The aircraft came to rest predominantly upside down on its right side, leaning against its mast-mounted assembly. Both pilots suffered fatal injuries.

The centralized accident investigation (CAI) board determined no one was operating the flight controls for the 11 seconds preceding the accident. The backseat pilot's "I got it" referred to his receipt of the target grid coordinate; he never placed his hands or feet on the flight controls. The front-seat pilot misinterpreted the backseat pilot's "I got it" to mean he'd assumed responsibility of the flight controls. Head tracker information from the maintenance data recorder corroborates the CAI board's conclusion, showing both pilots were looking inside their respective cockpits for the last 11 seconds of the flight.

Standard crew terminology

Each aircrew training manual (ATM) contains detailed information regarding aircrew coordination. The AH-64D ATM contains the following paragraph:

"To enhance communications and crew coordination, crews should use words or phrases that are understood by all participants. They must use clear, concise terms that can be easily understood and complied with in an environment full of distractions. Multiple terms with the same meaning should be avoided."

The CAI board determined the accident crew

If you or other crewmembers fail to follow standard crew terminology, you'll create an ambiguous communications environment highly prone to successive errors that can culminate in an accident.

failed to follow several aircrew coordination essential elements and basic principles, but all the errors were traced back to a lack of standard crew terminology. The paragraph cited in the ATM is critical. If you or other crewmembers fail to follow standard crew terminology, you'll create an ambiguous communications environment highly prone to successive errors that can culminate in an accident.

This accident illustrates how a lack of standard crew terminology creates errors that can be cumulative in nature, with mistakes becoming so powerful that even the most experienced crewmembers cannot overcome them (the backseat pilot in this accident was an IP who had over 1,800 flight hours). In fact, the backseat pilot used terminology specifically called out in the ATM as ambiguous when he said "I got it."

Why did this crew make these errors? The CAI board concluded haste and overconfidence—two common trends in aircrew coordination-related accidents—were involved. In essence, the accident crew deconstructed their standards failsafe when they failed to use standard cockpit terminology. As the standards failsafe continued to weaken, the effects of haste and overconfidence became unchecked and caused the crew to continue to make mistakes, culminating in the accident-inducing final error.

Conclusions

Standard crew terminology is the common thread through all aircrew coordination competencies. Ambiguity is not allowed in the cockpit or between crewmembers. We simply cannot efficiently process ambiguous instructions. If you've allowed ambiguity in your cockpit, you're lucky to still be alive. Make no mistake—you've committed a potentially lethal error. ♦

Editor's note: This short article does not capture all the complicated interactions that occur between crewmembers during a typical training flight or an actual mission, nor does it address all the aircrew coordination basic qualities or essential elements. If you have questions regarding these issues, contact your local IP or SP.

—Comments regarding this accident may be directed to the Accident Investigations Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

8 elements of crew coordination

1. Communicate positively—sender directs and receiver acknowledges.
2. Direct assistance.
3. Offer assistance.
4. Announce actions.
5. Acknowledge actions—repeat critical parts.
6. Be explicit.
7. Provide aircraft control and obstacle advisory.
8. Coordinate action sequence and timing; request tail clear, receive clear acknowledgement, and turn tail.

"The Shaker Is the Taker"

Dr. Lawrence Katz
ARI-RWARU

Aircrews rely upon communication for maximum performance and safety. This seems readily apparent and it's the reason that the Aircrew Coordination Training Enhancement (ACTE) program strongly emphasizes the importance of clear, timely, relevant, complete, and verified verbal communications. However, while this is a critical component of crew functioning, little attention has been directed towards the influence of nonverbal communications on effective aircrew coordination.

Nonverbal communications occur in the cockpit. They include such events as facial expressions, head nods, hand motions, shrugs, shoulder taps, pointing, and even visual monitoring of another crewmember's actions. The interviews I've conducted while serving as the point of contact for the development of ACTE have repeatedly confirmed that crew interactions during training and missions are often unspoken.

This begs the question, "What happens when these nonverbal communications are prevented or impeded?" Specifically, some Army rotary-wing aircraft employ a tandem-seating configuration and all Army helicopters operate at times with limited in-cockpit visibility resulting from night (unaided) and night vision goggle (NVG) flight. The resulting reductions in nonverbal communications may have an important impact on crew coordination.

Several crewmembers reported that even in the tandem-seat Apache, certain nonverbal conventions have emerged. "The shaker is the taker" for example, has become a common reminder that shaking the cyclic indicates taking control of the aircraft when electronic communications are impaired. Some Apache instructor pilots (IPs) reported that they often use the mirror in an attempt to search a student's head movements for indications of confusion. However, there seems to be general agreement that the Apache requires a different level of verbal interaction than side-by-side configured aircraft.

As one IP put it, "Apache IPs are forced to talk more. They can't hit the student upside the head." LTC Andy Wellesley, Chief Ground Instructor at the United Kingdom School of Army Aviation, states, "When we shifted from the Cobra to the Apache, we added lots of sophistication but may have lost standardization in communications. Now we must verbalize what was normally nonverbal when we would get busy in times of high workload." He reflected on the comfort level afforded by a side-by-side seating configuration. "It's just that reassurance there's another human that you can communicate with nonverbally and make eye contact." Similarly, LTC Peter Terrett, Chief Flying Instructor at the United Kingdom School of Army Aviation, reported that IPs used to rely upon nonverbal communications to pick up on signs of distress or confusion, because quite often you can identify when the student is going to go wrong.

We need your help on this...

We are currently conducting research to explore the impact of limited nonverbal communication on aircrew coordination. As you can tell by the sources cited in this article, this issue is of international interest. A necessary first step of this project is to identify what types of nonverbal communications are used among crewmembers in the different airframes, in either the training or the operational environment.

Nonverbal communications include any interactions in which a message is sent or received without using written or spoken words; e.g., prodding, pointing, tapping, gesturing, etc. Please share with us any examples of this behavior that you or others you know have ever used. What was the nonverbal behavior and what was its purpose? What message was being sent? Why wasn't it verbalized?

To provide input, e-mail the author and include the airframe in which the nonverbal communications have occurred. All information will be kept in strictest confidence. Only group summary results will ever be discussed or reported. No personally identifiable information will be used in reporting results of this project to any agency, either within or outside the U.S. Army. Individuals participating in this research will remain anonymous. ♦

—Lawrence Katz, Ph.D. is a Research Psychologist with the Army Research Institute Rotary Wing Aviation Research Unit (ARI RWARU) at Fort Rucker, AL. He is the Technical Contracting Officer Representative for the ACTE Program. He can be reached by calling DSN 558-2385 (334-255-2385) or e-mail lawrence.katz@rucker.army.mil.

Crew Coordination

I was in law enforcement and our mission was marijuana eradication in a Bell UH-1H. I'd been involved in a number of these operations, so the mission was somewhat routine. The marijuana farmers knew their plants could be easily spotted from the air so they tried to hide them by planting them under trees and mixed with other plants.

The method for finding and eradicating the marijuana plant is not exotic. We hover taxi low and slow to brush rotor wash on the foliage. When marijuana plants are disturbed by the wind, they have a distinctive green color that is easy to spot. Once spotted, we place or direct ground crews to cut the plants and tie them in bundles. We sling load the bundles to waiting trucks.

I was the primary set of eyes to look for marijuana on this mission. I shared the cabin with two other pilots. We had done this stuff before, and knew what we were supposed to do and how to do it. We wore standard flight suits, helmets, gloves, boots, and mission equipment. Before takeoff, the cabin doors were slid open. I was free to move from side

to side, but was secured from falling out of the cabin via a body harness and strap connected to a hard point ring on the cabin floor. We maintained crew commo via the intercom.

On this flight we took another agent who had no official duty other than riding along and watching us do our job. He was belted into a rag and tube seat and given a headset with which he could listen, but he couldn't talk to us on the intercom.

His interpretation of my expression was that I was angry with him. He misinterpreted anger for terror!

We were working a wide valley, at and below the treetops, approximately 100 feet above the rocky creek bed. I was moving back and forth from the left to the right side of the cabin door. On the last move to the left side, I lengthened the safety strap through the buckle and tugged on it to take up the slack, and then got out onto the skid. Our extra "non-crewman" noticed this, and thought I was trying to unhook the safety strap from the floor ring. Without telling or showing me, he disconnected the safety strap from the ring. I was now untethered and didn't know it.

I slid out with my feet on the left skid, my butt on the edge of the floor, and my right hand holding the small cabin door. Seconds later, as we were moving sideways to the right up the slope, a wire suddenly came into the pilot's view. It was very close and almost under the rotor disk about to strike the pilot's window. He made an understandably rapid and substantial input of left cyclic. The aircraft rolled severely to the left to avoid hitting the wire. This abrupt movement caused my feet to slip off the skids and my butt to slide off the edge of the floor. My butt landed hard on the skid just as my ribs struck the floor edge. Both of my feet were outboard of the skid, but I still had a grip of the door with my right hand. As I'm sitting on the skid and the aircraft is finally getting back level and under control, I noticed my safety strap hanging beneath my feet!

I looked at the non-crewman and saw that he knew what almost happened. His interpretation of my expression was that I was angry with him. He misinterpreted anger for terror!

The pilots up front still didn't know what had happened in the cabin. They were still reacting to the near wire strike. We later communicated that since we had passed through that location at least twice before, we had probably passed under that wire—twice! How could we have missed it? We climbed up and looked down to where we knew the wire to be, but we still had a hard time seeing it. We had the Wire Strike Protection System (WSPS), but the way we were moving sideways, the WSPS wouldn't have helped.

The non-crewman revealed later that he released the safety strap because he thought I wanted more room to maneuver. ♦

Editor's note: Our thanks to the author who was lucky to remain attached to the UH-1H long enough to be able to tell us this story. As the story above shows, you—the pilot—may be in for a big surprise. These surprises may be avoided if you invest the time necessary for thorough preflight briefings. A preflight briefing may not contemplate changes that occur during flight. Communicating such changes to all crewmembers is essential. To do so may require you to take the time to stop or slow down and explain the situation. Without clear communications, small misunderstandings may occur; and as we've seen, small misunderstandings can lead to disastrous results.

Keep in mind, however, that you may experience a malfunction or emergency during which you cannot take the time, for there is none available to stop or slow down and chat it over with your crew. In those events, you have to rely on the formal training these crewmembers have received or the preflight briefing you have provided.

—Adapted from Helicopter Professional Pilots Safety Program (Heliprops), Volume 13, Number 3, 2001.

The Right Headset in Your Fixed-Wing Aircraft

CW4 Paul Miller, CW4 David Littner, CW4 David Keshel,
CW4 Elza Brokaw, and CW3 John J. Lill
WOSC 05-03

Editor's note: The active noise cancellation and active noise reduction (ANC/ANR) headsets are only appropriate for "fixed-wing" aircraft. This technology cannot be used in rotary-wing aircraft because the equipment defeats the lateral impact protection of the helmet.

As a crewmember, precise communication is imperative for crew resource management and mission success. According to studies done by Frederick V. Malmstrom, Ph.D., active noise reduction headsets significantly reduce pilot's physical and mental fatigue, as well as loss of proficiency during flight.

In years past, there could have been a misconception that David Clark headsets were the only ones the Army allowed. This was because units were making unauthorized modifications to aircraft electrical systems to power other headset systems. The U.S. Army Aviation and Missile Command (AMCOM) fixed-wing program management office (PMO) determined that battery-powered aviation ANR headsets are authorized as long as no modifications are made to the aircraft. Many units have locally procured such headsets and have had great success with off-the-shelf ANR products.

The principle of the ANR headset is to cancel unwanted low-frequency noise. Unwanted noises are those sounds that interfere with the pilot's reception and understanding of crewmember and air traffic control communications. Passive attenuation of high-frequency noise is accomplished mainly through the ear cup, noise-absorbing padding, and secure fitting ear seal design. By placing a miniature microphone

inside the ear cup, noise entering from the flight deck through the ear cup is sensed and analyzed by an electronic circuit. The electronic signal is inverted, amplified, and transmitted through the earphone canceling out the noise, whether you are actively talking or just listening to the radio or another crewmember. Most of the electronic noise-canceling technology headsets are failsafe in that they provide individual circuits for both the ANR portion and the radio/intercom portion of the headset. If the headset power source (battery pack) or ANR electronics fail, the headset will continue to function for communications.

In accordance with testing performed at the U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL, by Dr. A.J. M. Houtsma, Ph.D., both the Bose AHX 32-01 and David Clark (DC) P/N 40862-01 perform very well at reducing exposure to hazardous noise levels. Testing was performed at a flat 108 dB(A) for frequencies starting at 63 Hz extending to 4,000 Hz.

The two headsets tested took very different approaches to reducing noise attenuation with both passive and active technologies. The DC P/N 40862-01 performed very well with passive attenuation at all frequency levels, mostly attributed to the heavy construction of the plastic shell, noise-reducing materials within that shell, and the gel-type ear cups that conform very well to the contours of the skull around the ears. With the ANR off, the DC headset reduced the sound level below the Army's 85-decibel threshold for hazardous noise, and above 300 Hz, reducing it below the OSHA standard of 80 decibels. After turning the ANR on, this headset performed very well at reducing the low frequencies well below the 80-decibel level and maintained the higher frequencies well below 80 decibels. The effect of ANR is very noticeable.

The Bose model AHX-32-01 did not provide low frequency passive noise attenuation below 200 Hz, and reduced the noise level below the Army 85-decibel threshold at approximately 300 Hz. In the higher frequencies, the Bose provided very effective passive noise attenuation. After turning the ANR on, the Bose reduced noise attenuation below the 80-decibel OSHA standard across the frequency spectrum tested.

The two headsets tested took very different approaches to reducing noise attenuation with both passive and active technologies.

Marketing by both companies highlights findings in this unsolicited study of two commonly used ANR headsets. The DC headset is very good at passive noise attenuation in low frequencies, such as for propeller-driven airplanes, and does a good job in the high frequencies. The DC headset provides noticeable ANR especially good in the above applications. The Bose headset is more lightweight and may be more appropriate for long mission profiles based on interviews with pilots who have used both products. The ANR headset is better suited for use in jet aircraft where there is considerable noise energy above 1,000 Hz in comparison with propeller aircraft. Pilots have commented that the Bose audio clarity is excellent. No matter the make or model of headset, many studies have discovered significant reduction in performance when an eyewear frame breaks the seal of the ear cup. Caution must be taken to minimize the eyewear structure penetrating the seal. Using wire-style frames may help preclude this problem.

Individual units will have to decide which headset is appropriate to meet their needs.

Many products are available through FEDLOG and commercial venders with government sales representatives are ready to assist your needs. The David Clark model is approximately $300 less than the Bose, both having a 5-year warranty. For more information, log on to their Web sites: **http://www.bose.com/** and **http://www.davidclark.com/.**

—This article was written by CW4 Miller, CW4 Littner, CW4 Keshel (team leader), CW4 Brokaw, and CW3 Lill as a class project while attending the Warrant Officer Staff Course 05-03 at Fort Rucker, AL.

HaveQuick II Radio

CW3 Bryan E. Allen
Camp Page AAF, Korea

The Army gives us great equipment to use; it may not all be on the cutting edge of technology that is readily available at high-end techno retailers, but it is still world-class. You will find that our aircraft radios are no exception. Would you ever think about taking off on a mission without your radios working properly? Are you sure? What do radios need in order to be fully operational prior to flight? I have entertained this question many times, and depending on who you ask, you get varying answers. Instructor pilots will more likely give you the textbook answer and that is usually sufficient information for us "line dogs." But my experience has taught me that ALL available radios, under given circumstances, are absolutely necessary.

I am an avid fan of the HaveQuick II radio, found in most Army rotary-wing aircraft. Ask any AH-64 pilot and they'll tell you the HaveQuick II radio is crucial to mission accomplishment. However, in the UH-60 community, we seem to lack the institutional discipline to put this radio to use on a daily basis. I've heard pilots state they don't need the HaveQuick because it's not a secure radio. That's true, but it can be made secure quite easily by utilizing the KY-58, which should be installed with the ARC-164 (or equivalent) radio set. Pilots have also said HaveQuick takes too long to employ. False! There are at least two simple ways to put this system into operation. First, schlep over to flight ops (if you don't know the way, ask your friendly neighborhood 15P) or the S-2 shop and pull out the special instructions, and then find the section that lists all the multiple words of the day (MWODs). Depending on your current location in the world, these MWODs will either be "training WODs" or "theater WODs." Theater WODs are used during actual wartime missions.

Once you've retrieved the WODs, see the TACOPS officer again (or your standards section) and get the HaveQuick II checklist, or you can open your -10 and use the one in there. Just follow the instructions in the checklist. Trust me, once you've done this a couple of times, you'll see how simple it is. This may take a little more planning on your crew's part than you're used to, however this is the single most daunting task of using HaveQuick II.

The second way involves a little planning for your ops and commo section. You may be aware the MWODs can be loaded by a common fill device (CFD), better known as an ANCD. Depending on the proficiency of your commo guys, this procedure requires some input from the pilots. Once the MWODs are loaded in the CFD, just flip up the little cover on top of your ARC-164, plug in the fill cable, and push the little red button.

After spending a year engaged with enemy forces in Iraq and Kuwait, the requirement to have an operational radio capability hit close to home.

Some of you may be wondering why this article is in *Flightfax*. After spending a year engaged with enemy forces in Iraq and Kuwait, the requirement to have an operational radio capability hit close to home. When talking to Air Force airspace controllers over Baghdad on more than one occasion, I was told to go to the current HaveQuick II frequency to get airspace updates. Had I not taken the time to ensure my HaveQuick II was up and running, someone else might be writing an article of my ill-fated flight in a totally different section of this publication!

The radio works, folks, and it doesn't take a rocket scientist to figure it out. All it takes is an understanding of the radio and the few extra minutes it takes to put the system into operation. HaveQuick can give you access to a wealth of knowledge that our dedicated Air Force guys provide on a regular basis. Now wouldn't it be nice to be able to talk to the AH-64s when you come under fire and your FM decides to take a vacation? ♦

—CW3 Allen is the Airfield Commander and Safety Officer at Camp Page AAF, Korea. He may be contacted at bryan.allen@us.army.mil.

FY05 Aviation Mid-Year Review

Charisse Lyle
U.S. Army Combat Readiness Center

The Army continues to be extremely busy this fiscal year. Many of our Soldiers are deployed in combat missions around the world, and this continues to have an effect on the number of accidents reported thus far. On the home front Active, National Guard, and Reserve Component forces are protecting our borders and key nodes of infrastructure. Army Aviation is involved in these operations 24/7. This article will concentrate on a review of only Class A accidents due to the fact that some in-theater accident reports are still filtering into the Combat Readiness Center.

Army Aviation experienced 17 Class A accidents during the first half of FY05, claiming the lives of 17 Soldiers and one civilian Army contractor, and costing over $31 million. Over a third of the accidents (7) occurred in the Central Command (CENTCOM) area of operations (AO).

Leading accident events

■ **Loss of situational awareness.** There were three accidents where the aircrews lost situational awareness and allowed the aircraft to descend into the ground. These accidents resulted in three fatalities. Aircrew coordination failures contributed to all three accidents.

■ **Inadvertent instrument meteorological conditions (IIMC).** Two IIMC-related accidents, both involving UH-60L aircraft, resulted in seven fatalities. Pre-mission planning errors were contributory in both. Aircrews continued flight into deteriorating weather conditions and, upon encountering IMC, failed to correctly execute the IIMC procedure.

■ **Wire strikes.** There were two wire strikes involving a UH-60 and an OH-58D, both occurring at night and resulting in two fatalities. One occurred in Iraq and one in CONUS.

■ **Aircraft collisions.** Two aircraft collisions occurred during this period—a mid-air between two OH-58Ds and a collision between an AH-64 and a UH-60. Both occurred in Iraq at night and resulted in four fatalities.

Airframes

■ **UH-60 Black Hawk** (35%). The UH-60 accounted for six Class A accidents during this timeframe. Currently, one accident is still under investigation.

• Thirty-nine percent of the accident fatalities occurred in one IIMC-related accident. This accident was initiated when the UH-60L crew planned for day operations, but departed during darkness. The weather listed in the en route section of Form 175-1 was below the unit's minimum required weather for night operations. During the flight, the crew encountered IMC and, as they attempted to transition to instrument flight rules, struck a 1,700-foot guy wire on a television transmission tower at approximately 80 knots. The aircraft was destroyed and all seven people on board received fatal injuries.

• In a related accident, the pilot in command of the lead aircraft of two UH-60Ls flying an OPBAT/night vision goggle (NVG) training mission, continued flight into deteriorating weather. As the lead aircraft initiated IIMC procedures, the pilot

experienced spatial disorientation. The aircraft decelerated and descended into trees at near-zero airspeed. The aircraft sustained major damage and five of the seven personnel on board were injured. Preflight planning errors allowed the mission to continue using expired weather information. This led to the en route portion of the flight being conducted in weather that was less than the night minimum requirements.

• A UH-60L struck the top wire on a high-tension power line in Iraq, became entangled, broke loose, and subsequently made an uneventful rolling landing into a nearby field. The left side of the aircraft sustained extensive damage. Because the crew was familiar with the route, they did not use their map to navigate. These wires were depicted on their map.

• Another wire strike occurred when an EH-60A contacted a radio tower and wires during NVG low-level flight, and subsequently crashed into a nearby field.

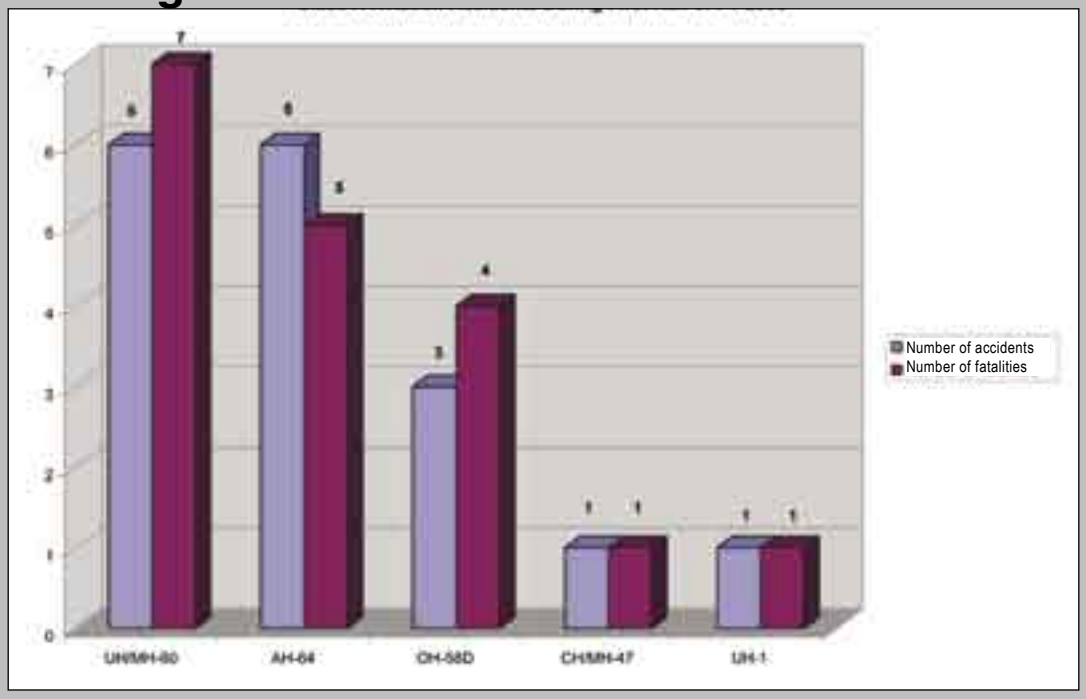
• Other accidents included a UH-60A whiteout during an approach that resulted in a tree strike and extensive aircraft damage. Also, a pilot-induced hard landing was reported while practicing dust landings, which caused the main rotor blades to strike the tail cone.

■ **AH-64 Apache** (35%). The Apache accounted for six Class A accidents during this time period. Two AH-64 accidents are still under investigation.

• While conducting a night formation flight approach to the forward arming and refueling point utilizing the night vision system, it is suspected the AH-64A crew lost visual contact with the lead aircraft, a UH-60A. As the UH-60's tail wheel touched down and the main landing gear was approximately one foot off the ground, the AH-64's tail section impacted the UH-60's main rotor system from above. Both aircraft were destroyed in the postcrash fire. All occupants in the UH-60 escaped without injury; however, both AH-64 pilots were fatally injured.

• While an AH-64 crew was conducting a team, daylight close-combat attack training mission, the front seat pilot on controls initiated a transfer of the flight controls while turning inbound for the attack run. Eleven

Class A Aviation Accidents During First Half of FY 2005



seconds later, the aircraft impacted a hillside, killing both pilots. Both crewmembers had been focused on receiving target grid coordinate information and neither pilot was flying the aircraft at the time of impact. The front seat pilot had relinquished the flight controls before ensuring the backseat pilot had assumed control of the aircraft.

• An AH-64D crew was performing day gunnery training. The pilot had initiated a right break while safeing the weapons system. The aircraft descended to ground impact and was destroyed, one pilot received fatal injuries and the other pilot was injured.

• A tree strike occurred during AH-64D day initial aircraft qualification training (BAG training), which was initiated by a misunderstanding between the instructor pilot (IP) and the rated student pilot (RSP). The RSP's understanding was that he was to conduct a terrain flight approach to a remote training site; however, the IP had actually directed him to execute a turn over the training site and continue south. The RSP initiated the approach and the IP was late with corrective action.

■ **OH-58D Kiowa Warrior (KW)** (18%). The KW was involved in three accidents, all in the CENTCOM AO.

• The aircrew of an OH-58DR was escorting a convoy at night in Iraq that had lost a vehicle earlier in the day to a roadside explosive device. It is suspected that both pilots became preoccupied with searching for roadside explosives and failed to detect wires in their flight path. The aircraft struck the wires and crashed. Both pilots received fatal injuries and the aircraft was destroyed.

• While conducting a multi-ship, night zone reconnaissance at terrain flight altitude, using AN/AVS-6(V) NVGs, the pilot on controls in the trail OH-58DR aircraft lost visual sight of lead. The trail aircraft's main rotor blades struck lead's vertical fin and tail rotor. Both aircraft lost control, impacted the ground, and were destroyed. The lead OH-58D pilots received minor injuries while the pilots in the trail aircraft were fatally injured. It is suspected that the pilot confused lead's NVG position lights with the surrounding ground lights, a visual illusion called ground light misinterpretation. There were no radio communications from trail to inform lead of the loss of visual contact.

• During a day combat recon mission, the OH-58DR aircrew's .50 Cal machine-gun malfunctioned. Both pilots were focusing inside the cockpit troubleshooting the weapons system and lost situational awareness. The crew failed to notice their descent in time to prevent ground contact.

Crew coordination failures and loss of situational awareness are a recurring theme in the majority of these accidents.

■ **MH-47E Chinook** (6%). The aircrew landed on a narrow road in a steep ravine to offload U.S. Soldiers. The Soldiers remained at the rear of the aircraft to wait for the aircraft to depart. An Afghan interpreter broke away from the group, started up the right slope and was struck and killed by the aft main rotor blade.

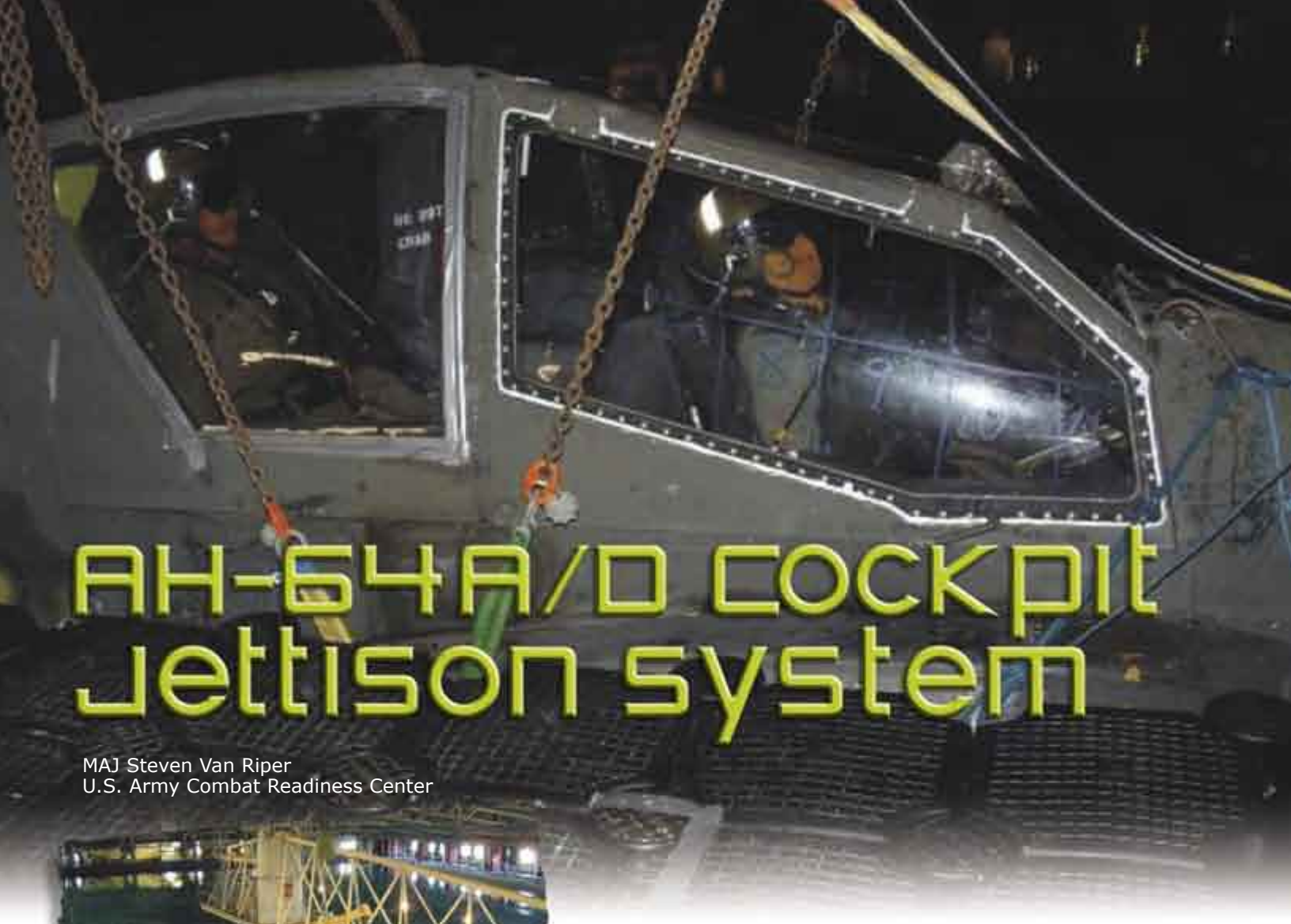
■ **UH-1 Huey** (6%). A collision with the ground on a day single-pilot UH-1M flight resulted in one fatality.

Summary

Crew coordination failures and loss of situational awareness are a recurring theme in the majority of these accidents. Due to the enemy threat in the CENTCOM AO, aircraft are operating in pairs. This places both aircraft in the same airspace and increases the risk of an aircraft collision. Wire strikes continue to plague the helicopter community. Trying to maintain VFR under IMC is a deadly mistake that continues to claim Soldiers' lives every year. Improper preflight planning, failure to take appropriate action when first encountering deteriorating weather, and failure to immediately and correctly execute the IIMC procedure upon entry into IMC conditions have proven very costly. ♦

Editor's note: These statistics are current from the USACRC database as of 11 July 2005. Delayed reports and follow-up details on preliminary reports could change the statistics, figures, and findings.

—Ms. Lyle is an Engineering Research Psychologist at the U.S. Army Combat Readiness Center. She may be contacted at DSN 558-2091 (334-255-2091), or e-mail charisse.lyle@us.army.mil.



AH-64A/D Cockpit Jettison System

MAJ Steven Van Riper
U.S. Army Combat Readiness Center

Joint U.S. Army and United Kingdom Ministry of Defense testing has demonstrated that the AH-64A/D Canopy Jettison System (CJS) will function underwater; however, its safe use cannot be assumed because of the potentially lethal blast levels created by activation of the detonation cord and the rapid sink rate induced as a result of the flooded cockpits.

Test results

The testing confirmed that the CJS will function when the aircraft is submerged and the crew stations are full of water; BUT initiation of the CJS, when the crew stations are full of water, generated a pressure wave that would be fatal to the crew. Even in instances where the crew stations are only partially filled with water, the shock wave could propagate through the water and affect any submerged body parts. Depending on the overall level of crewmember submersion, this could also prove fatal. Additionally, immediately after activating, the CJS pieces of the cockpit transparencies were forced into the crew stations by the inward water pressure. Some of these pieces were large enough to impede egress and would have to be moved to allow crewmembers to escape.

Further testing showed that the rapid cockpit flooding due to the activation of the CJS is likely to sink the aircraft more rapidly then previously

thought, reducing the possibility of a successful crew egress.

During initial testing the canopy was jettisoned prior to impact with water. The crew stations quickly filled with water and once the initial impact motion had ceased, the aircraft sank to a depth of 57 feet (18 meters) within approximately 11 seconds.

During follow-on testing the canopy was not jettisoned; i.e., transparencies intact. The testing revealed the cockpit remained above the water for 5 seconds with a nose high attitude, before tilting backwards. The cockpit remained partly submerged for another 9 seconds, becoming fully submerged after a total of 14 seconds. After 16 seconds, one of the cockpit windows imploded with the crew stations quickly filling with water (later testing demonstrated that at depths of 7 to 10 feet [2 to 3m], one of the four cockpit transparencies will naturally implode due to water pressure). The aircraft then sank to a depth of 57 feet (18m), approximately 26 seconds after initial impact.

Findings

The preliminary report's two primary findings stated that the CJS cannot be used once the crew stations are partially filled or completely filled with water. Units employing the AH-64A/D for overwater missions should reconsider current training procedures and programs to ensure awareness of the potential effects (potentially fatal shockwave and rapid sinking) when the CJS is activated underwater.

Recommendations

In response to these findings, the Attack Helicopter Program Manger's Office has completed DA Form 2028 to add the following warnings and caution to the AH-64A/D Operator's Manual.

WARNING

Activation of the Canopy Jettison System with the cockpit partially full or submerged full of water will generate a pressure wave that may result in crew injury and/or death.

WARNING

If the Canopy Jettison System has not been activated prior to ditching in water, the external water pressure may cause the canopies to implode (collapse inward) as the aircraft sinks beyond 2 to 3 meters. The cockpit will flood almost immediately and the aircraft will begin to descend rapidly in an uncontrolled manner; canopy sections may also block the egress route.

CAUTION

If the Canopy Jettison System is operated underwater, the canopies are likely to implode (collapse inward) due to the external water pressure. This may hinder egress and/or block escape routes.

The Directorate of Evaluation and Standardization (DES) has reviewed and concurred with these recommended warnings and caution and supports the proposed changes to the operator's manual.

The system safety engineers at the U.S. Army Combat Readiness Center and in the program manager's office will continue to explore engineering and design solutions that will improve crewmember survival probabilities should the aircraft ditch into water. Current options include:

- Installation of a breakout tool on all aircraft.
- Modifying or replacing the detonation cord to achieve an acceptable noise/blast level combination.
- Modifying the aircraft with an additional floatation capability. ♦

Editor's note: The warnings and caution in this article are for information purposes only. This article does not officially change any portion of the operator's manual or act as training guidance. If overwater flight is commonplace in your unit or only an occasional event, until the aforementioned warnings and caution are formally approved, be aware of the findings of these tests and understand the consequences of your actions.

For more information, contact the following individuals:

Mr. Bob Frazier
Contracted System Safety Manager (256) 313-4202
Bob.Frazier@peoavn.redstone.army.mil

CW4 Duane Crawford
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A New Look at AWRs

James Procyk
USARDEC

The two most frequent airworthiness release (AWR) feedback statements are "Where did you bury the restrictions?" and "How am I supposed to put this wad of AWRs in the logbook?" Both indicate poor communication of safety information. Well, there's good news ahead because someone listened...

The Aviation Engineering Directorate is implementing a new AWR format intended to improve communications of restrictions and operating instructions, warnings, cautions, and notes as well as other important information. To begin with, application information, AWR authorization, and point of contact information is now located on page one. You can find the operating and safety information starting on page two instead of in the middle of the document hidden behind the references, scope, configuration, and installation instructions.

The new format was devised to get vital information to the right people promptly to operate, maintain, and install the equipment. The new design also allows the operationally pertinent authorization, restrictions, and operational information be carried in the logbook. This will significantly reduce the bulk of papers representing AWRs for a given aircraft, thereby making operational safety information much easier to find.

Other information, such as the maintenance and inspection instructions, is typically used only once and can be filed for later use. Installation instructions, normally a one-time or once-per-special season event, are moved to a separate appendix instead of at the front of operations and restrictions, obscuring information used every flight.

By using the document name rather than a list number, most references will be recognized without referring back and forth to the formal reference list. Below is a side-by-side comparison with the shaded areas indicating sections carried in the logbook. A full copy will still be required to be kept on file.

Concurrently we are initiating other subtle communication improvements; e.g., ensuring we write warnings and cautions using the same technical manual definitions you use to interpret them.

Looking forward, a new evolving feature has been added to the end of Appendix A called the Commander's Corner. The intent is to provide information unique to the AWR configuration that may be helpful in mission planning and risk management. As envisioned, it may contain uncertainty and risk information on this and alternative methods, equipment, and environments. Customer feedback on this feature will determine its future form or demise.

Black Hawk and Apache Divisions in the Aviation Engineering Directorate are starting to issue AWRs in the new format. All Army aircraft AWRs will be issued in the new format after 1 October 2005. Older AWRs are still valid and will be reformatted as they come up for revision after October. ♦

—For more information on AWRs, contact James Procyk, Process Standardization Manager for Aviation Engineering Directorate, Redstone Arsenal, AL. He may be contacted at DSN 897-8408 (256-313-8408) or e-mail james.procyk@amrdec.army.mil.

Old All-in-one Format

1. References
2. Scope
3. Configuration
4. Operations and restrictions (including installation)
5. Special inspection and instructions
6. Logbook entries
7. Termination
8. Point of contact

Signature

Logbook Form 2408-13-1

New Partitioned Format

1. Scope (what and why)
2. Validity (supersedes and terminates)
3. List of appendices
4. Point of contact

Signature

A. Restrictions and operation information
B. Configuration and installation details
C. Inspection, maintenance, and logbook entries
D. References

Logbook Form 2408-13-1

Check Your Rope Ladders!

Rivet & Webbing Detail Notice

➔ ATTENTION ➔

Ladders must conform to this type of webbing and stainless steel rivet/washer assembly for live use. Any ladders of alternate materials must be immediately pulled from service.

Recently our U.S. Air Force (USAF) brethren were flying an HH-60 in support of a survivor rescue mission when their rope ladder broke, injuring three pararescuemen (PJs). The rope ladder in question is made by Randon Tech Manufacturing of Scottsdale, AZ, and the model number is ELD 800PD. Normally, the life limit on these ladders is 6 to 8 years; this particular rope ladder was 17 years old.

Randon Tech and the HQAFSOC are developing a new Operator's Manual for this ladder system with specific inspection and use criteria. The Army Combat Readiness Center is proactive in joining the USAF in creating a joint publication. As an interim measure the following is offered:

- Check rivets … anything made after 1994 should have stainless steel rivets and washers. WARNING: Aluminum rivets and washers should not be used.
- Check nylon webbing for tears, nicks, fraying or the "fuzzies"; nylon material that is unraveling should be taken out of service.
- Check webbing carefully. If it looks smooth like the seatbelts in your car, it was made prior to 1989 and should be removed from service.
- Check for dirt, mud, and mildew.
- Do not store when wet.
- If used in saltwater, rinse with fresh water and dry prior to storage.

For more information, contact Randy Salo, Randon Tech Manufacturing, 480-998-2335 or e-mail randontek@aol.com. Air Force contact is SMSgt Robert Foster, HQ AFSOC/DOV DSN 579-7791.

—Article submitted by Bob Giffin, Aviation Systems Safety Manager, USACRC, DSN 558-2381 (334-255-2381), or e-mail bob.giffin@us.army.mil.

2005 ALSE User's Conference

Commanders, aircrew life support equipment (ALSE) officers, and other interested personnel are invited to attend the 2005 Army ALSE User's Conference in Huntsville, AL. The conference will be held 23-25 August 2005 at the Holiday Inn Select.

For conference registration, please contact Melanie Barksdale at e-mail Melanie.Barksdale@peoavn.redstone.army.mil. For hotel reservation, call (256) 533-1400.

—For more information, contact Bill Grubbs at William.Grubbs@peoavn.redstone.army.mil or John Jolly at John.Jolly@peoavn.redstone.army.mil.

ACCIDENT Briefs

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class C**: The No. 2 engine overtemped on startup following a hot refuel operation. TGT reported at 967ºC for 2 seconds.

■ **Class E**: The No. 1 generator failed on run-up. Three attempted resets with no results. Maintenance replaced the No. 1 generator.

■ **Class E**: During flight under night vision systems (NVS), the pressurized air system (PAS) was momentarily interrupted for approximately 2 seconds. No caution warning lights were noted. Approximately 5 minutes later, the MASTER CAUTION and SHAFT DRIVEN COMPRESSOR (SDC) lights illuminated. During the landing (less than 30 seconds later), smoke filled the cockpit. The aircraft landed without further incident and an emergency engine shutdown was conducted. Postflight inspection showed the SDC badly charred. The SDC was replaced and the aircraft returned to flight. *Late report*.

■ **Class E:** During cruise flight, the crew smelled smoke, followed by the illumination of the SDC light. On short final, the OIL PSI ACC GRBX light illuminated. The aircraft was landed safely and the crew performed an emergency shutdown. Upon postflight inspection, a large puddle of oil was found under the aircraft. Maintenance concluded the SDC had a ruptured O-ring seal due to fair wear and tear (FWT). *Late report*.

■ **Class E:** During flight, the SDC failed, causing smoke to enter the cockpit, reducing visibility. The environmental control unit (ECU) was turned off and the smoke cleared. The SDC light illuminated and the crew made a MAYDAY call. The crew conducted an emergency landing at a local airport followed by an emergency engine shutdown. The fire department was called with no further incident. *Late report*.

■ **Class E:** During level flight at 1,000 feet and 90 KIAS, Chalk 4, of a flight of five, detected a burning odor in the cockpit. Chalk 5 reported seeing smoke coming from Chalk 4's aircraft. On short final, the SDC CAUTION/WARNING light illuminated and the cockpit filled with smoke. After landing, the pilot completed an emergency engine shutdown and the aircrew egressed the aircraft. The aircrew saw smoke coming from the turtleback area and dispensed a handheld fire extinguisher. There was no fire, only smoke coming from oil leaking from a cracked SDC case onto the hot components. Post incident analysis determined SDC failed due to FWT. *Late report*.

CH-47

D Model

■ **Class A**: The crew received a low fuel pressure indication followed by a dual engine flameout. The crew entered autorotation and the aircraft landed hard.

■ **Class C (Damage):** A CH-47D aircraft sustained damage from the rotor wash of a second aircraft. As the first aircraft was being shut down, its forward rotor blades contacted and damaged the tunnel cover as the second aircraft was landing in the vicinity.

■ **Class C (Damage)**: The crew experienced a split torque (Nr) reading during hovering flight. Maintenance downloaded the No. 1 engine DECU and confirmed a No. 1 engine speed exceedance, requiring a fore and aft transmission replacement.

■ **Class C**: The crew experienced a series of engine torque splits during flight (No. 2 engine low). Postflight download of the No. 1 engine DECU confirmed that the engine did exceed limitations. Maintenance determined that both the fore and aft transmissions needed replacing. Engines were sent to CCAD for analysis.

OH-58

A Model

■ **Class C**: During startup, the PI inadvertently rolled the throttle off after releasing the starter. The crew let the engine cool down and then attempted a second start. This time the PI concentrated on not holding down the idle release button. When the engine exceeded TOT limits, the throttle was closed but the PI failed to motor the starter, causing a hot start to 1,000°C. *Late report*.

DR Model

■ **Class C**: Maintenance revealed an NP exceedence following manual throttle operations. Engine replacement required.

■ **Class C**: The engine experienced engine overspeed and overtemp conditions upon transitioning to FADEC from manual throttle control.

TH-67

A Model

■ **Class A**: While conducting day instrument flight training, the aircraft began an uncommanded right yaw. The IP entered a left descending autorotation. The aircraft crashed and was destroyed. The IP was fatally injured and the two pilot trainees received injuries.

UH-1

V Model

■ **Class E**: During cruise flight at 100 knots and 900 feet AGL, the engine oil pressure started fluctuating between 10 and 60 PSI. The engine oil temperature climbed to 110°C for a few seconds, and then up to 130°C where it stabilized. Other indications were normal. The PC declared an emergency and landed. The crew performed an emergency engine shutdown. Ground personnel observed smoke coming from the engine during the final approach.

UH-60

A Model

■ **Class C**: The crew was conducting a high performance hoist (MEDEVAC) RL progression training when the hoist disengaged from the uppermost attaching point from inside the aircraft and fell to the ground. The hoist is deemed destroyed and the aircraft was slightly damaged.

■ **Class C**: The aircraft tail wheel strut failed, resulting in the loss of the tail wheel during a landing to the sod.

■ **Class E**: While conducting traffic patterns to a field site, the aircraft rotor RPM increased to 108 percent. The crew reduced the PCL on the No. 2 engine to get the rotor RPM back to 100 percent and landed safely without incident.

■ **Class E:** The aircraft was taking off when the No. 2 HYD PUMP CAUTION light illuminated with a corresponding MASTER CAUTION light, followed by the illumination of the BACKUP PUMP ON advisory. The crew initiated the emergency procedures and returned to the airfield without further incident. Maintenance inspected the No. 2 hydraulic pump and determined there was no output pressure from the pump. The cause of the failure is unknown. The pump was replaced and the aircraft returned to flight.

■ **Class E**: While flying straight and level, a bird struck the top right-side greenhouse window, breaking the window. The crew determined the aircraft had no adverse effects in handling or flight control and reduced airspeed to 100 KIAS, returning to home base with no further incident. *Late report*.

L Model

■ **Class C**: The copilot was flying the aircraft at 200 feet AGL while the PC was inside the cockpit tuning radios. The PC looked up and said, "Birds at 12 o'clock!" and subsequently took the controls and applied aft cyclic to try to climb over the flock. The aircraft struck 16 birds, damaging two main rotor blades, one tip cap, and the front avionics compartment. The PC returned to home base. *Late report*.

DHC-7

■ **Class E**: The aircraft was on a training flight when during descent, the MASTER CAUTION and No. 2 ENGINE OIL light illuminated. The crew confirmed the oil pressure was below minimum and shut down the engine. The crew continued the descent, approach, and landing without further incident. Maintenance replaced the No. 2 engine propeller blade seal and the aircraft was returned to service.

RC-12

D Model

■ **Class E**: The fireguard gave the crew an abort start signal when he saw sparks coming from the No. 1 engine compartment. The transformer ground fault burned through the left-hand firewall assembly due to two of the four grounding bolts had worked loose, causing an electrical arc.

■ **Class E**: During cruise at FL 140 and 160 KIAS, the crew noticed a sudden drop in the No. 1 oil pressure gauges. Emergency procedures were performed and a descent was initiated. A precautionary landing was made at home station and the aircraft was shut down without further incident. Maintenance replaced a faulty oil pressure transducer and the aircraft was released for flight.

P Model

Class E: During climbout, fuel was observed venting from the right-hand wing fuel vent located in the aileron alcove. Aircraft landed safely. Maintenance discovered sand in the fuel vent. *Late report*.

RQ-11

■ **Class C:** Contact was lost with the aerial vehicle (AV) during flight mode and could not be regained. AV crashed and has not been located.

■ **Class C:** Contact was lost with the AV during the recovery phase. AV crashed and has not been located.

■ **Class C:** Ground control linkage was lost with the AV shortly after launch. Efforts failed to guide the AV back and subsequently crashed. AV was not recovered.

RQ-7A

■ **Class B**: AV operator attempted command chute deployment without success and the GCS lost control of the AV at 800 feet causing it to crash. The AV was completely destroyed.

■ **Class B:** The AV experienced a generator failure and possibly an ignition failure during flight. This caused the engine to quit and the vehicle crashed. The AV was a total loss.

RQ-7B

■ **Class B:** Suspected failure of the data interference box at the ground control station. Control of the aircraft was lost and it crashed after the recovery chute deployed.

■ **Class B**: AV was returning home when the operator received an engine failure warning. The RPM then dropped to zero and AV crashed.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

Why CRC?

The CRC is the Army's focal point for analyzing accidents, serious incidents, and combat loss reports, identifying lessons learned and tactics, techniques, and procedures (TTPs) to mitigate and prevent future losses.

The CRC is the knowledge center for ALL losses:

Accident • Combat • Medical • Criminal

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

AUGUST 2005 ✦ VOL 33 ✦ NO 8

There are NO New Accidents

Flightfax

Commander and Director of Army Safety
BG Joseph A. Smith

Deputy Commander
COL George Bilafer

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

There are NO New Accidents (Part I)

Author's note: I am writing this article after 4 years as a board president for the U.S. Army Combat Readiness Center (CRC). During this time, I have conducted 17 investigations and participated in the staffing and report preparation of over 200 more. There is a saying among the investigators that "There are no new accidents, just repetitions of the old ones." I hope by your reviewing these accidents, I can help you avoid the next repetition. This is the first of two articles that discuss aviation accidents that I have personally investigated. Part II will appear in next month's Flightfax.

Rules are made to be followed

In the first accident I investigated, the pilot in command was a highly experienced Department of the Army Civilian (DAC) aviator who made a mistake. How highly experienced? How about 20,000 rotary-wing flight hours? That's right, 20,000 rotary-wing flight hours, and in broad daylight he hit a set of wires that had been in the local flying area for over 20 years. Wires he knew were there. Wires he had crossed thousands of times. Wires that were marked on his map.

How did he let it happen? First, he was navigating from memory. When you fly in the same area for 20 years you figure you can do that. When the student pilot asked where they were, he came inside the cockpit, found a point on the map and showed it to him. This brought both sets of eyes inside the cockpit at a critical point when a set of high-tension wires appeared from behind the trees. By the time he realized they were there, it was

too late. He took the controls and tried to fly under the wires but was unable to do so. Fortunately, his 20,000 hours of experience enabled him to execute a controlled crash that caused no significant injuries. However, the aircraft was destroyed.

There were standards in place to prevent this accident. The brigade SOP required no less than 50 feet above the highest obstacle while in terrain flight. It also forbade dipping into open areas surrounded by obstacles. The student pilot on the controls not only was flying below 50 feet but also dipped into an open field that had the wires on the far end. Had the crew been operating IAW the standard, there would not have been an accident.

Two of the best aviators in the unit

A highly experienced crew consisting of an instructor pilot (IP) and a maintenance test pilot (MTP) were scheduled to conduct an annual proficiency flight. Between the two crewmembers were over 5,000 hours of flight experience. They were two of the three most experienced aviators in the company. The chain of command considered it a near "no risk" mission and crew. These two guys never had any problems.

The crew planned the flight, which included night vision systems, instruments, formation, traffic pattern work, and mountain flying. They prepared a risk assessment worksheet (RAW) and were briefed by the company commander. After preflighting the aircraft and ensuring they had plenty of fuel, they took off and flew straight into the mountains to do the mountain portion of the check ride first. They selected a relatively small landing zone (LZ) at 10,500 feet and attempted an approach to a landing. After passing below the highest obstacle, the MTP in the front seat of the AH-64A elected not to land and made an attempt to climb out of the LZ. As the aircraft began to climb, the rotor revolutions per minute dropped and the crew was unable to regain it. They had run out of power. The aircraft descended into 50- to 60-foot trees, rolled, and hit on its right side, destroyed. The MTP sustained a head injury and the IP had cuts and bruises.

The performance planning done before the mission indicated there was sufficient power to execute the maneuver. So what happened? The board found that the power margin available was less than 2 percent at the time of the accident. Two percent! Why would two aviators with the experience mentioned above put themselves in a position where a wind shift on final could cause serious problems? Why did the chain of command allow them to go into the mountains with full fuel tanks? The answer to the first question is overconfidence in their abilities, one of the most common causes of accidents. The answer to the second question is at the heart of this lesson learned.

The company commander who briefed them did not know they intended to go into the mountains first. He did not know they were going to the small LZ they selected. The mission brief indicated a training area and not the specific LZ. He did not know that the power margin would be less than 5 percent. The RAW indicated less than a 10-percent power margin but not the 2 percent planned. What he did know was that two of his best aviators were going out to do a check ride and they didn't need him questioning them on the mission planning. It is there that he made a mistake. He needed to ask the questions. CAPTAINS, TAKE NOTE: JUST BECAUSE YOU DON'T HAVE SENIOR WINGS DOESN'T MEAN YOU CAN'T ASK QUESTIONS. If someone had just asked questions, the crew would have realized they needed to do some traffic pattern work to burn some fuel before going to the mountains.

Perishable skills are indeed perishable

IPs always talk about perishable skills. The rest of us often roll our eyes and agree to keep from arguing. I am now a believer. Here's why. An 8,000-hour IP was conducting UH-60 night vision goggle (NVG) environmental qualifications during reception, staging, onward movement, and integration at the National Training Center (NTC). He had three aviators,

two crew chiefs (CEs), and a standardization instructor pilot (SP) in the aircraft on a moonless night with gusty winds from the west. The mission was to "hot seat" the three aviators in the right seat and for the SP to work with the CEs. The first portion of the flight went without incident, and the second PI to be trained moved into the right seat. He had flown for 30 to 45 minutes when the IP took the controls and announced he was going to demonstrate a crosswind landing and takeoff to the south. He successfully completed the landing and conducted a before-takeoff check. He applied power to execute the takeoff and began a climb. He never cleared the dust cloud and flew into the ground. The aircraft tumbled and was destroyed. The IP and one of the CEs suffered serious injuries.

The board determined that several factors contributed to the accident. There was a false horizon to the south caused by a ridgeline between the aircraft and the garrison area. It ran down from right to left. The winds were variable between 270 and 330 degrees at 20 to 25 knots. The board found that the IP on the controls began an unintentional left turn immediately after takeoff. This was probably influenced by the false horizon. The left turn and variable winds placed the aircraft in a tailwind condition that kept the IP from being able to clear the dust created by the downwash. The dust cloud was blown along with the aircraft. Lastly, the power application that had been sufficient all night when taking off into a headwind was not sufficient to maintain a climb in the tailwind condition.

The most significant finding of the board was that while the IP was current in NVG flight, he had flown fewer than 10 hours of NVGs in the previous 8 months. He had also missed a pre-deployment training exercise. The board found that he was current but not proficient in NVG flight. Combining this with the arduous conditions of the NTC led to disaster. His "perishable skills" had not been exercised sufficiently at home station to ensure his success at the NTC. There was another significant problem in this accident that leads to the next lesson learned.

The lesson to be learned here is WHEN YOU THINK SOMETHING IS WRONG, SAY SO. There's a reason two to six people in an aircraft are called a crew.

Crew coordination saves aircraft and lives

As the IP executed the takeoff described in the paragraph above, there was no help from anyone else in the aircraft. The PI and both CEs realized that the aircraft was in an unannounced left turn. They all knew they were in a crosswind condition, but no one told the IP he was turning or asked why he was turning.

The board wondered why. The explanation from each of them was that they were sure the IP knew what he was doing. All of them had flown together many times before and all three trusted the IP without question. This phenomenon is often referred to as excessive professional courtesy. It occurs when a less experienced crewmember fails to question a more experienced member even when he knows something is wrong. This happens often. (See *Flightfax*, February 2003.)

Another example occurred when an MH-6J IP flew to an elevated platform with obstacles nearby to insert troops. The other PI later stated that he knew they were lower and closer to the obstacles than in previous iterations, but he didn't say anything because he was sure the IP knew what he was doing. The rotor system struck one of the obstacles, and the aircraft crashed and was not repairable. The PI suffered serious injuries but has fully recovered. The lesson to be learned here is WHEN YOU THINK SOMETHING IS WRONG, SAY SO. There's a reason two to six people in an aircraft are called a crew. Without help, everyone makes individual mistakes. It's our crewmates who must help us avoid them. ♦

—LTC McInnis retired from the Army in 2004 and currently works at the U.S. Army Aviation Technical Test Center at Cairns AAF, AL. He may be contacted at william.mcinnis@us.army.mil.

If the Weather is Bad, DON'T Fly!

We train our crews over and over to avoid flying in deteriorating weather conditions. It's dangerous! If the weather is bad, don't fly! If the weather gets bad, turn around and go home or land where you are and wait it out. This article will attempt to draw attention to the continuing problem that we in Army Aviation struggle with every day.

I recently read an article in a leading magazine regarding FAA and General Aviation addressing accidents involving poor aeronautical decision-making. The article asks how many pilots prepare for a flight and then declare, "I think I'll have an accident today!" Why then, on occasion, will pilots consciously make a decision to continue visual flight rules (VFR) flight into deteriorating weather conditions? I know Army pilots don't intentionally set out to have an accident, but crews must manage risks associated with weather hazards and exercise effective decision-making skills.

The folks in civil aviation have the same concerns we do. I truly believe every Army Aviator should ask himself these questions before he encounters instrument meteorological conditions (IMC) while flying VFR:

■ What is my plan and what are my personal limitations on ceiling and visibility, even if we decide to disregard published standards?

■ When do I say, "Enough is enough!" and turn around or land?

■ Have I covered

everything possible to prevent an accident?

Up to this point you are probably saying, "I've heard it all before and this old fool is just rambling!" There is no doubt in my mind that you have heard it all before. Do you do the necessary things to prevent an accident? What about your buddy? When was the last time you talked about accident prevention? Let me guess, it was during your once-a-year safety stand-down day, right?

I just completed an accident investigation where a CH-47D crashed, killing 18 people onboard and destroying the aircraft. Do you want to guess what they were doing prior to the crash? You don't have to guess, you already know. The crew was continuing VFR flight into decreasing weather conditions. This was a flight of two, performing general support and resupply. Earlier in the mission, the pilot in command (PC) in the lead aircraft had flown into decreasing visibility and got away with it. The air mission commander (AMC) in Chalk 2 never demanded they turn around or land; instead he went along with the PC's decision to press on. You can pet a rattlesnake only so many times before it WILL bite you. The same holds true if you press on and push the envelope—one of these many times, you WILL crash.

If you are an Army Aviator still performing flight duties and you strap on an Army aircraft with the intent to fly, you better know your personal plan and limitations for flying VFR in decreasing weather conditions. If you are a person responsible for selecting AMCs, make sure they understand their responsibilities and are capable of making sound decisions when things start going bad. Army Aviation is serious business. American families put their faith, trust, and confidence in us to move their loved ones from point A to point B safely. They deserve nothing less than our total dedication and professionalism to do just that. ♦

—Comments regarding this accident may be directed to the Accident Investigations Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

Flying in Bad Weather Causes Another Fatal Accident

This is yet another inadvertent instrument meteorological condition (IIMC) accident. The mission was a day general support mission, a 1½-hour flight to transport personnel across state from a military installation to a civilian complex. Although the mission was scheduled one week before departure, the pilot in command (PC) and the company commander discussed the mission just one day before mission departure. The PC completed and rated the risk assessment worksheet as low risk for a *day* visual flight rules (VFR) flight. This was considered the mission brief.

Poor pre-mission planning

The morning of the mission, the relatively inexperienced crew filed the flight plan and received a weather brief. The weather brief called for 600-foot ceilings en route and 2 miles visibility. The crew flew the UH-60L from the airfield to the VIP pad for passenger pickup. The passengers were loaded and the aircraft departed at 0630 local. Official sunrise was at 0710 local. I think you can see the pattern building here, not daytime yet and weather minimums below VFR.

By looking at the radar plots, we determined the crew had used the GPS to plot a direct course from home station to their destination. The crew had sectional charts onboard but had not used them to plan the route. When the aircraft departed, the ceiling and visibility must have been much less than predicted because the radar plot showed the aircraft at 34 feet above ground level at one point and less than 60 knots.

Approximately 20 minutes into the flight, the crew became disoriented, most likely due to the decreasing visibility and low clouds. The PC called approach control and requested an instrument flight rules (IFR) clearance. Approach asked for their position and the PC told them to standby. This fact alone led us to believe the crew didn't

know exactly where they were and the weather had come down enough for them to consider going IFR.

Approach attempted to contact the crew but didn't get a response. The crew had made the decision to commit to IMC, but they didn't know where they were when they made that decision. The aircraft struck a 1,700-foot television transmission tower support cable and crashed inverted in an open field, killing the crew and all passengers. Had the crew used the sectional to plan the route of flight, they would have seen the direct course took them right over a group of TV antennas.

Lack of command involvement

The morning of the mission, the weather was not good as described by experienced aviators driving to work that morning. One older, very experienced pilot said the ceiling and visibility were well below VFR, and he couldn't believe anyone would be flying that morning. No one in the chain of command reviewed the weather forecast and mission planning documents or contacted the PC at any time to get a mission update or briefing on weather conditions.

Lack of experience

The fact that the crew didn't plan the route of flight, didn't get an updated briefing, and didn't depart in daytime as briefed, with less than required weather minimums are all elements of lack of experience.

You can say this accident was caused by many factors, but when it is all said and done, the lack of planning, the lack of command involvement, and the lack of experience all played heavily in the cause of the accident. ♦

—Comments regarding this accident may be directed to the Accident Investigations Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

CW2 Katrina Bolls
Fort Polk, LA

It was late evening and our MEDEVAC crew got a call to transfer a stroke patient from the post hospital to a city 120 miles north. We were a crew of four—pilot in command (PC), pilot (PI), crew chief, and medic—flying a UH-1V helicopter. We also had a doctor and medical attendant onboard to assist with the stroke patient.

Our crew medic advised us to keep the altitude as low as we could due to the condition of the patient. The weather conditions were visual flight rules (VFR), and after a map reconnaissance and verifying the height of the obstructions along our route of flight, we decided to fly at or above 600 feet above ground level (AGL) on a direct course from hospital to hospital with the aid of night vision goggles. The PI on the controls was flying about 1,000 feet mean sea level, which was about

"Oh My God, To

600 to 700 feet AGL. The PC was in the left seat navigating with the VFR sectional to assist with antenna and tower avoidance. We were also talking to radar approach, which had us on radar and assisting with obstacle avoidance hazards near our flight path.

The PC announced there should be a tower to our 1 o'clock and two towers to our 11 o'clock. Both pilots confirmed they had them all in sight and agreed we would split the difference and fly between them but above them. All three towers were indicated on the map as being below 430 feet AGL, so we were well clear.

About the time we were abeam the towers, the PI on the controls announced, "Oh my God, tower 12 o'clock!" The PC shouted, "Climb! Climb and come left!" The PI immediately maneuvered the aircraft up and left. We missed the tower but realized it had been at our altitude and directly in our path. This tower was neither indicated on the map nor had any lights on! That is when we realized just how close we came to striking the tower and possibly killing all seven individuals onboard the aircraft.

We immediately called approach and informed them of an unlit tower at that location and gave them the grid and approximate height of the tower. We were flying at an altitude that was at least 200 feet higher than the highest obstruction along our route. We followed the map diligently and had all crewmembers keep their eyes outside the aircraft to assist in scanning.

An hour later into our mission, the weather got considerably worse with isolated heavy rain showers, bringing the visibility down close to our minimums. Just think if our flight had been delayed an hour. There is no way we could have seen the tower during these poor weather conditions.

Upon returning to home station, we contacted base operations and informed them of the unlit tower. They posted a local NOTAM and also disseminated the information to all aviation units on post. The PI onboard our aircraft was also the unit's assistant safety officer, and he contacted the Department of Army Regional Representative (DARR) to give them the information. The DARR informed us that he would call the owner of the tower and notify them that the tower was unlit, unpainted, and had almost caused a fatal accident with a helicopter. The owner would also be informed that the tower was in violation of the law for not being lit, that he should post a formal NOTAM, and that he could possibly incur a fine from the FAA.

Approximately a week later, the PI and assistant safety officer conducted a safety survey flight with one of the standardization pilots to confirm the exact location of the tower, its height above ground, and to get an exact grid of the tower's location. They found the tower to be approximately 675 to 700 feet AGL—and still unlit and unpainted!

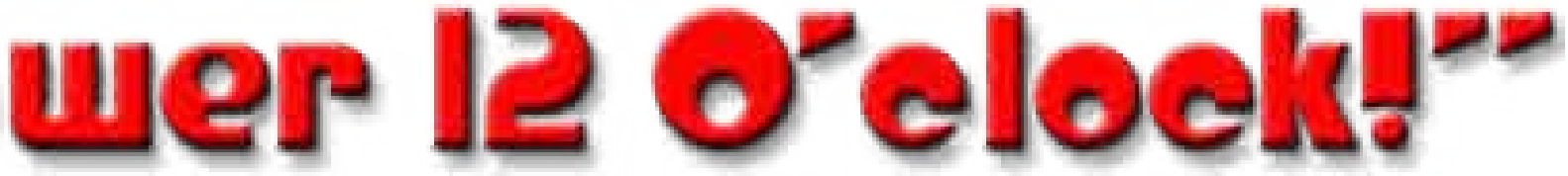
Lessons learned

■ Every crewmember should scan, especially at night.

■ Fly above the maximum elevation figure listed on the VFR sectional.

■ Report all hazards immediately for the safety of others. ♦

—CW2 Bolls is a UH-1V MEDEVAC PC at Fort Polk, LA. She may be contacted at (501) 626-3841.



Line of Death

CW5 J.J. Holmes
U.S. Army Combat Readiness Center

It was time to train another group of aviators on urban operations (rooftop landings). We had spent the week before in classroom training and were now ready to start urban site training.

We did our typical in-depth briefing and a few more classes on techniques. Then we went to the urban training site. We landed four aircraft on the ground in the training area and shut down. Even though we had diagrams and pictures of the site, it's always best to conduct a walkthrough of the area and see everything with your own eyes before conducting training.

The training area was a good size with plenty of buildings to land on. To enhance training, we split the training area in half and flew two aircraft on each half of the training site, as per our briefing. This allowed two aircraft to fly right traffic on the right side of the training area and the other two aircraft to fly left traffic on the left side of the training area. To make sure the aircraft crew knew their area and did not fly into the other training area, we established the "line of death."

A line of death is nothing more than you will stay on your side of the line and we will stay on our side of the line so we don't run into each other. The line of death has to be a prominent feature that everyone can identify from the air, in this case a road that ran down the middle of the urban site.

Our instructors always used the crawl, walk, and run training method. We started by conducting training on our side of the training area with single-ship traffic to flat roofs and then we trained on pitched roofs. After an hour, both groups of aircraft switched sides, as briefed, to get training on the other rooftops. Toward the end of the second hour, we joined up as a flight of four and made formation rooftop landings. This was all conducted during daylight prior to conducting the second period under night vision goggles (NVG) later that night.

Everything went as planned on the first day of training. The second day of training was the same as the first except the new pilots switched to another instructor pilot (IP) to get as many techniques from varied sources as possible. It's also a check to see if the other IPs were teaching students to the correct standards. The day period went as planned, as well as the first hour of night training.

After finishing the first hour of NVG training, we switched to the other half of the training area. Of course, after making the first landing to a rooftop, the IP got out and relieved himself of all the ice tea from dinnertime. The IP climbed back into the cockpit ready to continue training. The copilot took off from the rooftop and turned left instead of right traffic as he was briefed. He forgot that he switched to the new right-hand traffic pattern. As the aircraft started into the left-hand turn, the IP looked left and saw another aircraft that had taken off and was just to his left rear. There was no time to get completely on the controls, so he hit the cyclic with both hands and forced it full right. At the same time the IP yelled, "Turn right!" Just a fraction of a second later and this could have been a midair collision.

There are three lessons learned here. The first is the "line of death" could literally mean death if you cross it. Second, even if the other pilot was doing a good job, never let your guard down. The last lesson learned is if the IP comes on the controls to make adjustments, under no circumstances are you to let go of the controls until a three-way positive transfer of controls are executed. This last one is important because the IP only had time to push the cyclic to avoid the accident; he didn't have control of the pedals or collective at the low altitudes he was flying on takeoff. ♦

—CW5 Holmes is the Operations Division Chief. He wrote this article while attending Aviation Safety Officers Course 04-004. He may be contacted at jj.holmes@us.army.mil.

CW3 David B. Higginbotham (Team Leader),
CW3 Marty Adkins, CW3 Blair Albrecht, CW3 Jim Funk, CW3 John Mattson, and CW3 Mark McIntosh

In 1986, I was a UH-1H crew chief at Fort Campbell, KY. My mission was to fly a night vision goggle (NVG) flight. On my way to the airfield, I saw the wreckage of several aircraft, all Hueys and Black Hawks. From my first look, it appeared the Black Hawk had taken the worst of it.

Over the next several days, we got the gist of what had happened. After leaving the refuel area, the pilot in command (PC) of the UH-1, while flying under goggles, had made his approach to the "inverted Y" slime lights of the running UH-60, which had been waiting to move into the forward arming and refueling point (FARP). After losing its tail rotor gearbox, the Huey continued forward about 75 meters, where it landed hard. The Black Hawk came off the ground, lost its tailboom and most of its other parts. Flying debris also destroyed my aircraft that was sitting on the parking pads adjacent to the crash site. Remarkably, there was only one minor injury to one of the Black Hawk crew chiefs.

After the accident, we learned the PC wasn't NVG current; the aircraft had three Red Xs when it took off, and the PC had a reputation for scaring his crewmembers. Long story short: they never should have taken off! Since the PC was apparently getting out of the Army in about 30 days, he was permitted to ETS without much inquiry.

Less than 3 years later and thoroughly enjoying the civilian life, I awoke one morning to hear about a UH-1 crash that had occurred in Massachusetts and had claimed the lives of six Delaware National Guard Soldiers. Little did I know at the time that the PC in the accident was the same one who had landed on the Black Hawk. When I did find out, my first thought was, "Why was that guy flying another Army aircraft?" Over the following years I heard more details about the accident PC. His reputation had followed him, and he apparently hadn't learned from his previous mistakes. I spoke to other pilots who had known him in Delaware and had refused to fly with him.

When a pilot has a well-known reputation like that, why is the command continuing to let him or her fly? What does it take to permanently remove that individual from flight status before a preventable disaster occurs? What would you rather do, make a pilot mad by telling him he's a cowboy or speak at his funeral? So, is it mad or dead?

The Army isn't the only service that has this problem, nor is it unheard of in the civilian arena. Many of us are familiar with the film of the 1994 B-52 crash at Fairchild Air Force Base and have heard the stories of that pilot's antics in the years leading to that crash. The National Transportation Safety Board (NTSB) has identified numerous events where the pilot involved in an accident had a prior history of poor performance, adverse employment actions, or even criminal activity. Their investigations found that errors by pilots whose backgrounds had not been checked prior to hiring were identified as contributing factors in seven crashes of scheduled air carriers involving 111 fatalities.[1]

In 1996, Congress enacted legislation called the Pilot Records Improvement Act (PRIA) (49 U.S.C. § 44703 (h) through (j)). This law:

> *"…was enacted to ensure that air carriers adequately investigate a pilot's background. PRIA was primarily the result of seven fatal airline accidents between 1987 and 1994 that were attributable to pilot error. Through [the NTSB's] subsequent investigation it was determined that, although the pilot(s) had a history of poor performance, the current employer had not investigated the pilot's background for competency or other safety related information."*[2]

Ultimately, it's up to us. It's up to us to cry foul when we see something not right; it's up to us to mentor the freshman aviators in our midst to help them survive to become senior aviators; it's up to us to ensure that reckless behavior is identified and, most importantly, documented; therefore, it's up to us to tell our commanders when there's a loose cannon in our group.

Within the Army, when pilots or aircrew members move from one unit to another, they often hand-carry their flight records to the gaining unit. I'm not making any accusations here, but this certainly presents the opportunity for an offending aviator to "lose" any of the incriminating information in his or her records. The gaining unit is left with one option: creating a new record for the aviator. The first line of the record states, "Previous records lost," and a potential rogue aviator is back in business. Another way high-risk aviators continue their careers is in the same way as my first example. They move from one unit or component to another, and the losing unit hasn't documented any of the problems they've identified. They leave it to the gaining unit to make all of the same unpleasant discoveries that the losing unit has recently survived. That is simply unacceptable. It is a disservice to the gaining unit, as well as the Army as a whole, where aircraft and personnel are such a precious resource.

On the positive side, the rogue aviator is an uncommon problem. Our civil brethren have put in place certain systems to minimize the likelihood of a poor performer's continued career in such a critical job as flying an aircraft. But on the negative side, when a bad pilot still manages to slip through all of the checks and balances, the results are often disastrous.

So here I am, years later, and back in the Army (National Guard now) and at the Warrant Officer Staff Course with the assignment of

[1] GAO-02-722, Aviation Safety, "Better Guidance and Training Needed on Providing Files on Pilots' Background Information"
[2] http://faa/gov/avr/afs/pria/

completing a staff project for either a decision briefing or publishing an article. What better subject to cover than the problem I've described above, as it applies to Army Aviation? My first stop was the U.S. Army Combat Readiness Center (formerly known as the U.S. Army Safety Center) for a data query. The helpful folks there listened to me and my classmates' questions and concerns and developed several very helpful queries from their accident and incident databases. Basically, they examined data from the last 10 years for pilots who had been involved in more than one Class A through C accident to see if there was any way to identify accident-prone aviators. But just like the stock market, past history was not a reliable indicator of future performance, which in itself is good news. Of all the accidents and incidents reviewed, 18 pilots were involved in more than one. And often there were additional circumstances that led to the first or second accident that weren't necessarily the lucky winner's fault. In short, the data didn't support our concern.

We were not the first to figure this out. In 1983, Darwin S. Ricketson, Jr., of the Army Safety Center, and Michael G. Sanders of the Army Research Institute conducted a much more detailed examination of the issue.[3] Their major finding was that "if accident proneness exists, it is very complex and there seems to be no clear-cut way to identify such individuals." Furthermore they stated, "There is no practical or valid way of identifying a high-risk/accident-prone Army Aviator based only on the number of accidents experienced." However, they strongly recommended that pilots who are identified as not having adequate self-discipline and who take unnecessary risks with their aircraft and fellow crewmembers should be identified and considered for removal from aviation service. And therein, my friends, lies the rub: It's up to us. Fortunately, the Army is developing some tools to help us.

At this writing, Army Aviation does not maintain a centralized system capable of performing queries, trend analysis, or producing summarized reports on individual skills or unit proficiency levels. The current DOS-based Automated Flight Records System (AFRS) is antiquated, unresourced, and abandoned by most Army Aviation units. However, the Army is in the final stages of developing a system called the Centralized Aviation Flight Record System (CAFRS). The planned system should provide a common database where authorized users can query an individual's flight hours, readiness levels, IATF information, and up or down slips. Among other things, the planned system will:

- Be globally accessible.
- Permit remote operations and performance tracking.
- Provide capability for automated visibility of enlisted and officer aircrew.
- Compile qualification and training data in a centralized database.

The availability of this information will allow commanders and other designated individuals another tool to assess crew selection in terms of individual experience levels and past history. Such information could even be used to identify potential hazards based on crewmember experience levels. Provided the right information is entered in the records, it will also permit a gaining unit to assess its new pilots, with an eye toward any identified high-risk behaviors.

But again, ultimately, it's up to us. It's up to us to cry foul when we see something not right; it's up to us to mentor the freshman aviators in our midst to help them survive to become senior aviators; it's up to us to ensure that reckless behavior is identified and, most importantly, documented; therefore, it's up to us to tell our commanders when there's a loose cannon in our group. That is, if you survive your first encounter with the loose cannon. ♦

—This article was written by CW3 Higginbotham, CW3 Adkins, CW3 Albrecht, CW3 Funk, CW3 Mattson, and CW3 McIntosh as a class project while attending the Warrant Officer Staff Course at Fort Rucker, AL.

"High-Risk Aviator Study", Darwin S. Ricketson, Jr., U.S. Army Safety Center; Michael G. Sanders, Army Research Institute (1983).

The Smoothest Landing Ever... WELL, ALMOST!

CW4(P) Haydn G. Decker
JFHQ, Oklahoma ARNG

Every person who flies Army aircraft will at some point ask himself, "Do I have what it takes to deal with that 'Ahhhh, sh@#$!' situation when it happens?" Some people might go their whole flying career without facing that tight spot; but most will experience a tricky situation and have a "There I was" story to share with fellow aviators. Sometimes these stories are in the spotlight for all to see; other times you'll only hear about them when you buy your buddy a round. But they all have two things in common: they are all tales of how a crew came together to handle a critical situation and lived to fly again, and they all have lessons that can be passed on. In keeping with Army tradition, here is one of those stories.

Several years ago, right after finishing the transition course and flight training in the C-23 Sherpa, our crew of four was returning from a 2-week training mission. During that 2-week period, I planned flight plans, briefed, and demonstrated several different ways the C-23 could be used in the Specials Operations community. Some events included cross-country flights of 1,000 miles plus, high-altitude operations above 18,000 feet on the pipe (C-23 aviator talk for being on oxygen and using the mask), and landing to high-altitude airports and short fields. We flew 3 to 5 hours every day. After a while, you start getting pretty good, damn good as a matter of fact! All my training and the opportunity to practice with a very experienced instructor pilot (IP) was paying off. I felt comfortable in the aircraft and had demonstrated both left- and right-seat dependent tasks.

On the last leg of the trip, the IP asked me to perform a maximum-braking, short-field landing from the right seat. I wanted to make this the softest, shortest landing anyone had

ever seen in a Sherpa. I called for all the appropriate checks and even had the flight engineer recalculate our landing weight, refiguring the new speeds for our approach and landing. I then bugged the airspeed indicator so I could be right on the required speeds for this perfect landing.

The only thing I didn't say was, "Watch this one!" The final approach was uneventful, slight round out at the bottom, flare, and the smoothest touchdown you ever felt with full brakes and full reverse on the props. It was one of the smoothest, shortest C-23 landings on record. As we taxied to the first turnoff, I called for the after landing check. As we started our turn, the right side of the aircraft dropped, dipped … uh, went down! It doesn't matter how you say it—the right-side tire went flat.

The aircraft was not completely clear of the runway, so now we have a runway that must be closed at a major international airport, which doesn't make the tower very happy. I immediately announced that we must have popped the thermal plug in the right tire. The thermal plug is designed to pop whenever the wheel and tire are overheated to keep from having an explosive blowout. I mean after that smooth touchdown and braking, that's what it had to be.

As the crew exited the aircraft, I could hear the laughter. I was the last one out and there it was as plain as day—a black skid mark from the point of touchdown all the way to where the tire blew. That's right, Mr. Cool! Mr. Watch This just landed with his size 13 on the right brake pedal at touchdown. This is the first lesson you learn in flying rotorcraft or fixed-wing—heels on the floor, heels on the floor, heels on the floor! I can still hear my instructor at Fort Wolters, TX, yelling, "How many times do I need to remind you, heels on…" You get the picture. This aircraft is equipped with an anti-skid system; but like most, the wheel has to be spinning first or the anti-skid system will not work.

Yeah, it cost me several beers over the years to buy the crews' silence anytime we were telling war stories. Anytime one of them started with, "I remember the time Haydn…" Before he could finish, I made sure his thirst was taken care of. Gee, I guess by writing this I won't have to buy next time. ♦

—CW4(P) Decker may be contacted at Joint Force Headquarters (JFHQ), OKARNG, Oklahoma City, OK. He is rated in the OH-23, UH-1-B, -C, -D, -H, AH-1G, OH-58, U-21, and C-22. He is also an IP in the OH-58 and UH-1. Mr. Decker wrote this article while attending Aviation Safety Officer Course 05-002 at Fort Rucker, AL. He may be contacted at haydn.decker@faa.gov.

ACCIDENT Briefs

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class A**: A 4th Infantry Division Soldier was killed on 11 July 2005 when his aircraft crashed into a hillside while conducting team training. The accident aircraft was the lead AH-64D practicing day close-combat attack operations. During one of the simulated engagements, the lead aircraft failed to initiate a climb to clear rising terrain. The impact fatally injured the pilot occupying the copilot gunner (CPG) station and injured the pilot occupying the backseat. (PLR 05114)

■ **Class A**: During student training at a stagefield, an aircraft on final approach landed on top of another operating AH-64, contacting the main rotor system of the stationary aircraft. Debris from the collision damaged a third operating aircraft.

■ **Class A:** While in flight, the crew experienced a loss of power during a right bank, and the aircraft subsequently descended to ground impact.

CH-47

D Model

■ **Class E:** While conducting nap-of-the-earth (NOE) flight at night using the night vision system (NVS), the crew heard an unusual noise aft of the pilot station. The pilot in command (PC) suspected the SDC and landed the aircraft immediately. After landing, the SDC CAUTION light illuminated.

MH-6

M Model

■ **Class B:** Aircraft touched down tail-low during autorotation training, severing the tail boom.

MH-60

K Model

■ **Class E:** While at a hover, the TAIL XSMN CHIP light illuminated. The PC landed, taxied into parking, and shut down the aircraft. Maintenance found a gouge in the tail rotor pitch change shaft assembly and replaced the shaft assembly.

OH-58

A Model

■ **Class C:** Aircraft experienced an explosion in the engine area during a simulated engine failure. Aircraft was successfully autorotated to the ground. Engine explosion resulted in damage to the tail boom.

UH-60

A Model

■ **Class C:** Aircraft experienced a No. 2 engine failure in flight and crew performed a roll-on landing. Post-flight inspection revealed main rotor blade (MRB) damage from contact with the ALQ-144.

■ **Class C:** While taxing into a designated parking area, the aircraft's main rotor system contacted the black MRB of a parked aircraft. Accident aircraft sustained damage to three MRBs.

L Model

■ **Class C:** The aircraft MRB tip caps contacted the top of a concrete barrier during parking. All four MRB tip caps required replacement.

■ **Class E:** On approach at 500 feet AGL and 60 KIAS, the

Fact: **As of 11 July 2005, the Army has experienced 25 Class A through C AH-64 accidents this fiscal year. Of those accidents, there have been 10 Class A accidents, of which 8 occurred during daytime operations, resulting in 8 Soldier deaths.**

STABILATOR CAUTION light illuminated and the audio sounded, indicating a stabilator failure from the auto mode. Maintenance replaced the stabilator actuator.

■ **Class E:** During engine startup, the FIRE light on the master warning panel illuminated along with the No. 1 engine emergency off handle. No fire was found. The aircraft was shut down without further incident. Maintenance replaced the No. 1 engine fire sensor.

■ **Class E:** The No. 1 engine pitch-change link (PCL) failed to go into LOCKOUT. Maintenance replaced the push-pull control cable and a maintenance operational check (MOC) was completed. Aircraft was released for flight.

RQ-11

■ **Class C**: Aerial vehicle (AV) entered sporadic uncommanded flight modes and ultimately crashed despite attempts to gain control.

RQ-7A

■ **Class B:** Ground control received high-temp indication immediately following launch. AV was unable to sustain climbout and descended, impacting the ground.

■ **Class C:** AV missed the arresting gear on landing and subsequently contacted a barrier, damaging the tail assembly.

■ **Class C:** AV failed to maintain rate of climb following launch and descended, landing hard.

■ **Class C:** AV failed to respond to recovery control input and initiated an uncommanded climb. Recovery chute was deployed, but AV sustained damage upon contact with the ground.

■ **Class C:** AV missed arresting wire on landing, bounded into the air, and missed arresting net, crashing into jersey barrier. The right wing was severed and fuselage sustained cracks.

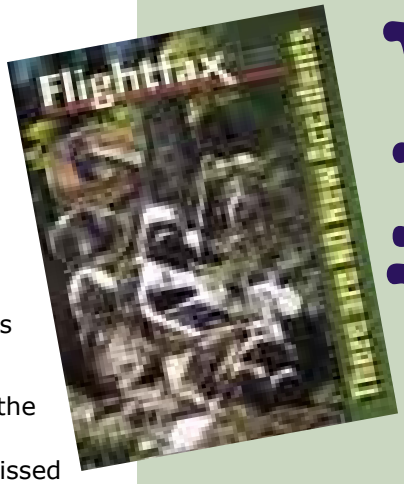
RQ-7B

■ **Class C:** AV experienced engine failure following overheating of the cylinder after approximately 4 hours of flight time. Recovery chute deployed, but AV sustained damage.

■ **Class C:** AV descended after takeoff into ground without recovery chute deployment.

■ **Class C:** AV was launched without being secured to launcher shuttle and subsequently fell to the ground, damaging propeller and wings, as well as the shuttle and launcher frame.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).



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Are you an aviator, crew chief, or an aviation safety officer who enjoys writing? Shakespeare need not apply, but *Flightfax* is looking for authors to publish short articles (500-800 words) in our monthly magazine.

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- *November– "Situational Awareness"*
- *December– "ALSE issues"*

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If any of these topics interest you or if you have a few of your own, e-mail the editor at paula.allman@crc.army.mil.

The Dirty Dozen

- Lack of Crew Coordination
- Complacency
- Distraction
- Exceeding Your Limitations/Abilities
- Indiscipline
- Fatigue
- Stress
- Peer Pressure
- Lack of Knowledge
- Lack of Training
- Lack of Leader Involvement
- Lack of Pre-mission Planning

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

SEPTEMBER 2005 ✦ VOL 33 ✦ NO 9

The Most Important Attribute of an Army Aviator or Crewmember is...

Discipline

U.S.ARMY

Flightfax

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

Investi

"Let Me D
You Hol
Discipline

is the most important attribute of an Army Aviator or crewmember. Learned discipline allows inexperienced aviators and crewmembers to overcome a deteriorating tactical situation or unexpected weather conditions. Unwavering discipline keeps a mid-level aviator from attempting maneuvers beyond his capabilities and from placing his crew in situations of unnecessary risk. Discipline enhanced by experience allows senior aviators and crew chiefs to make solid recommendations to air mission commanders and influence the actions of fellow crewmembers.

o It...
d Your Diet Coke"

Indiscipline can result in anything from a paper cut, to brain damage, to death. That is what's so disturbing about the whole indiscipline thing—you never know what the results might be. As an aircrew, you might be able to find that "sucker hole" and get your aircraft with eight passengers onboard below the clouds, OR you might hit a 1,000-foot television broadcast tower! You might do that break turn and get a great photograph you can e-mail home, OR you might impact a rocky hillside and suffer brain damage so severe that you won't be able to recognize any of your family members.

Discipline is not isolated to the cockpit, but it can end in the cockpit. Just as several layers of carbon fiber make armor plating strong, multilayered discipline—including your air mission commander, troop or company commander, and squadron or battalion commander—is essential. However, no matter how robust the discipline in these top layers, a discipline breach in the cockpit can be catastrophic.

A recent accident illustrates the result of cockpit indiscipline. In this accident, the crew was providing security during a supply ring flight. A risk assessment worksheet (RAW) was completed for the mission, with the mission complexity portion of the RAW indicating COMBAT. During the flight, a request was made from one of the aircraft in the flight to perform a maneuver with a steep bank angle which would expose the underside of the aircraft. The crew agreed to this photographic opportunity and had a short discussion on who would be on the flight controls during the maneuver. The discussion ended with, "Let me do it, you hold your Diet Coke."

The crew performed a breaking turn with a bank

angle in excess of 60 degrees. Consequently, the crew failed to anticipate and recover from the high sink rate from the aggressive maneuver and the aircraft impacted the ground and was destroyed. Thankfully, the crew suffered only minor injuries.

As stated earlier, the RAW indicated COMBAT, but this was not meant to allow the crew to do whatever they wanted. The crew was briefed to perform maneuvers or mission deviations only in response to tactical situations.

When the accident occurred, they were not maneuvering away from surface-to-air fires, there was no call for immediate assistance by ground troops, nor were there any troops-in-contact. The crew's indiscipline resulted in the total loss of a helicopter. The enemy never lifted a finger. This lack of discipline directly impacted the combat readiness of this unit.

The facts

Many of you may be unaccustomed to this level of exposure. To further emphasize the situation, we offer the following—

■ Between 1 October 2002 and 29 June 2005, 88 Army aircraft have been lost to accidents. Replacement costs for these aircraft will exceed $1 billion.

■ In fiscal year 2005, 34 Soldiers lost their lives to aviation accidents; that's 14 percent of all Army Soldier accidental fatalities.

Any feelings these statistics and this article might give you pale in comparison to a visit to one of our regional medical centers or civilian hospitals treating survivors of these accidents. Our national industrial base can manufacture or rebuild helicopters, but no factory can restore brain function or full mobility to a Soldier injured in an accident.

Conclusion

With the recent sharp rise in Army Aviation accident rates, increased emphasis has been placed on determining what root causes precipitated the accidents. Are you a potential root cause? Does your current level of discipline rule out inappropriate behavior in the face of command pressure or peer pressure? What about loss of "cool points?" If YOU have been trained, signed-off, and knowingly induce a maneuver while flying an aircraft, then YOU are required to anticipate, adjust, and recover from any flight conditions that may transpire.

If you are unsure of your abilities given the environmental conditions (wind, density altitude, or temperature), the performance limitations of your aircraft, or your personal limitations, don't do an extreme maneuver until the conditions are more favorable. If you are not briefed to do a certain type of maneuver or mission, don't do the maneuver or mission until you are properly authorized and have applied all applicable mitigation measures. Extreme tactical situations may require real-time mission modification, but these situations should be taken into consideration during contingency planning. Most importantly, if you know you can successfully execute the maneuver and have been briefed, BUT the maneuver is not appropriate—

DON'T DO IT!

Discipline begins and ends with you, the Army Aviation Soldier. Unwavering discipline will result in increased professionalism between your aircrew members and will reduce the probability of accidents within your unit. ♦

—Comments regarding this accident may be directed to the Accident Investigations Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

"Nothing can be more hurtful to the service than the neglect of discipline; for that discipline, more than numbers, gives one Army superiority over another."

--GEN George Washington

Investigators' Forum

Simple Mission Turns Tragic

Near dusk, the AH-64A crew was conducting a routine continuation training flight in the local terrain flight area (TFA) in overcast, light rain conditions. The crew flew to a nearby airfield to conduct traffic pattern maneuvers and then flew on a nap-of-the-earth (NOE) route over a major river. At the release point of the NOE route, the crew flew into the TFA for approximately 10 minutes before returning to the river.

Upon their return, it is suspected that the crew navigated at terrain flight levels as they attempted to rejoin the NOE route and mistakenly returned to the river beyond the anticipated route release point. The crew then assumed a flight profile along the river that was too low and too fast for environmental conditions. It is suspected the crewmembers were flying toward a setting sun, and the crew failed to detect wires suspended across the river at 50 feet above ground level; consequently, the aircraft struck multiple 1.25-inch wires and crashed into the river. The aircraft was destroyed and both crewmembers suffered fatal injuries.

Why did it happen?

The exact cause of the accident could not be determined due to no survivors, eyewitnesses, or digital source collection means on the aircraft. It is suspected that the crew was overconfident in their abilities to rejoin the intended route with the aid of only a 1:250,000 scale map and onboard navigation equipment because of their familiarity with the local TFA. Overconfidence is also suspected within the crew by them assuming a flight profile on the river that was too low and too fast for the environmental conditions in which they were flying. In addition, fatigue on the part of the pilot in command (PC) may have degraded his ability to concentrate and exercise proper judgment. The PC had taken a checkride the night before and then departed early the morning of the accident to attend several medical appointments.

Lessons learned, recommendations

The crew failed to conduct adequate pre-mission and in-flight planning. Complete and adequate flight planning is a critical element in the success of any mission. Not only does it provide the information required to perform an aircrew's duties, it also puts the crew in the correct mindset to perform the mission safely. Skipping required planning steps due to overconfidence or complacency can lead to disastrous results.

The mission briefer and approval authority were not available to perform face-to-face risk management duties. The mission briefer compromised his ability to conduct a thorough and relevant briefing by conducting the briefing via radio while he was, himself, engaged in another aviation mission. A critical step toward ensuring crews perform to standard is thorough oversight by the mission briefer and approval authority. They are vital links in the risk management process. They help ensure crews conduct detailed mission planning, as well as ascertain whether the crew is fit and able to fly the mission before assigning, briefing, or approving it. ♦

—Comments regarding this accident may be directed to the Accident Investigations Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

Investigators' Forum

Mishap or Malpractice

It was the end of a hot, windy day in the high desert. The Apache and its crew, an experienced instructor pilot/pilot in command (IP/PC) and a novice copilot gunner (CPG), had been standing ready for a Quick Reaction Force mission all day but had not launched. Their standby mission was to conduct close combat attack (CCA) gunnery training.

The planned takeoff time for the gunnery mission was approaching; however, the crew had to first attend an after-action review (AAR) from a previous mission. The lessons learned from these AARs were important and had already permeated throughout the squadron, resulting in the risk assessment worksheet (RAW) being updated three times in the past 4 months.

The CPG took care of the preflight while the PC handled the paperwork. Unfortunately, with two missions to deal with and little time to waste, some items were overlooked. Some of the items, including getting the weather and the RAW approved, later proved to be critical.

The pilots strapped in and cranked the auxiliary power unit (APU). The Apache was fueled and armed with 300 rounds of 30 mm and 24 rockets. The mission was to conduct team CCA training with running and diving fire; however, their sister Apache was already turning blades. They hurried to join them, but as they were going through the aircraft powerup, both weapons processors failed.

Armament was called and the crew had no choice but to cancel the team training. No problem, they decided they would go alone. When the Apache was ready to fly, the pilots cranked up and taxied for takeoff. Inbound to the range, they accomplished a mission handover from their sister Apache and contacted the Operations Control Facility (OCF) controller on the FM radio and called for a target.

The Apache was flying well that day. The pilots made six attacks using a combination of rockets and 30 mm cannon fire. They were coming around for the seventh run when things got out of hand. It was a hot, high-density altitude (DA) day with the temperature in the high 30s Celsius and a DA of over 7,800 feet. The six inbound runs may have made them a little complacent … and a little overconfident. Although the crew was not cleared for combat maneuvering flight (CMF) training, the PC executed a 98-degree right bank angle and kept the nose above the horizon for about 6 seconds as he lined up on their inbound course.

"Altitude low! Altitude low!" came the computerized voice as the 17,000-pound Apache sank to less than 50 feet above the sand-swept, rocky terrain. The aircraft stopped its descent at 39 feet and some change. The nose came up and they climbed just high enough to nose it over and let loose another devastating rocket attack. Maybe it was the altitude loss, or maybe it was the main rotor downwash on the tail of the rocket, but they overshot by 300 meters and were cleared for immediate re-attack by their ground controller. Unfortunately, they did not take the "altitude low!" warning seriously enough to modify their flight maneuvers.

Two more successful attack

runs later and they were headed outbound. Now ready to turn inbound on their 10th and final engagement, the PC on the flight controls said, "I'll get us turned around here," as he banked the aircraft to the right to 98 degrees. It was eerily the same. The same bank angle, the same nose-up attitude, and, unfortunately, the same low above ground level (AGL) altitude when they initiated the turn. The radar altimeter read 106 feet AGL when the PC banked the aircraft. This time, he only kept the nose above the horizon for 3 seconds before he dropped it to gain airspeed.

The combination of low altitude, high DA, and excessive bank angles proved fatal for the Apache and injurious to the crew. The aircraft was destroyed and the CPG is still recovering from head injuries and broken bones. What went wrong? How could an IP, trained in CMF by the Directorate of Evaluation and Standardization (DES), with over 4 months in-country do so many things wrong? Are there lessons to be learned here to prevent one of us from making the same deadly mistake? Read on and see for yourself.

From a Combat Readiness Center perspective

So what was the cause of this accident? Was the PC overconfident in his ability to perform CMF training or was this a case of indiscipline? Webster's dictionary defines discipline as "a rule or system of rules governing conduct or activity." Therefore, indiscipline simply means a lack of discipline—or not following the rules.

The PC was qualified to teach this maneuver. In fact, he had been trained in CMF by a DES standardization pilot (SP) a few months prior and was taught the hazards associated with conducting CMF at low altitudes in extreme environmental conditions. He had also performed this maneuver nine previous times on that same day. He had logged more than 300 hours in-country and had flown in a variety of local environmental conditions. These are all acceptable reasons to be confident, not necessarily overconfident, in his flying abilities.

The PC's actions that day make a convincing case for indiscipline versus overconfidence. Consider these facts: the PC did not obtain approval authority to conduct the mission, did not verify that an air mission commander had been designated for this CCA mission, did not sign the mission briefing form for the CCA mission, and he did not obtain a weather briefing prior to departure. In addition, the PC disregarded the cautions in the aircrew training manual on several occasions on this day alone, warning against excessive bank angles at terrain flight altitudes. Moreover, he had been previously restricted from teaching CMF training by the troop commander due to reports of overly aggressive flight maneuvers from other fellow aviators.

As professional aviators, we must be accountable for our actions, or inactions, in the cockpit. We must not accept undisciplined behavior from fellow aviators; we must hold each other accountable. It is when we depart from established procedures, either willfully or through neglect, mishaps result. Those who are dependent on us to be professional—in this case, the CPG—are the ones paying the high price.

When we talk about reducing mishaps, we must focus on what is preventable. Willful aircrew indiscipline or violations of procedures are controllable by those of us in Army Aviation. We know the pressures to complete the mission can create tough situations and challenge our aircrew, but as professionals, we must always strive to do the job correctly and safely. Concerned leadership, effective training, professional behavior, and on-target composite risk management should be the "mantra" of every leader. ♦

—Comments regarding this accident may be directed to the Accident Investigations Division at the U.S. Army Combat Readiness Center, DSN 558-9552 (334-255-9552).

From a DES Perspective

CW5 Craig Winters
Directorate of Evaluation and Standardization

What caused the preceding accident? Basically, an excessively steep bank angle at too low of an altitude did not allow the pilot sufficient altitude for recovery. How do we prevent future combat maneuvering flight (CMF) accidents? The answer is through education and training. We have raised an entire generation of attack helicopter pilots that have not been trained to maneuver their aircraft.

When discussing or performing CMF, it is important to understand that you have to manage three forms of energy: power, the margin between power required and power available; kinetic energy (airspeed); and potential energy (altitude). These three forms of energy are commonly referred to as our bank accounts. One of the basic CMF rules of thumb is "never empty your bank accounts."

When operating in a high-altitude, desert environment with a combat-loaded AH-64D, your power bank account is nearly empty at takeoff, which leaves airspeed and altitude. When operating at altitude, even with a narrow power margin, the AH-64D is quite maneuverable. As altitude is decreased, airspeed may not be available to trade off for lift and must be evaluated prior to and during the maneuver. This is aggravated as helicopter gross weights and density altitude (DA) increases. What this means is when you are operating at terrain flight altitudes with a loaded Longbow at high DAs, you can't bank as steeply as you can at higher altitudes. Remember to always leave yourself a way out.

Combat maneuvering flight proficiency is essential to success on today's battlefield. As with nap-of-the-earth (NOE) flight and night vision goggle (NVG) flight, the only way for our aircrews to attain and maintain proficiency at CMF is through a structured and disciplined training program.

CMF rules of thumb

■ Never move cyclic faster than you can maintain torque, trim, and rotor.

■ Correct for changes in performance, loading, and environmental factors.

■ Plan for contingencies; e.g., have a way out.

■ Expect the collective to DROP during "G" loading if your hand isn't on it.

■ NEVER EMPTY YOUR BANK ACCOUNT!

■ CMF must be practiced (it IS a perishable skill; therefore it needs to be instinctive).

■ Crew coordination is CRITICAL. Who is inside? Who is outside? Who is shooting with what?

■ Rolling into steep turns, anticipate the nose drop and add aft cyclic.

■ Can be used as an advantage.

■ Never let the nose drop below the target!

■ Know where the wind is from and plan accordingly.

■ Sink rates must not be allowed to develop.

■ Always land and take off into the wind.

■ Give yourself more altitude and recovery time.

■ Avoid large flares to a stop.

■ If possible, maintain effective transitional lift until in-ground effect.

■ Don't forget, jettison when necessary. ♦

—CW5 Winters is a AH-64 A/D standardization pilot at the Directorate of Evaluation and Standardization, Fort Rucker, AL. He may be contacted at DSN 558-2532 (334-255-2532) or e-mail craig.winters@us.army.mil.

"Oh, Ye of Little Faith!"

Gary D. Braman
CAS, Inc.
Huntsville, AL

As a former accident investigator, I'm always on the lookout for high-risk aviators, or what we used to call "cowboys." Cowboys are not identifiable by age, gender, race, rank, or position. They can be anyone in your unit: the commander, the operations officer, an instructor pilot (IP), or the aviation safety officer (ASO). They can be the best or the worst officer in your organization. Their behavior can be very obvious or very discreet. They don't like doing things by the book and don't understand why they should. They become defensive when confronted and will always have an excuse for their actions. They also have a very difficult time complying with the instructions on the mission briefing sheet. When flying, one of their favorite terms is, "Watch this!"

I once served on an AH-64 accident investigation board. Shortly after arriving at the scene of the accident, we were handed the tape from the aircraft's video recorder. After viewing the tape, I knew we were dealing with cowboys. An accident had been inevitable during this flight; it wasn't a question of "IF" an accident was going to happen, it was "WHEN."

The mission was a single-ship, day aircrew training manual (ATM) training flight for an officer who had not flown much but was scheduled to deploy on a Joint Readiness Training Center rotation. The training was to include high- and low-level reconnaissance, low-level flight, and nap-of-the-earth flight with target-engagement operations. The crew was briefed to conduct the flight in the local training area utilizing several different sectors and transition corridors.

As part of preflight planning, the crew checked the weather, computed aircraft performance data, and assessed the risks associated with the mission. Additionally, they conducted all mission and crew briefings. The crew then filed their flight plan and completed the preflight inspection of the Apache. The time was about 1400 when they took off. The pilot in command (PC), who was also a unit IP, was in the backseat on the controls, and the copilot was in the front seat. They conducted ATM training consisting of low-level and NOE operations in several different training areas. They also practiced multiple target engagements and high- and low-recon of landing zones. This training was completely documented on the aircraft's videotape. The video also showed the PC operating the aircraft as low as 3 feet above ground level (AGL) at 26 knots between trees and wires beside common-use roads. At one point, the copilot was heard to say, "Yeeeeeee-haaaaaaaa," as the PC completed a return-to-target maneuver.

At one point, the copilot was heard to say, "Yeeeeeee-haaaaaaaa" as the PC completed a return-to-target maneuver.

The crew continued their flight along a common-use roadway until arriving at one of the large drop zones scattered around the reservation. The PC turned the aircraft left to a heading of 320 degrees toward a stand of trees. As the aircraft approached the trees, the PC noted a gap in the trees and asked the copilot, "Do you think we can make it between there?"

The copilot answered, "Nope."

The PC then remarked, "Sure we can. Look how big it is. Oh, ye of little faith."

At 1532, immediately after the PC's remarks, the No. 4 main rotor blade struck a 2½-inch diameter limb, breaking off an 8½-inch piece of the blade. The Nos. 2 and 3 main rotor blades also struck the tree. The aircraft shook violently, but the aircrew was able to land in an open field unassisted.

The aircraft was at 16 feet AGL and 76 knots when it struck the tree, resulting in more than $1 million in damage to the aircraft. So, "cowboys" are still alive and well in Army Aviation. As hard as we try to identify and eliminate them in initial flight training, some still manage to get through. As professional aviators, we have a responsibility to report and eliminate them once they have been identified. Our business is a dangerous one, and the cowboys only increase the risk. We must not condone their behavior by doing nothing. ♦

—Mr. Braman is a Senior System Safety Analyst for CAS, Inc. He supports the Utility Helicopters Project Management Office in Huntsville, AL. He may be contacted at gary.braman@uh.redstone.army.mil. Mr. Braman was an active duty accident investigator assigned to the U.S. Army Combat Readiness Center when he wrote this article.

COMMANDERS, DON'T BE AFRAID TO ACT

LTC Mike Langham
Command Judge Advocate
U.S. Army Combat Readiness Center

"You cannot be disciplined in great things and undisciplined in small things."

GEN George S. Patton Jr., May 1941

Discipline is a necessary character trait of a Soldier. It is instilled in all of us from the first day we enter military service. It touches every aspect of our lives and is a vital component of integrity. It is reliance on discipline that can save lives and conserve vital combat resources.

In the military, we train to standards that have been established from experience. There are reasons for the rules, even if we don't personally know what all the reasons might be. Adhering to these standards is the basis for discipline. Hand in hand with discipline is accountability for breaches of discipline. Accountability is another vital component of integrity.

There are times when individuals toss discipline to the wind and fail to follow the standards they've been taught. Several of the articles in this issue of *Flightfax* address such situations. Fortunately, most of the crewmembers involved in these examples of indiscipline did not become fatality statistics. Unfortunately, we in the Combat Readiness Center (CRC) see too many instances of indiscipline where the participants are not so lucky.

I agree with the author of "Mishap or Malpractice" that "[a]s professional aviators, it is time … to be held accountable for our actions or inactions in the cockpit." But how is this done? Although

a commander cannot use the findings and recommendations of a safety investigation as the basis for administrative or punitive action, he can rely on collateral reports, reports of surveys, line of duty determinations, and other criminal or administrative reports to provide the factual basis for action against a Soldier or civilian employee.

There are several tools available to commanders to correct indiscipline. I would like to address the commander's options under the Uniform Code of Military Justice (UCMJ). The UCMJ has several provisions that may be used to hold military personnel accountable for their indiscipline and the impact it has on the safety of Soldiers.

■ **Article 93 – Cruelty and Maltreatment**. "Any person subject to this chapter who is guilty of cruelty toward, or oppression or maltreatment of, any person subject to his orders shall be punished as a court-martial may direct." A Black Hawk pilot who chooses to take an infantry squad on the "ride of their life" and intentionally sets out to "make them puke" could be guilty of this Article.

■ **Article 119 – Involuntary Manslaughter**. "Any person subject to this chapter who, without an intent to kill or inflict great bodily harm, unlawfully kills a human being by culpable negligence." A similar offense is negligent homicide.

■ **Article 134 – Negligent Homicide**. If on the same "ride of their life" the Black Hawk pilot exceeded the aircraft's capabilities and crashed the aircraft, killing those same infantry squad members, the pilot could be prosecuted for these offenses which carry a potential sentence of a dishonorable discharge, forfeiture of all pay and allowances, and confinement for 10 years for involuntary manslaughter or 3 years for negligent homicide.

■ **Article 92 – Failure to Obey Orders or Regulations**. This Article is most commonly available to commanders for safety violations.

Many provisions of regulations are included for the safety of our Soldiers, their family members, and the general public. Failure to adhere to these regulations can lead to an Article 15 or prosecution under Article 92. Violations of this Article include disobeying an order, disregarding regulations, or being derelict in the performance of one's duties. The maximum punishment for these offenses varies with the degree of culpability of the defendant.

Violating an order or regulation is fairly clear cut and is an easy concept for each of us to understand. If the Army has published an order or regulation and it is lawful, you must follow it. To be guilty of dereliction of duty, you need only be found to have acted with simple negligence or with culpable inefficiency in the face of a duty to act otherwise. "Negligence" is any act or failure to act when you have a duty to use care. Aviation is an inherently dangerous business and you always have a duty to use care in the operation of an aircraft. "Culpable inefficiency" means a reckless, gross, or deliberate disregard for the foreseeable results of an act or a failure to act without a reasonable or just excuse. Operating an aircraft on the edge of its performance limits ("hot-dogging," or "crankin' and banking") would be acting with culpable inefficiency.

The stories in this issue of *Flightfax* are a vivid reminder that indiscipline often leads to tragedy. Commanders should learn from these tragedies and not accept indiscipline within their units. Don't ignore complaints made about safety. Most importantly, don't be afraid to act.

If you have any questions about this article or your obligations as a leader to maintain the health and welfare of your Soldiers, contact the USACRC Command Judge Advocate or your local Judge Advocate's office. ♦

—LTC Mike Langham is the Command Judge Advocate at the U.S. Army Combat Readiness Center. He may be contacted at DSN 558-2924 (334-255-2924) or e-mail mike.langham@crc.army.mil.

There are NO New Accidents

(Part II)

LTC W. Rae McInnis, Retired
U.S. Army Aviation Technical
Test Center

Author's note: There is a saying among the investigators that "There are no new accidents, just repetitions of the old ones." I hope by reviewing these accidents, you can avoid the next repetition. This is the second article that discusses aviation accidents that I investigated."

There are reasons we memorize Chapter 9

Any safety officer can tell you that 80 to 90 percent of accidents are caused by human error. A search of the Combat Readiness Center (CRC) database confirms that. That doesn't mean that aircraft never break. They do. There are rare occasions when the failures are so catastrophic that the crew can only hang on and hope. But there are other times when it's up to the crew to memorize and apply Chapter 9. Here are two cases where knowledge of aircraft emergency procedures and the application of common sense saved four aviators from injury or worse when their aircraft failed them:

■ An OH-58D Kiowa Warrior (KW) was Chalk 3 in a flight of four aircraft (three OH-58Ds and one SH-60) 40 miles offshore at approximately 90 KIAS when things began to go wrong. The crew heard a bang, followed by a high-frequency vibration. Moments later there was another bang, and the aircraft yawed right and tucked its nose. The crew accurately identified the problem as loss of tail rotor components. They first tried to keep the aircraft in forward flight to maintain the slipstream. This was not possible because one of the components lost was the vertical fin. The more experienced crewmember then took the controls, rolled off the throttle, and executed what was later described as a perfect autorotation to the water. Both crewmembers swam out and were rescued within minutes. This crew did everything right from the onset of the emergency. They knew exactly how to respond to the situation and were rewarded

with no injuries and a pair of Broken Wing awards.

■ Another crew who responded well to a mechanical emergency was flying Chalk 3 in a flight of six AH-64As over desert terrain. Shortly after leaving a holding area, the instructor pilot (IP) in the pilot's station heard a loud report, followed by a grinding noise and feedback in the pedals. There were no cockpit indications of any problem. The IP wisely decided to land and announced his intentions to the flight. The feedback in the pedals led him to execute a roll-on landing to the desert in case he lost tail rotor authority. At approximately 15 feet, the PI announced there was a fire light. The IP decided to continue to land and then fight the fire. He landed at approximately 40 knots to the unimproved surface without even breaking the tail wheel pin. He then executed an emergency shutdown, pumped both fire bottles into the auxiliary power unit (APU) compartment, and got out of the aircraft. Over the next 45 minutes the IP was forced to watch his aircraft burn to the ground. What he didn't know at the time was that the APU clutch had exploded, sending shrapnel throughout the turtleback area of the aircraft. Hydraulic fuel or oil lines were ruptured and caught fire. It is suspected that airframe integrity was compromised within 5 minutes of the onset of the emergency and within 3 minutes of the first cockpit indication. By landing immediately and executing the emergency shutdown, the IP removed himself and his pilot (PI) from further danger. (*Flightfax*, July 2002)

Good people don't always do the right thing

Our Army, the Aviation Branch in particular, is filled with outstanding men and women who are intent on accomplishing their unit's mission. They train hard, generally abide by published standards, and are willing to go the extra mile when necessary. They are great people. So why do great people make bad decisions? Why do experienced pilots choose to violate standards they are very familiar with? The answers to those questions lie at the heart of many accident investigations. The answers that usually come up are haste and overconfidence. That is, people get in a hurry to get a mission completed or believe their skills enable them to execute maneuvers and prosecute the mission outside of published standards. Here are two such stories:

■ A Cavalry Troop was executing situational training exercise (STX) lanes in support of a ground force. Three KWs were rotating on and off station when ENDEX was called. The AAR site was announced and one of the three aircraft flew down the lane to ensure that all the ground vehicles were moving. As he passed the last one, he entered a turn, during which he allowed his airspeed to drop to less than 20 KIAS. The KW began a sideslip descent that the pilot was unable to recover from. He did manage to level the aircraft before impacting the ground. The aircraft was destroyed, and the pilots were uninjured.

So, what happened? Why did the aircraft stop flying? The pilot on the controls expedited the turn to follow the ground troops. The data cartridge from the aircraft indicated that the bank angle when the sideslip started was 67 degrees with less than 20 knots of forward airspeed. The KW simply did not have enough power to maintain flight. A 3,000-foot per minute rate of descent was established and there was no way to recover. Haste and overconfidence. The pilot wanted to expedite the turn and believed he was capable of executing a turn greater than 60 degrees, despite the restriction in the -10. (*Flightfax*, September 2002)

■ A more tragic incident where haste and overconfidence caused an accident was when a UH-60 crew took off for home from another airfield utilizing night vision goggles (NVGs). They encountered deteriorating weather that was worse than anticipated. Rather than return to the airfield and wait out the weather, or remain overnight, the crew decided to push on. Their down time was 2100, and apparently they thought they could make it despite the

conditions. Because the primary route required a greater altitude than an unofficial alternate route, the crew chose to take the alternate routing. Getting lower and lower, they tried to get through a low pass as the weather turned into downpours and occasional thunder and lightning. At some point, they lost visual reference and flew into the side of a hill at over 90 KIAS. The aircraft was destroyed and all five crewmembers were killed.

In both these cases, the crews were well respected. Witness after witness said they couldn't believe that the crew had deviated from the standard. How do we stop these accidents? As individuals, we cannot let mission accomplishment override everything else. There are few commanders who would question an aviator for being too safe. As leaders, we absolutely must ensure our subordinates understand that there is no mission in peacetime or combat important enough to risk an accident. They must also understand that standards will be ruthlessly enforced and that mission accomplishment is not an excuse for violation.

"Objects in the rearview mirror are closer than they appear...."

OK, maybe not the rearview mirror, but there are many accidents caused when crews either drift or fly into obstacles they were sure they were clear of. Blade strikes are among the most common accidents that happen to rotary-wing aviators. One that comes to mind involves a very experienced IP who allowed his aircraft to get too close to an obstacle. As a result, the aircraft was destroyed and crewmembers received minor injuries.

This case is an AH-64 entering an attack-by-fire (ABF) position at night. Flying as Red 2 in the lead team in a flight of six, the IP in the backseat of the aircraft moved to "set" to the right of Red 1. The ABF was in a small valley that ran from right to left with tree lines separating large open fields. As the IP moved to the right of Red 1, he settled near an intersection of two tree lines. He continued to move slightly forward, leaving the T intersection of trees to his 5 o'clock position. All you AH-64 pilots know that the night vision system doesn't go back past approximately the 3 o'clock position. The PI in the front seat was wearing NVGs in accordance with the limited airworthiness release to help keep the aircraft away from obstacles. Unfortunately, both pilots became focused on the lead aircraft, and their aircraft began to drift backwards. The VTR in the aircraft indicated the aircraft was lower than the crew intended. The aft drift ended as the tail rotor struck 75-foot trees. The No. 5 driveshaft sheared and the aircraft began to spin. The pilot lowered the collective and the aircraft crashed to the ground. The crew received only minor injures, but the aircraft was destroyed.

Why did it happen? The IP allowed himself to descend lower than he intended because he was focusing on the lead aircraft while simultaneously trying to talk to the front seater through his procedures. The drift then began and he failed to notice. The board determined the experience level of the front seater was such that the IP was virtually single pilot. This happens more often that we would like to admit and must be addressed when training young aviators. Hard decks, slant range restrictions, and crawl-walk-run philosophies are basic tools to help mange the risks.

Don't depend on luck

A troubling part of being a CRC investigator is that you see the mistakes of others and they remind you of the ones you made in the past. Fortunately, my mistakes didn't lead to any serious accidents. I was just lucky. Unfortunately, I now know that you can't depend on luck to prevent accidents. Good risk management; a sound, well-understood safety philosophy; and, perhaps most importantly, leaders in the right place at the right time are what prevent accidents. I hope what is written here will help readers avoid some of the mistakes others have made without having to depend on luck. ♦

—LTC McInnis retired from the Army in 2004 and currently works at the U.S. Army Aviation Technical Test Center at Cairns AAF, AL. He may be contacted at william.mcinnis@us.army.mil.

NEWS & notes

Individual Soldier Hemostatic Dressing

Effective immediately, the Chitosan dressing, NSN 6510-01-502-6938 for the package of one and NSN 6510-01-503-8726 for the package of five, is the approved individual Soldier hemostatic dressing. Each Army Soldier deployed to the CENTCOM AOR will carry one Chitosan dressing; each combat lifesaver will carry three Chitosan dressings; and each 91W (combat medic level I and II) will carry five Chitosan dressings as part of their aid bags. Priority of issue is to the combat medic, combat lifesaver, and then the individual Soldier, in that order. In FY05, and until theater stockage is sufficient to meet the above-stated requirement, issue three Chitosan dressings to each combat medic Level I and II and three to each combat lifesaver.

The issue of Chitosan dressing for currently deployed Soldiers will be by unit requisition in theater and then, when received, direct issue to their Soldiers. Issue to newly deployed Soldiers will occur during RSOI operations.

Quikclot may still be used but IAW ALARACT 016/2003 Army policy states, "Intended users are medical care providers to include medics, if properly trained."

Funding will be provided by FORSCOM as the executive agent for sustainment in OIF/OEF.

The POC for medical policy issues is COL William Tozier, OTSG/MEDCOM, at DSN 471-6525 (210-221-6525), or e-mail william.tozier@us.army.mil; the POC for logistics is LTC Robert May at DSN 761-1973 (703-681-1973) or e-mail robert.may@us.army.mil. ♦

USAREUR Begins Winter Safety Campaign

The U.S. Army Europe's (USAREUR) winter safety program will run from 1 October 2005 through 30 April 2006. European winters present a wide range of hazards, including carbon monoxide poisoning, driving on black ice, cold-weather health hazards, and treacherous winter driving and flying conditions.

The campaign's purpose is to reduce accidental injuries and deaths to Army Soldiers, civilians, and local national employees, and to also protect Army assets.

For more information, visit the USAREUR Safety Web site at **http://www.per.hqusareur.army.mil/services/safetydivision/usareur_winter_safety_campaign.htm.** ♦

BETTER TO HAVE A DAMAGED EGO THAN A DAMAGED AIRCRAFT

CW3 Julio Morales
3-10th Aviation
Fort Drum, NY

The mission was a simple one. We were to fly a CH-47D from Camp Humphreys, Korea, to an antenna outpost about 1½ hours south of our location, pick up a few Soldiers and two connexes, and then fly them down to their support base. We departed Camp Humphreys on time with a CW2 as the pilot in command (PC), a CW3 who was an OH-58A/C instructor pilot with a lot of experience in that aircraft but brand new to Chinooks, and me, a CW2 at the time with about 250 hours of total flight time.

The PC and CW3 were to fly the first leg of the flight to the support unit's base and make final coordination with our point of contact there. I was to swap with the CW3 and fly the second leg of the flight. We departed the support base and headed up to the antenna site, which was about 3,000 feet up on the side of a mountain. The landing pad would have been big enough for the Chinook if it had not been for the connexes, so we decided to put the aft landing gear on the pad, load the passengers, and then pick up the first connex.

The passenger pickup went smoothly. They had been onsite for a few weeks and had not been able to enjoy any Korean cuisine, so they were happy to see us. After we had the passengers on board, the flight engineer loaded the hook without any problems using the aircraft shepperd's hook. We then descended down to the supported unit's base camp, delivered the first connex, and dropped off the passengers.

At this point, I swapped with the CW3 and took the left seat. We then departed the base and made the climb to the antenna site. I was on the controls, and the PC told me that 3,500 feet would be a good altitude to approach the pad. However, when the pad came into view I was already at 4,000 feet and too high to attempt an approach. I told the PC I was going to make a right descending turn and approach the pad from a lower altitude. As I made the turn, I turned my head to the left and down to make sure I had a good visual of the pad. When I turned my head to the right again, my world went upside down.

When I looked at my instruments, I realized I had placed the aircraft into a high rate of descent of more than 2,000 feet per minute and we were at approximately 150 knots indicated airspeed. I pulled aft on the cyclic and applied thrust to arrest the rate of descent and slow down our airspeed. I *felt* we were too nose-high, so I placed the controls back to their original position, which again put us at a high rate of descent and a higher airspeed than what I wanted.

I tried to get the aircraft back to a level attitude, feeling we were still too nose-high, but my instruments were telling me that we were diving. I knew there was something terribly wrong with me at this time. I remember telling the PC to take the controls and looking to the right side to verify that he took them. As he did, he gave me a strange look and asked if I was alright. I told him I was not feeling well. He said that my eyes looked like they were not "caged." Later he explained that my eyes were going around in my eye sockets but were not focusing on anything.

The PC continued to fly the mission to the pad, and we picked up the connex and dropped it off at the support base. We then headed home. The PC asked if I wanted to fly back home and I took the controls—even though I was not feeling 100 percent ready. Although we were flying visual flight rules (VFR), I kept a very close eye on my instruments on the way home. Afterward, I realized I had experienced spatial disorientation. I was lucky to be able to transfer the controls to the PC. Had I been flying single-pilot, this story might not have made it into *Flightfax*.

We are told throughout flight school to "trust your instruments." After being in this position, however, I can tell you that it's not as easy as it sounds. Making yourself do something when your body's instincts are telling you to do something else can be quite a task. I'm glad I had enough situational awareness to know that I needed help to get this situation under control.

Thinking back on the decision to take the controls and fly home when I was not 100 percent ready was also a mistake. I should've let the PC fly the aircraft back home. Unfortunately, my pride had been hurt and I had to prove myself to the crew. Many times we go that extra 30 seconds simply because we cannot or will not admit we've exceeded our capability or made a mistake or a bad decision. So we make an even greater mistake or worse decision. Thankfully, it worked out; but I was lucky.

Every time I fly now, whether it's VFR or IFR, I pay close attention to my head movements and avoid rapid head movements at all costs. I've learned a very good lesson—it's better to have a damaged ego than a damaged aircraft … or worse. ♦

—CW3 Morales can be contacted at julio.morales1@us.army.mil. He wrote this article as a class assignment while attending Aviation Safety Officer Course 05-002 at Fort Rucker, AL.

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-6

J Model

■ **Class E:** While performing aerial gunnery, the aircraft's CHIPS XMSN caution light illuminated. The aircraft landed to the rearm pads and shut down. Further inspection of the chip detector revealed chips in the transmission. The aircraft was trucked back to the airfield. The transmission was replaced, and the aircraft returned to service.

AH-64

A Model

■ **Class A:** The aircraft descended and impacted terrain during forward flight, striking a berm head-on. Both crewmembers suffered minor injuries, however the aircraft was destroyed.

D Model

■ **Class A**: While conducting close combat attack training, the aircraft impacted the ground. The frontseater suffered fatal injuries and the backseater suffered minor injuries.

■ **Class A**: While returning from a mission, the crew, while not communicating properly, unknowingly applied counteracting control inputs, resulting in loss of aircraft control. The aircraft crashed and the crewmembers sustained minor injuries.

■ **Class C**: The aircraft experienced an overtorque condition (130 percent for 1 second) during simulated engine failure. Maintenance replaced main transmission and tail rotor drive shafts, as well as the nose gearbox.

MH-6

J Model

■ **Class E**: The aircraft was Chalk 2 of a weapons test fire in combat. The pilot observed T/R TXMN CHIPS WARNING light and landed the aircraft. The tail rotor gear box chip detector was cleaned off and the pilot ran up the aircraft and the light did not illuminate. On approach, the crew observed the chip light illuminate again and landed at the airfield. Aircraft was shut down and maintenance was notified. The tail rotor gear box was replaced, and the aircraft was returned to service.

MH-47

E Model

■ **Class B**: During taxi to land, the "butterfly" cowling (to the right-side upper fan of the aft pylon) separated from the aircraft and flew into the aft rotor system, damaging all three rotor blades.

OH-58

A Model

■ **Class E**: During flight in gusty conditions on a hot afternoon, the LOW ROTOR RPM light and audio came on several times. Maintenance was unable to duplicate the fault, and the aircraft was released for flight.

D Model

■ **Class E**: At the completion of an autorotation during a normal ground run, the forward left cross tube broke. The aircraft was shut down without further incident, and maintenance replaced the cross tube.

■ **Class E**: During hovering flight, the pilot noticed the low fuel pressure light and conducted a precautionary landing. Maintenance replaced the fuel pressure switch, and the aircraft was released for flight.

UH-1

V Model

■ **Class B**: The contract instructor pilot perceived a hard landing during readiness training and elected to return the aircraft to the home station for inspection.

■ **Class E**: While preparing for precision approach radar (PAR), the pilot noticed the transmission oil temperature gauge indicated zero degrees. The pilot in command (PC) cancelled instrument flight rules (IFR) and made a straight-in visual landing. The aircraft landed without further incident.

UH-60

A Model

■ **Class C**: The crew experienced a No. 1 engine "hot start," with TGT spiking at 909ºC. An inspection revealed the No. 1 engine plug was still in place.

■ **Class E**: During a HIT check, the fire light and auxiliary power unit (APU) T-handle illumi-

nated while the APU was not operating. There were no other indications of fire. The aircraft was shut down. The sensor flame detector was replaced, and the aircraft returned to service.

■ **Class E**: While in NVG formation as Chalk 2, the stabilator auto unit mode failed. After pressing the AUTO MODE button once, the stabilator failed again. The crew returned to home base without incident and completed a normal shutdown. Maintenance personnel replaced the lower actuator and released the aircraft for flight.

■ **Class E**: During the No. 2 engine HIT check (anti-ice portion), the ANTI-ICE light illuminated and the TGT rose more than 130ºC. This exceeded the maximum 110ºC rise allowed for this check. The engine inlet anti-ice modulating valve was replaced, correcting the problem.

L Model

■ **Class C**: A suspected wire strike during flight resulted in main rotor blade damage.

■ **Class C**: During maintenance runup, the aircraft initiated an uncommanded yaw to the left, striking maintenance stands, and sustained sheet metal damage

■ **Class E**: On a short final to the runway, the aircraft experienced auto mode failure. The stabilator would not manually slew below 30 degrees, and the flight was terminated.

C-12

U Model

■ **Class C**: The aircraft was in cruise flight when it suffered a lightning strike. Post-flight inspection revealed damage to the weather radar radome.

C-26

B Model

■ **Class D**: While on a short final for landing, the aircraft struck a bird. The aircraft landed without further incident. The bird strike made a small dent in the leading edge of right wing.

■ **Class E**: At 11,000 feet mean sea level (MSL), aircrew had both hydraulic lights come on. The crew declared an emergency and landed without further problems.

■ **Class E**: During climb, the hydraulic lights illuminated and the pressure gauge went to zero. The crew performed emergency landing gear extension and landed aircraft.

RC-12

D Model

■ **Class E**: During cruise flight at 4,000 feet MSL, the No. 2 engine oil temperature dropped to zero and the crew returned to base and performed a normal landing. Maintenance replaced a faulty oil temp connector and released the aircraft for flight.

H Model

■ **Class E**: During a No. 2 engine start on battery power, the No. 1 engine N1 dropped to approximately 40 percent, resulting in the TGT rising to 740ºC. The aircraft was immediately shut down. Maintenance was notified and replaced a faulty starter generator on the No. 1 engine. The aircraft was released for flight.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

STUPID IS AS STUPID DOES

Got enough power?

20 knot tail wind + 20 knot ground speed = HOVER
Downwind approaches/takeoffs can require OGE hover power

Flightfax

ARMY AVIATION RISK MANAGEMENT INFORMATION

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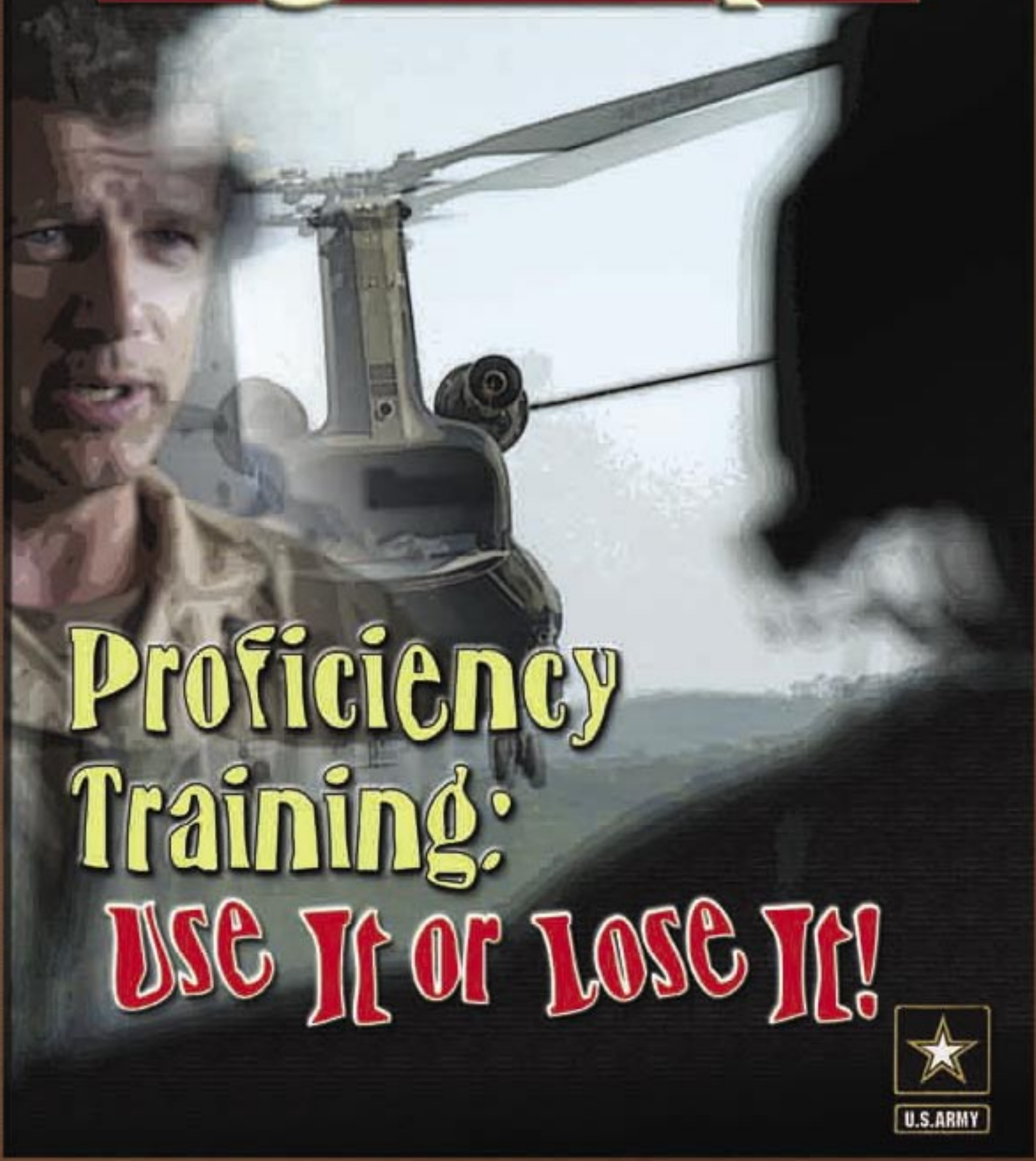

Proficiency Training: Use It or Lose It!

U.S.ARMY

Flightfax

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

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

Proficiency
Use It or Los

In the past 6 months, we have investigated two accidents related to proficiency. In both incidents, the aviators were trained to fly the aircraft but were not proficient in certain operations of the aircraft.

It's similar to riding a bicycle for the first time since childhood. After we first learned to ride a bicycle, we rode every day and became very good at it. At 16, we started driving a car and forgot the bicycle. Later on—much later in some cases—we decide to try to ride a bicycle again for a little exercise. So we head off down the road and bust our butt because we are no longer proficient in bike riding.

The same holds true with flying. We can fly every day for years and do just fine. That is until something happens that we are not proficient to handle, and an accident occurs. The next two examples will demonstrate this point.

An AH-64D crashed because the pilots were not knowledgeable about the operation of the backup control system (BUCS). The BUCS is an

Training: se It!

integrated electrical fly-by-wire emergency flight control system on all AH-64 aircraft. The system was designed to be used only as an emergency backup to the hydromechanical flight controls and is an integral part of the aircraft to make it more survivable in combat. The problem today is some aviators are not familiar with the use or function of the BUCS.

The accident in question happened when the crew began to fight for the controls and decoupled the cyclic and collective hydromechanical flight controls due to a lack of crew coordination and confusion in knowing who had the controls. Once a flight control is decoupled, the BUCS automatically gives fly-by-wire flight control to the backseat pilot. The only way the front-seat pilot can take back control is to engage the BUCS trigger located on the front-seat collective. The pilot in command in the backseat of this aircraft did not know he would be relinquishing the controls to the front-seat pilot when he instructed him to engage the BUCS trigger. Also, the front-seat pilot did not know he had control of the aircraft when he pulled the BUCS trigger, subsequently the aircraft crashed.

The aircrew members received training on the BUCS when they attended the aircraft qualification course but didn't understand that once a control axis is decoupled, the aircraft goes into BUCS automatically for that axis. This equates to a training problem—or the crew just hadn't been staying in the books.

Study materials and the aircraft operator's

manual are available in every AH-64 unit for pilots to stay proficient on the BUCS. If a unit does not have training materials, they can contact us here at the Combat Readiness Center and we will get those materials to them. Pilots who don't study and stay knowledgeable in their airframe are just asking for trouble.

In another incident, an instructor pilot (IP) flying a TH-67 during a training mission misdiagnosed an in-flight emergency. The student pilot had the aircraft so out of trim that the IP took the controls and said they had lost the tail rotor. The IP put the aircraft into an autorotation from approximately 2,300 feet and attempted to perform a 180-degree turn and land in a field. However, he misjudged his rate of closure and the aircraft hit the ground hard—tail skid first. The aircraft bounced forward and crashed.

The IP had not performed practice autorotations to the ground since 1994. In certain phases initial training IPs are not afforded the opportunity to practice autorotations, leading to a lack of proficiency in execution. The fact that someone is an IP or has thousands of flight hours doesn't negate the fact that training and task iteration is required to stay proficient in aircraft type and design. ■

—Comments may be directed to the U.S. Army Combat Readiness Center Help Desk, DSN 558-1390 (334-255-1390).

Plan, Train, Execute...Survive

CW4 John Hager, CW4 Bert Shober, CW4 Ken Sleeger,
CW3 Ken Grider, CW3 David Keehan, CW3 Frank
Mancuso (team leader), and CW3 Scott Vega
WOSC 05-06

November 2001, the war had started several weeks earlier and we were returning to the forward staging base (FSB) after completing another successful mission. The weather was getting worse and visibility was less than a mile. Our flight of six aircraft tightened formation one to one and a half disk so we wouldn't lose sight of each other. The conversation within the flight had stopped and talk within the aircraft was minimal. Chalk 6 was barely able to see lead, but we had to continue.

The flight had enough fuel to make it to the FSB, but there was no time for delays. It was not like we were able to land at the closest civilian airport, recheck weather, refuel, and file an instrument flight plan. Landing the flight in a semi-permissive, dusty mountainous environment with zero illumination would be more dangerous than if we continued. We were at war, and the FSB was the only place to land—no other options.

We had already flown 8 hours and had 2 more to go. We were informed that the weather would clear about 100 miles north of the FSB, and that became our focus … almost there … concentrate … slow movements … make sure you don't screw the guys behind you and we'll all make it back.

As visibility increased and the stars began to shine, we could almost feel the sense of relief from the other aircraft. The formation spread three to five disks and conversation inside the aircraft again improved. The FSB was now in sight and we landed without incident. Our debrief went well—mission success. But how could we fly as a flight of six in low visibility conditions without the high workload required to continue the mission under poor weather conditions?

The problem is that typical Army Aviation inadvertent instrument meteorological conditions (IIMC) training does not take into consideration the realities and limitations of combat theater operations. Aviators do not adequately prepare themselves for a sudden lack of visibility in an environment that affords little or no radar coverage, operational NAVAIDs, or an established instrument flight rules (IFR) structure.

Certain theaters require aviators to avoid flight at high altitudes due to enemy threat. These considerations result in a certain amount of anxiety or fear when encountering instrument meteorological conditions (IMC). The lack of training, little or no confidence, and the fear of flying high in a combat zone have caused aviators to descend and look for the ground after entering IMC inadvertently instead of executing the IIMC emergency procedure.

The results were disastrous in May 2004 when a flight of two Chinooks, flying in Iraq, encountered IIMC in a sandstorm. One of the aircraft properly performed IIMC procedures while the other descended and contacted the ground. Just recently, a similar event happened in Afghanistan when another Chinook lost contact with the ground in severely reduced visibility, descended into the ground, and crashed. Aviators

are inadvertently encountering IMC instead of planning to separate the flight before marginal weather.

Most aviators know IIMC plans are briefed during helicopter air mission briefings (AMBs), but are seldom discussed in detail to prevent an emergency IIMC breakup. So, why are we waiting until the weather is so bad that the formation is forced to break up after inadvertently encountering IMC? Shouldn't we try to prevent the emergency before it happens by planning formation breakups prior to the emergency? In Operations Enduring Freedom and Iraqi Freedom, radar threat is no longer a factor, and climbing to a safe tactical altitude that allows for obstacle clearance should be the priority when encountering marginal weather. The infrared (IR) threat should not be a concern if you are in the clouds because most IR threats have to acquire the helicopter visually. So if you are in IMC, the enemy cannot see you and there is no threat. If you decide to scud run instead of climb to altitude, you may lose visual contact with the ground and crash, helping the enemy by taking assets out of the war.

All Army helicopters are now equipped with global positioning system (GPS) receivers and have the ability to execute GPS approaches to places never considered. The GPS gives aviators the ability to fly tactical IMC (TAC IMC) in environments that have no NAVAIDs or IFR structure. Formation breakups and tactical instrument operations must be deliberate and well-planned to ensure mission success and reduce risk. Below are some recommended techniques for TAC IMC and formation breakups in a combat environment, which can be tailored for any area of operation. These recommendations should spark ideas and help units develop formation breakup tactics, techniques, and procedures to allow crewmembers to continue using tactical instruments. It is up to the unit instructor pilots to develop plans that are suitable for their type airframe and environment.

The lack of training, little or no confidence, and the fear of flying high in a combat zone have caused aviators to descend and look for the ground after entering instrument metrological conditions inadvertently instead of executing the IIMC emergency procedure.

■ During the planning phase, a decision has to be made whether the flight will return to base or execute a formation breakup and continue with the mission if marginal weather is encountered. This decision is mission-dependant and must be made before departure.

■ Since lead is usually the most experienced, it is important for them not to take the entire flight beyond the least experienced crew's comfort level.

■ Lead is counting on the aircraft behind to tell him when the weather is becoming uncomfortable. The trail aircraft are the first ones to lose sight of the aircraft in front.

■ TAC instrument operations can only be flown if the aircraft GPS is operational.

■ Recovery airfield and/or refuel location must have favorable weather conditions and/or an instrument approach procedure (GPS or electronic navigation) that supports arrival.

■ Plan aircraft gross weights for worst-case TAC altitudes when weather is expected to be marginal.

■ Since there is no IFR structure, each planned route, or route segment, must have a briefed minimum en route altitude (MEA) that will allow for obstacle and terrain clearance. The TAC IMC altitudes in mountainous environments should be no less than 500 feet above the highest obstacle/terrain and no less than 1 nautical mile (NM) left and right of

course (greater than 1 NM in mountainous terrain may increase TAC altitude to an unattainable altitude).

■ If the weather is good at the departure point, marginal en route, and good at your destination, you could:

- Separate the flight into teams of two, three, or four aircraft. Any more makes formation breakups difficult when encountering bad weather.
- Depart as a flight and, when weather begins to get worse, separate the flight by time; e.g., Chalks 2, 3, and 4 aerial hold while gaining appropriate 5-, 10-, and 15-minute separation from lead. It is important to remember lead sets the hard time at the arrival location and all other aircraft need to maintain the planned speed and course with the required time separation.
- Depart the starting point with a timed separation and maintain that separation until reaching your destination; e.g., lead sets hard time for arrival at destination and/or rejoin point, Chalk 2 departs 5 minutes after lead and lands 5 minutes after lead; Chalk 3 departs 10 minutes after lead and lands 10 minutes after lead. All aircraft fly the planned speeds and remain on time and on course—no exceptions.

■ Four aircraft is the maximum number that can reasonably be expected to accomplish a TAC IMC mission along a single route and rejoin. Timing and lateral separation by geographic locations are currently the only means of deconflicting aircraft since TAC altitudes that provide clearance might be too high for aircraft to separate by altitude in a mountainous environment.

■ Time spacing is recommended to be no less than 5 minutes between aircraft. Keep in mind radio communication is key to success and larger flights may cause lead to lose contact with trail, so the flight must relay information to each other.

■ The flight must remain on the planned course line.

■ The flight must fly the same planned en route groundspeed (airspeeds may result in different groundspeeds at different locations along the route). If planned speeds cannot be maintained or have to be adjusted, ensure the entire flight acknowledges the speed change before executing.

■ If the weather becomes good, the flight can be rejoined prior to the destination.

- Planned ground linkup (priority during marginal weather).
- En route rejoin (lead slows at a planned air control point (ACP) until all aircraft join the formation).
- Aerial rejoin (lead holds at a planned ACP until all aircraft join the formation).

■ If weather becomes so bad that continuing becomes unsafe, rejoin a planned alternate return route. This will allow the separated aircraft to deviate from the ingress route and join the egress route without interfering with inbound aircraft. It is important that lead passes the new arrival time to the alternate location as soon as possible so the flight can maintain its timed separation. Avoid reversing the ingress route if possible. If route reversal is the only option, ensure trail reverses first (confirm with radio communication), then in reverse chalk order. Since there is no way for pilots to know the exact location of each aircraft, unplanned en route changes while in IMC is not recommended.

The most important item to remember is that we should train as we fight. All formation breakup techniques must be rehearsed. The first time you attempt a formation breakup should not be when the weather is marginal. Hopefully this article will inspire thoughts and ideas that will help pilots overcome the challenges required to fly in a low visibility, tactical environment. We all know that you cannot plan for every contingency. But why not plan for the ones that you know will eventually become a factor? ♦

—This article was written as a class project while attending Warrant Office Staff Course 05-06 at Fort Rucker, AL.

STACOM Message 06-01

New Aircrew Training Manuals Update

The updated Aircrew Training Manuals (ATMs) have been approved by the Department of the Army (DA), printed, and should be arriving at your location soon. They include:

- Training Circular (TC) 1-248, *OH-58D Kiowa Warrior*, dated 12 September 2005.
- TC 1-240, *Cargo Helicopter CH-47D*, dated 12 September 2005.
- TC 1-218, *Utility Airplane C-12*, dated 13 September 2005.
- TC 1-251, *Attack Helicopter AH-64D*, dated 14 September 2005.
- TC 1-237, *Utility Helicopter UH-60*, dated 27 September 2005.
- TC 1-238, *Attack Helicopter AH-64A*, dated 28 September 2005.

All of the publications are DA-authenticated and available through the Army publication and distribution system. They can also be found on the Army Knowledge Online Web site (**www.us.army.mil**) and the General Dennis J. Reimer Training and Doctrine Digital Library Web site **(http://www.train.army.mil**).

Two additional ATMs are currently in the editing/approval process and should be printed by December 2005. Those include:

- TC 1-228, *OH-58A/C.*
- TC 1-211, *Utility Helicopter UH-1.*

The ATM implementation instructions and any updated procedures can be found on the Fort Rucker Directorate of Evaluation and Standardization (DES) home page (**http://www.rucker.army.mil/cdir/atzq-es.html**) in the appropriate aircraft branch/section. The new Army Regulation (AR) 95-1 will resolve conflicts between the new ATMs and the current AR 95-1 simulator requirements by removing simulator minimums. Each individual ATM has established simulator requirements for its aircraft. Waivers to AR 95-1 requirements or questions concerning AR 95-1 should be directed to CW5 Howard Swan, Aviation Standardization Officer, HQDA, DAMO-AV, DSN 222-8349 (703-692-8349), e-mail howard.swan@sodcsops.daops.army.pentagon.smil.mil or howard.swan@hqda.army.mil.

There are also several conflicts between the new ATMs and the current *Commander's Guide*, TC 1-210. The Directorate of Training and Doctrine is developing changes to TC 1-210 to get answers to the field as soon as possible. The new aircraft ATMs will take precedence over the existing *Commander's Guide* dated 8 January 1996 until the new *Commander's Guide* is published. Questions or issues concerning TC 1-210 should be directed to CW5 Leonard Eichhorn at DSN 558-1820 (334-255-1820) or e-mail leonard.eichhorn@rucker.army.mil.

DES is the proponent for the new updated ATMs. Questions or issues concerning the ATMs should be directed to the following POCs:

- **Scout:** CW5 Fred Peacock, DSN 558-1579 (334-255-1579), e-mail fred.peacock@rucker.army.mil.
- **Attack:** CW5 Craig Winters, DSN 558-2532 (334-255-2532), e-mail craig.winters@rucker.army.mil.
- **Utility:** CW5 Albert Taitano, DSN 558-2456 (334-255-2456), e-mail albert.taitano@rucker.army.mil.
- **Cargo:** CW4 Matthew Carmichael, DSN 558-3354 (334-255-3354), e-mail matthew.carmichael@rucker.army.mil.
- **Fixed Wing**: CW5 Joseph Walsingham, DSN 558-2453 (334-255-2453), e-mail joseph.walsingham@rucker.army.mil.

Standardization communications (STACOMs) are prepared by the Directorate of Evaluation and Standardization (DES), U.S. Army Aviation Warfighting Center, Fort Rucker, AL 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 support.

SCOTT B. THOMPSON
COL, AV
Director of Evaluation and Standardization

NCO Corner

Don't Look the Other Way

MSG John "Buddy" Keen
U.S. Army Combat Readiness Center

In today's fast-paced world, we've come to accept a lifestyle of "getting there fast." But at what cost? In the name of speed, whether it's behind the wheel or getting a job done, we sacrifice safety. You can measure the price of that sacrifice in Soldiers permanently removed from our ranks.

The statistics aren't just numbers—each one represents a Soldier's life. Many of our young Soldiers are dying in automobile and motorcycle accidents because they lack good judgment, drive at high speed, and drive or ride under the influence of alcohol or while fatigued. Sadly, they die before surviving enough close calls to learn from them. In all too many cases, they believed they could drink and drive without any consequences.

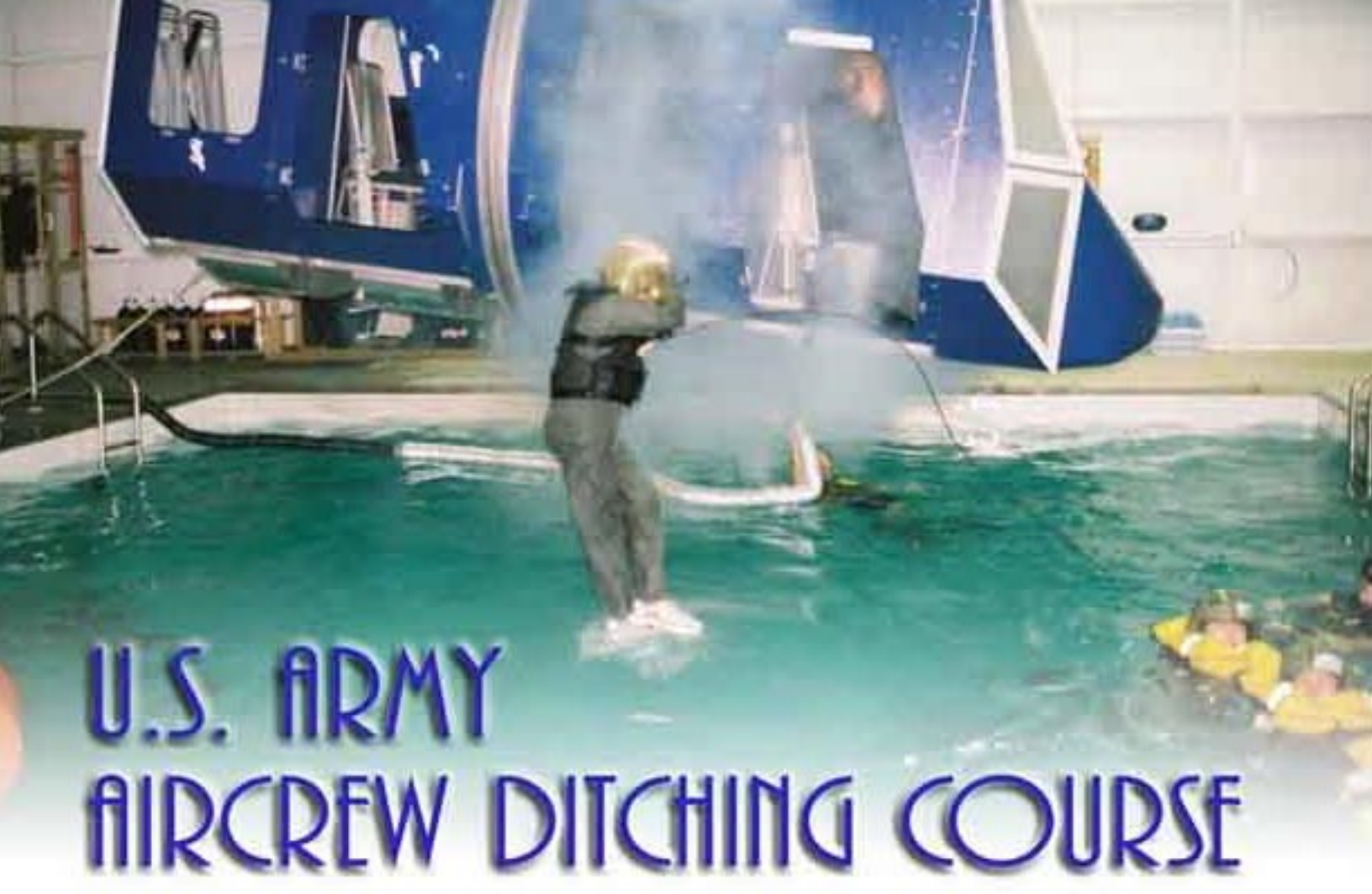
I worked as a state trooper before coming to the Combat Readiness Center to work as an accident investigator. I performed hundreds of motor vehicle accident investigations involving people who caused accidents or were victims of someone else's carelessness. Some of the worst experiences in my career were the many times I had to inform a family of a loved one's death. Their responses included guilt, anger, denial, and feeling responsible for the incident. The response I didn't expect was, "We were wondering when this would happen." Yet that's what I heard from some people. They knew the victim well enough to know something terrible might happen but never did anything about it. They just looked the other way.

That's something to think about. How many times do we see someone acting in a careless or reckless manner and say nothing? It's our responsibility as friends, Soldiers, and leaders to point out and correct these errors. As leaders, we must discipline wrong behavior and hold individuals accountable for their actions. However, we also have a duty to use our past experiences to help guide and train our Soldiers so we don't lose them prematurely. When we do nothing—when we look the other way and then make excuses when a Soldier is hurt or killed—we're just WRONG!

When we were younger we learned we weren't always the best judge of our abilities. We also learned that Murphy's Law—what can go wrong will—still applied. Today's young Soldiers are no different than we were. They also often overestimate their abilities and turn a blind eye toward danger.

As leaders, we've lived and learned. Now it's our turn to teach our Soldiers to learn and live. They're watching us because we set their goals and our expectations of them. When it comes to safety, if we don't care enough to correct them when they're wrong, they'll think it doesn't matter—that we've chosen to look the other way. But if the phone rings in the middle of the night and the unsafe Soldier we ignored is now in the morgue, we'll personally know the cost of a safety statistic. We won't be able to look the other way then. ♦

—MSG Keen is a POV Accident Investigator at the Combat Readiness Center. He may be contacted at DSN 558-9398 (334-255-9398), or e-mail John.Keen@crc.army.mil.



U.S. ARMY AIRCREW DITCHING COURSE

CPT Gifford Jones, U.S. Army and
Chad J. Copeland, Survival Systems USA

One of the Army's most progressive training schools is receiving positive reviews for the guidance it is providing aircrews that might find themselves in an overwater ditching situation. The Aircrew Ditching Course (ADC), one of the Army's finest acknowledgements of the emerging joint operations involving overwater flight, has been training students at its Fort Rucker, AL, location for nearly 2 years.

The course includes 16 hours of intense training on how to prepare for an overwater ditching, appropriate egress procedures, and surface survival techniques while awaiting rescue. The course also incorporates the Aqua Lung Survival Egress Air (SEA) MK2 Emergency Breathing System (EBS), which allows the aircrew to breathe underwater and execute necessary steps to survive an aircraft ditching.

The course is punctuated by one of the most advanced underwater escape trainers in the world. The Modular Escape Training System (METS™), designed by Survival Systems USA Inc., accurately replicates the AH-64, UH-60, CH-47, and OH-58 helicopters. These trainers allow aircrews to enter their familiar aircraft environment, ditch and invert in a 90,000-gallon training tank, and escape from the trainer while closely supervised by the Survival Systems staff.

The 2-day training course contains 8 hours of academic instruction and 8 hours of practical application. On the first day, the students are given a tour of the facility, followed by 4 hours of academic instruction. The academics are predicated on 22 years of experience, research, and development on how to survive

an overwater ditching. Everything from the history of aircraft ditching to the appropriate brace position to minimize bodily injury, steps to safely egress the aircraft, and how to safely employ the EBS are thoroughly covered by the Survival Systems staff. The EBS instruction is a course on the dangers of breathing compressed air, compressed air physics, and how the SEA MK2 works and is properly maintained.

The afternoon session builds on the lessons taught in the class through practical application. The students are introduced to the Shallow Water Egress Trainer (SWET), where they practice egress procedures while turned upside down in a shallow and controlled training environment. The first lessons are on breath control to allow the students to concentrate on egress procedures and build confidence in their abilities.

Once the student is comfortable with egress procedures, they are placed in the METS™ in their appropriate crew station next to their appropriate aircraft exit (UH-60, OH-58, etc). All of the exits on the METS™ are custom built to accurately represent an actual aircraft exit. The entire METS™ is built as close to aircraft specifications as possible to ensure the aircrew gets an accurate feel for their own helicopter during egress. The flight controls, stroking seats, and armor plating all simulate actual movements in a crash sequence. The students will go through multiple evolutions that gradually increase in difficulty—starting with doors off and concluding with traveling to a secondary exit, jettisoning the exit while upside down, and egressing safely.

After successful breath hold exercises, the EBS is introduced to the aircrew and applied to the egress skills they have already learned. The aircrews learn how to clear and breathe upside down with the SEA MK2, practicing in the SWET, then return to the METS™ to use the EBS during egress sequences and further increase their confidence in egressing underwater.

The second day of instruction starts with a review of the previous day's instruction followed by four hours of academics on advanced surface survival, life raft use, and cabin evacuation. The student continues to deal with complex underwater egress scenarios until they master the skills of egressing a submerged aircraft upside down, in the dark, with an EBS using a secondary exit.

The class then continues the practical exercises with group drills. The class is loaded into the METS™ and taught how to organize a surface evacuation; this exercise is complicated by the addition of smoke generators to restrict visibility. During the drill, the students evacuate the aircraft, activate carbon dioxide (CO_2) cartridges in their life preservers, and organize the group to inflate and enter a life raft. The aircrew is also shown group formations to lock into if a life raft is not available. During these group formations, the aircrew is shown how to care for an injured person, move as a group, and stay together in rough seas. By the end of the second day, the class is physically exhausted and extremely proud of the survival education they now possess.

The Fort Rucker facility is the first fully equipped, Survival Systems USA-staffed, overwater training device for the U.S. Army, and the student feedback has been positive to say the least. This program supports the new draft Army Regulation (AR) 95-3, which is expected to be approved soon, and gives the Army a standard of excellence that is not matched by any other service. This course is the Army's first Aircrew Ditching Course to be fully integrated into the Army Systematic Approach to Training to ensure future overwater training sites follow the same high standard of training. This training center represents the dedication of the U.S. Army's leaders to its aircrews and recognizes the value of every warfighter.

For more information on the Army Aircrew Ditching Course, contact the authors at 888-386-5371 or 860-405-0002, or visit their Web site at **www.survivalsystemsinc.com**. ♦

Dodging "Feathered Bullets"

CW3 Russ Maguire
Rhode Island Army National Guard

A recent flight convinced me that hazards don't always take the more obvious shape of trees, towers, wires, or other aircraft. On this particular night, while cruising along at 700 feet above ground level (AGL), I was navigating the final leg of my night vision goggle checkride. With the UH-1 instructor pilot (IP) on the controls to my right, we were at level flight following a climbout from terrain flight altitude when a startling WHACK—like the sound of a slamming door—straightened us both up in our seats.

FACTOID:

More than 195 aviation fatalities have been recorded worldwide due to bird strikes.

The crew chief wasted no time accounting for the cargo area behind our station, noting everything was secure. The IP reduced the airspeed and quickly confirmed the source of our concern. Apparently, as I was crosschecking navigation points on the map, a bird suddenly crossed our flight path and struck the aircraft just below the windscreen. We headed toward a known landing zone to check out the damage. Once we landed, both the IP and the crew chief jumped out to inspect the aircraft, especially the battery compartment and lower windscreen. In this case, the aircraft suffered no telltale signs of a collision. The IP determined the midair was unavoidable.

In 10-plus years of flying Army helicopters, I've had some memorable near-misses with a wide sampling of bird species. But an actual strike? This was a first. Yet history has shown that Army and Air Force crews—along with our civilian counterparts—routinely face common hazards in the skies we share with birds. When trying to dodge these "feathered bullets," the end result is the same.

Bird strike hazards and high costs

To underscore just how catastrophic these midairs can be, more than 195 aviation fatalities have been recorded worldwide due to bird strikes. This information is readily available and shared by *Bird Strike Committee USA* (**www.birdstrike.org**), a steering group represented by agencies that include the Federal Aviation Administration (FAA), Department of Agriculture (USDA), and Department of Defense. In the U.S. military, two prominent bird strike disasters serve to punctuate this historical data:

■ **September 1995, Elmendorf Air Force Base, AK**. The aircrew of a U.S. Air Force (USAF) E-3 AWACS never gained controlled flight following multiple bird strikes on takeoff. All 24 aircrew/passengers were killed.

■ **September 1987, Colorado**. The aircrew of a USAF B-1B, on a low-level run, lost control following a large bird strike, resulting in the death of three occupants.

The avian/aircraft strike hazard remains equally significant today. To corroborate this trend, one would have to look no further than the data already compiled by the U.S. Army Combat Readiness Center. In a 10-year accident data search (1995-2004), a yearly average of 25 bird strikes were reported, totaling 249 accidents. There were no fatalities or injuries attributed

to the strikes, but the data shows the Army's materiel losses exceeded $1.2 million during this period. In the same timeframe, the USAF reported an average of 3,567 bird strikes per year with materiel losses totaling $330 million. On the civilian side, the FAA recorded some 56,000 bird strikes from 1990 to 2004 for an average of 3,700-plus strikes per year. In total, the National Transportation Safety Board believes reported bird strikes cause more than $300 million in damage to U.S. civilian and military aviation each year.

Lost numbers?

If Army Aviation's 10-year bird strike data (249 *reported* collisions) seems slightly unspectacular it may be because, like the data collected by civil aviation researchers, only about 20 percent of all bird strikes are believed to be reported annually. In short, industry experts who study bird strike hazards consider them to be severely underrepresented in accident databases, belying a much more pervasive problem.

Along with this shortage of reliable data, in an August 2004 *Air Safety Week* report, wildlife experts at the FAA and USDA cautioned the industry about two significant trends: increasing air traffic, at least near-term, coupled with the continued resurgence of many bird species due to stricter hunting regulations. As avian populations continue to rise alongside aircraft operations, researchers are now seeking a more complete accounting of bird strikes to fully capture, quantify, and characterize the problem.

Why report a bird strike?

When I experienced my first bird strike, I wasn't aware that the incident should be reported to my unit safety office because, like many bird strikes, there was no damage to the aircraft. In fact, all Army accidents and incidents, regardless of how minor, are reportable (Army Regulation 385-40). Given the information about a particular bird strike and the subsequent actions of the flight crew, unit safety officers can classify the accident or incident and report the information accordingly.

Lead researchers from the FAA and USDA call the cataloguing of aircraft/bird strikes data-driven safety. Here are three examples why. The ability to identify the bird species responsible for a particular bird strike, or a series of near-misses, allows Army airfield managers to prioritize hazard mitigation practices. Bird-strike data also tells field experts about wildlife trends (e.g., migratory flight paths) affecting aviation, the size and/or types of birds that cause accidents, incidents, and near-misses, as well as areas where strikes are most likely to imperil aircrews. Finally, industry experts can assimilate bird-strike data into aircraft designs and airworthiness studies, which seek to enhance airframe and engine component safety.

Anyone, from an aircrew member to airport/airfield staff, can report a bird strike. While dodging "feathered bullets" is sometimes a necessary maneuver, dodging the requirement to report a strike is not. Sitting down with your unit safety officer to fill out the paperwork may seem like extra work with no meaningful end. But in the bigger picture, an enlightened industry—and more immediately, informed fellow crewmembers—will benefit from this safety reporting. ♦

FACTOID:

In a 10-year accident data search (1995-2004), a yearly average of 25 bird strikes were reported, totaling 249 accidents. No fatalities or injuries were attributed to the strikes.

Editor's note: For more information on bird strikes and bird control around airfields, visit the Air Force's Bird/Wildlife Aircraft Strike Hazard (BASH) Program Web Site: **http://afsafety.af.mil/AFSC/Bash/home.html**. *BASH is one of the oldest organizations committed to reducing wildlife-related hazards to aircraft.*

—CW3 Russ Maguire is an Army National Guard aviator with the 249th Medical Company (Air Ambulance), Quonset Point, Rhode Island. He may be contacted at francis.maguire@us.army.mil. CW3 Maguire wrote this article as a class project while attending Aviation Safety Officer Course 05-003 at Fort Rucker, AL.

ARAP: Helping Leaders Save Lives

Charles Schieffer
U.S. Army Combat Readiness Center

The U.S. Army Combat Readiness Center (USACRC) recently developed the Army Readiness Assessment Program (ARAP) to communicate the Army's strong conviction that Composite Risk Management (CRM) is the only way to defend against the significant losses currently being experienced in the force. Regardless of why or how a Soldier is lost, the result is the same—one less Soldier available for the fight. As accidents in our formations continue to degrade combat power, the CRC is committed to finding innovative ways to reduce accidents, decrease fatalities, and keep our Soldiers fit to continue the Global War on Terror. ARAP is a Web-based initiative that provides battalion-level commanders with data on their formation's readiness posture through five segments:

■ Processes Auditing—assesses the processes used to identify hazards and correct problems.

■ Reward Systems—assesses the unit's program of rewards and discipline to reinforce proper behavior and correct risky actions.

■ Quality Control—places emphasis on high standards of performance.

■ Risk Management—assesses the health of unit processes.

■ Command and Control—assesses leadership, communication, and policies as they relate to CRM.

Designed for use by battalion-sized units, the program asks several questions of battalion commanders. Wouldn't you like to know if your unit is about to experience a mishap? Wouldn't you like to prevent the loss of personnel and equipment? Don't you want to protect your combat power?

One of ARAP's goals is to identify and correct organizational conditions that could increase the potential for mishaps. Following survey administration (the assessment phase), the commander receives one-on-one feedback on key issues regarding command climate, safety culture, resource availability, workload, estimated success of certain safety intervention programs, and other factors relating to their unit's overall readiness.

Here's how it works. The battalion commander completes a personal telephone registration process with a member of the CRC ARAP team. From there the commander and unit personnel complete the online portion of the survey, which consists of 61 scaled questions that can be answered in about 12 minutes. Once two-thirds of the battalion has taken the survey, the battalion commander calls the CRC to receive an in-depth debrief of the results. This brief includes a discussion of the unit's strengths and weaknesses and also provides suggestions for possible courses of action and solutions used by previous battalion commanders.

So, what's in it for me?

■ **All assessments are confidential**. Only unit commanders or their designated representatives and the CRC have access to results. A confidential debrief is conducted on a one-on-one basis between the commander and the CRC.

■ **Assessments are predictive**. Studies conducted by the U.S. Navy over the past 6 years show that units in the survey's lower spectrum have twice the number of fatalities and more than twice the number of Class A accidents.

■ **All assessments and users are anonymous**.

■ **These assessments are a "free look" inside a unit**. They allow commanders to take an honest look at their safety culture and evaluate CRM processes.

■ **The program is Web-based, quick, and easy**: **https://unitready.army.mil**.

For more information on ARAP or to schedule an assessment for your battalion, contact Charles Schieffer, ARAP Program Manager, at DSN 558-9362 (334-255-9362), or by e-mail at **charles.schieffer@us.army.mil** or **arap@crc.army.mil**.

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class B**: The aircraft experienced separation of the tail rotor from the gearbox during flight. The crew was able to execute an emergency precautionary landing. The aircraft experienced a hard landing causing damage to the landing gear, gun, and belly.

■ **Class B**: The aircraft engine was inadvertently started during a maintenance procedure. The tailboom rotated right and struck the connected aviation ground-power unit (AGPU).

■ **Class C**: Postflight inspection revealed an apparent tail rotor blade strike.

■ **Class C**: The aircraft experienced an engine overtorque during a single-engine VMC approach with the backup control system engaged.

OH-58

C Model

■ **Class C**: The aircraft contacted the ground hard during an autorotative landing. Damage to the tailboom and transmission deck was found.

D(R) Model

■ **Class B**: During takeoff from refuel, the crew experienced brownout conditions. The nose of the aircraft contacted the ground causing damage to the nose of the aircraft, WSPS, and undercarriage.

UH-1

V Model

■ **Class E**: During cruise flight, a bird struck the main rotor blade just above and in front of the cockpit. At the time of bird strike, the aircraft was over a swamp. The aircraft was flown to the nearest suitable landing area and the crew performed a precautionary landing. The main rotor system was inspected by the maintenance officer. No damage was discovered. The aircraft returned to service and was flown back to Fort Polk, LA.

UH-60

A Model

■ **Class A**: The aircraft landed hard in brownout conditions and rolled onto its side causing extensive damage to the main rotor system and transmission. All personnel exited without assistance.

■ **Class B**: The aircraft was ground taxiing for MEDEVAC takeoff when its main rotor system struck the tail rotor of a parked aircraft.

■ **Class C**: The APU door separated in flight, contacting the main and tail rotor systems.

■ **Class C**: During landing at a landing zone for MEDEVAC pickup, the aircraft's belly and tailboom struck the ground causing the tail wheel strut to separate from the aircraft.

L Model

■ **Class A**: The aircraft impacted the ground during a demonstrated autorotation, causing significant damage.

■ **Class B**: The aircraft's main rotor blade contacted the ALQ-144 during landing to uneven terrain.

RC-12

D Model

■ **Class C**: Postflight inspection revealed No. 1 engine propeller damage (suspected foreign object damage).

RQ-5A

■ **Class B**: The aircraft arresting hook missed initial arresting cable. The AVO trainee attempted go-around, and the aircraft's main landing gear struck the secondary ground arresting gear (drum). The main landing gear was ripped from the aircraft.

■ **Class C**: The operator experienced failure of the electrical power distribution system (engine shutoff) subsequent failure of the tail hook to completely lower. The aircraft entered a ditch.

RQ-7A

■ **Class B**: The aircraft entered an uncommanded flight mode, impacting the ground. Total loss is presumed.

■ **Class C**: The aircraft experienced an overtemp condition and RPM spike following climbout.

RQ-7B

■ **Class C**: The AVO experienced an "engine fail" indication during operation. The aircraft was maneuvered to a suitable landing area and the landing chute was deployed.

■ **Class C**: The AVO experienced a high engine temperature reading and initiated a return. Engine temperature continued to rise and RPM decreased steadily, reaching less than required for landing. The aircraft impacted the ground.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

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ARMY AVIATION RISK-MANAGEMENT INFORMATION

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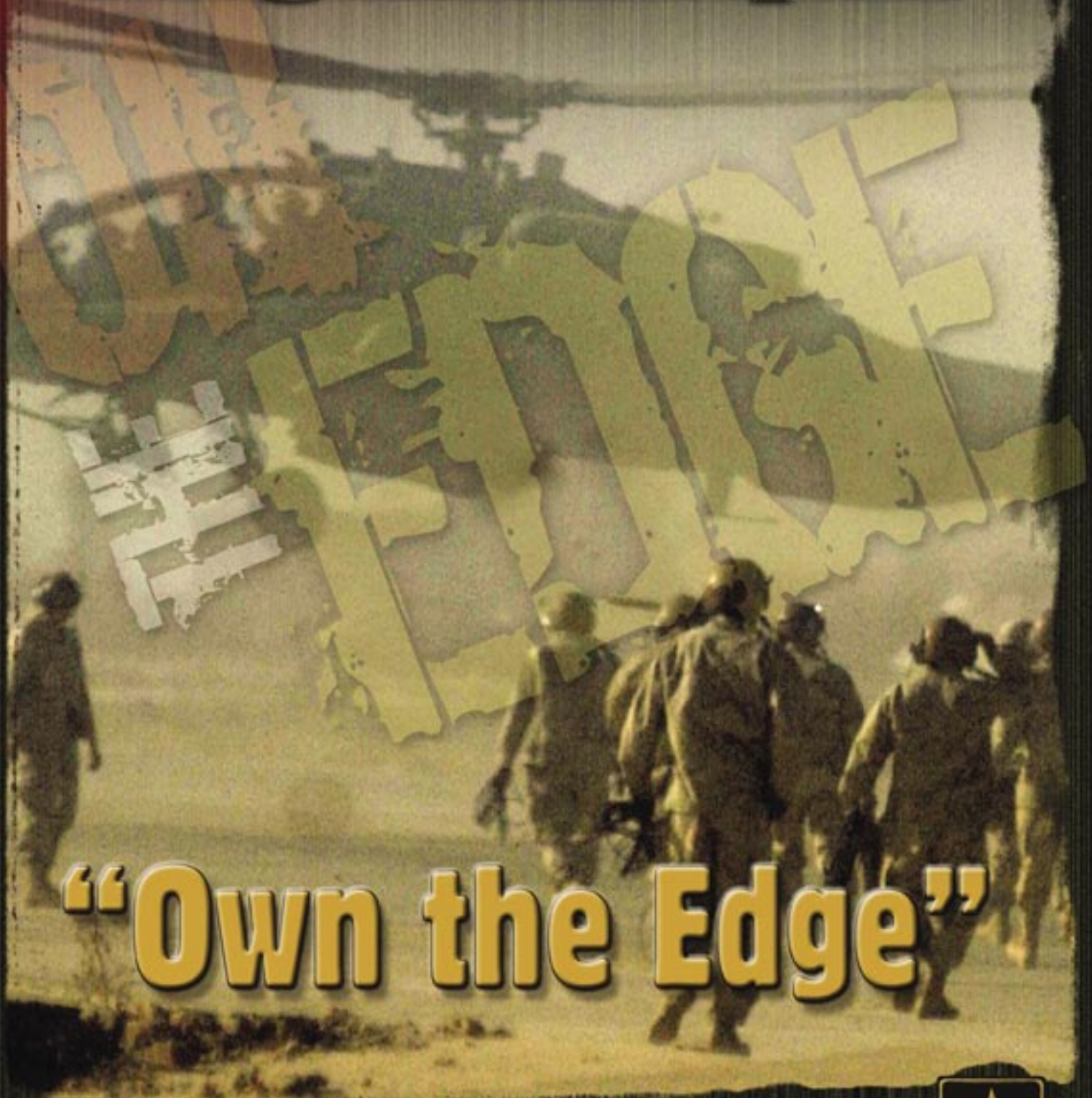

"Own the Edge"

PLUS: 2005 Aviation Safety Performance Review

U.S.ARMY

Flightfax

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner
FROM THE DIRECTOR OF ARMY SAFETY

"Own the E

Our Army continues to fight the Global War on Terrorism, with our Soldiers fighting two active campaigns against a determined enemy. More and more of our Active and Reserve Component forces are returning home hardened combat veterans. They've been "on the edge" in Iraq and Afghanistan and see themselves as combatants in every aspect of their lives.

This mindset has become clear to me as I've traveled and talked to Soldiers, NCOs, and officers. They don't want to be viewed as the "geeky guy on a moped who is decked out in safety gear." They are warriors. This mindset presents a unique challenge to leaders who are trying to manage risk. As leaders, we want to capture the energy and intensity that comes with being on the edge and channel it in a more constructive way. This enables warfighters to manage risk and operate in a deliberate manner so they "own the edge."

The Combat Readiness Center continues to serve as the knowledge center for all losses, helping commanders connect the dots on loss prevention and providing leaders with tools to manage risk. We know Soldiers are on the edge, but we want them to own the edge through Composite Risk Management (CRM).

As we start a new year, our Army is launching a new campaign to get the CRM message down to

first-line supervisors and individual Soldiers. CRM enables every Soldier to own the edge, no matter where they are in the fight. CRM teaches Soldiers how to think—not what to think—and challenges them to be smart about managing risk. This concept puts individual Soldiers and leaders in control of how far on the edge they can operate.

When a Soldier wakes up each day—whether in combat, training, or off-duty—we want him to ask himself one simple question: "What could take me out of the fight today?" If you are fighting in Iraq or Afghanistan, it could be the enemy. However, if you are driving home on a 4-day weekend, it could be fatigue, speed, or alcohol. Even in combat, it's more likely you'll be taken out of the fight by an accidental hazard than by the enemy. No matter the threat, the most effective way to counter risk is CRM.

Once Soldiers internalize CRM, they begin making smart risk decisions wherever they are—be it in theater, in garrison, at home, or on the road. Safety transcends from nothing more than a separate paragraph in an operations order or an afterthought during mission planning to something instinctive and intuitive. With CRM, Soldiers become more lethal and ready so they're not just on the edge, they OWN THE EDGE!

Joe Smith

CRM—Surviving the E

CW4 Mark A. Martin
Fort Bragg, NC

On a dark night in a combat environment, the last thing you want your copilot to say is, "Hold on—the hydraulics just quit!" What now? The enemy is NOT the only variable on the battlefield.

It was a dark night with almost no illumination. The OH-58D Kiowa Warrior crew was conducting routine reconnaissance and security during combat operations in support of ground forces. An hour and a half into the mission, a collective servo hydraulic fitting failed and the aircraft began losing hydraulic fluid. The controls became stiff and the aircraft pitched violently.

The crew correctly diagnosed the situation and took immediate action to return the aircraft to base. They alerted the tactical operations center (TOC) of their situation and informed the battle captain that they would be executing a run-on landing to the forward operating base's (FOB's) bomb crater-damaged, partially lit runway. The battle captain activated the pre-accident plan and notified the forward arming and refueling point (FARP) at the end of the runway. Despite the FOB having no other crash rescue assets, crew chiefs, FARP personnel, and others collected all available fire extinguishers and moved to the edge of the runway to await the aircraft's arrival.

In the cockpit, the pilots' training and 9 months of combat experience translated into precision and calm under pressure. The dimly lit runway came into sight as they lined up for the final approach. The crew knew they had one chance to get this right.

The emergency response team waited in silence and darkness for the aircraft to touch down. The pilot expertly aligned the aircraft on the runway to narrowly miss a partially repaired bomb crater. A small shower of sparks from the skids was the only indicator that this was not a normal landing. The successful outcome of this incident was the culmination of many well-designed systems.

■ **Training**. The pilots were trained and prepared to execute the appropriate emergency procedure. Additionally, the TOC personnel and battle captain understood the urgency of the situation and were trained in the pre-accident plan. First responders realized they lacked the required crash rescue resources to take appropriate steps to further protect the crew in the event the landing was unsuccessful. However, the lack of resources doesn't relieve the responsibility to provide the best possible opportunity for success. Realistic training starts at home station and must be re-evaluated and refined once in the area of operations.

■ **Facilities**. Forward-deployed units are faced with complex hazards that, if not adequately controlled, are likely to cause loss of combat power. Leaders in a combat zone must assess all accidental hazards, as well as combat threat. In this case, leadership assessed the hazards associated with operating from an unlit runway and provided high-quality, solar-powered lights to aid the aircrew in completing a successful approach. Continuous

nemy and More

The aircraft sustained no damage. The pilot executed a textbook run-on landing in zero illumination under NVGs to a bomb-cratered runway.

The second picture shows the 90-degree elbow coupling on the center servo that failed, resulting in a complete loss of hydraulic fluid and subsequent emergency. This failure (crack) was undetectable and would never have been found by maintenance unless the line had to be removed for some reason—which it normally isn't. Bottom line: Be prepared for any emergency.

improvements to facilities are required throughout deployment. Failure to make continued improvements or plan for remote emergency situations results in acceptance of unacceptable high risk. Prioritization of efforts and appropriate allocation of assets and resources is the key to success in this area.

■ **Operations**. The foundation for Army Aviation operations is the air mission brief (AMB). The air mission commander makes use of the AMB and integrates Composite Risk Management (CRM). Aircrews should leave the AMB with a clear understanding of the mission and commander's intent. A thorough and detailed AMB ensures crews have the necessary information and guidance to understand and manage the hazards they will face during the mission and ultimately accomplish their goal. The enemy is not the only variable on the battlefield. Aircrews must understand and manage both tactical and accidental risk while performing their wartime mission. It is the commander's responsibility to ensure staff monitors and enforces CRM during mission execution.

Summary

Combat operations require managing the hazards associated with both tactical and accidental risk. In a combat environment, the two coexist at all times. My experience in Operation Iraqi Freedom shows that a well-trained and prepared unit can manage both successfully. CRM increases understanding at every level of the dangers associated with operating in a tactical environment. A proactive safety program lays the foundation for success in times of emergency. ♦

—CW4 Martin is the Squadron Safety Officer for the 1-17th Cavalry, Fort Bragg, NC. He was assigned to FOB McKenzie, OIF3, Iraq. He may be contacted at mark.martin1@us.army.mil.

FY05 Aviation Safety Performance Review

Charisse Lyle
U.S. Army Combat Readiness Center

The Army continues to be involved in high-risk operations this fiscal year, particularly in support of Operations Enduring Freedom and Iraqi Freedom (OEF/OIF). Multi-aircraft collisions and the inability to handle inadvertent instrument meteorological conditions (IIMC) continues to be a problem; however, brownout-related accidents have dramatically declined since the start of the conflict. This can be attributed to increased aircrew experience in theater and the controls that have been implemented to decrease the risk.

Army Aviation experienced 123 Class A through C accidents in FY 2005, costing more than $228 million. According to the accident reports thus far, 39 percent occurred in OEF/OIF. There were 31 Class A aviation accidents, 7 more than FY04, and Soldier fatalities almost tripled from last year, up from 12 to 35 in FY05. Of these fatalities, 63 percent occurred in two accidents involving a Chinook and Black Hawk with multiple personnel on board. Both cases involved incorrect aircrew response to IIMC. The Class A rate was also slightly higher for FY05 (2.8 flight accidents per 100,000 flying hours verses 2.2 in FY04).

Almost half of the Class A accidents and more than half of the fatalities (65 percent) in FY05 occurred in OEF/OIF. These included two multi-aircraft collisions, a wire strike, a ground collision due to an unnecessarily aggressive flight maneuver, one IIMC-related accident, and one brownout accident.

Airframes

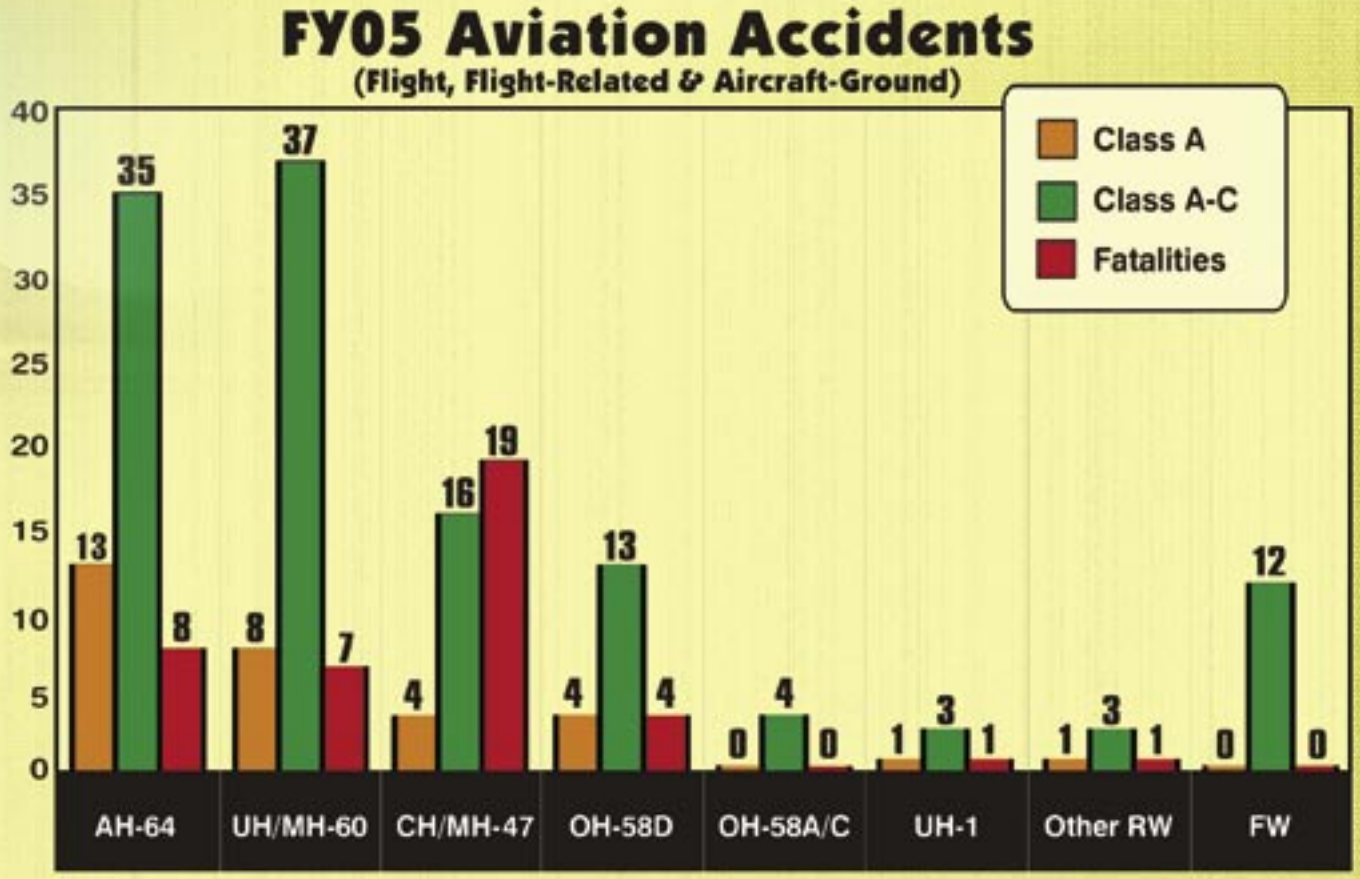
The table on page 7 depicts the accident number breakdown by accident class for each aircraft type. Highlights of these accidents follow.

AH-64 Apache (28 percent)

The Apache had the highest number of Class A accidents and second most Class A through C accidents in FY05. There were two Class A accidents in which an Apache landed on another operating aircraft.

Two more Class A accidents were caused by a breakdown in crew coordination. In one accident, neither pilot was flying the aircraft; in the other, both pilots were flying the aircraft, making opposing control inputs.

One Class A accident was caused by the pilot executing an excessively steep bank angle for conditions (low altitude, high density altitude, and high aircraft gross weight). In another Class A accident, cyclic travel was restricted by the front-seat pilot who had not buckled his lap belt. His body shifted forward in the seat and blocked the flying pilot's ability to apply aft cyclic



to complete a steep turn, resulting in the aircraft impacting trees.

Another Class A accident occurred while initiating a break at the end of a running fire attack in an AH-64D. The pilot on controls (backseat) focused his attention inside the cockpit to SAFE the weapons system at a critical stage of the maneuver. It is suspected negative habit transfer was a factor. Before his AH-64D transition, the pilot had flown the AH-64A. The ARM/SAFE button is located only in the backseat in the A-model. There were two other suspected contributing factors. First, the low terrain contrast and inadequate terrain definition degraded the pilots' ability to recognize the approaching terrain. Second, on a previous running attack, the aircrew had fired both rockets and the 30mm gun at slower airspeeds. The final attack run was much faster, and the crew hastily attempted to fire the same amount of ammunition. This resulted in less recovery time and airspace to maneuver.

Three Class C accidents involved 30mm gun failure—at least two of those reportedly due to a faulty lot of ammunition.

UH/MH-60 Black Hawk (30 percent)

The Black Hawk had the largest number of Class A through C and the second most Class A accidents. A contributing factor in two of the Class A accidents was IIMC, resulting in seven fatalities. In both cases, the crew continued flight into deteriorating weather and, upon encountering IIMC, improperly executed the IIMC procedure. In another Class A accident, the crew, upon landing, became disoriented in whiteout conditions and allowed the aircraft to drift into trees. The last Class A accident involved a brownout in Iraq that resulted in a hard landing and left the aircraft overturned on its side.

There were three Class B and C accidents in which the UH-60 main rotor blades contacted the rotor blades of a parked aircraft while taxiing—all occurring during the day.

Hard landings caused aircraft damage in seven accidents. In one accident, there was reported confusion on the proper technique for landing the aircraft in a dusty environment. The

unit pilots used terms like "planting the aircraft" or "sticking the aircraft to the ground." However, on dusty but rocky terrain, rapid reduction of collective may cause the main rotor blade to flex downward and make contact with the tail boom, which is what happened here.

There were two wire strikes—one a Class A in which the aircraft contacted a radio tower and wires during low-level flight and crashed into a nearby field, and the other a Class C that resulted only in main rotor blade damage. Both accidents occurred at night.

CH/MH-47 Chinook (13 percent)

The CH/MH-47 experienced four Class A accidents and the greatest number of fatalities with 19. All but one of the fatalities occurred in an IIMC-related accident. After encountering a dust storm, the aircrew continued flight, lost control of the aircraft, and crashed.

The remaining fatality occurred in a flight-related accident. The aircraft landed on a narrow road in a steep ravine to offload Soldiers. The Soldiers remained at the rear of the aircraft waiting for the aircraft to depart. An Afghan interpreter broke away from the group, started up the right slope, and was struck by the aft main rotor blade.

There were two instances of landing gear failure during ground taxi. Also, a cockpit door separated from the aircraft during an approach.

OH-58D Kiowa Warrior (11 percent)

Four Class A accidents and four fatalities occurred in the Kiowa Warrior (KW) in FY05. Compared to the other force modernized aircraft, the KW had the fewest Class A through C accidents.

There was one KW wire strike, resulting in two fatalities and a destroyed aircraft. The aircrew of an OH-58DR was escorting a convoy at night in Iraq that had lost a vehicle earlier in the day to a roadside explosive device. It is suspected that both pilots became preoccupied with searching for the roadside explosives and failed to detect wires in their flight path.

A midair collision between two KWs resulted in two fatalities and two destroyed aircraft. While conducting a multi-ship, night zone reconnaissance at terrain flight altitude, using AN/AVS-6(V) night vision goggles (NVGs), the pilot on controls in the trail KW lost visual sight of lead. The trail aircraft's main rotor blades struck lead's vertical fin and tail rotor. Both aircraft lost control and impacted the ground. It is suspected that the pilot confused the lead's NVG position light with the surrounding ground lights, a visual illusion called "ground light misinterpretation." There was no radio communications from trail to inform lead of the loss of visual contact.

A breakdown in crew coordination also contributed to this KW Class A accident. During a day combat recon mission, the aircrew's .50-Cal machine-gun malfunctioned. Both pilots were focusing inside the cockpit troubleshooting the weapons system and failed to notice their descent in time to prevent ground contact.

A hard landing, which incurred Class A damage, and a Class C overtorque occurred during practice autorotations. In the former, the instructor pilot was late with power recovery.

There were three engine overspeeds during manual throttle operations and one hot start that resulted in Class C damage.

Fixed Wing (10 percent)

There were 12 fixed-wing accidents (all Class B and C), two of which were materiel failures. Both of the materiel accidents involved the C-12 aircraft and resulted from a landing gear failure and an engine failure. Two-thirds of the fixed-wing accidents involved the C-12. These included an engine overspeed and three lightning strikes. Lightning strikes comprised one-quarter of the fixed-wing accidents.

Summary and recommendations

Flight indiscipline contributed to at least four accidents in FY05. Willful violations of known standards set the stage for an accident.

Continuing a deadly trend, IIMC claimed 25 lives in FY05, with one of these fatal accidents occurring in theater. Environmental conditions in theater make it critical flight crews be proficient on instrument flight procedures. The terrain often has low contrast and little definition, and because many missions are conducted at night, flight crews may find themselves in instrument flight conditions even though there are no clouds.

Breakdowns in crew coordination are a recurring theme in these accidents. Training in effective crew coordination is essential, and it is imperative that every member of the crew stay actively engaged in identifying hazardous conditions. A crew chief may be the only

crewmember to recognize cues that indicate an aircraft is encountering an unsafe condition. Mission planning for every flight should include preplanned crew coordination elements, particularly for high-workload situations.

Aviation units should use the heads-up display (HUD) with NVGs whenever possible. The additional information the HUD provides can improve overall flight crew situational awareness during limited visibility conditions. Crews must be effectively trained on the system using a crawl, walk, run methodology that is included in the unit training plan.

In addition, the Combat Readiness Center (CRC) has developed a number of useful tools to assist leaders and individual Soldiers in assessing the hazards found on the battlefield and at home. These tools include Preliminary Loss Reports, the Risk Management Information System, the Accident Reporting Automation System, and the Army Readiness Assessment Program, all of which can be found on the CRC Web site at **https://crc.army.mil**. Let's turn the arrow down for FY06 and OWN the edge! ♦

Editor's note: These statistics are current from the CRC database as of 8 November 2005. Delayed reports and follow-up details on preliminary reports could change the statistical data and findings.

—Ms. Lyle is an Engineering Research Psychologist at the U.S. Army Combat Readiness Center. She may be contacted at DSN 558-2091 (334-255-2091), or e-mail Charisse.lyle@us.army.mil.

Helping to Connect the Dots

John Langhammer
U.S. Army Combat Readiness Center

In May 2004, the Combat Readiness Center (CRC) stood up the MACOM Support Branch (MSB). The MSB is a highly motivated and responsive team of five safety professionals who focus on improving our partnership with the MACOM safety offices. As a proactive team, the MSB concentrates on facilitating the exchange of information and capturing issues and concepts to enhance current safety programs.

The MSB mission is to provide the Army MACOM Safety Offices and CRC a "face in the field" by assigning a single point of contact (liaison) for coordinating and tracking safety issues and requests for assistance while maintaining a forward-looking posture to enhance the Army's combat readiness.

MSB goals

■ Establish and maintain a positive working relationship between the MACOM and CRC by providing customer-focused support.

■ Provide support as the lead agency for integrating Army safety policy, programs, and initiatives into all MACOM safety programs.

■ Spotlight the Army- and MACOM-level future safety requirements 12 to 24 months in advance.

■ Institutionalize the branch mission within the CRC and the Army.

MSB core functions

■ Coordinate with MACOMs, Army staff, installation management agencies, other services and federal agencies, and the civilian industry regarding Composite Risk Management integration, safety program development, and leveraging of identified best practices.

■ Provide consultative services and develop and disseminate support materials for sustainment of base operations accident prevention programs.

■ Direct and track MACOM requests for assistance, training, and/or support.

■ Maintain a suspense database for CRC actions and reports to the MACOMs.

■ Contact MACOMs and track unreported accidents to the CRC.

All MSB personnel can be contacted by e-mailing macomsupportbranch@crc.army.mil, or calling (334) 255-3706/3576/3649/3858 (DSN 558). ♦

—John Langhammer is the MACOM Support Branch Chief. He may be contacted at hans.langhammer@crc.army.mil.

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AVIATION STANDARDIZATION

STACOM Standardization Communication

MESSAGE 06-02

UH-60 IP Supplemental Info for TC 1-237: Task 1082, Perform Autorotation

This STACOM provides additional information to instructor pilots (IPs) on Task 1082, "Perform Autorotation," in Training Circular (TC) 1-237, dated September 2005. The description in Task 1082 was changed to provide the opportunity for IPs to train under more realistic conditions and to coincide with procedures found in the UH-60 operator's manual. IPs are no longer required to arrest the descent during practice autorotations before reaching 200 feet above ground level (AGL), as stated in the old TC 1-212. During training, TC 1-237 requires practice autorotations to be terminated using one of three methods:

■ **Power recovery**. Upon receiving the command "power recovery," the pilot on the controls (P*) will apply the collective as necessary to arrest the rate of descent while simultaneously maintaining trim with the pedals. The P* continues to apply sufficient collective to arrest the rate of descent and establish a normal climb.

■ **Terminate with power**. Upon receiving the command "terminate with power," the P* will adjust the collective to arrest the descent at an altitude that will ensure the tail wheel will not contact the ground (conditions permitting; ground speed at the termination of the maneuver should be the same as for touchdown).

■ **Touchdown autorotations**. Touchdown autorotations may only be conducted in an emergency or in the simulator. During touchdown autorotations, the P* will adjust the cyclic and collective to smoothly cushion the main gear onto the landing surface. After the main wheels are on the ground, the P* smoothly lowers the collective to full-down, neutralizes the cyclic, and maintains heading and ground track with the pedals. The P* will use the brakes as necessary to stop rollout.

The transition from TC 1-212 to TC 1-237 recognizes the complexity of the task and requires formal academic and flight training. Units should make maximum use of flight simulators to enforce positive crew coordination and define crew and individual responsibilities. The complexity of the task requires instructors to understand the flight dynamics and performance characteristics while

conducting autorotational training. Listed are recommended topics for academic training:

- Field Manual (FM) 1-203
- Section VIII, Autorotation
- Training Manual (TM) 1-1520-237-10
- Chapter 5, Limitations
- Chapter 7, Airspeed System Correction
- Chapter 8, Transient Droop Characteristics
- Chapter 9, Engine Malfunction—Partial or Complete Power Loss
- Chapter 9, Figures 9-4 and 9-5, Autorotative Glide Distance Chart

Maneuver phases

■ **Entry:** This phase begins when the IP instructs the P* to enter autorotation. The P* begins with a smooth reduction of the collective in order to maintain rotor RPM within limits. It is a common tendency during this maneuver for the P* to decelerate at or below 80 KIAS due to lack of experience and the oculoagravic illusion. The tendency to immediately decelerate reduces the airspeed below the optimum 80 KIAS at the 50- to 75-feet AGL deceleration point. At this point, airspeeds below 80 KIAS will not be enough to effectively arrest the rate of descent. Additionally, when the airspeed system correction chart is factored in, it requires 4 knots (UH-60L clean) to be added. This adjustment is made due to airflow on the Pitot static system.

Some IPs choose to train an autorotation at 80 KIAS because it is the recommended autorotational airspeed in the autorotative glide distance chart. IPs must understand it is "recommended" because 80 KIAS results in the lowest rate of descent at the airspeed that will effectively arrest that rate of descent. This may not be the optimum airspeed immediately following a dual-engine failure.

There are many factors influencing the distance required to make the desired landing area, including winds, density altitude, gross weight, and most importantly, airspeed to glide distance ratio. Upon entering autorotation, the primary focus of the P* is manipulating the flight controls as necessary to establish an autorotational descent and landing to the most suitable area. The best course of action during a dual-engine failure may require adjusting to maximum glide airspeed, resulting in an increased rate of descent to make the landing area. The indicated airspeed needs to be adjusted to ensure a safe landing area regardless if the result is a greater descent rate than that achieved at the recommended 80 KIAS. It is much harder to regain airspeed after it has been reduced, and altitude may not be sufficient to gain it back.

■ **Descent:** Upon entry of the maneuver, there are a couple of key tasks that must be completed by the IP. First is rotor RPM management. The IP must monitor and maintain the rotor RPM within Chapter 5 limitations. During the maneuver, the aircraft is in a powered-on state, and the rotor RPM limits of 91 to 95 percent transient, 95 to 101 percent continuous, and 101 to 107 percent transient apply. During training, the IP is responsible for monitoring rotor RPM and adjusting the collective as necessary to maintain the rotor RPM within limits. This is even more imperative during autorotations with turn due to the tendency of the rotor RPM to rapidly increase. Prior to the maneuver, applying good crew coordination principles, the IP will announce his actions to the P* before making any control inputs.

The operator's manual states maintaining the rotor RPM at 100 percent will provide a good rate of descent, and rotor RPM above 100 percent will result in a higher rate of descent. Allowing the rotor RPM to increase above 100 percent may offset any advantages gained by using the 80 KIAS to effectively arrest the rate of descent. The operator's manual also states during the deceleration, an increase in rotor RPM is desirable in that more inertial energy in the rotor system will be available to cushion the landing. An increase in rotor RPM can be obtained by descending faster than 80 KIAS and trading off airspeed during the deceleration rather than maintaining a higher rotor RPM and higher rate of descent.

Secondly, throughout the maneuver the IP must call out altitude, airspeed, and trim and ensure the steady state factors of rotor RPM, airspeed, and aircraft trim. Every aviator must understand high-rotor RPM, aircraft out-of-trim, and airspeed faster or slower than 80 KIAS will result in an increased rate of descent and an increase or decrease in the glide distance. It is at the discretion of the IP to terminate the maneuver at any time by commanding "POWER RECOVERY" due to the inability of the P* to achieve a steady state autorotation or the inability to reach a safe landing area.

■ **Deceleration:** The 50- to 75-feet AGL deceleration is the most critical part of the

maneuver. Due to the high rates of descent in the UH-60, an IP must give the command of "DECELERATE" to allow the P* adequate reaction time to establish a decelerative profile by 50 to 75 feet AGL. It is critical the IP be in a position to decelerate the aircraft at no lower than 75 feet AGL to ensure a safe margin for the termination phase of the maneuver. IPs must realize it takes approximately 2 to 3 seconds for the P* to react to the command of "DECELERATE," during which time there will be a significant loss of altitude. It is critical for IPs to take into account turbine lag and transient rotor droop characteristics and plan for the application of power at the deceleration point. IPs must maintain awareness of the power requirements necessary to execute a termination with power or a power recovery. It will be necessary for the IP to match rotor RPM with engine RPM at some point during the aircraft deceleration. Applying torque levels of 15 to 20 percent during the deceleration will allow the engines to spool up and keep transient droop at a minimum. Again, the IP should manage the collective inputs, keeping the P* informed of his movements, but try to alleviate negative habit transfer to the P*. The IP should use a combination of deceleration and power to terminate the maneuver with power. IPs must be aware that decelerating to airspeeds below the maximum endurance/rate of climb airspeed during a power recovery or below 80 KIAS for a termination with power will result in a higher power requirement and may not stop the rate of descent.

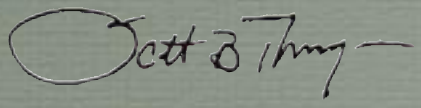
■ **Termination:** The IP must be prepared to recover the aircraft and prevent the tail wheel from touching the ground during the "termination with power" portion of the maneuver. To accomplish a proper termination, IPs must ensure aircraft attitudes are sufficient to bring the aircraft to a stop at the desired termination point. During terminations, special attention must be given to maintaining an aircraft attitude that prevents the stabilator from making ground contact. To alleviate rotor droop caused by the rapid loading of the rotor system with low Ng speed and low torque levels, aviators must lead with collective inputs.

Summary

The description in Task 1082 was changed to provide the opportunity for IPs to train under more realistic conditions and to coincide with procedures found in the UH-60 operator's manual. Task 1082, "Perform Autorotation," is a very complex maneuver and requires effective crew coordination. Due to this, academic and flight training must be deliberate and effective. Units must develop training programs incorporating academics and the flight simulator and then culminate with practice autorotations in the aircraft.

Standardization pilots and IPs are the only ones authorized to conduct autorotational training in the aircraft per the aircrew training manual (ATM). Based on varying experience, IPs will have varying levels of comfort and proficiency in training this maneuver. However, it is critical to continue to concentrate on using sound judgment and applying proper power management principles while conducting this or any ATM maneuver. Environmental conditions and aircraft passenger and equipment loading configurations must always be taken into account during training.

Commanders must be aware of the increased complexity of this maneuver to their aircrews and apply sound risk management principles when approving this type of training. Commanders may implement risk management control measures based on crew experience level and environmental conditions; however, the goal is to train the ATM task while keeping it as realistic as possible. The technical points of contact at DES for this STACOM are CW4 Allen O'Brion, DSN 558-1797, or e-mail allen.obrion@rucker.army.mil; and CW4 Chuck Lent, DSN 558-0518, or e-mail charles.lent@rucker.army.mil.



SCOTT B. THOMPSON
COL, AV
Director of Evaluation
and Standardization

NEWS & notes

Simple Green® Is Not for Aircraft Washing

Don't use "Simple Green®" for washing aircraft or aircraft components. Ensure no unauthorized cleaning products are being used on your aircraft or in the shops as a component cleaner.

It has been brought to the attention of the AMCOM Depot Maintenance Engineering Team that numerous units are using the commercial product "Simple Green®" as an aircraft wash. STOP! This product has been through DoD testing and was determined to be highly corrosive on aircraft aluminum. It can also be a catalyst for hydrogen embrittlement in high-strength aircraft alloys.

While it's a highly effective cleaning agent for floors and non-aluminum/non-high-strength alloy vehicles, this product is not approved for aviation usage. If your unit has been using Simple Green® on a regular basis, it is recommended a thorough fresh-water wash with the approved cleaners per the appropriate airframe maintenance manuals be accomplished as soon as practicable. This should be followed by a corrosion inspection/treatment and application of approved corrosion prevention compounds.♦

—POC is Richard Cardinale. He may be contacted at DSN 861-4041 (361-961-4041) or e-mail corrosion@amcom-cc.army.mil.

Aircraft Washing Tips – No High Pressure, Please

Some units are using high-pressure washers to clean aircraft. That's a no-no. As per para 3-3.9 of Technical Manual (TM) 1-1500-344-23, *Aircraft Weapons System Cleaning and Control*, use no more than 175 psi nozzle pressure when using a water hose. Pressure washers can develop very high pressure, sometimes in excess of 1,500 psi. That pressure can harm numerous items on aircraft, including bearings, composite panels, and painted surfaces. A soft spray, no more than 175 psi nozzle pressure, is all an aircraft can handle—the softer, the better.

Here are some other targets to keep in mind when your aircraft needs a bath.

■ **Don't overdo the chemicals**. You need chemicals to clean the aircraft, but don't overdo it. The right amount cleans the area intended. Too much causes runoff that can damage wiring and bearings, as well as doing potential harm to the environment.

Start with a dampened cloth. If the dirt is stubborn, add water to dampen the cloth some more. If there's danger of runoff, you can protect the areas prone to get damaged with some waterproof paper, NSN 8135-00-753-4662, and preservation sealing tape, NSN 7510-00-852-8180.

■ **No lint, please**. Any old rag might be fine for some cleaning chores, but an aircraft needs lint-free cloths. Lint can clog a filter, ruin an electrical contact, or pollute a vital fluid. Don't take that chance.

■ **Standing water corrodes**. Any standing water left on the aircraft after cleaning needs to be wiped up.

■ **Preventing corrosion**. The aircraft is clean, so everything's fine, right? Hold on, the job's not finished until a corrosion prevention compound has been added to all those areas called for in your TMs.♦

—Courtesy of PS Magazine

—Submitted by CW5 William W. Williams IV, IP/SP/IE/ASO, Army Aviation Support Facility, Rhode Island Army National Guard, DSN 247-4527 (401-275-4527), e-mail william.williams@ri.ngb.army.mil.

Bogus ACUs Not To Army Standards

Chris Trumble
U.S. Army Combat Readiness Center

There are three civilian companies producing Army Combat Uniforms (ACU) not to Army Standard. These civilian companies are producing ACUs that are off-shade to the Army-authorized ACU. The Army has the copyright and is not allowing civilian companies to produce the Army-authorized, NSN-approved, stock-type ACU.

There are three main ways to detect the civilian-type ACU from the Army versions:

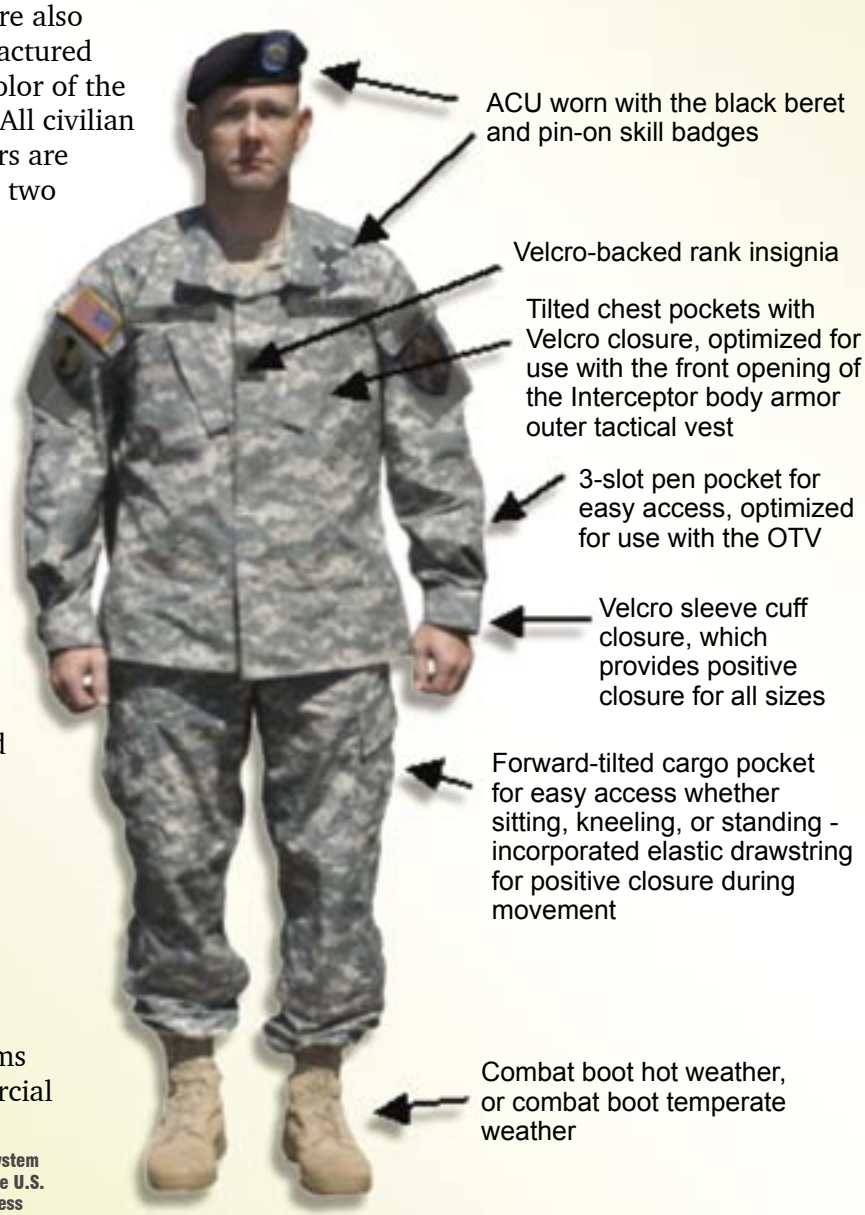
■ Company one produces a dark green Velcro zipper.

■ Company two produces the ACU with no pleat in the back of the coat.

■ Company three produces the ACU with no tab on the sleeves, a tan zipper, and the trousers don't have a drawstring in the cargo pocket.

T-shirts are also being manufactured slightly off-color of the ACU shade. All civilian stock numbers are either one or two numbers off from Army-authorized NSNs. The official Army version of the ACU goes on sale April 2006. Soldiers should not waste their money on unauthorized uniforms. This is also good information for deployed Soldiers to determine if the enemy is using uniforms from commercial venders. ♦

—Mr. Trumble is a System Safety Engineer at the U.S. Army Combat Readiness Center. He may be contacted at DSN 558-2372 (334-255-2372) or e-mail christopher.trumble@us.army.mil.



Litefax WHAT WERE THEY THINKING?!?

Chris Frazier
Staff Writer/Editor

There's no arguing it takes a good bit of smarts to pilot an aircraft. Not everyone can do it. Just ask any aviator—they'll be glad to tell you. At times, however, aviators—like the rest of us—can suffer from a mental brownout. While digging through the Combat Readiness Center's accident report database, we've uncovered several instances where aviators (yes, aviators) have had some momentary lapses in their left-brain thinking while operating aircraft. Fortunately, no one was injured in these accidents—other than maybe a few bruised egos. From time to time, Flightfax will be publishing some of these "What were they thinking?" moments in this space we're calling "Litefax." If you have a story you'd like to submit to Litefax, we'd love to publish it. We'll even do it anonymously to protect you from any more ribbing from your buddies. For more information on how to submit a story to Litefax, send an e-mail to flightfax@crc.army.mil.

What Pole?

A UH-60L crew was ground taxiing to parking on an airfield when the pilot in command (PC) noticed a wooden pole adjacent to the apron. As the aircraft got closer, the PC asked the pilot on controls if he saw the pole, and he acknowledged that he did. The pilot—apparently suffering from some form of short-term memory loss—then made two 90-degree turns, striking the pole with three of the aircraft's main rotor blades and tip caps. The crew conducted an emergency shutdown.

Investigators cited crew coordination failure as a contributing factor to the accident. Both the PC and pilot on controls visually confirmed and verbally acknowledged the hazard. The non-rated crewmember in the left rear seat also visually identified the pole but did not verbally announce it since he heard both pilots say they saw it.

Findings from the accident revealed the pole had been identified by at least two other aircrews 3 weeks prior to the UH-60L incident. However, safety officers on the airfield apparently failed to make removing it a top priority. According to Unified Facilities Criteria 3-260-01, May 2001, requirements, fixed and mobile objects such as poles are not allowed to be within 75 feet of the edge of the apron.

It was recommended all four UH-60L crewmembers conduct a post-accident evaluation and complete aircrew coordination qualification or refresher training as applicable. It was also recommended the safety officers create and manage an airfield hazard log and keep it updated.

The aircraft, which suffered Class C damage in the accident, was inspected, repaired, and released for flight.

No, Not That Handle!

Following a mission, a UH-60A passenger got a little confused when he attempted to exit the rear cabin of the aircraft. The passenger mistook the cabin door window emergency release with the cabin door handle and ejected a single Plexiglas® pane onto the landing surface.

The passenger's smooth move cracked the Plexiglas®, causing Class E damage. The aircraft was able to recover to home station after the cracked pane was reinstalled on cabin door. A new Plexiglas® pane was to be installed in the aircraft. ♦

—Contact the author at DSN 558-2287 (334-255-2287), or by e-mail at christopher.frazier@crc.army.mil.

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class A**: The aircraft was Chalk 2 in a flight of two when the crew reported a loss of power to one engine and a subsequent descent into the trees.

■ **Class C**: The aircraft experienced an engine overspeed during simulation of "Low NP" during flight in the traffic pattern.

■ **Class C**: The aircraft experienced a main rotor overspeed condition during a right turn with reduced collective.

CH-47

D Model

■ **Class C**: The aircraft's right cockpit door came off during a maintenance test flight.

■ **Class E**: The crew was Chalk 2 in a flight of two and on final approach to the airfield when the M-60 tail gun mount attached to the ramp broke away from the aircraft and fell to the ground. Recovery operations were initiated, and the weapon was found a half hour later. The aircraft was repaired and returned to service. *Late Report.*

■ **Class F**: As power was increased to reposition the aircraft to a hover, the No. 1 engine compressor stalled at approximately 40 percent torque. The No. 1 engine was retarded to ground. The aircraft returned to parking and completed shutdown, and the engine revealed foreign object debris (FOD) damage to compressor blades. Further inspection revealed the hinge pin missing and suspected to have caused the FOD damage.

MH-47

D Model

■ **Class A**: The aircraft became unstable during a pinnacle landing, overturned onto its right side, and descended down a slope. A post-contact fire ensued. All crewmembers onboard were able to egress with some injuries. The aircraft was destroyed.

OH-58

C Model

■ **Class D**: During initial entry rotary-wing (IERW) basic combat skills training, a student pilot was returning from a stagefield when a turkey buzzard impacted the aircraft on the left-front windshield. The bird penetrated the windshield and impacted the instructor pilot (IP) occupying the left seat of the aircraft. The IP assumed control of the aircraft and landed with no further incidents. *Late Report.*

D(I) Model

■ **Class E**: The pilot in command (PC) started the engine while the exhaust pillow was still installed. The crew chief presented the charred pillow to the PC for inspection, and the PC assumed all parts of the pillow were present. At the completion of the mission, the crew did not note any problems on postflight inspection. The next crew on shift noted on preflight inspection of the aircraft that a strap from the pillow had been tangled in the transmission driveshaft and damaged two oil lines. *Late Report.*

■ **Class E**: During cruise flight at 150 feet and 75 knots, the crew identified a flock of birds in the path of the aircraft. The PC in the left seat began a climb in order to evade the flock. Approximately 1 to 2 seconds after identification, two birds contacted the left windscreen. The first bird made a hole and then struck the face of the PC in the left seat. The second bird became lodged in the hole left by the first. The crew made a precautionary landing at the nearest airfield, where first-aid was rendered to the PC. The windscreen was replaced, and the aircraft was returned to service. *Late Report.*

D(R) Model

■ **Class A**: The aircraft contacted wires during a reconnaissance flight, and the crew accomplished a forced landing. Damage was reported to the main and tail rotor system, fuselage, tailboom, and landing gear. The WSPS did not engage the wires. The crew suffered no injuries.

■ **Class C**: The aircraft's main rotor system contacted the FM homing antenna during runup for flight.

UH-1

V Model

■ **Class D**: During a live hoist training event, one support seat of the Jungle Penetrator (JP) became lodged underneath the right-side jump door. The hoist operator did not recognize the JP was lodged and continued to raise the hoist cable. The JP support seat bent the bottom and outer frame of the jump door and broke the bottom jump door hinge. The PC directed the aircraft to land. *Late Report.*

UH-60

A Model

■ **Class A:** The aircraft overturned during landing at an unimproved/dusty landing zone in response to a MEDEVAC call. There was damage to all four main rotor blades and the tailboom.

■ **Class B:** During a multiship flight at 130 KIAS 80 feet AGL, a flock of pigeons flew up from the ground after Chalk 1 passed. Chalk 2 maneuvered to avoid the birds when it struck three pigeons. One pigeon struck the aircraft on the No. 2 engine inlet railing and was ingested into the engine. The crew did not experience any engine malfunctions during flight to indicate possible bird ingestion until postflight inspection revealed the bird remains inside the No. 2 engine inlet. Late Report.

■ **Class C:** Postflight inspection revealed damage to the tail wheel strut and stabilator (trailing edge). Damage is suspected to have occurred during landing.

■ **Class E:** While sitting on the parking ramp, the power control levers (PCLs) were being advanced to the fly position when the No. 1 hydraulic pump illuminated for more than 2 minutes. During this process, the pilot placed the PCLs to idle. After going to idle and preparing to shut down the engines, the No. 1 hydraulic light went out. The crew aborted the flight and terminated the mission. Maintenance personnel replaced the pump assembly, performed a maintenance operational check, and released the aircraft for flight.

L Model

■ **Class A:** The aircraft experienced a "settling with power" during approach to a high altitude LZ, contacted the ground, and rolled onto its side. Four personnel onboard sustained injuries.

■ **Class B:** The aircraft tail rotor contacted a light pole during ground taxi. The tail rotor and stabilator sustained damage.

■ **Class D:** During the landing phase of a night vision goggle (NVG) troop insertion to an LZ, the PC encountered brownout conditions while landing. Upon touchdown, the right-side main landing gear dropped into a hole. The aircraft noticeably leaned to the right, and the tail swung around to the left. The PC immediately increased collective to prevent a dynamic rollover. The aircraft rose in a level attitude, performed a go-around, and completed the mission. Postflight inspection revealed the tail wheel strut assembly, some sheet metal, and the lower anti-collision light had been damaged during the incident. Maintenance repaired the damage, and the aircraft was returned to service.

■ **Class D:** During an air movement of personnel, Chalk 2 of a flight of two struck a duck-sized bird. The aircraft was at terrain flight. The aircrew accomplished a successful precautionary landing. The left-front windshield was shattered and partially caved in. The aircraft suffered no other known damage. Late Report.

■ **Class D:** The crew was conducting an NVG training flight. Upon initial departure, a crewmember reported an NVG case had fallen out of the aircraft. The crew returned to the runway and recovered the NVGs.

■ **Class E:** While conducting a post-phase maintenance test flight, a controllability check was conducted before lift-off with no abnormalities noted. The aircraft was brought to a hover, and the control response was abnormal. The aircraft was immediately landed without further incident.

EO-5B

■ **Class D:** During initial climb while flying through a rain shower, a bright flash was seen in close proximity to the aircraft. There was no indication on the lightning sensor display, and there were no abnormal indications noted in the cockpit or by the equipment operators. The crew determined the weather was worse than forecasted and decided to return to base. Postflight inspection revealed possible lightning damage to an antenna. Maintainers completed the required inspection of the airframe and system equipment, and one antenna was replaced. The aircraft was released for flight.

■ **Class E:** During the startup/runup process, maintenance personnel noticed fuel leaking from the No. 4 engine nacelle. The crew shut down the aircraft in accordance with the checklist without further incident. Maintenance replaced the hydraulic pump, and the aircraft was released for flight.

■ **Class E:** During runup, the No. 1 hydraulic pump caution light illuminated. In accordance with the mission equipment list, the crew shut down the No. 2 engine and verified the No. 1 hydraulic pump had failed. The crew shut down the aircraft without further incident. Maintenance replaced the No. 1 hydraulic pump, and the aircraft was released for flight.

RC-12

D Model

■ **Class E:** While taxiing on a parallel taxiway, a pheasant flew through the No. 2 propeller. The crew performed a normal shutdown. On postflight inspection, no damage was found, and contract maintenance released the aircraft for flight.

F Model

■ **Class E:** While on a maintenance test flight with props set 1900 RPM, the aircraft yawed slightly while pitching up. All activities were stopped to determine the problem. Within 20 seconds, the aircraft repeated the movement. The only indication on the instruments was a slight decrease in RPM on the No. 2 engine. Seconds later, the No. 2 engine repeated the movement. This time the copilot saw the engine rotating on the mounts and a ball of fire coming out of the exhaust pipe. The crew shut down the No. 2 engine and conducted a precautionary landing at an airfield. The aircraft

landed without further incident. Late Report

H Model

■ **Class E:** While on takeoff roll, the aircraft struck three birds. The crew performed a traffic pattern and a normal landing and shutdown. On postflight inspection, bent sheet metal, along with bird remains, were discovered around the nose gear doors and landing light. Contract maintenance repaired the sheet metal and released the aircraft for flight.

■ **Class E:** While performing a prop feather check, the pilot inadvertently placed the wrong condition lever to the feather position. The torque rose to 110 percent for 1 second and then dropped into the normal range. Maintenance suspected an overtorque condition and removed the engine for further checks. Late Report.

RQ-11A

■ **Class C:** The aerial vehicle operator (AVO) lost control and video feed with the unmanned aerial vehicle (UAV) during flight. The UAV was never located and is presumed destroyed/lost.

■ **Class C:** The AVO lost contact with the UAV during flight. The UAV was never recovered.

■ **Class C:** While conducting reconnaissance, mission waypoints were inadvertently reset. The UAV went into a power-off descent in search of the new lower altitude. The waypoints were moved back to the preplanned setting, but the UAV could not counter the computer change in altitude and crashed.

RQ-5A

■ **Class C:** The UAV experienced engine failure while being operated in the traffic pattern. After the aircraft was landed, significant damage was noted.

RQ-7A

■ **Class B:** The UAV failed to respond to command/control input and impacted the ground at an approximate speed greater than 100 KIAS. The UAV has not been recovered and total loss is presumed.

RQ-7B

■ **Class B:** During recovery operations, control of the UAV was lost on the third landing attempt and crashed.

■ **Class B:** Control of the UAV was lost during flight and it defaulted into home flight. Emergency procedures to regain control failed. The UAV was allowed to continue flight with its remaining 7 hours of fuel to buy time to regain linkage. Once engine fuel starvation occurred, the ACE box automatically rebooted and the recovery chute was deployed, but the UAV still sustained damage on impact.

■ **Class B:** The UAV experienced a generator and subsequent ignition failure during flight and crashed, bursting into flames upon impact. The wreckage, including the payload, was recovered.

■ **Class B:** The UAV launched at 50 percent throttle on a heading of 189 degrees for approximately 250 yards before impacting the ground.

■ **Class C:** The UAV experienced an engine failure following launch. The recovery chute deployed, but the UAV impacted the ground.

■ **Class C:** The UAV experienced generator and subsequent engine failure while in a holding pattern to land. The landing recovery chute deployed at 250 feet AGL, but the UAV suffered crash damage.

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, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

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Valuable Lesson in Power Management—May

WEATHER
Don't Carry the Load Alone—June
Flying in Bad Weather Causes Another Fatal Accident (UH-60L)—August
Gambling on the Weather—April
If the Weather is Bad, DON'T Fly! (CH-47D)—August
Plan, Train, Execute … Survive—October
Tempting Fate—March
Thunderstorms … One of Aviation's Most Hazardous Phenomena—March
Wait It Out—June
You Know the Airspace, But Do You Know the Airspace You're In?—March

WIRE STRIKE
"Oh My God, Tower 12 O'clock—August
Simple Mission Turns Tragic (AH-64A)—September
Tallest Wires I've Ever Seen—April ♦

Last Flightfax this year…

We are consolidating the November and December issues of Flightfax. All personnel of the Army Combat Readiness Center wish you and your family a Merry Christmas and a Safe and Happy New Year.

OWN THE EDGE

WIN THE FIGHT

USE COMPOSITE RISK MANAGEMENT
& OWN THE EDGE

own the EDGE

Composite Risk Management