Flightfax

ARMY AVIATION RISK MANAGEMENT INFORMATION

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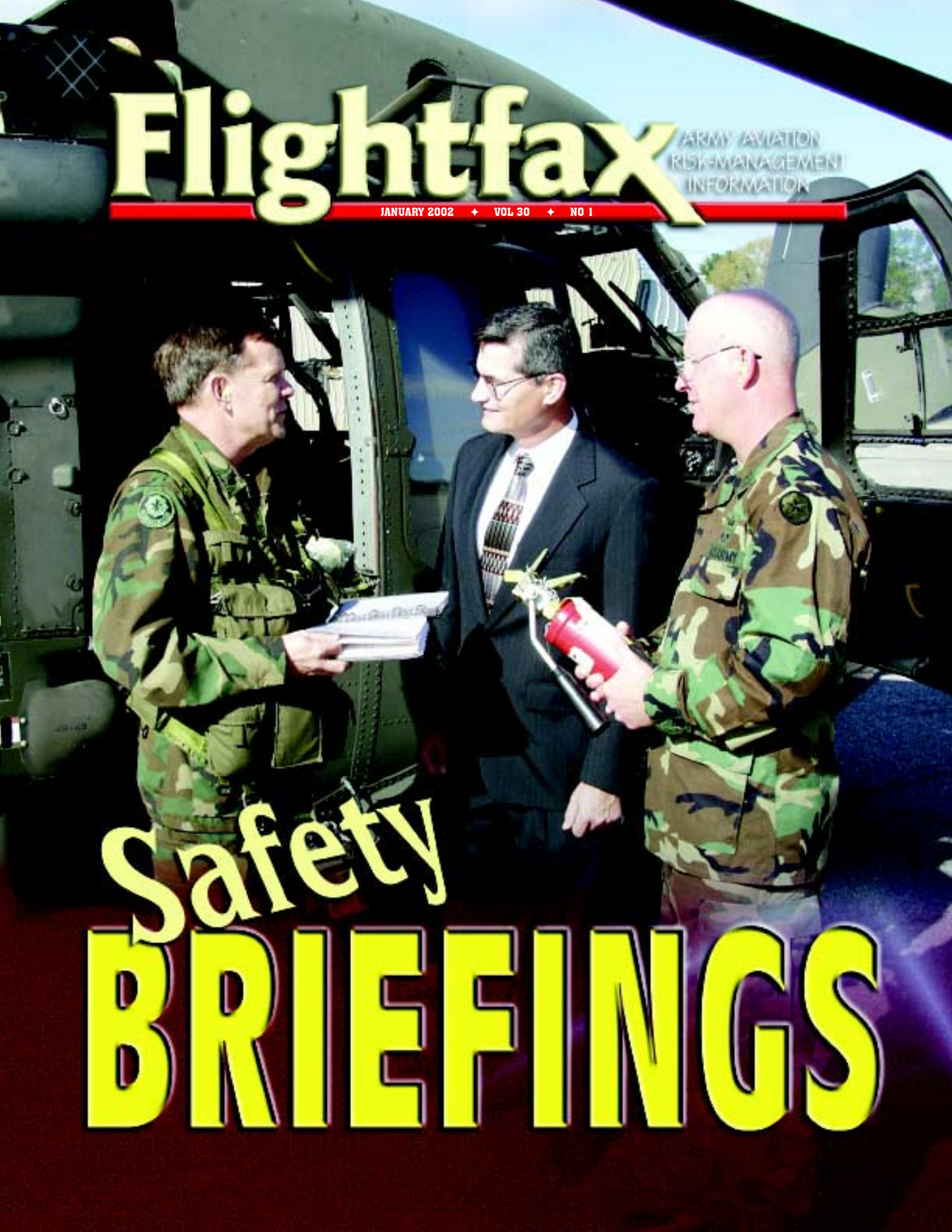

Safety BRIEFINGS

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Safety is Readiness First Priority

While some of us were fortunate enough to enjoy the holiday season with family and friends, many of our fellow soldiers continued to hold the torch high and execute real-world missions around the globe. Wherever you were, I hope yours was a safe one. Even with all its hustle and bustle, the holiday season isn't just a time of joy and celebration, it is also a time of somber reflection and a time to contemplate future challenges.

The year 2001 will not soon be forgotten. The indescribable horrific acts of cowardice that wrought violence, destruction, and pain on thousands of innocent people are burned into our memories forever. On September 11th, our hearts broke. But the attacks on our homeland rallied our spirit as Americans, and solidified our determination to do whatever was required to eradicate terrorism and make the world a safer place for all who value freedom and security. The year 2001 marked the beginning of a new kind of war—against a new asymmetric enemy. The challenges ahead of us are many.

As an Army, readiness to respond to whatever missions we are asked to do is priority one. In January of each year, we habitually put the final touches on OPORDS and training plans that have been working since the early fall. We continue to refine and begin to execute METL training, attend schools, conduct combat training center (CTC) rotations, and Reserve Component Annual Training (AT) events—all in an effort to further hone our warfighting skills and improve our readiness. I submit to you, however, that before the first aircraft can pull pitch, the first tank roll out of the motor pool, or the first parachute canopy can inflate, we must ensure we have fully integrated risk management into our plans. Incorporating risk management into every facet of an operation significantly enhances readiness by reducing accidental losses. The loss of a solider or damage to any piece of Army equipment seriously impacts our readiness, and ultimately our ability to fight and win this war on terrorism.

The fact that we lost 169 soldiers in accidents during FY01 clearly reinforces that we are part of an inherently dangerous profession, where soldiers willingly put themselves in harm's way every day to protect our freedom. At some level, we are all leaders. And as leaders, we have a responsibility to identify hazards that could potentially cause our fellow soldiers to be hurt or killed. A leader's ability to concentrate finite resources at the critical place and time to destroy the enemy is crucial to battlefield success. Similarly, our ability as leaders to recognize hazards, and put controls in place to reduce risk, is paramount to winning the war against accidents, and preserving resources for warfighting on the battlefield. While eliminating all risk may be impractical, technically and tactically competent leaders making informed decisions at the appropriate level will significantly enhance the Army's readiness.

For a unit to successfully fight as a cohesive combat force, leaders must take the time to ensure safety and risk management are integral parts of all plans and missions. Effective leaders will not allow their subordinates to cut corners, take unnecessary risks, or ignore potential hazards. True leaders will apply the same risk management standard of an informed decision at the appropriate level to both combat and training missions.

Command involves accountability. It's hard enough knowing that you will potentially lose soldiers to enemy fire, but the thought of losing soldiers needlessly because of inattention, indiscipline, or the failure to mitigate risks to the lowest level possible ought to be every leader's worst nightmare.

I challenge each of you to continue to inculcate solid risk management in all that you do, both on and off duty, in garrison and in the field. Our soldiers are counting on you to lead the way. Remember, safety and readiness go hand-in-hand.

Fly Safe!
BG Simmons

What does your passenger brief contain?

And, by the way,— are you conducting them?

Some crewmembers aren't taking the time to brief their passengers in accordance with their aircraft checklist! Some are only giving the passenger brief lip service! Are these fair statements? Before you shoot the messenger, first take a look at how your unit is doing business. Are you taking the time to complete the required brief? Do you cut the brief short because of time? You've flown this VIP before, so one brief is enough, right? WRONG! The aide to the VIP says he is too busy to be bothered? What other excuses have you heard or accepted in the past? Ask someone in your unit to conduct a random survey of passengers flown to see just what kind of briefing they have received. You may be surprised at what they tell you. This aviator conducted a very unscientific survey of visitors (i.e. flight surgeons, VIPS, etc.) touring here at the U.S. Army Aeromedical Research Laboratory (USAARL) and I heard a lot of stories. Many thought you use the same procedure for emergency release of the door assembly for both the UH-1 and UH-60 during an egress. Getting this simple procedure wrong could cost them their lives while trying to get out of a burning or sinking aircraft.

Aircraft crewmembers know what to do when they get into their aircraft – where to step, and not to step, what to touch and not touch, when and how to buckle and unbuckle their restraint system, where the fire extinguishers and survival kits are, and how to use them, and that their helmet's chin strap should be secured and their sleeves rolled down. However, it's just as critical that passengers, whether they are civilian or military, know these things.

Remember, passengers aren't as familiar with the routine or emergency procedures that are second nature to aircrews. Don't ever assume that they know about your aircraft, simply because they are wearing a uniform and maybe even aviator wings. Remember, your passengers don't know what they don't know. This could lead to serious accidents and injury.

Every pilot-in-command, as well as each crewmember is required to ensure that all passengers, military and civilian alike, are briefed on emergency actions prior to flight in accordance with their aircraft operator's manual. Here are some general suggestions that can apply to just about any aircraft passenger briefing.

■ **Flight data.** Brief passengers of intended route, altitude, time enroute, and weather.

■ **Approaching and departing the aircraft.** Explain proper direction to approach and depart the aircraft to avoid rotor blades, propellers, and exhaust heat. Also go over proper entry and exit procedures.

■ **Seating.** When passengers occupy seats in the area of aircraft controls, caution them against unintentional or inadvertent interference with the controls, both during flight, and when entering or leaving the aircraft.

■ **Smoking.** Remind passengers that smoking is prohibited on board or within 50 feet of any aircraft.

■ **Emergency entrances, exits, and equipment.** Identify location and demonstrate operation of jettisonable doors and windows, escape hatches, cabin doors, cargo ramps, cutout/kickout panels, first-aid kits, troop alarms, jump lights, and emergency escape equipment (axes, etc.).

■ **Safety belts and should harnesses.**

Make sure passengers are familiar with use and operation of this equipment and the requirement to use it.

■ **Helmets.** If passengers are equipped with helmets, remind them to keep the chinstrap secured and the nape strap tight.

■ **Overwater flight.** If flight will be conducted over water, familiarize passengers with flotation equipment, the location and general use of all life-support equipment, and methods of emergency egress in water.

■ **Survival equipment.** Point out location and explain general use of survival equipment such as flares, rafts, radios, etc.

■ **Fire extinguishers.** Point out their location and explain how to use fire extinguishers, with special emphasis on occupant safety (people first, equipment last.)

■ **Clothing.** Brief passengers that shirtsleeves must be rolled down during the entire flight. Be sure that all passengers without helmets wear earplugs or other hearing protection.

■ **Protective masks.** If toxic chemicals are carried inside the aircraft, make sure all passengers have protective masks readily available.

■ **Refueling.** Ensure passengers off-load and remain at least 50 feet from the aircraft during refueling.

■ **Equipment security.** Caution passengers not to throw anything from the aircraft at any time, in flight or on the ground. In addition, remind them to secure all equipment inside the aircraft to prevent it from becoming a missile in the cabin during a crash, and outside the aircraft to prevent it from being sucked into rotor systems, engine intakes or being blown into people/equipment.

■ **Emergency landing position.** Explain and demonstrate proper body position: Bend forward at the waist with feet planted firmly on the floor. Rest chest on knees and hold the position by enfolding and locking arms around and behind thighs.

■ **Off-loading.** Instruct passengers that under normal conditions they should wait until they receive word/signal from a crewmember. In an emergency, they should off-load and move away from the aircraft, to a pre-briefed position. (During a fire, egress should be immediate; no fire, wait until the blades stop turning.)

There is no excuse for cutting short, amending or omitting the passenger brief… your operator's manual requires it. It would be tragic to have someone unable to free themselves, after an accident, from your aircraft because you didn't brief them on how to use the emergency exits. What if they didn't know how to get you out, use the fire extinguisher, to fight a fire or use your survival radio to get help? ***Proper passenger briefs each and every time! Just do it!***

—CW5 Scott Johnson, US Army Aeromedical Research Laboratory, DSN 558-6960 (334) 255-6960, scott.Johnson@amedd-emh1.army.mil

FORSCOM ARMS Surveys 1QFY02 Review

What we look for, what we find

Command Factors:

Two deficiencies are recorded frequently. First, Commanders fail to list safety duties for staff offices, subordinate commanders, leaders and individuals. In units that have retained the commander's accident prevention plan, (CAPP) duties are usually listed; however, the statement that safety duties are an individual responsibility is often overlooked. Second is the failure to train the safety staff. Both the Aviation Safety Officer, (ASO) and the Alternate or safety NCO, require training. A formal aviation safety officer's course is the standard for the ASO. NCOs and alternates are often locally trained.

■ **Safety Administration:** The most common deficiency found concerns the safety awards program which the ASO must manage. In most units, individual safety awards, safe driver's awards, impact safety awards and unit safety awards programs should be active and operational. The findings vary from overlooking an applicable area, to having no functional safety awards program. We also commonly find that the ASO has not assisted in the preparation, rehearsal, and review of the pre-accident plan.

■ **Safety Surveys:** The two most common findings in this area are incomplete surveys and failing to enter deficiencies on the unit hazard log. Several good survey tools are used in the field, including our own FORSCOM commander's guide, the 13th edition guide, and the regional accident prevention survey (RAPS) checklists. The error occurs when an area applicable to the unit is not reviewed. The result is an incomplete survey. Not entering deficiencies on the unit's hazard log is another common problem. That error starts a downward spiral from which it is hard to recover. If the issues are not noted, the council will not act, corrections might be missed and problems can repeat.

■ **Safety council:** The failure of the council to review and document survey results and findings, and to offer corrective recommendations is the most common error. The council minutes should include action officers and suspenses to open items. Overlooking action officers or suspenses are common findings.

■ **Safety meetings and training:** Frequently the training make-up is the most glaring issue in the training arena. We have also found programs that neither include a plan for the topics to be covered in the current year, nor show a record of those discussed the previous year.

■ **Reports and Investigations of Hangar, Aircraft and Shops:** We seldom find grave problems in these areas. No systemic errors are apparent.

■ **Safety Related Programs:** Most OSHA programs are reviewed by the ARMS inspection; Hearing Conservation, Fire Prevention, Hazard Communications, Hazardous Waste, Foreign Object Damage (FOD), Drivers Training, and Personal Protection Equipment (PPE) are the programs evaluated in this area. Hearing conservation is the most frequent deficiency noted. Hearing conservation poses a particular problem in Army Reserve and National Guard aviation units; both cover hearing conservation for fulltime employees and flight-crews, but routinely overlook the exposed part-time soldiers. Another frequent deficiency is Hazard Communications. "Right to know" training is generally provided; however, hazard reviews (driven annually or with the induction of new hazards) are overlooked.

■ **Standard Operating Procedures (SOP):** We look for the requirements of AR 385-95 to be addressed in the general SOP or the Safety Management section of the SOP. While the SOP sub-area is generally not a problem, one frequent oversight is the requirement for the ASO's to describe procedures for review of monitored safety programs.

We look forward to future updates in Flightfax. Our new Division Chief, COL Carl Merkt, is extremely focused on Aviation Safety, and looks forward to being in the field. If you have a suggestion for ARMS improvement, drop him a line at Carl.Merkt@forscom.Army.mil

—CW5 Jim Donadini, ASO, Team One FORSCOM ARMS, donadinijames@forscom.army.mil

POV accident changes aviator's life

Eleven years ago on a cold December night, I received a phone call that brought me to my knees, made me realize how fragile the course of life is and changed my family forever. My mother's voice on the phone sounded like that of another. She was barely able to get the words out as she tearfully told me of the horrible accident. Her mother and her only sister had been blindsided on an open stretch of freeway. Neither had been wearing seatbelts and life would never be the same.

Granny was not seriously injured, but my only aunt; my mentor, a single, beautiful, successful 38-year old woman was in a coma, and doctors did not expect her to pull through. She was on the side of the impact, and had been thrown forward into the windshield. The damage to her brain was severe. An established trainer of thoroughbred horses, she had always been independent, strong, loving and determined.

It was three years after the accident before her eyes opened and a totally new life began for her. What a different world she had to face, confined to a wheel chair with tubes throughout her body, unable to walk, talk, or even feed herself. In one brief moment, the combination of fatigue, an impaired driver, and failing to wear seatbelts, resulted in the destruction of so many dreams and of so much happiness.

The series of events that so dramatically altered my aunt's life and my entire family's outlook cannot be changed. Opportunities and choices we consider as just a part of everyday life are no longer possible for my aunt. The outcome of this accident could have been completely different, perhaps just a few cuts and bruises, if my aunt and grandmother had worn their seatbelts.

Today my aunt is communicating through a voice-related computer. She can momentarily stand with mechanical assistance only through her determination and commitment. It was ten years after the accident, before she was fed her first non-liquid meal.

My family's passions for education on proper seatbelt usage, and the prevention of drinking and driving, have continuously grown. I feel that our efforts have made a difference, but there is so much more to be done.

All of us must be assertive, make an effort to keep individuals from drinking and driving, and educate everyone on the importance of seatbelt safety. If the effort results in a change of just one life it is worthwhile. We as aviators abide by pre-flight checklists for safety and survival. Why do we feel that similar precautions are optional on the ground?

I never expected something this tragic to happen to someone that I love so dearly, but in a split second, it did… and it could happen to you. You can make a difference.

—(The author is a Medical Evacuation Officer.)

Updated rules on accident classifications

As of 1 Oct 2001, AR 385-40, *Accident Reporting and Records*, is clarified with minor changes to definitions of accident classifications.

Accident Class	
A	An Army accident in which the resulting total cost of property damage is $1,000,000 or more; an Army aircraft or missile is destroyed, missing, or abandoned; or an injury and/or occupational illness results in a fatality or permanent total disability.
B	An Army accident in which the resulting total cost of property damage is $200,000 or more, but less than $1,000,000; an injury and/or occupational illness results in permanent partial disability, or when three or more personnel are hospitalized as inpatients as the result of a single occurrence.
C	An Army accident in which the resulting total cost of property damage is $20,000 or more, but less than $200,000; a nonfatal injury that causes any loss of time from work beyond the day or shift on which it occurred; or a nonfatal occupational illness that causes loss of time from work or disability at any time.
D	An Army accident in which the resulting total cost of property damage is $2,000 or more but less than $20,000.
E	An Army aviation incident in which the resulting damage cost and injury severity do not meet the criteria for a Class A-D accident ($2,000 or more damage; lost time/restricted activity case). A Class E aviation incident is recordable when the mission (either operational or maintenance) is interrupted or not completed.
F	Foreign Object Damage (FOD) aviation incident (Also known as Class F

—Fran Weaver, US Army Safety Center, DSN 558-1141 (334) 255-1141, weaverf@safetycenter.army.mil

Know All Your Limitations and Software Anomalies

For those of us who fly software configured aircraft, knowing the limitations and anomalies for the version of software, is as important as knowing the limits in Chapter 5 of your –10, and can lead to mishaps if these software limitations are not adhered to. A recent accident investigation revealed that pilots may not always understand all their limitations—especially those who recently transitioned from the OH-58D(I) to the OH-58(R).

In the OH-58D, limitations are covered in TM 1-1520-248-10 for both the OH-58D(I) and the OH-58D(R). Additionally, an Interim Statement of Airworthiness Qualification (ISAQ) also applies to both aircraft. Finally, depending on what version of software and Control and Display System configuration your aircraft is equipped with, there may be an additional Airworthiness Release (AWR) for your aircraft. If your aircraft is equipped with any special equipment, there may be additional AWRs for that particular equipment installation, whether it is temporary or permanent. All of these additional documents add further limitations or restrictions to the way you must operate your aircraft.

For instance, the ISAQ is what currently restricts the OH-58D to a 5200 lb maximum gross weight, even though the –10 limit is 5500 lbs. In this case, there is a conflict between the –10 and the ISAQ, so the ISAQ applies. The ISAQ contains many additional Notes, Cautions and Warnings that must also be observed.

Been tasked to conduct a shipboard mission? Flying in the vicinity of land-based or Navy ships may induce malfunctions or anomalies in certain aircraft systems. Going to the gunnery range? Better review the limits and restrictions associated with ICS Y-cords, AIM-1 DLR lasers, 2.75 inch rocket firing, Hellfire and Stinger operations. Got version 7.0 software installed? Do you know all the anomalies of this version of software? Do you really understand what they mean? For instance, the acceleration cue on the hover page is "noted" that it does not work properly/is unusable in 7.0 software. Many pilots interpret this as meaning the entire hover page is unusable, so they don't use the hover page, when in fact all the other functions on the hover page are fully operational.

Has your unit just transitioned to the R model with CDS 3 and B.0.1 software? If so, make sure you understand your aircraft is equipped with a different engine and a different version of CDS and software, and the anomalies with previous versions of software do not apply to your current aircraft. In this case, if there is a conflict with the –10, the ISAQ and the AWR, the AWR shall prevail.

Are you using the approved automated performance planning software for the R3 engine? Did you download the AWR that goes with the software? If your unit is equipped with CDS 4 and digital software, there is a separate AWR for your configuration too... and you guessed it, there are different software limitations and anomalies for this version as well.

Going to a Combat Maneuver Training Center and equipping your aircraft with MILES-AGES II and SMODIM (Smart Onboard Data Interface Modem) equipment? Again make sure you read and understand the limitations and restrictions for installation of special mission equipment.

ISAQs and AWRs supplement the operator's manual and are "limits" of your aircraft. Do you fully understand your limits? When you take your annual –10 test, is it a generic test, or is it a –10 test associated with the actual version of the aircraft you fly with all the ISAQ and AWRs related to that version?

—Major Mike Cumbie, Chief, Scout-Attack, US Army Safety Center, DSN 558-3754 (334) 255-3754, cumbier@safetycenter.army.mil

NCO CORNER

Tools—Let's talk torque wrenches

Keeping torque wrenches up to snuff is a tough job. Your general aircraft maintenance manual, TM 1-1500-204-23-9, has some info on taking care of them. Even more info can be found in TM 9-243, Use and Care of Hand Tools and Measuring Tools. Plus, keep these points in mind.

■ Not all torque wrenches are alike. Some torque wrenches may look the same, but they can be quite different.

■ If a maintenance task requires torque in inch-pounds, don't grab a foot-pounds wrench. Eyeball the wrench markings to pick the correct tool.

■ Remember that the high and low readings of a torque wrench scale will not be as accurate as the readings in between, so use a wrench where the torque you need falls in the middle two-thirds of the scale.

■ Before you torque, clean all parts involved with dry cleaning solvent. Clean the threads of the fastener, the mating surfaces and the head of the wrench.

■ Lubricate a bolt only when your TM tells you to lube it. Oily threads reduce run-up friction and allow overtorque.

■ Torque the nut, not the bolt, unless your TM tells you differently; and when the torque is reached, STOP.

■ Getting an accurate torque means going slow and steady until you reach the required torque. Herky-jerky motions make for bad readings. If you think a reading is bad, back the nut off with a standard wrench and retorque. Never use a torque wrench for loosening. That'll damage its calibration.

■ Seizures ruin readings. During the last few turns, just before you reach the torque you want, you might hear a popping sound. It means the fastener has stopped turning momentarily. So back off the fastener with a standard wrench and retorque.

■ A torque wrench is not a hammer, so don't use it like one. Likewise, don't toss or drop the wrench. Rough treatment KO's calibration. (Editor's note: If you drop a torque wrench, the calibration may need adjusting. Tell your tool room so it can be turned into TMDE.)

■ When you finish a job, check the manufacturer's manual that came with the torque wrench. It should tell you what setting to use for storing the wrench.

■ If you have a bending-beam torque wrench, just stop turning and remove the wrench. The pointer should return to zero. Be careful, though; the pointer is not protected. If you bend or damage it, it won't maintain calibration and the next guy won't be able to use the wrench. It must be turned into your local TMDE shop for calibration and repair.

■ Micrometer and other torque wrenches can be set at zero before storage unless your tool room SOP says differently.

■ Setting the reading to zero takes pressure off the spring while it's not in use. If you leave the pressure on, the calibrated spring will stretch, weaken, collapse or lose tension. That can ruin its accuracy.

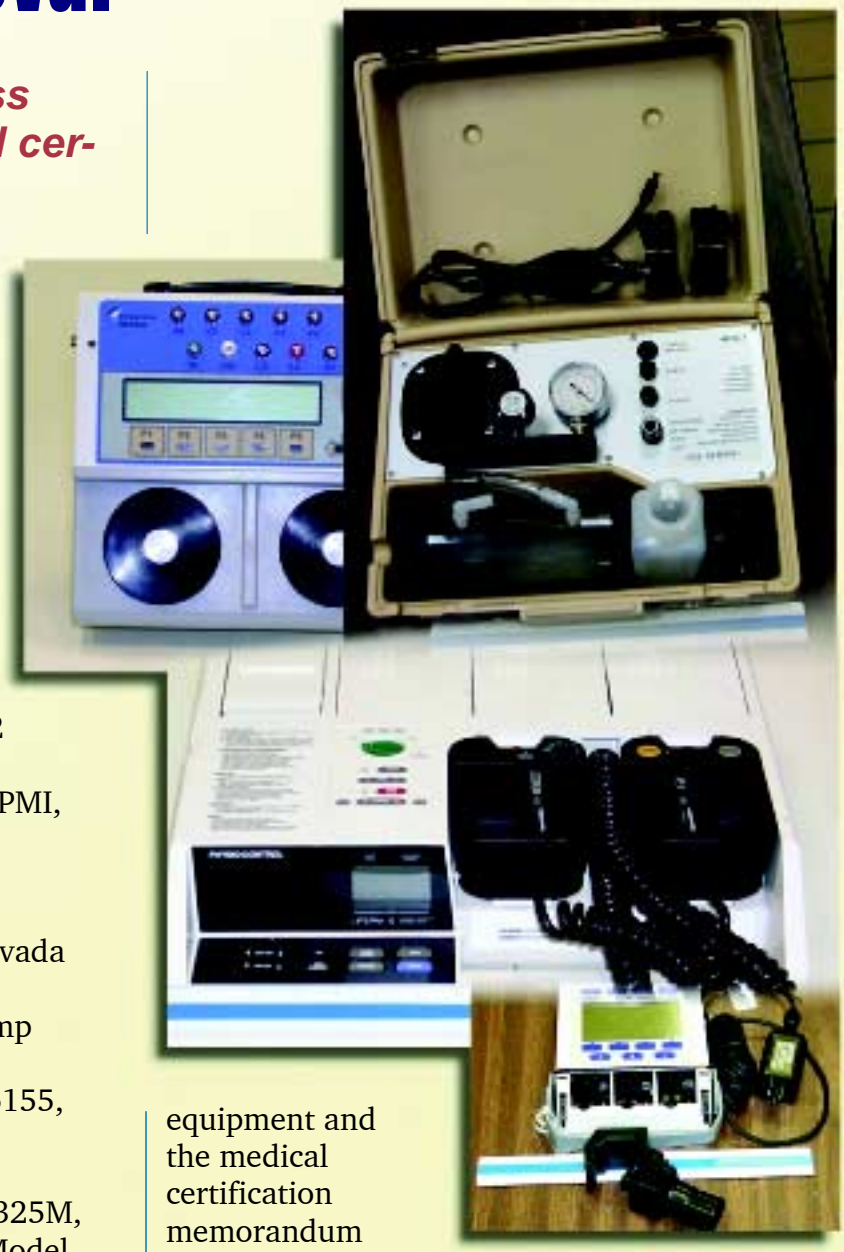
■ Finally, store each wrench in its own box. Never throw one into a tool box with other tools. You'll damage it every time.

Questions about TMDE calibration? Check with your local TMDE coordinator.

—PS Magazine No. 586

In-Flight Medical Electronic equipment gets AWR approval

Notification of Airworthiness Release (AWR) and medical certification of in-flight medical electronic equipment.



The following medical equipment has been approved for use aboard UH-60A MEDEVAC Helicopters by the U.S. Army Aviation and Missile Command (AMCOM), and the U.S. Army Medical Research and Materiel Command (MRMC) as a result of the Airworthiness Certification Evaluation (ACE) completed at the U.S. Army Aeromedical Research Laboratory (USAARL) in accordance with AR 70-62 and AR 40-61:

- The Physio Control Lifepak 10-59PMI, NSN 6515-01-480-9614
- Lifepak 10-62PMI, NSN 6515-01-481-0245
- Defibrillator/Monitor, the DNI-Nevada Patient Simulator
- Alaris MedSystem III Infusion Pump 2863B or 2865B
- BCI 3303GR, NSN 6515-01-489-6155,
- Pulse Oximeter
- Impact 754 Ventilator
- Impact Portable Aspirator Model 325M,
- Impact Portable Suction System Model 326/326M,
- Unitron Portable Power System, 60 Hertz (Hz) Converter Adapter Plate
- Propaq 106EL/206EL Vital Signs Monitors.

For additional information on the Airworthiness Release (AWR) issued by AMCOM for UH-60A MEDEVAC Helicopters, equipped with the above medical carry-on equipment and the medical certification memorandum approved by MRMC, visit USAARL website (www. USAARL. army.mil). The USAARL POCs for ACE are Dr. Khalid Barazanji, (334) 255-6888, DSN 558-6888, khalid.barazanji@se.amedd.army.mil; or CW3 David Talarczyk, (334) 255-6909, DSN 558-6909, david.talarczyk@se.amedd.army.mil.

—RAFAEL C. MONTAGNO,LTC, MS, Director, MEPD (334) 255-1166/1170
rafael.montagno@se.amedd.army.mil

NEWS & notes

SI/FI Conference

The Directorate of Evaluation and Standardization (DES) Utility and Cargo branches recently hosted a conference for Standardization/Flight Instructors (SI/FI) at Fort Rucker. 125 attendees from as far away as Korea came together to share information, training techniques and updates with other experts in the SI/FI community. Attendees got updated on Aeromedical training, ambiguous areas of non-rated crewmember standardization issues, and Aircrew Training Program Management.

Hopes are to make this an annual event. Many requested more classes on individual aircrew training folder (IATF) management and record keeping, and incorporation of the altitude chamber with the Aeromedical training. Other future topics may include NVG tours and classes, written evaluation development, standing operating procedure (SOP) development, fundamentals of instruction, and Army regulations.

—SFC Robert Cashin, DES, DSN 558-1780 (334) 255-1780, cashinr@rucker.army.mil

Attention MEDEVAC Commanders and Standard-ization Officers

Senior leaders within the Medical Service Corps agree, now more than ever, on the importance of representation for Aeromedical Evacuation in Army Aviation Standardization.

Operational requirements continue to increase for active and reserve component MEDEVAC units without a commensurate increase in resources. In light of recent events, and a possible commitment to homeland security, Aeromedical evacuation assets are stretched to their limits.

As a result, and in the interest of safety and standardization, the Medical Service Corps Advisor position at the Directorate of Evaluation and Standardization (DES) is now filled; CPT Kenneth S. Helgren is now the MSC Advisor at DES. CPT Helgren is available to you, the MEDEVAC Commander to assist, research or answer any standardization related questions or issues you or your Standardization Officers have.

Questions or comments can be addressed to CPT Helgren at the Directorate of Evaluation and Standardization, Building #4503, Room 119, Kingsman Street, Fort Rucker, AL 36362. His phone numbers are (334) 255-1446, DSN: 558-1446, FAX: 255-2770. email; kenneth.helgren@us.army.mil. Look for CPT Helgren at the 2002 Army Medical Evacuation Conference in February.

NOTICE: HEMTT Tanker—Fuel Line Elbow

One problem we are seeing that continues to surface on FORSCOM Aviation Resource Management Survey (ARMS) is the HEMTT Tanker (M978) fuel line elbow being in contact with the V5 valve. There is a compliance problem with TACOM Safety of Use Message (SOUM) 94-07, partly because an illustration was not provided. Since then, the Army Petroleum Center has obtained a TACOM illustration on how to solve the deficiency.

The key to the solution is cutting off the bolts at the jam nut, and use metal bands (2 each) to support the pup joint. (See illustration.) If the bolts have already been cut off and you do not use the metal bands, over time the fuel line elbow will drop onto the coupler, or onto the valve itself. This will start chaffing until a groove is worn into the elbow. This can eventually cause a hole to be worn in the fuel line elbow, causing a fuel leak and potential fire.

Help us get the word out. Regardless of unit type, non-compliance increases the risk of a leak which becomes an environmental and a safety issue. Have your maintenance and POL folks ensure compliance with TACOM SOUM 94-07.

—Jim Lupori, US Army Petroleum Center, DSN 771-6445 (717) 770-6445, jlupori@usapc-emh1.army.mil

Use bands to support pup joint.

An accident waiting to happen.

Cotton or not?

"Required items: ID tags, serviceable flight gloves, cotton underwear." How many times a year do we as aviators hear a version of this sentence in a pre-mission crew brief? The truth is, most of us probably read through it without really giving much thought to being caught in a flash fire.

If you ever have the opportunity to speak to someone that has lived through such an experience, it will change your outlook! I was stationed with a fellow aviator who was shot down in Somalia. As he recalled his experience, he showed us the injuries he had received, even with the proper clothing items.

You might say "I purchase all of my uniform requirements at the Military Clothing Sales facility, so I'm good, right?" The answer is—maybe yes, maybe no.

I recently discovered that I could no longer get 100 percent cotton boot socks. I tried for black, green, even white. As I checked further, I was told that cotton socks could not be ordered. Apparently the introduction of synthetics had nosed out 100 percent cotton clothing items.

This situation has carried over to brown tee shirts and underwear sold by Military Clothing stores. While some are 100 percent cotton, some are 50/50 blends.

I have been informed that most clothing sales stores are aware of our requirements and are working to phase out the blends. Fort Rucker, Fort Campbell and Fort Stewart have placed special orders for 100 percent cotton black boot socks. (Now, if we could just get the one-piece flight suits!)

This may seem like a trivial issue to you—unless you know someone who has been caught in a fire. Wearing 100 percent cotton next to your skin can make all the difference to your survival. Please take time to check the labels.

—Merle D. Goodall, Fort Campbell, KY 42223 (270) 798-2746

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class C

A model

■ While on final approach to landing with a simulated engine failure, a student pilot oversped the good engine. Engine torque on the operating engine reached 128% for approximately one second, 2 percent above the limit. The IP took the controls and increased collective to load the rotor system and control the overspeed. The IP landed the aircraft without further incident.

■ During simulated single engine failure, the No.2 engine exceeded torque limits.

Class E

A model

■ During day RL progression training, crew was conducting HIT check when Master Caution and Shaft Driven Compressor (SDC) segment light illuminated. Crew immediately completed a hard shutdown without further incident. Investigation revealed failure of the SDC pressure switch. SDC pressure switch was replaced.

CH-47

Class C

D model

■ Instructor pilot simulated single engine failure by pulling No. 1 engine offline. The PI on the controls adjusted torque between 100-110%. As aircraft approached base leg altitude, PI increased thrust to arrest descent. Torque increased to 140-150 %. (Limit is 123 %.) IP immediately reduced thrust below maximum and aircraft was landed without further incident.

Class E

D model

■ During hover flight, Master Caution flickered followed by a left rectifier segment light. The aircraft returned to the parking area and was shutdown without further incident. Maintenance found moisture in the master caution panel. Master caution panel was replaced and aircraft was returned to service.

OH-58

Class B

D-R model

■ During NOE flight, while repositioning to an OP, aircraft struck a tree. Hard landing resulted in substantial damage to three of the main rotor blades, the landing gear, the mast turret assembly, and the fuselage.

Class C

A model

■ During engine start, TOT peaked at 1000 degrees Celsius. Aircraft was shutdown without further incident.

D-I model

■ During engine start, engine temperature peaked at 1079 Celsius. Aircraft was shutdown without further incident, engine being replaced.

■ During test flight in minus 14 degree Celsius weather, crew had difficulty with the computer and desk unit (CADU) causing the battery to become weak. Aircraft was shutdown to allow CADU battery charge. After minor delay, the maintenance pilot (MP) elected to run-up the aircraft to check the CADU function. During the run-up procedure, the MP noticed that the throttle was stiff. The engine began to accelerate abnormally and the turbine gas temperature (TGT) rose through 200 degrees Celsius. The MP executed an emergency shutdown by turning the fuel handle valve off. Engine continued to accelerate until the MP used both hands to close the throttle. All TGT strips were illuminated, and Engine Monitor page showed TGT at 1047 degrees Celsius for 3 seconds. There was no residual fire. The accident board determined that the aircraft's prolonged exposure to the cold temperatures allowed moisture on the throttle cable and fuel control to freeze, rendering the throttle difficult to move.

D-R model

■ IP was demonstrating manual throttle operations from the left seat. At the termination of the approach, IP switched from manual throttle to auto. Engine subsequently overtorqued to 143% for 6 seconds and mast torque reached 142% for 4 seconds. Aircraft was landed without further incident.

RC-12

Class E

N model

■ During taxi for run-up checks, aircrew experienced difficulty steering and noticed the tire on the nose wheel was flat. Aircraft was shutdown without further incident. Maintenance replaced nose wheel tire.

UH-1

Class E

H model

■ Aircraft's transponder malfunctioned during cruise flight. Aircraft landed without further incident. Maintenance replaced transponder control head, and released aircraft for flight.

UH-60

Class C

A model

■ During OGE rescue hoist operations in mountainous terrain using night vision goggles, aircraft drifted aft and downward. Left aft portion of main rotor blade came in contact with trees. Major damage to all four tip caps of the main rotor system, as well as one of the leading edge nickel abrasion strips. Debris was also thrown into the tail rotor system, damaging three tip caps on tail rotor paddles. The aircraft was landed without further incident.

K model

■ During approach to elevated site, aircraft's main rotor blade struck terrain. Damage to all four main rotor blade tip caps.

L model

■ Aircraft contacted tree during approach to landing strip. Stabilator damaged.

Haven't gotten around to filling out all those forms?

You know you need to tackle that issue that's been nagging at you. Wouldn't it be great if you could just take care of it on the computer?

If you've been held back by the dread of filling out DA Form 2028 or Product Quality Deficiency Reports (SF 368), help has arrived! A new Army electronic deficiency reporting system has just been put in place. Here's where to send them.

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DA Form 2028

The DA Form 2028 can go several ways:

Snail Mail:
Commander, AMCOM (US Army Aviation and Missile Command)
AMSAM-MMC-LS-LP, B-5301, Room 1128
Redstone Arsenal, AL 35898-5230

E-Mail: ls-lp@redstone.army.mil
FAX: DSN 788-6546/Commercial 256-842-6546
Web Access: www.uhpo.redstone.army.mil

The point of contact is Dale A. Lowe. . He can be reached at DSN-746-7758/Commercial 256-876-8858.

High Flight

Oh, I have slipped the surly bonds of earth
And danced the skies on laughter-silvered wings

Sunward I've climbed, and joined the tumbling mirth
Of sun-split clouds—and done a hundred things
You have not dreamed of—
Wheeled and soared and swung
High in the sunlit silence. Hovering there,

I've chased the shouting wind along, and flung
My eager craft through footless halls of air.

Up, up the long delirious burning blue
I've topped the windswept heights with easy grace

Where never lark, or even eagle flew.
And, while with silent, lifting mind I've trod

The high untrespassed sanctity of space,
Put out my hand, and touched the face of God

—Pilot Officer John G. Magee, 1941

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

FEBRUARY 2002 ✦ VOL 30 ✦ NO 2

Flight into TRANSFORMATION

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

US Army RAH-66 photos by: Rich Zellner

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Thanks for what you do everyday

Flightfax is frequently a vehicle where we openly discuss Army aviation in a critical manner as we describe failures of equipment or human error that resulted in tragic accidents, which in turn resulted in our accident rates climbing. We tend to share the bad news—and fail to balance it with the good.

Too often, we let numbers and rates be the focus of our stories. I'm setting the record straight: numbers and rates are but one measure of success. The real essence of Army aviation, and the Army itself, lies in its people. This month, I want to personally recognize and pay tribute to the dedicated, skilled professionals who make up our aviation units.

I could take just about any aviation unit in our Army and use it as an example of great training, outstanding leadership, or even superior maintenance. Based on limited space, I would like to briefly talk about just two shining examples of our great aviation units.

First, I would like to recognize the outstanding soldiers and leaders in the 160th Special Operations Aviation Regiment. It is no secret that this unit clearly represents the idea of tough, tactical training that produces a truly combat ready outfit. I am routinely in absolute awe of what these aviation professionals consider a routine mission. For years, they have led the way in the development of night operations and precision flying. You do not accomplish what this unit has, and continues to accomplish, without technically and tactically competent leadership. We should be proud that "US Army" is stenciled on the left breast pocket of each our 160th soldiers.

Second, I would like to reflect on some of the great things that are going on in the l01st Airborne Division. Led by a great Army Aviator, MG Dick Cody, the 101st routinely sets the standard for real air-ground integration. The air assault concept was developed in the 1960's, but I think it has reached its most effective state with the outstanding training that is currently underway in the division. Integrating sound maintenance procedures has increased their ability to train more realistically and with more frequency. When you couple the mobility of the aircraft and the toughness of the infantry soldiers in the 101st, I think you have an unstoppable combination.

Both of these units push the envelope in training and preparation for combat. My hat is off to them. I am proud every day when I watch the news and read the reports of the exploits of these units in the current conflict.

To all the great soldiers in the 160th Special Operations Aviation Regiment, in the l01st Airborne Division, and in all of our other outstanding aviation units, thanks for what you do every day. With great pride, determination, and professionalism, you fulfill your commitment to keep our nation safe, strong, and free. "Above the Best" isn't just our aviation song, it is what you are. **Train Hard—Be Safe**!

BG Simmons,
Director of Army Safety

Aviation in the 21st century

Transformation accelerated

An accelerated aviation modernization plan predicts that by the end of 2004, the Army's operational fleet will consist of only four types of helicopters: the AH-64 Apache, the UH-60 Black Hawk, the OH-58 Kiowa Warrior, and the CH-47 Chinook.

The AH-64 Apache is the Army's attack helicopter. By the end of 2002, attack helicopter battalions in heavy divisions will be restructured from 24 to 18 AH-64 Apaches. Corps level attack battalions will be converted from 24 to a maximum of 21 aircraft.

The UH-60 Black Hawk will remain the foundation of the Army's utility helicopter fleet. To have the capability required for the Objective Force, the Army will continue to recapitalize and upgrade the UH-60.

The CH-47 Chinook will continue to provide medium/heavy lift capability for the foreseeable future. The CH-47F model upgrade program is slated to begin in early 2003.

For the long-term, the RAH-66 Comanche remains the Army's highest aviation priority and is the centerpiece of Army aviation objective force transformation. Comanche will provide the commander on the ground with more timely and accurate information about tactical situations. Comanche provides the ability to orchestrate devastating firepower and synchronize mobile security, even in the most challenging operational environments.

The plan, the result of a two-year effort, contains specific guidance to accelerate the retirement of older, "legacy aircraft" from the Vietnam era. It allows the Army to compress the procurement timeline of the Comanche aircraft and moves newer helicopters into National Guard and Army Reserve units sooner.

The Chief of Staff of the Army has established a goal of attaining a 90 percent mission capable rate, in contrast to the current fleet average of 75 percent.

The Army's plan will reduce the total number of aircraft by more than 400 in the active force, and 600 in the reserve forces. This includes accelerating the retirement of the UH-1H Iroquois "Huey" helicopter and of the AH-1F Cobra attack helicopter.

—adapted from an Army news release

This just in: "Aviation Transformation Update"

An Aviation Transformation strategy was briefed to the Chief of Staff of the Army (CSA), GEN Eric Shinseki on 4 January 2002. The briefing finalized the Army Aviation Interim Transformation Structure, and presented a detailed implementation plan. The CSA approved the implementation plan, starting in FY02. The implementation plan included funding associated with transformation, elimination of Fort Rucker IERW backlog, and limited aviation unfunded requirements (UFRs) associated with transformation.

There are four open issues requiring further effort and staffing associated with transforming aviation to the interim structure:

- A strategy and feasibility analysis to achieve a 90% mission capable rate in Army aviation.
- A complete review of TDA aircraft distribution plans to include the CTCs, ATEC, and MEDEVAC.
- TRADOC in concert with the DA Staff is developing and O&O plan that will set the required capabilities for our fixed wing force and where it can best be positioned to meet operational requirements.
- Detailed memorandums of agreement (MOA's) between Active and Reserve Component aviation units to facilitate aircraft transfers.

The Army's Aviation transformation to the interim force structure focuses resources on maintaining our war fighting capability by divesting of legacy aircraft and investing in objective force systems and capabilities.

Safety and the Army Transformation Campaign—RAH-66 Comanche Design

The overarching theme of the Army Transformation Campaign is that the soldier is centric to all future combat systems. The Manpower and Personnel Integration (MANPRINT) Program is the Army's executive safety program for ensuring the soldier is centric during materiel development. The RAH-66 Comanche is the Army's model MANPRINT program. Comanche is making great strides in Human Engineering, System Safety and Soldier Survivability.

Human Engineering

Human Engineering ensures that aviators, maintainers, and support personnel are all being considered in the RAH-66's development. Comanche's design will mitigate many hazards that have caused accidents in legacy aircraft. Aviation ground support systems are also being considered as part of the Comanche's overall development process. Improvements include integrated work platforms, onboard Fault Detection/Fault Isolation (FD/FI) diagnostics, and modular Line Replaceable Units (LRU). Identifying operational challenges, considering them during the design phase, and engineering systems that mitigate or eliminate hazards reduces the risk to the soldier.

System Safety

System Safety is the process of mitigating risk by controlling hazards through design. Comanche is applying this philosophy to force protection. While adaptation of System Safety principles has led to fewer physical hazards, new and often more complex hazards involving the human-to-machine interface are emerging. Situational Awareness and Soldier Machine Interface (SA/SMI) requirements and expectations are among these. The ability to gain and maintain information dominance in the future's battle space requires the soldier to receive, analyze, and transmit large amounts of digital information. The RAH-66 Comanche's Mission Equipment Package (MEP) provides a glimpse into the future of SA/SMI for the Army. Correct development and integration of future combat system's SA/SMI is critical to the

safety of our soldiers. The ability to gain and maintain information dominance will be key to mitigating risk on the digital battlefield.

Soldier Survivability

Soldier Survivability describes the characteristics of a system meant to reduce fatigue, detectability, damage, injury and fratricide. The Comanche is designed to minimize these factors.

Fratricide is the most complex challenge. The ability to provide an accurate common operating picture to all members on the digital battlefield will greatly reduce the possibility of friendly fire incidents. A soldier who is overwhelmed with information will quickly become combat ineffective and inevitably induce fratricide hazards into the digital battlefield. The soldier must remain in the decision loop; however, some decisions that are based on correlation of factual data will be automated. Routine decisions will be made by onboard software and executed. Critical tasks requiring human intervention will be presented to the pilot for a decision. Comparable technologies are also being applied in the areas of supportability. Embedded Fault Detection/Fault Isolation self-diagnostics will all but eliminate troubleshooting procedures while Line Replaceable Units will reduce aircraft downtime and the maintainer's workload.

One of the primary goals of the program is to increase situational awareness and reduce pilot workload through automation. Automation, in the form of the Aided Target Detection Classification system (ATDC) as well as the Automated Flight control system (AFCS), means the aircraft is going to be there for them.

Comanche will empower the commander, leader, aviator, and maintainer to project a more capable, integrated, and lethal force. The result of this will be more decisive engagements and increased force protection. *We don't want a fair fight.* The ability to dominate the enemy both physically and mentally is the goal. Comanche pilots as well as other future combat system operators will benefit from equipment that is being designed with them in mind.

—CW3 Mark A. Martin, Assistant, TSM-Comanche MANPRINT/System Safety Officer
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Is the glass cockpit safer? Researchers look at accident rates

Digital technology is the wave of the future for Army aviation. On the crest of this wave is the use of multifunction displays (MFDs) to replace traditional dedicated cockpit instruments. These MFDs integrate the information previously provided by electro-mechanical instruments, with the speed and processing power of microprocessors and the adaptability of cathode ray tubes (CRTs) and/or flat panel technology displays.

A single MFD can be configured to provide some or all of the information needed for navigation, communications, weapons systems management, and aircraft control. The cockpit design based on MFDs has given rise to the phrase "glass cockpit."

Automation and the glass cockpit design have been in use in commercial aviation for some time with great success and increased safety. However, Army helicopters fly entirely different missions in more demanding flight environments. Therefore, it is reasonable to ask if the current trend in cockpit redesign has been a safe and successful one for Army aviation.

To take the first step in answering this question, researchers at the US Army Aeromedical Research Laboratory (USAARL),

working in collaboration with the US Army Safety Center (USASC) and the Aviation Branch Safety Office (ABSO), compared accident rates for models having traditional dedicated instrument cockpits, and those having glass cockpits.

The US Army has integrated the glass cockpit design into four aircraft series: the AH-64 Apache, the UH/MH-60 Black Hawk, the CH/MH-47 Chinook, and the OH-58 Kiowa. The glass cockpit models of these aircraft are designated as the AH-64D, MH-60K, MH-47E, and OH-58D. In addition, there are two hybrid crewstation configurations that mix MFDs and dedicated instruments, the MH-47D and the MH-60L.

The accident frequencies and flight hours were obtained from the Risk Management Information System (RMIS) maintained by the USASC. Accident rates were calculated for several different time periods. However, rates based only on the period for which accident data and flight hours were available for all aircraft models investigated (FY98-FY00) were considered to be the best rates for comparison. These rates are presented in the accompanying chart. Accident rates are expressed as accidents per 100,000 flight hours.

The highest accident rate across all models in the study was 23.00 for the glass cockpit AH-64D; the second highest accident rate was 21.32 for the hybrid cockpit MH-47D. For dedicated cockpit models only, the highest rate was 18.36 for the AH-64A. For the two hybrid models, the highest rate was 21.32 for the hybrid cockpit MH-47D. The highest glass cockpit rate was 23.00 for the AH-64D.

An inspection of the chart shows that glass cockpits models had greater accident rates as compared to dedicated cockpit models for three of the four aircraft series. The exception is the CH/MH-47, where the rate for the hybrid model is greater than for both the dedicated and glass cockpit models.

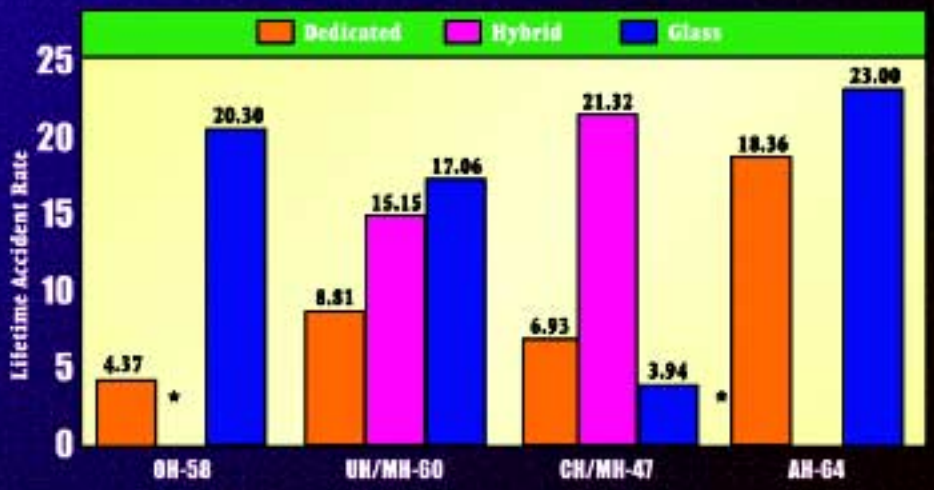
Taken overall, the findings of this study suggest that there is reason to be concerned that aircraft with hybrid or glass cockpits have higher accident rates than aircraft with traditional dedicated cockpits. However, great care must be taken in drawing this conclusion.

First, statistical tests found that the higher glass cockpit rates were significant *only* for the OH-58D. There were insufficient flight hours for the other glass cockpit models to make their higher rates statistically significant.

Finally, higher accident rates for glass cockpit models *do not* imply that the cockpit design alone is the cause. There are several other possible explanations. These include: differences in aircraft handling qualities, added systems that increase workload, poor organization of data on the MFDs, or perhaps, aircraft models with enhanced capabilities, such as the use of MFDs, engage in riskier missions.

The complete accident study can be viewed at **www.usaarl.army.mil** by entering the Technical Reports section and searching for USAARL Report No. 2001-12.

—Clarence Rash, physicist, USAARL, DSN 558-6814 (334) 255-6814, Clarence.Rash@se.amedd.army.mil



Note: Asterisk denotes no hybrid model exists for this aircraft series. Accident rates for all accident classes combined by aircraft series for FY98-FY00.

Black Hawk REBUILD

Recapitalization program upgrades UH-60s

In 1978, when the first UH-60A Black Hawk rolled off the production line, the Army had its first new utility helicopter since the UH-1 Iroquois (Huey) was introduced in 1959.

The Army originally planned to build a new aviation system every 20 years because that's about how long it can safely expect an aircraft to last the rigors of training and battle. Now, however, the Army plans to retire all UH-1Hs by the end of FY04, but there is no new utility helicopter in the works to replace the Black Hawk. So what's an Army to do if it intends to have utility aviation support in the Objective Force of 2020? The answer is recapitalize the Black Hawk: strip it down to its airframe, rebuild it with components to meet the Army's current and future operational requirements and give it at least 20 more years of life.

That's a tall order. Today's Army has 964 UH-60As and about 567 UH-60Ls. The main differences between the two models are the UH-60L has T-701C engines with more horsepower than the A model's T-700 engines. The L model also has an improved durability gearbox.

"Black Hawk recapitalization will be a blocked, evolutionary approach" according to COL Bill Lake, Utility Helicopter's project manager at the US Army Aviation and Missile Command (AMCOM). Because the UH-60 is the Objective Force utility aircraft, we have developed a program to rebuild the Black Hawk to give it better capabilities, more durability, and 20 years more service to our Army.

This recapitalized Black Hawk, designated the UH-60M, will use some components of the older A and L model's, such as the Improved Durability Gearbox, that can be expected to support it through its new life cycle. The UH-60M will include many new features such as the more efficient T-701D engines, the Wide Chord Blade main rotor system, improved crashworthy seating, an integrated cockpit with digital displays, improved digital flight control computers, Dual Embedded Global Positioning and Inertia Navigation (EGI), active vibration suppression, improved aircraft survivability equipment, improved transportability, and a redesigned and fully crashworthy main and auxiliary fuel system.

Last year the Defense Acquisition Board gave the UH-60M recapitalization effort a green light to proceed toward system development and demonstration. Four prototype UH-60Ms will be produced under a contract awarded to Sikorsky by AMCOM in May 2001. Under this contract, Sikorsky will convert a UH-60A into a UH-60M, a UH-60L into an M model, a UH-60A (medical evacuation) into an M model, and build a new production M model from scratch.

Currently in its development and demonstration phase, UH-60M will enter low-rate initial production in FY04 and eventually increase production to about 90 aircraft per year until 2020. A total of 1217 UH-60A and L aircraft will be recapitalized to the UH-60M. New built UH-60M will be "cut-in" to the existing UH-60L production line in order to grow the Utility Helicopter fleet size to meet interim and objective force requirements.

The introduction of the UH-60M means more than just another 20 years of life for this utility workhorse. The M model will bring increased operational capability to our utility helicopter fleet while reducing operation and support costs by more than $500 per flight, hour compared to the A model.

Black Hawk update

Teardown has begun on the first three Army Black Hawks slated for upgrade to the new UH-60M configuration.

The two UH-60As and one UH-60L mark the first aircraft officially inducted into the Army's comprehensive Black Hawk recapitalization program.

The first aircraft scheduled for upgrade is a UH-60A manufactured in 1985. It last served with the 507th MEDEVAC at Fort Hood, Texas. The second is a UH-60L from Fort Stewart, Ga. that was built in 1989. The last is a UH-60A manufactured in 1977 that was the third production Black Hawk to roll off Sikorsky's assembly line. It last served the Naval Test Pilot School in Patuxent River, MD. It will be upgraded to the UH-60M MEDEVAC configuration.

Sikorsky will also install a new glass cockpit with four multi-function displays, two control display units, a modern flight control computer, a new avionics suite, and a narrower instrument panel that will significantly improve chin bubble visibility. In addition, the aircraft will be fitted with a new cabin and transition section that uses high-speed machine frames, which reduce the cost and complexity of the cabin.

The UH-60M composite spar wide-chord blade will provide 500 pounds more lift than the current UH-60L blade. The new General Electric T700-GE-701D engine currently under development by the Army will add an additional 400 to 500 pounds lift.

The maiden flight of the first UH-60M is scheduled for 2003. After completion of the first four aircraft, work on the initial production UH-60M aircraft will begin in 2004, and will eventually increase to 90 aircraft inducted per year by 2012.

—James Hawkins, UHPMO, 256-955-0231 DSN 645-0231
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Letter from the field – Airborne Weather Radar

The November issue of Flightfax Magazine included an article titled "More or Less on Radar." The article describes an airborne procedure in which the pilot can allegedly determine the strength of the Electro Magnetron Tube (EMT). This is not an OEM or Army approved procedure nor is it a valid/accurate method to determine EMT power.

PM Fixed Wing has researched this procedure and queried several Wx radar OEMs, and numerous aviation radar experts/engineers to include Steve Sweet from Honeywell and Archie Trammell. Their comments are summarized below:

- Not a valid procedure.
- Procedure could show reduced power levels, however, reduced power levels could be the result of a bad receiver, RADOME, Magnetron or several other components in the radar system.
- Procedure is not accurate - degree of error is so large, it could show new radar with 100% power, only producing 70% power.

Many pilots have the understanding that because this was published in Flightfax, that this procedure is OEM and/or Army approved. OEM procedures are currently the only approved way to check for proper operating Wx radars. This can only be done with approved test sets or through OEM bench tests. Since this article was published, the field has seen a surge of Wx radar write-ups in the logbooks, with the Flightfax procedure the reason for the write-up. This is having a detrimental impact on readiness and O.R. rates.

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EDITORS NOTE: **All technical articles published in Flightfax are thoroughly reviewed for correctness. The staff consults a variety of SMEs in an effort to preclude printing any misinformation, however, at no time should it be construed that an article published in Flightfax supercedes Army doctrinal publications to include FM's, TM's or AR's.**

Commanders Safety Course mandatory before taking unit command

A new Commanders Safety Course for officers, selected to command units from company through brigade, will give commanders the tools they can use to build their unit safety programs through all levels of command.

Completing the Commanders Safety Course will become a pre-command requirement once it comes online within the next three months.

The idea behind the course is to allow a brigade commander to know that his company commanders, by completing the course, have been grounded in building and conducting unit safety programs.

Those officers selected for battalion and brigade command will also be required to complete the course before beginning the Pre-Command Course at Fort Leavenworth, KS.

"This program is also for the young lieutenant who has not had any safety training and he's saddled with being a collateral duty safety officer," said Dwight McLemore, Training and Doctrine Command Safety Office. "He can learn how to do his additional duty job really fast, and he meets the pre-command requirement, too."

But it's much more than a safety course, according to LTC Steven Foley, Schools Division Chief, Training and Doctrine Command.

"The Army leadership told us to give commanders, command sergeants major and first sergeants the tools and knowledge to implement and manage a unit safety program to incorporate risk management in everything they do," he said.

Risk Management is the first tool. According to Foley, this program helps identify hazards as well as control measures to minimize risk involved in unit and individual actions and duties.

The second one is the Unit Safety Program. It uses an example of an outstanding unit safety program from the 2nd Airborne Brigade, Fort Bragg, which was approved by the Forces Command Inspector General. Students will be able to build their own unit safety program using data gathered from an enormous Army safety program reference list.

The last tool is a resource navigator, a portal through the Army Safety Center. The navigator contains the URL (Uniformed Resource Locator) links to "just about everything about safety that we can identify," Foley said. "That means if I'm writing a risk management assessment for a road movement, I look up control and hazards for that activity," Foley said. "If some other guy elsewhere who's using the tool at the same time thinks up hazards that I didn't think of, my computer will be automatically updated with those hazards." That happens because the tool is collecting and storing data, not only internally to the local area network, but also externally in a large data bank that will be part of this program. Users will be able to take those tools with them after completing the course, by either downloading from the Reimer Digital Library, or by requesting a CD-Rom from the Army Training Support Center at Fort Eustis, VA.

The Commander's Safety Course was created as a result of a directive from Gen. Eric K. Shinseki, Army Chief of Staff, to the Army Safety Center and TRADOC. He wanted a course that could help commanders identify and reduce needless accidents and deaths of our soldiers. He also wanted a course that would qualify an officer, sergeant major or a first sergeant to perform safety program duties and invigorate risk management training and programs within the institutional and operational Army.

—Jim Caldwell, TRADOC Public Affairs Office

(Editor's note: The Safety Center is the proponent for the course. Dr. Brenda Miller developed the Program of Instruction and TRADOC built upon that to develop the distance learning product.)

Care and feeding of your OH-58 Data Transfer devices

The OH-58D is equipped with a Data Transfer Cartridge (DTC) or a Data Transfer Module (DTM). These cartridges transfer and store mission planning data. A portion of the cartridge is also used to record real-time flight data and can be extremely useful in providing data in the event of an accident or incident. In many cases the data output has served as an analytical maintenance tool for the maintenance officer or aviation safety officer. In numerous cases, analysis of the data confirmed that limits were not exceeded during an incident. Normally, the end result was that data confirmed that a component did not need to be replaced.

Data extracted from the cartridge can also be used to simulate the last minutes of flight during accident investigations. For example, on request, the US Army Safety Center (USASC) can convert data sets into a flight visual program using *FlightVis*®. This capability is extremely useful during accident investigations or pilot safety and standardization meetings and mishap debriefings. The program recreates flights using real-time datasets generated from decompressed data files from the DTC/DTM.

It's only as good as it is maintained

During several recent OH-58D accident investigations, the DTMs/DTCs were found to be blank or void of useable data when post accident download was attempted at the USASC. Inspection of these cartridges indicates units are *not* complying with the guidance in OH-58-00-ASAM-03 (False Engine Out Warnings).

In addition to providing guidance on false engine out indications, the purpose of this ASAM is to also ensure batteries for the data transfer cartridges are replaced on a regular basis so that data is accurately recorded.

If available, a DTC/DTM should be installed prior to every flight. Batteries will be replaced every 30 days and the 30-day battery requirement will be annotated on a label attached to each DTC. There is no standard for labeling; however, the cartridges should be annotated with the date of the last battery change and this should be checked on preflight inspections.

Many units have varying policies on DTC/DTM use and storage/handling. In some units, they always remain in the aircraft, and in some units, the DTC/DTMs are issued by operations personnel, much like aircraft keys. Regardless of the way your unit controls DTC/DTMs, the bottom line is you should insure the battery has been replaced every 30 days. Remember, the DTC/DTM is only as good as it is maintained.

In the event of an accident, secure the accident scene and *do not* attempt to remove the DTC/DTM from the aircraft unless instructed to do so by the accident investigation team. *Do not* attempt to apply power to the cartridge or otherwise read data or transfer data. If the DTM/DTC has been removed it will be secured IAW AR 385-40. Prior to mailing the cartridge to the USASC, call DSN 558-3410/2660 for shipping and handling instructions.

—Major Mike Cumbie, Aviation, USASC and Doyle N. Wootten, Flight data recorder analyst, COBRO, US Army contractor, doyle.wootten@safetycenter.army.mil

Plan Annual Training With Safety In Mind

Well, it's that time of year again. The annual training plan and training calendar have long been submitted and approved, and now it's time to start detailed planning for annual training (AT).

In order for the reader to gain the proper perspective on this issue, understand that Army Reserve (AR) and National Guard (NG) soldiers do not conduct training like their active duty brethren. Our active duty contemporaries usually train every day. While we adhere to the same tasks, conditions, and standards, our program requires breaking the tasks into blocks lasting about two days, sandwiched around two-to-four week periods of "leave." It is the lack of continuous training time, in a highly technical/tactical skill with no equivalent in the civilian job market, that makes AT no simple task. This is a real challenge for Reserve Commanders.

Each AT session represents a period of intense training. Leaders need to remind their soldiers that they are accountable for their actions, and self-disciplined performance to standard can have the greatest impact on accident prevention. Planning with safety in mind is a sure-fire prerequisite to successful training.

Command Climate

The first step is to develop a command climate that permeates safety throughout the organization. Make it clear that standards must be adhered to, and that supervisors enforce them. This philosophy has to start from the top, and be executed from both—top down and bottom up.

FM 100-14, *Risk Management*, states that risk management must be integrated into mission planning, preparation and execution. Leaders and staffs must continuously identify hazards and assess both accident and tactical risks, then develop and coordinate control measures. This process applies to AR/NG units as well as active component units.

Supervision

Tough, realistic training conducted to standard is the cornerstone of Army warfighting skills. Our mission demands high-intensity field training in a realistic combat environment, and the potential for accidents is high. As leaders, you've been around long enough to see fenders dented, fingers pinched, and ankles twisted. Unfortunately, some leaders have seen worse—and have attended the funerals that resulted. Supervision is the key to preventing accidents. Simply put, leaders can reduce accidents by consistently enforcing standards in training and discipline.

Rules to remember

Rule No.1: No unnecessary risk should ever be accepted. The leader who has the authority to accept a risk has the responsibility to protect his soldiers and equipment from unnecessary risk. A risk that could be eliminated or reduced and the mission still be accomplished is an unnecessary risk and must not be accepted.

Rule No. 2: Risk decisions must be made at the appropriate level. The leader who's going to have to answer if things go wrong is the leader who should make the decision to accept

or reject the risk. In some cases, that will be a senior officer. In many cases, it will be a first-line leader. Small-unit commanders and first-line leaders are going to make risk decisions in combat; as much as possible, they should make risk decisions in training.

Rule No. 3: The benefits of taking a risk must outweigh the possible cost of the risk. Leaders must understand the risk involved and have a clear picture of the training benefits to be gained from taking the calculated risk.

Advantages of risk management for leaders

- Detect risks before losses.
- Quantify risk.
- Provide risk control alternatives.
- Better decisions.
- Greater integration of safety.
- Increased mission capability.

Risk management is, in reality, a smart decision-making process, a way of thinking through a mission to balance training needs against risks in terms of accident losses. Once understood, it is a way to put more realism into training without paying a price in deaths, injuries, and damaged equipment.

The US Army Reserve Command (USARC) teaches risk management four times annually and the Army Safety Center can assist with risk management instruction on a unit-by-unit basis.

—POC: LTC Keith M. Cianfrani, USAR Advisor, DSN 558-9864 (334-255-9864), keith.cianfrani@safetycenter.army.mil.

WANTED

UH-60 PILOTS interested in receiving laser surgical correction for refractive error and participating in a rated Army aviator study. The US Army Aeromedical Research Laboratory and the Walter Reed Refractive Research Center have initiated a study to evaluate the use of refractive surgery for active duty, rated aviators within Army aviation.

What is the Rated Aviator Refractive Surgery Study? This study is a two-year prospective evaluation of the efficacy and safety of keratorefractive surgery in rated Army aviators. This study will evaluate standard, FDA approved photorefractive keratectomy (PRK) and laser in-situ keratomileusis (LASIK) procedures to determine whether PRK and/or LASIK are compatible with the Army aviation environment.

It has been estimated that 24-39% of rated Army aviators require optical correction for flying duties, and refractive surgery, of any type, is not permitted in Army aviation. This makes the use of spectacles or contact lenses essential for clear, undistorted vision, but the loss or displacement of these correction devices can cause difficulties during flight. Additionally, spectacles reduce compatibility with NVGs and HMDs.

What are the qualifications required to get into the study?
To qualify as a candidate you must be an active duty, rated aviator of a UH-60 aircraft, be between the ages of 22-50; meet all current FDME requirements; suffer from near-sightedness, far-sightedness and/or have astigmatism; and desire to have laser surgical correction of your refractive error. Candidates must not have any aeromedical waivers for visual conditions other than the requirement to wear corrective lenses (you may have a waiver to wear contact lenses).

Interested?
Contact USAARL for more information:
LTC Corina van de Pol, OD, PhD (334) 255-6862, DSN 558-6862 e-mail: corina.Vandepol@se.amedd.army.mil
SSG Daniel Fuller (334) 255-6809, DSN 558-6809 e-mail: Daniel.fuller@se.amedd.army.mil

NEWS & notes

3rd Annual AGSE Users Conference 3-7 June 2002 At Fort Campbell, Kentucky

The Aviation Ground Support Equipment (AGSE) Weapons Systems Management Office, Redstone Arsenal, Alabama will host the **Third Annual AGSE Users Conference 3-7 June, 2002 at Fort Campbell, Ky.**

The theme this year is "Focus on the User." Attendance is intended for Aviation Officers, NCOs, and enlisted personnel from throughout the Aviation Community. The focus on Thursday, 6 June is on the maintainers. Issues important to the community will be collected for discussion at the conference. Email user issues NLT 6 April 2002 for inclusion. For more information on the conference, housing options, display availability, or user issues - email Major Hank Isenberg at **henry.isenberg@redstone.army.mil**, or Doug Cowart at **doug.cowart@redstone.army.mil.**

Army Knowledge Online features Flightfax

Have you logged on to your Army Knowledge Online (AKO) account? AKO is the Army's portal for soldiers and civilian employees worldwide. Along with all its other useful features, you can get *Flightfax* and *Countermeasure* and other benefits from the US Army Safety Center website, right there on AKO. Here's how:

1. Log on to AKO.
2. Scroll down the left column to SPECIAL STAFF.
3. Click on SAFETY.
4. Click on the Safety drop down.

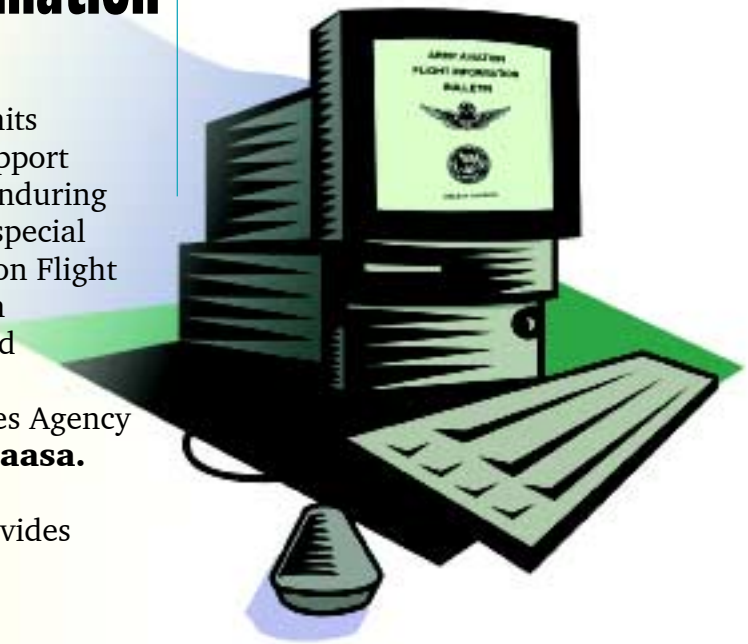
You're there!

Special edition Flight Information Bulletin

Army aviation units operating in support of Operation Enduring Freedom can use a special edition Army Aviation Flight Information Bulletin (FIB) recently posted to the US Army Aeronautical Services Agency website at **www.usaasa.belvoir.army.mil**

This bulletin provides operational support for Army units deployed into the CENTCOM AOR in support of Operation ENDURING FREEDOM. Subjects covered in this special FIB include Instrument flight procedures policy, FM immunity issues, Flight Information Publications, Flight Inspections, IMC recovery and NOTAMS.

Units may download and print copies as needed. Updates to this Special Edition will be published in future editions of the quarterly FIB, and on the USAASA website. Comments and questions concerning this Special FIB should be directed to LTC Owens at DSN 656-4872/4882, Comm (703) 806-4872/4882 email: **owensb@belvoir, army.mil** Or you may write to: **Commander, U.S. Army Aeronautical Services Agency, ATTN: ATAS-AI, 9325 Gunston Road, Suite N319, Fort Belvoir, VA 22060-5582.**



ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-6

Class B
J model

■ While conducting day live-fire team gunnery training, during a left break from a diving fire engagement, aircraft's engine and rotor RPM decayed. Due to low altitude, higher than normal rate of descent, and engine droop recovery time, the PI was unable to arrest the rate of descent. The aircraft impacted the ground at approximately 40 knots in a near level attitude and rolled over, coming to rest on its right side. The aircraft was extensively damaged and the crew received minor injuries.

AH-64

Class E
A model

■ After flight, maintenance personnel found damage to three tail rotor blades. On previous flight aircraft landed at an unimproved landing site. The remainder of the flight was 200 feet or greater above the highest obstacle. There was no evidence of a tree or bird strike. Suspect damage was caused by object blown into tail rotor on landing. Damage classified as fair wear and tear (FWT). Tail rotor blades were replaced, the maintenance operational check was performed, and aircraft was released for flight.

C-12

Class E
R model

In cruise flight, FL210, OAT -20 C, light freezing precipitation and light turbulence, pilot's outer windscreen cracked and then spider-webbed. Aircraft was landed at home base without further incident. Windscreen was replaced and aircraft returned to service.

C-26

Class E
B model

■ On take-off in Instrument Meteorological Conditions at 400 feet, the PC initiated a right turn as assigned by ATC. In the right turn at about 800 feet above ground level the right engine firelight illuminated. The firelight remained on for about 10 seconds. The turn was stopped and the aircraft leveled off at 2000 feet. The crew completed an instrument approach. Maintenance found the right hydraulic pump by-pass line lying against the lower 45 degree detector. Maintenance repositioned the by-pass line.

CH-47

Class C
E Model

■ Aircraft was damaged during landing to an unimproved site. Right rear wheel penetrated the surface of the earth. Ramp and landing gear damaged.

OH-58

Class E
D model

■ While in cruise flight, FE noticed hydraulic fluid seeping. The No. 2 flight control hydraulic system was low. The crew made a precautionary landing and found the No. 2 flight boost pressure line seeping at a junction. Maintenance replaced the T-fitting and aircraft was released for flight.

Class B
DI model

■ Aircraft drifted rearward during a simulated Hellfire missile engagement. Postflight inspection revealed damage to two main rotor blades, vertical fin, and fuselage. The replacement of aircraft components was completed and aircraft was released for flight.

Class C
DI model

■ Aircraft experienced hard landing during snow qualification training.

Class E
DR model

■ During engine run-up, crew chief (CE) informed pilot that they were leaking fluid from the aft section of the aircraft. After shutdown the crew found that the transmission drain valve had been left open, CE closed valve and refilled transmission sump. Upon second cranking attempt, CE informed pilots that the aircraft was still leaking fluid. Aircraft was shutdown once again. The crew found that a transmission line in the previously serviced area was not torqued properly, but was only hand tightened. Maintenance cleaned up spilled fluid, and tightened line to proper torque. After maintenance flight, aircraft released for flight.

RAH-66

Class C

■ Following extensive maintenance, the aircraft was undergoing maintenance ground run. During shutdown, an unusually loud noise was heard, accompanied by loss of all engineering instrumentation indications. It was determined that slip ring bearings in an engineering instrumentation package in the rotor head had failed. That failure caused the instrumentation housing to break free of its mounting on the aircraft deck. Damage occurred to decking.

UH-60

Class C
K model

■ During a rolling take-off, aircraft experienced a significant rotor droop during climb-out near the departure end of the airfield. Crew initiated emergency procedures and placed both engine power control levers to lockout, effectively recovering the rotor RPM. The crew landed the aircraft without further incident. There was damage to the engine due to overtorque, but there were no crew injuries.

COMING soon to a theater near you!

DRIVE TO ARRIVE

Several talented country music artists have joined up in the Army's campaign to prevent soldier deaths in POV accidents. In movie theaters across the Army and Air Force Exchange Systems (AAFES) worldwide, military moviegoers will soon be treated to short public service video clips while waiting for the main feature to begin.

Country artists Joe Diffie, Collin Raye, Tammy Cochran, Charlie Robison and Travis Tritt are featured in the *"Drive to Arrive"* **high resolution videos, produced by the U.S. Army Safety Center. Watch for them at your local AAFES theater next time you take in a flick, and** *"Drive to Arrive."*

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

March 2002 ✦ VOL 30 ✦ NO 3

Was Anyone *Flying* the Aircraft?

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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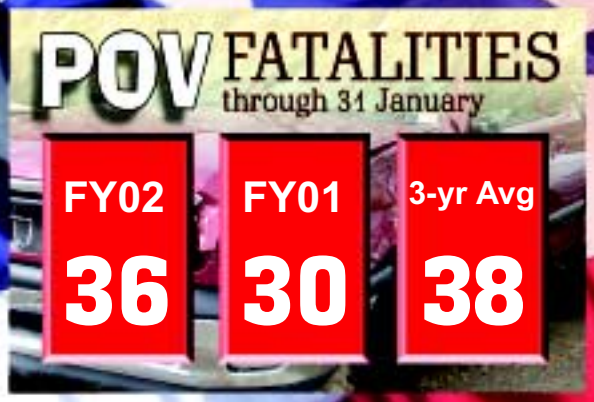

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

The number one killer of soldiers...

Isn't the bad guys we're fighting in our proclaimed war on terrorism. We are losing soldiers to an enemy we face every day, right here at home. Privately owned vehicle (POV) accidents have taken the lives of 36 soldiers during the first four months of this FY—a far greater number than have been killed in combat during Operation Enduring Freedom.

Although, compared to FY00, we closed out FY01 with an 11 percent decrease in POV fatalities, we still lost 99 soldiers in POV accidents. Each year from FY92 through FY01, POV accidents have accounted for approximately 60-65 percent of the total Army accident fatalities. We can, we must, do better.

The Army's senior leadership is adamant that the Army redouble its efforts in attacking POV accidents. The Sergeant Major of the Army is working with the NCO Corps to help commanders significantly reduce these losses. A 20-percent reduction from last year is an achievable goal. However, we must always be mindful that selection of a number is simply one metric for measuring safety performance, and **never** lose sight of the fact that numbers represent lives lost. The loss of even one soldier will always be one too many. That we lose soldiers in preventable POV accidents is totally unacceptable.

Most of the POV accidents this FY have been caused by the usual traffic hazards: speed, fatigue, and failure to wear seatbelts/helmets. Analysis continues to reveal that soldiers constantly underestimate their personal risk and overestimate their personal ability, causing errors relating to speed and fatigue.

FY01 data reveals that Army POV fatalities were 37 percent lower than the nation's demographically similar population. Male drivers under the age of 25 are the most likely age group to become involved in fatal accidents. A significant difference between the Army and the general public, of course, is that we as Army leaders can exert more control over soldier behavior. We have plenty of opportunities and authority to strongly influence the behavior and risk decisions of our young, most-at-risk soldiers. If we aren't doing that, then we should be.

POV accident prevention involves continual senior leader and NCO involvement. Division commanders should be briefed by the chain of command from squad leader to battalion commander on each POV fatality, and ensure that the information is shared with other local commanders. Leadership at all levels must take an active role in promoting safety awareness and risk management as the primary factors in preventing POV accidents and fatalities.

NCOs should know where every soldier is going while on leave, what he or she will be doing, and when every soldier will be returning to the unit. Make traffic safety

a discussion topic at meetings. Jump start the dialogue with one of the five new videos from the POV Accident Prevention "Drive to Arrive" Campaign. These videos are now available to download at our website, http://safety.army.mil, and will be available in VHS format at **http://afishp6.afis.osd.mil/dodimagery/davis/.**

POV accident prevention also requires that we —general and private alike—exhibit the individual self-discipline to obey traffic laws and all post-specific guidance regarding POV operation every day, every time we slide behind the wheel. Let's make "Drive to Arrive" more than a slogan. Let's put it into practice and help enhance combat readiness by neutralizing the threat that has for far too long been the number one killer of soldiers.

—BG James E. Simmons,
Director of Army Safety

Warning: Summer severe weather hazards

Cold weather hazards are slowly melting away, but summer weather flying hazards are stepping up to the plate to take their place in your checklist of things to worry about. Warmer weather hosts a variety of severe and even violent conditions that can develop rapidly: thunderstorms, hurricanes, tornadoes and their companions—turbulence, wind shear, hail, and (the most significant) lightning, which is probably the leading hazard associated with thunderstorms.

Before you encounter any of these severe weather phenomena that summer promises, prepare yourself. Brush up on known hazards and how to avoid or minimize the results.

The weather has no respect for experience or ratings, nor will it manifest sympathy for the inexperienced and unqualified. If you lack training, qualification, or adequate preparation, be prepared to pay the high price that severe weather will demand. While the weather may have no respect for your abilities, or the lack thereof, you can respect the hazards associated with severe weather conditions and learn to assess and manage risks accordingly. Never accept a weather risk if there is a control option that would lower that risk.

One of the best protections against accidentally encountering severe weather in flight is being forewarned of its possible existence or development. A thorough and complete preflight weather briefing is critical. Some operational weather Squadrons now have an Instrument Refresher Course (IRC) online, so that pilots can brush up on seasonal hazards. But the pilot's responsibility for avoiding severe weather does not end with the preflight briefing. It continues with constant in-flight weather observations, and careful attention to radio weather advisories along the route. Stay informed, stay alert. Forewarned, you are less likely to run into trouble.

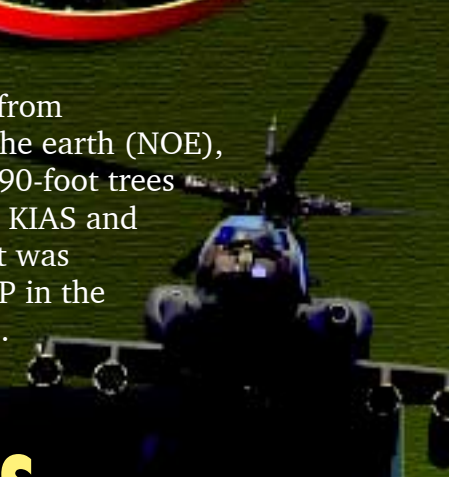
Develop a healthy respect for nature's often unpredictable and awesome power. Don't let weather hazards spoil your warm weather flying.

Was Anyone Flying the Aircraft?

The crew of the AH-64 was using the Night Vision System on the last night of a forward deployed multinational training exercise. This accident aircraft moved into the Gun 2 position when the original Gun 2 developed a communications problem. As the accident aircraft moved into the Gun 2 position, the Troop Commander's aircraft moved into the Gun 3 position. The Squadron Commander's aircraft, a separate element providing command and control of the attack teams, moved into the Gun 4 position.

After passing the Squadron Release Point, the Instructor Pilot (IP), flying in the front seat of the accident aircraft, remembered his additional Gun 2 responsibilities and tried to contact the personnel on the ground. The IP directed the pilot (PI), who was flying the aircraft, to tune the radio, located in the rear cockpit, to the correct frequency to establish communications with the ground troops. Meanwhile the IP was using the Target Acquisition and Designation System to scan for targets and locate an approaching Attack by Fire position.

Since the radio frequency had not been preset, the PI assumed the request to tune the radio implied a transfer of controls. The PI released the controls, and began setting the appropriate frequency. He focused his attention on the radio, which left no one flying the aircraft. The PI recalled the IP asking, "What's going on?" just prior to impact. While transitioning from low-level to nap of the earth (NOE), the aircraft entered 90-foot trees at approximately 90 KIAS and crashed. The aircraft was destroyed, and the IP in the front seat was killed.



Lessons Learned

The primary concern of the pilot on the controls is flying the aircraft. All other concerns must be secondary. When on the controls, a pilot must properly scan and divide his attention between flying the aircraft and performing other crew duties. Recurring crew coordination training will reinforce the need for thorough communications among the crew.

Emergency Egress: Not A Time for Errors (It could be life or death)

Pretend you are a passenger in the back of the Black Hawk that has just been involved in a crash. You suddenly find yourself surrounded by a black, acrid smoke. The orange glow of a fire is growing brighter, and there is a corresponding increase in heat from the lower right side of the aircraft.

This passenger had been in the Army for over 15 years, and knew his way around, but he could not get the left side cabin door open. The heat was increasing rapidly. He maintained the presence of mind to go for the emergency window exit. He could not see clearly, so he felt his way in the smoke filled cabin to the window. The handle was gone from the door. *(See photo 1.)* He decided it probably had been broken off in the crash sequence.

Fortunately, another soldier involved in this mishap had egressed successfully from one of the pilot's doors. This soldier looked back to the burning aircraft. He saw hands frantically moving around the window on the inside. This brave soldier returned to the fire, forced the side door open (while sustaining severe burns), and aided the rescue of this passenger and several other survivors. The aircraft was ultimately consumed in the fire.

Later, the investigation board was unable to identify failure modes on the door emergency exits because the doors were destroyed in the fire. During the interview process, the passenger who attempted egress from the inside expanded on his experience with the broken missing handle. He correctly felt along the bottom of the side cargo door window and searched for the handle. He knew to pull up and rearward on the handle to release the window. *(See photo 2.)*

What went wrong?

Okay, crewmembers, here's a test. What is wrong here? This passenger was correct in his actions in the aircraft with which he was totally familiar—a UH-1. The problem is—he was in a UH-60!

The emergency egress handle on the UH-60 cargo door is below the center of the window. *(See photo 3.)* The handle is pulled to the rear to release the window *(photo 4)* and the window will fall away from the door. The passenger interviewed in the mishap was working at Corps level staff, and seldom received a detailed passenger briefing while flying with the Corps Commander. Although he had looked at the emergency egress

Photo 1

Photo 2

handle innumerable times, in the emergency he reverted back to what he had been trained on years before.

This is a test—It is only a test

Before you become too critical of this aviation unit, let me ask: How sharp are you? When was the last time YOU trained on emergency egress? When have YOU actually turned that handle and allowed the window to fall out of one of your unit's aircraft? Once a month? Once a year? Never? How about your passengers? How thorough a briefing do YOU provide them? Do you tell *and* show them where the exits are and how they work? How about planning this training for your annual unit Safety Stand-Down? What would be the cost of this training? It will cost a few feet of copper safety wire, a designated person/ persons to catch and replace the window each time one is released *(photo 5)*, and a little coordination with unit maintenance to have a TI replace and sign off the emergency exit handle safety wire at the end of training.

One more question to determine how aware you are of your surroundings. In the above paragraphs, we mentioned that you pull the handle to the rear. Correct? Yes, but— you only pull rearward on the left inside cabin doors. You pull forward on the right side cabin doors; or (like unscrewing a bottle) all emergency release actions are a left release, turn, or twist. You can see both the UH-1 handles in photo 1.

One last question for those of you that THINK you pay attention to detail. Go back to photos 1 and 2. Anything else worthy of note there that has not been covered so far? (Answer below.) Don't feel foolish. Feel confident. Training should be part of every day operations. DO IT!

—Mr. Joseph Licina (DSN 558-6893) and CW5 Robert (Scotty) Johnson (DSN 558-6881), Aircrew Protection Division, U.S. Army Aeromedical Research Laboratory, Fort Rucker, Alabama.

Answer: *The emergency egress handles in photos 1 and 2 are not marked (painted) with yellow and black stripes (per Chapter 9 in the aircraft -10).*

Photo 3

Photo 4

Photo 5

USAARL to conduct IHADSS helmet fit survey

A 2-hour flight can seem like 10 hours with a helmet hot spot. Every aviator knows that a good helmet fit enhances flight performance, and a poor fit may be a critical distracter in combat.

At present, most rotary-wing Army aviators use the HGU-56/P helmet. This helmet is relatively uncomplicated to fit, due to the large number of helmet sizes available and the use of thermoplastic liners (TPLs.) Once the proper helmet size is established from head circumference, TPLs may be adjusted if necessary. The process of fitting a HGU/56P is usually accomplished in minutes. It is relatively easy to maintain the fit once established. This is beneficial for the aviator because he/she will have the helmet throughout their aviation career.

One major exception to the use of the HGU-56/P is in the AH-64 Apache community. AH-64 aviators use the Integrated Helmet and Display Sighting System (IHADSS). The IHADSS helmet, at the time of its development, was lighter in weight and provided improved impact protection over the then-current SPH-4 series helmet. The IHADSS is the only helmet approved for the AH-64 and has been in use for over 20 years.

The study will consist of a questionnaire distributed through each Apache unit's safety officer or via mail.

A unique feature of the IHADSS helmet is that it serves as a platform for a Helmet Mounted Display (HMD). The HMD provides pilotage and fire control imagery and flight symbology. In order to view the HMD imagery, the helmet/HMD must be fitted such that the exit pupil of the HMD is properly aligned with the aviator's eye each time it is donned. This makes the fit and stability of the IHADSS helmet critical considerations. Achieving a proper fit of the IHADSS helmet is complicated by its intricate system of straps and pads. A proper, customized, repeatable fit is required in order to maintain the exit pupil position and optimize the resulting full Field of View (FOV). Fitting of the IHADSS helmet typically takes several hours to complete. This fitting process must be repeated every time aviators are transferred to a new duty station, as they *cannot* take the IHADSS helmet with them. It is part of the AH-64 aircraft system and is unit property.

Several studies conducted to investigate performance of the IHADSS system have identified helmet fit as an area of concern. However, no definitive study focusing on helmet fit has been conducted.

To begin to address this deficiency, the U.S. Army Aeromedical Research Laboratory (USAARL), Fort Rucker, Alabama, will be conducting a study on the fit, design, comfort, and performance of the IHADSS helmet. Data from this study will provide input into the complex issue of helmet fit and the use of HMDs. This will be useful in improving future HMD helmet designs such as the planned RAH-66 Comanche. In addition, this data will assist flight surgeons and unit commanders in addressing helmet fit issues that will enhance individual and unit readiness and performance.

The study will consist of a questionnaire distributed through each Apache unit's safety officer or via mail. All AH-64 Apache aviators are invited to participate in this study and will automatically receive a questionnaire by mail in March/April 2002. All information will be collected anonymously and will be used for research purposes only.

—Clarence E. Rash, research physicist, USAARL, DSN 588-6814/6866, (334) 255-6814/6866, Clarence.rash@se.amedd.army.mil.

Inadvertent Drift at a Hover— An All too Familiar Accident Scenario

Inadvertent drift at a hover and subsequent contact with obstacles in the flight path is an all too familiar and recurring accident scenario in the OH-58D Kiowa Warrior. A review of the Army Safety Center data base indicates, that between FY94 to FY01, the Army has recorded 5 Class A, 1 Class B, and 11 Class C accidents as a result of inadvertent drift and contact with obstacles. These accidents have resulted in four fatalities, three non-fatal injuries, and a combined injury and aircraft damage cost of over $40 million.

The OH-58D is arguably one of the most demanding cockpit workload intensive aircraft in the Army's inventory. The scout/attack mission it performs requires much of its flight profile in extended hovering modes at NOE altitudes, in the presence of terrain flight obstacles such as trees or rocks. The cockpit division of duties typically requires the pilot in the right seat to fly the aircraft, while the left seat pilot operates the Mast Mounted Sight and other aircraft systems. This often requires the left seat pilot to be totally focused heads-down inside the cockpit and thus unable to assist the pilot in detecting drift. In many of these scenarios, both pilots are at times heads-down in the cockpit. The design of the OH-58D is such that the pilot has no flight control aids to assist in maintaining a stabilized hover with the exception of the heading hold mode. The aircraft is equipped with a hover display page on the Multifunction Display, with velocity vectors and other aids to assist the pilot in detecting drift; however, many pilots fail to use these and other aids, such as the ANVIS Display Symbology System (ADSS), as aids to assist them in detecting and avoiding drift.

The most common scenario is drifting laterally or rearward during OGE hover, and striking the tail rotor or main rotor with an obstacle such as a tree, a rock or even another aircraft. Most of these scenarios involve simulated weapons engagements, transmitting digital reports, or situations requiring the crewmembers to be focused inside the aircraft, such as aerial observation. Crew experience ranged from SIP's with thousands of hours, to pilots with very little time.

Avoiding inadvertent drift in the OH-58D requires positive coordination between the crew *and* use of onboard systems to assist in drift detection. Some observations:

- The pilot not on the controls must immediately alert the pilot on the controls of drift. Both pilots must positively communicate to each other when they are focused inside the cockpit for more than 2-3 seconds.
- Remember the common tendency to drift forwards or backwards when masking or remasking vertically.
- Maintain sufficient distance from obstacles and other aircraft to allow for safe maneuvering. Give yourself some room to safely accommodate for drift. More than one aircraft should not occupy the same hovering or firing position.
- Maintain extra vigilance during NVG operations especially in zero illumination conditions. Visual cues are fewer in the low light conditions and crews must incorporate onboard systems to assist them.
- Use the MMS mode, hover/hover bob-up, heading hold, visual references, ADSS, or any combination to maintain position. Be sure to use proper scanning techniques to avoid spatial disorientation, obstacle avoidance, or becoming fixated on the Multifunction Display.
- Train frequently with the ADSS to make sure you are proficient with it. Remember it doesn't do you any good if you did not install it on your goggles prior to flight.

Inadvertent drift can be avoided. Vigilance, proper scanning, crew coordination, and use of onboard systems are a must in this high workload cockpit.

—Major Mike Cumbie, USASC, DSN 558-3754 (334) 255-3754, robert.cumbie@safetycenter.army.mil

Are you Mission Capable or Combat Ready?

I have been an Army aviator for nineteen years with seven assignments and two overseas deployments. Some of the units that I have been assigned to were mission capable, and some were combat ready. My definition of, "Mission Capable" means that a unit has the equipment, personnel and training to conduct operations. "Combat Ready" is all of that, plus attitude. When we believe in ourselves, in our fellow aviators, in the training program, and we are willing to put it to the test of the mission, we are combat ready.

This is the story of a combat ready attack battalion, and the effect that a Class "A" accident had on that unit.

I arrived in the attack battalion that was just fielding in 1994. Throughout the next several months I would get to know most of the personnel in the unit. They were a great bunch. There were the serious ones and the clowns, the experienced and the inexperienced, the leaders and the followers, the careerists, and those just trying something new.

Once we arrived at Fort Hood for CATB we were off and running. The next three months were filled with FTXs, gunnery, and battle drills. The average flight time per aviator was about 90 hours during the rotation. Our enlisted personnel were able to do the jobs they were trained to do without the external distractions found in garrison. We trained until radio silent attack missions became the norm. This can only happen when a unit can perform as one cohesive team. We were becoming an Attack Battalion that was mission capable, but we still had a long way to go before becoming Combat Ready.

After a two-week break, we were on the road to JRTC. Those that have been there, or to NTC, know that the pace of operations is breakneck, with long hours of planning for even the simplest of missions. We performed attack and cavalry operations, and deployed to forward assembly areas on many occasions leaving our support behind. We were beginning to rival the tactical proficiency of any unit that I had been a member of. The members of the unit built bonds between individuals, as well as between companies. We had reached the camaraderie that separates mediocre units from the truly great units. We crossed that threshold, and were combat ready.

Tragedy

During the next several months of training, I developed close friendships with several members of my company. Don and Mike were among these friends. Both were IPs and two of the best aviators I have served with. Don was the company clown while Mike was the free spirit who walked to a different drummer. They were both part of the team and I trusted them without reservation.

It was April. The battalion was conducting Hellfire gunnery before deploying on a JTF-6 exercise. We had done this type of attack mission fifty times as a company/battalion and always with great results. We knew the drill; deploy along a designated route until reaching the release point, occupy a battle position, engage vehicles along a road, and egress along the same route. Pretty simple, or so I thought. I was leading first platoon to the battle position that night and all was going as planned. We engaged our targets, went switches cold, and then made our egress. I called Mike, who was leading the second platoon, and advised him that the battle position was clear. We were making our way back to the FARP when we heard chalk three of the second flight calling over the radio. They had lost visual contact with the other aircraft and were trying to locate them. Soon, it became apparent that two aircraft were down. Later that night we learned that lead and Chalk Two had apparently drifted into one another in a deadly mid-air collision. The result: Mike and Don were gone, as well as the new company commander. The only survivor, a new platoon leader, walked away with minor injuries. Although my immediate concern was for my friends and their families I later realized that in the blink of an eye we had gone from combat ready to… nothing.

I learned three lessons from this tragedy.

■ First, the death of any soldier has a devastating effect on the personality of the unit. After the crash, we spent several months in shock. We lost the attitude that had made us a great

attack battalion. It was over a year, before enough new blood had come into the unit, that we began moving toward our former level of excellence.

■ Second, the immediate effect of a fatality is even greater on family members who at the home station. The spouses back home were scared and desperate for information. Commanders need to have a plan for how they will handle all of the unit's family members as well as fatality/injured personnel family members and how to disseminate information should an accident occur.

■ Third, It is hard to bury your friends. It only takes a blink of an eye for tragedy to strike. Should it happen, your life and your unit will change forever.

I have witnessed first hand that accidents have a great effect on a unit's readiness. Nothing stops a unit's momentum like a fatality. Our climb back to "combat ready" has been slow and sometimes frustrating but we'll get back.

—CW4 Erik A. Schimmer, Aviation Training Brigade, Fort Rucker, AL

Director's note:
As CW4 Schimmer's article so aptly points out, even the best-trained organizations can experience a shattering accident. As his unit and other units have found, the price of recovering from such an event is very high. It should make all of us re-look our commitment to risk management as a function of our mission planning and execution. The results of accidental risk can have just as profound an impact on a unit as the results of accepting tactical risk. An "ounce of prevention" far outweighs the "pounds of a cure." When we actively address both accidental and tactical risk in our planning and execution, and we have done everything within time and resources to reduce the price of accepting both these risks, then we truly are "Combat Ready" and prepared to execute our missions.

COL Mike Powell, Director of Operations, USASC

AAAA Awards

AAAA Avionics Award:
CW3 Bruce L. Brown, 1-52nd Aviation Regiment, Korea

Air Traffic Control Company of the Year Award: **E Company, 58th Aviation Regiment (ATS)**

Air Traffic Control Facility of the Year Award:
1-11th Aviation Regiment, Fort Rucker AL

Air Traffic Control Maintenance Technician of the Year Award: **CW3 Everette J. Smith II, HHD, 164th ATS Group unit, Seoul**

Air Traffic Control Manager of the Year Award: **SFC Randy T. Church, E Company, 58th Aviation Regiment (ATS), Germany**

Air Traffic Controller of the Year Award:
SPC Michael E, Intschert, 1st Battalion, 58th Aviation Regiment (ATS) Fort Bragg

Outstanding USMA Cadet of the Year Award:
2LT Joseph S. Minor

Outstanding ROTC Cadet of the Year Award:
2LT Dwayne W. Staples

Army Aviation Air/Sea Rescue Award:
50th Medical Company (Air Ambulance) 101st ABN DIV (AA), Fort Campbell

AAAA Aircraft Survivability Equipment Award:
CW3 Albert J. Maes, HHC, 1-210th Aviation Regiment, Fort Rucker

Aviation Medicine Award:
CPT Alexander G. Truesdell. HHS, 1st Military Intelligence Battalion, Germany

Fixed Wing Unit of the Year Award:
6-52nd Aviation Regiment , Joint Forces Training Base, Los Alamitos CA

Trainer of the Year Award:
CW4 Warren A. Aylworth, HHT 2-6 CAV, 11th Aviation Regiment, Germany

NCO CORNER

ALSE: Your Survival could depend on it!

Make sure survival kits have everything they need before they are needed.

Here's a checklist to use.

- Is the vest clean? A vest loses its flame-retardant properties if it's dirty.
- Does the distress marker light operate properly?
- Is the dial on the compass face intact?
- Does your pocketknife have a sharp blade?
- Is the water bag free of tears?
- Is the signaling mirror free of scratches?
- Are the survival kit and first aid items packed in separate zip-lock bags?
- Are nutrition items individually wrapped and sealed to prevent moisture damage?

If any problems exist, or if components are missing, refurbish the vests and order missing components from TM 55-1680-317-23&P and the latest project manager Aircrew Integrated Systems (PM ACIS) message AIS 00-02.

If you have the new aircrew integrated recovery survival armor vest and equipment (AIRSAVE), NSN 8415-01-442-1991, do your preventive maintenance checks and services like it says in TM 1-1680-361-10. The Airsave vest replaces the SRU-21/P and the survival armor recovery vest insert and packets (SARVIP).

ALSE techs, get a copy of AI500-02 by going to: **http://www.peoavn.redstone .army.mil/ acis/index.htm/** Go to "Request a username/ password" and follow the prompts. After a short interval for approval, you will have access to the web page. There you will be able to view and get copies of all current messages.

If you can't get on the internet,contact SSG Adam Byington, DSN 897-4262 (256) 313-4262, e-mail adam.byington@peoavn.redstone.army.mil; or John Jolly, PM-ACIS DSN 897-4262, (256) 313-4262, e-mail john.jolly@peoavn.redstone.army.mil

—PS Magazine

Here are the items you'll need for your survival vest:

Quantity	Item	NSN
1	Bag, storage, drinking water, 3 pts	8465-00-634-4499
1	Water, drinking,emergency, 4.2 ounces	8960-01-124-4543
1	Blanket, thermal/silver/OD	7210-00-935-6666
1	Compass, magnetic, unmounted, lensatic, luminous, M2	6605-01-196-6971
1	Fire starter, magnesium bar	4240-01-160-5618
1	Knife, multi-tool, Gerber(black)	5110-01-346-5341
1	Kit, signaling, A/P255-5A or L119	1370-00-490-7362
1	Light, marker, distress	6230-01-411-8535
1	Flashguard (AA) battery	6135-00-985-7845
1	Mirror, emergency signaling, 3X2 inches	6350-00-105-1252
1	Tourniquet, non-pneumatic	6515-00-383-0565
	Radio Set	
1 each	AN/PRC 90 or	5820-00-782-5308
1 each	AN/PRC-90-1 or	5820-01-158-6082
1 each	AN/PRC-90-2 or	5820-01-238-6603
1 each	AN/PRC-112 or	5820-01-279-5450
1 each	AN/PRC-112A or	5820-01-280-2117
1 each	AN/PRC-112C	5820-01-458-6018

Here are the first aid items you'll need:

Quantity	Item	NSN
1	Plastic bag	8105-00-837-7754
1	Adhesive tape, surgical, ½ in X 3 yd	6510-00-926-8881
1	Aluminum foil, heavy, 2 X 2 ft	9535-01-201-7014
10	Aspirin tablets	6505-00-118-1948
1	Bandage,adhesive	6510-00-913-7909
2	Bacitracin ointment, 10 oz.	6505-00-582-4191
10	Doxycycline hyclate caps	6505-00-009-5060
8	Loperamide hydrochloride caps	6505-01-238-5632
20	Cord,fibrous, 32/26 strand (550)	4020-00-246-0688
1	Dressing, first aid, field (camo)	6510-00-159-4883
4	Gloves,patient,exam	6515-01-364-8553
3	Insect repellent/sun screen .3 oz.	6840-01-452-9582
1	Moleskin, surgical 3X5-in pad	6510-00-203-6010
5	Pad, providone-iodine impregnated	6510-01-203-6285
6	Pin, safety	8315-00-787-8000
1	Plastic wrap, 12 X 36-inch sheet	8135-00-579-6489
½	Sponge, cellulose, Type II	7920-00-240-2559
1	Water purification tab	6850-00-985-7166

Drill Weekend Safety

It's been at least a month since your last drill weekend. It's always a busy Saturday morning trying to get the day organized. There is accountability of the soldiers, finalizing pay and personnel files, training briefings and staff meetings. So what role does safety play? Unit leaders must include safety and risk management in all aspects of a drill weekend. This begins with the drive to drill on Friday evening or Saturday morning. Some unit members travel long distances in hazardous conditions to attend drill. Commanders must be aware of this and tailor training schedules, if possible, to ensure that they do not put their soldiers at unnecessary risk. This does not imply that the training should be changed. However, consideration should be given to adjusting the schedule during inclement weather conditions, or anticipate conditions, such as fatigue, as a result of night training, to prevent personnel injury.

First line supervisors must enforce the safety policies of the unit commander. They must bear in mind that certain tasks have not been performed in at least 30 days and hazards could exist. A review of the standards is always a good idea. A unit wide safety brief should be conducted, as well as a section safety brief. A risk assessment should take place at least one month prior and updated as necessary. A thorough review of the training schedule should take place at the start of every drill weekend. Commanders need to stress safety and urge the unit not to take unnecessary risks.

Commanders are required to have a safety council meeting at least once a quarter. This is normally conducted during a drill weekend. This is a valuable tool to assist in unit safety management. All council members should adjust their schedules to attend these meetings.

Inactive Duty (IDT) or drill weekends are extremely busy. Commanders, leaders, and supervisors must all practice good risk management and not attempt to over task or over work their soldiers. They must look ahead and be aware of the hazards during drill, after work, and the fact that soldiers may travel long distances to return home.

Risk management must be included in every aspect of the drill weekend and encouraged in all aspects of off-duty periods as well.

—LTC Keith Cianfrani, USAR Liaison Officer, USASC

Call-Up "Tool Kit" Available

The Guard and Reserve Family Readiness Programs Toolkit is an important asset now available to families of service members being called to active duty or deploying.

The item is available as a printed product and on the internet at **www.defenselink.mil/ra/family/toolkit**

The tool kit is a standardized predeployment and mobilization handbook. It is an attempt to standardize information between services and the reserve component, so they can all use the same language when talking about deployment preparations.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class C
A model

■ During ground taxi, APU Master Caution segment light illuminated followed by a loud report. Aircraft engine was shut down and fire handle pulled. Post flight inspection revealed evidence of fire.

C-12

Class B
C model

■ Crew was unsuccessful in their attempts to manually lower the landing gear during approach. Aircraft landed gear up with engines running and propellers turning.

CH-47

Class A
D model

■ Accident aircraft was chalk three in a flight of three landing to an unimproved LZ in very dusty conditions under NVGs. The crew lost sight of the ground and the aircraft landed hard severing the right front landing gear. The forward main rotor system struck the ground and the aircraft came to rest on its side. Fourteen passengers and crewmembers injured.

Class E

■ After landing, IP noticed FWD LCT (Longitudinal Cyclic Trim) was stuck in the retracted position. Attempts to program manually failed. Aircraft was taxied to parking and shutdown. Maintenance replaced LCT Actuator. Maintenance test flight OK, aircraft returned to service,

OH-58

Class C
C model

■ While conducting run-up procedures, throttle was advanced to 100%. During avionics checks, engine and rotor RPM rapidly accelerated to 120%. Pilot on the controls reduced throttle to 100% N2. The engine surged a second time to 120%. Crew initiated an emergency engine shutdown. Main rotor blades, engine and hub replaced.

DR model

■ In the aircraft's first start following an engine flush, the power turbine accelerated to 124% for seven seconds. Investigation revealed the overspeed was a result of attempting a start with FADEC switch in MANUAL mode. Engine replaced.

■ Foreign object (FOD) damaged aircraft during maintenance operational check run-up. Aerosol can had been left undetected under the tail rotor drive shaft cover. Drive shaft severed.

UH-1

Class C
V model

■ Flight of two in an echelon left formation were making an approach to an improved landing area to drop off troops. While on short final, at approximately 15 feet above ground level, lead aircraft began to slide left. Pilot on the controls in chalk 2 announced he was moving into trail formation for the landing. Trail aircraft encountered rotor wash from lead and was overtorqued. Torque was observed coming down through 60 PSI. Aircraft was landed without further incident.

Class D
H model

■ During run-on landing, aircraft's rear cross tube collapsed resulting in damage to the aft lower fuselage. Downgraded from preliminary Class C.

UH-60

Class C
A model

■ Aircraft was ground taxiing to the takeoff pad with rated student at the controls when master caution light and No. 1 engine oil pressure light illuminated. Instrument indications were normal and aircraft returned to parking. Post flight inspection revealed that oil cap had not been installed. Maintenance refilled oil and determined that further analysis was required by Corpus Christi Army Depot. Engine replaced and sent to CCAD.

■ Aircraft's tailwheel strut collapsed during taxi to parking. Postflight inspection revealed damage to tailboom and strut.

L model

■ Loud report was heard during flight. Precautionary landing was executed. Postflight inspection revealed a high speed shaft failure with collateral damage to other components. Aircraft was being recovered following maintenance and inspection for a prior precautionary landing for engine malfunction.

■ Loud report was heard during flight. Precautionary landing was executed. Postflight inspection revealed a high speed shaft failure with collateral damage to other components, as well as evidence of corrosion on the flex pad. Unit fleet inspections to be conducted to determine source of corrosion.

Class E
A model

■ Aircraft was turning final when the crew noticed the No.2 TGT increase to approximately 889 degrees Celsius. Other indications consisted of loss of the No.2 Engine Np and No.2 Torque indications,and increase in No.1 Engine Np and Nr to approximately 103%. Crew determined the malfunction to be a No.2 high side failure. Crew retarded the No.2 PCL to allow the No.2 TGT to decrease. Crew performed a roll on landing without incident. Maintenance personnel replaced the ECU as a fair wear and tear item and aircraft was returned to home station without further incident.

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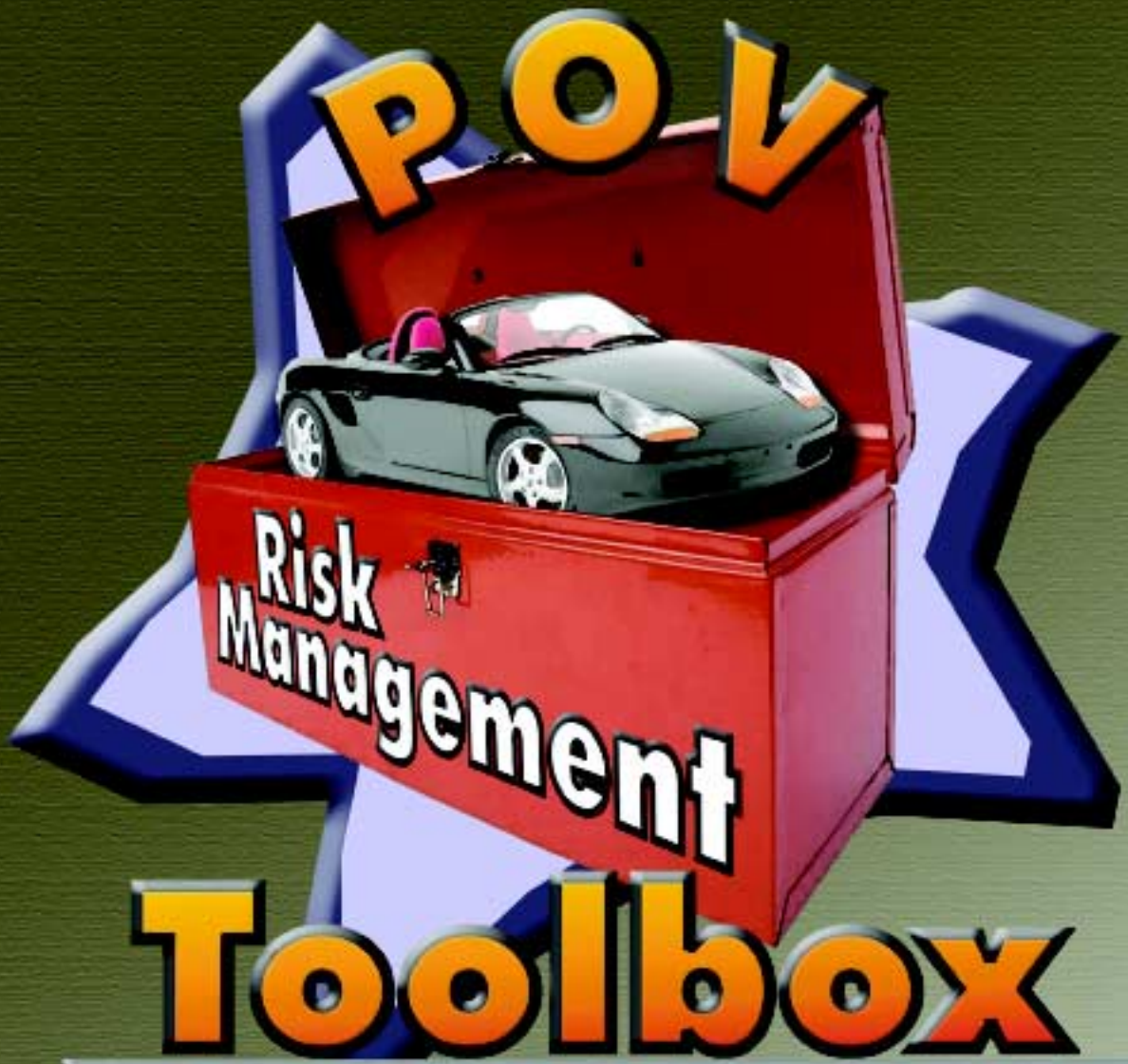

Privately Owned Vehicle Risk Management Toolbox

For Commanders, Leaders, Non-Commissioned Officers & Individuals

Third Edition

2002

http://safety.army.mil

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ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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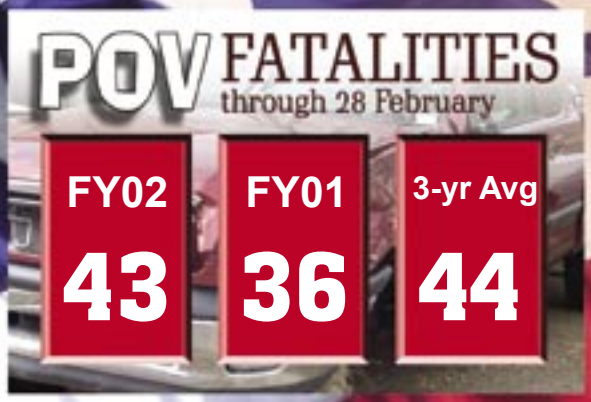

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Decision making at the appropriate level

The Army's Risk Management standard is an informed decision at the appropriate level of authority. In some cases, we aren't meeting that standard. Units are doing a good job of identifying and assessing hazards—but young leaders, whose experience level is not as extensive as it should be for making decisions that involve medium or high risk, are sometimes making those risk decisions.

When I was the Assistant Division Commander (Maneuver), 1st Cavalry Division, Fort Hood, Texas, the CG asked me to take a look at risk management in the Division. I took scenarios from the Risk Management Chain Teaching CD and asked several lieutenants to identify and assess the hazards, determine the level of risk—low, medium, high, or extremely high—and identify who had approval authority for the mission. Most of the lieutenants felt that they or their company commander had approval authority. I swore the lieutenants to secrecy and gave the same scenarios to battalion and brigade commanders the following day. Battalion and brigade commanders identified and assessed the hazards and determined the risk level. They felt that the risk decision should be elevated to at least battalion level for approval. A disconnect existed between the risk decision authority the lieutenants thought they or their company commander had, and what the battalion and brigade commanders perceived as within the purview of the lieutenants or the company commanders.

It's obvious that leaders at the platoon/company level should be given the opportunity to grow and the flexibility to make decisions so they can learn. But at the same time, they must know what the right and left boundaries are. Senior leaders must be involved in supporting and mentoring the platoon and company commanders, and deciding how far to let them go before reining them in.

The intent should not be to micromanage young leaders and stifle their learning and growth process. If the battalion commander/battalion command sergeant major takes the role of senior observer-controller, he or she can allow the learning, but stop the process before the accident. In FY 01, we had 10 Class A aviation accidents. In only one of those accidents was the battalion commander present during the planning, preparation, and execution of the training.

I have submitted my personal philosophy to you before and I do so again: Units that participate in tough, realistic training with **technically and tactically proficient leaders present** have significantly fewer accidents.

Two key points to consider: If your unit's SOP isn't specific on who has approval

authority for each level of risk, then it may need revision. Junior leaders should not have to decide if they have risk decision authority. Spelling out clearly in the SOP who has decision authority for low-, medium-, high-, and extremely-high risk missions is one means of making sure everybody knows the boundaries. Whether it's through the SOP or some other educational process, make sure the risk decision approval authority is clear.

Second point: You may want to consider adding an extra step to your SOP. Once the decision of level of risk is reached, informing the next level in the chain of approval gives an extra look at the process.

Sometimes it's tough finding the right balance between mentoring/supporting and what some might perceive as micromanaging. It's not necessary to always be loved as a commander, but it's vital to always be respected for technical and tactical proficiency and competence. I challenge each of our commanders to set the professional example of being involved—by word and deed—because each young leader you mentor during the planning, preparation, and execution of missions is your investment in the future of our Army.

Clearly defined risk decision approval authority for each level of leadership will help us ensure that we have combat ready battalions capable of going out and conducting tough, realistic training without hurting or killing soldiers before crossing the line of departure. If we practice it every day, every training mission, once we get into actual combat conditions, risk management will be an integral part of how we think and maneuver our way through situations as conditions change instantaneously.

Train Hard – Be Safe.

—BG James E. Simmons
Director of Army Safety

Visual illusions of the desert

Dusting off what we learned in the 90s, here's a revisit to some aviation lessons learned about how the eye reacts to desert environments, especially under Night Vision devices. These are the most common 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 it 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/her 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.

Aircraft plus high temperatures can equal DANGER

Virtually every area of the world in which the Army can be expected to operate will have temperatures high enough to significantly impact the way Army aviation performs its mission. High temperatures will affect the performance of the aircraft, aircraft engines, and aircrews rarely in a beneficial way. Luckily high temperatures are not likely to spring up unexpectedly like an afternoon thunderstorm, but rather will have an impact over a broad time and area.

Why do high air temperatures affect the performance of aircraft? Charles Law states that the volume of a fixed mass of gas at a constant pressure is directly proportional to its absolute temperature. Or put another way, $\frac{V_1}{T_1} = \frac{V_2}{T_2}$. Density is a measure of mass divided by volume, $\frac{mass}{V} = \rho$. Working around the equations we find that as temperature increases, volume increases, and density of the air will decrease. This is a simplified discussion of density altitude. With density in the numerator of the lift equation, the lower the density of air, the less lift produced by an airfoil. Rotary wing aircraft compensate for the loss of lift by increasing the Coefficient of Lift or increasing angle of attack. Higher angles of attack mean more power required to maintain the rotor rpm. Bottom line: the higher the ambient air temperature, the more power it takes to keep an aircraft aloft, assuming no change in pressure. The "hover" chart from chapter seven of the –10 confirms these generalizations. Higher temperatures mean more power to do the same job.

Another impact on the performance of an aircraft is the way that temperature affects the engines. Turbine engines take ambient air, compress it, mix in some fuel, add spark and then harness the energy from the expanding exhaust gasses. The first step of the process is directly affected by the air density and the temperature of the ambient air that is introduced into the compressor. The "power available" charts from chapter seven of the –10

demonstrate the decrease in available power as the temperature increases. This means as temperature increases the power needed to produce the same lift is increasing at the same time the engines are producing less power.

Mission ranges and available payloads can all be expected to decrease as the temperature increases. As an example, a CH-47's fuel flow, and mission range, will increase 7% with a change from fifteen to thirty-five degrees Celsius. It may be necessary to plan missions in cooler parts of the morning, or at night, in order to complete missions that require especially long routes or high payloads.

In addition to the effects on the performance of the aircraft, high temperatures will affect the crews as well. High temperatures will make crewmembers sweat more, which can easily lead to dehydration. The effects of even mild dehydration include decreased coordination, fatigue, and impairment of judgment, none of which are welcome in the cockpit.

Normally, the average day person loses four liters of fluid per day, which is generally replaced by the fluid we drink and the foods we eat. Exercise, sweating, diarrhea, temperature, or altitude can significantly increase the amount of daily fluid we need. The most common cause of increased fluid loss is exercise and sweating. While one is sitting in a hot cockpit, still more water is going to be lost to sweat. A 2% loss of body weight to dehydration will cause a significant loss of performance. For an average 200-pound crewmember, that equates to about two liters of water a day. The average adult loses about 0.7% of sweat per day, but sweat losses can be as much as 2.5 L per hour—far more than the amount which will cause a loss of performance.

As crewmembers operate aircraft on long missions, they need to hydrate to replace these fluids lost through sweat. On long missions crew relief may become another problem, one that will be exacerbated by the extra fluids consumed in hot weather. Utility and cargo aircraft with auxiliary fuel tanks can fly missions up to six hours, and aircraft with aerial refueling capability can fly even longer. Multiple trips through the FARP during long operations decrease even further crew opportunities to relieve themselves. All types of aircraft crews can encounter this problem, and commanders need to plan ahead for this.

Crewmembers can also be at risk from burns caused by coming in contact with heated metal during maintenance, inspections, or servicing. Wearing gloves during preflights and maintenance work can be a real benefit when outside temperatures are 35 degrees Celsius in the shade, and the aircraft has been baking in the sun all day. Long sleeves may be needed as well to work on aircraft that have hot metal panels or exhaust shrouds.

Additionally, the interiors of aircraft can exceed the temperature that will degrade or even damage avionics components. Opening the aircraft up to allow ventilation, or placing shades over the glass areas of the aircraft can significantly reduce the temperatures inside. Rapid temperature changes that can occur in a desert environment between day and night are conducive to the formation of condensation. This condensation can cause corrosion, water accumulation and fungal growth in partially filled fuel tanks. Other maintenance concerns for hot weather include distortion of seals, softening of fiberglass and plastics, and breakdown of lubricants.

Hot Weather environments are common for today's Army and require extra caution and planning from aircrews and maintenance personnel. Additional information can be found in the FMs and web sites listed below.

■ FM 3-04.202(1-202). *Environmental Flight*. 23 February 1983

■ FM 3-04.203(1-203). *Fundamentals of Flight*. 3 October 1988.

■ **http://www.usatoday.com/weather/wdenalt.htm Information on Density altitude**

■ Comprehensive information on heat injury and prevention can be found at **http://usachppm.apgea.army.mil/heat/**

—CW3 Dan Cramer is a CH-47 Maintenance Test Pilot for B Company, 1st Battalion, 228th Aviation Regiment, Soto Cano Airbase, Honduras http://www.usarso.army.mil/1st_228th/default.html

Avoiding heat injuries

All heat injuries are preventable, but in order to prevent heat injuries, it is important to understand them. Heat stress is caused by the interaction of three main variables; the mission, the environment, and the soldier. Each of these main variables has several considerations of its own—together, they can set the stage either for causing, or preventing a heat injury. Failing to consider these variables while planning, performing risk assessment, or while determining risk management steps, will result in heat injuries.

Mission: How hard are the soldiers going to have to work (working at an air conditioned desk, long periods in the aircraft sitting on the ramp or LZ in the sun, doing heavy maintenance out on the ramp)? What kind of uniform is required (Sleeves up BDUs, full flight gear, MOPP gear)? What kinds of loads will they have to deal with (fuel and ammo at a FARP, patients on litters, weapon and Kevlar only)?

Environment: This is the first thing most people think of. Unfortunately, it is often the only thing. How hot is it? How humid is it? Is there a lot of direct sun, or is there a lot of cloud cover? Is there any wind, or is it calm? What is the terrain like—grassy, jungle, desert, flat, hilly?

Soldier: Are soldiers acclimatized? Are they able to get adequate rest? How about nutrition, and hydration? Are the soldiers fit for the mission? Are any ill or on medications? Finally—has anyone had a prior heat injury?

If you can't answer these questions, you won't be able to take risk mitigation steps, and you will likely get heat injuries —so what risk mitigation steps can be taken?

1. Monitor your soldiers! This is probably the most important step. If one soldier becomes a heat casualty, then it means that other soldiers are at risk; if soldiers appear to be dragging, the unit should be evaluated quickly—they might not just be tired. Make sure special attention is given to soldiers who are ill, on medications, or have had a prior heat injury.

2. Acclimatization. It takes up to two weeks to become acclimatized. When deployed, leaders must take this process into account when planning missions.

3. Fluid intake. Soldiers should drink adequate fluids before and during the operation or training exercise (see chart on next page).

4. Physical conditioning. Infections, fever, recent illness, overweight, fatigue, drugs (cold medication), and previous heat injuries may

Fluid Replacement Guidelines for Warm-Weather Training
(Applies to Average Acclimated Soldier Wearing BDU, Hot-Weather)

		Easy Work		Moderate Work		Hard Work	
Heat Category	WBGT Index °F	Work/Rest*	Water Per Hour	Work/Rest*	Water Per Hour	Work/Rest	Water Per Hour
1	78-81.9	No limit	½ qt	No limit	¾ qt	40/20 min	¾ qt
2 (Green)	82-84.9	No limit	½ qt	50/10 min	¾ qt	30/30 min	1 qt
3 (Yellow)	85-87.9	No limit	¾ qt	40/20 min	¾ qt	30/30 min	1 qt
4 (Red)	88-89.9	No limit	¾ qt	30/30 min	¾ qt	20/40 min	1 qt
5 (Black)	>90	50/10 min	1 qt	20/40 min	1 qt	10/50 min	1 qt

**Rest* means minimal physical activity (sitting or standing) and should be accomplished in the shade if possible.

Note 1: The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hours of work in the specified heat category. Individual water needs will vary ± ¼ quart per hour.
Note 2: CAUTION: Hourly fluid intake should not exceed 1½ quarts. Daily fluid intake should not exceed 12 quarts.
Note 3: Wearing MOPP gear or body armor adds 10°F to WBGT Index.

Examples:

Easy Work	Moderate Work	Hard Work
• Walking hard surface at 2.5 mph, <30-pound load • Weapon maintenance • Manual of arms • Marksmanship training • Drill and ceremony	• Walking hard surface at 3.5 mph, <40-pound load • Walking loose sand at 2.5 mph, no load • Calisthenics • Patrolling • Individual movement techniques; i.e., low crawl, high crawl • Defensive position construction • Field assaults	• Walking hard surface at 3.5 mph, >40-pound load • Walking loose sand at 2.5 mph with load

Note: Soldiers who are overweight, dieting, or past heat casualties are more prone to heat injuries. As a result, their activities must be closely monitored.

increase the risk of heat stress.

5. Work schedules. If the tactical situation allows, heavy work and activities that require strenuous physical exertion (road marches/calisthenics) should be scheduled for early morning or late evening. Avoid working in the direct sun, whenever possible.

6. Loose-fitting clothing. Wear lightweight clothing that allows circulation of air and enhances the cooling evaporation of sweat. If the tactical situation allows, commanders need to consider permitting unblousing of boots, unbuttoning of BDU shirts, or other measures. Removal of BDU shirts should be done with caution, as this may increase the risk of sunburn.

7. Wet bulb globe temperature (WBGT). The

WBGT index is the best means of evaluating environmental heat. Commanders and NCOs must monitor the heat index, and if tactically possible, modify activities and soldier monitoring accordingly.

8. Be able to recognize heat injuries; perform first aid; and have a good, workable, and rehearsed evacuation plan:

■ *Sunburn.* Many people do not think of sunburn as a heat injury, but it is a frequent cause of injury to soldiers, and repeated exposures can lead to skin cancers later. Anyone can become sunburned, even on cloudy days. Fortunately, it is totally preventable, either through the use of sunscreen, or simply by keeping body parts covered.

■ *First Aid:* Cover the body part that is being burned. If there is pain or blistering with the burn, seek medical attention.

■ *Heat Cramps.* are painful cramps of the muscles caused by a heavy loss of salt through sweating. An individual may lose more than a quart of water per hour through sweating alone. Vomiting, diarrhea, or urination can make this, and all dehydration injuries, much worse. Generally, the cramps will disappear with treatment.

■ *First aid:* Move the victim to shade and loosen clothing. Treatment includes frequent intake of water, a cup (8 oz) every 15-20 minutes, not to exceed 1½ quarts per hour. Thirst is not an adequate indicator of dehydration. If cramps persist, dissolve ¼-teaspoon of table salt in one quart of water, and have the victim slowly drink at least one quart of the salt solution.

■ *Heat Exhaustion* is caused by excessive salt depletion and dehydration and is characterized by profuse sweating, headache, tingling sensation in the extremities, weakness, loss of appetite, dizziness, nausea, cramps, chills, and rapid breathing.

■ *First aid:* Lay victim flat in a cool, shady spot. Elevate feet and loosen clothing. Pour water on victim and fan to cool. If conscious, have the victim drink at least one canteen full of cool water with the salt solution. If soldiers do not recover after an hour, evacuate to the nearest aid station or other facility.

The important thing to remember about heat exhaustion is that there is often a fine line between heat exhaustion and heat stroke, and it is often hard to distinguish the two initially. If there is any doubt, assume the worst and start treating the casualty as if it were heat stroke.

Heat stroke can cause death or permanent disability if emergency treatment is not given. Heat stroke occurs when the body becomes unable to control its temperature; the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Lack of sweating in the heat is often listed as an important symptom of heat stroke; however, mental confusion, or disorientation will usually be seen first. Other symptoms include throbbing headache, flushed dry skin, nausea, and elevated body temperature.

■ First-aid: THIS IS A MEDICAL EMERGENCY—SEEK IMMEDIATE MEDICAL ATTENTION. Move the victim into the shade and cool with ice packs. If packs are not available, soak or douse victim with cool water. Fan body and elevate feet. Do not immerse in ice water. Do not try to give water to an unconscious victim. If medics or combat lifesavers are present, start intravenous (IV) fluids. Ensure the cooling process is continued during transport to medical facility.

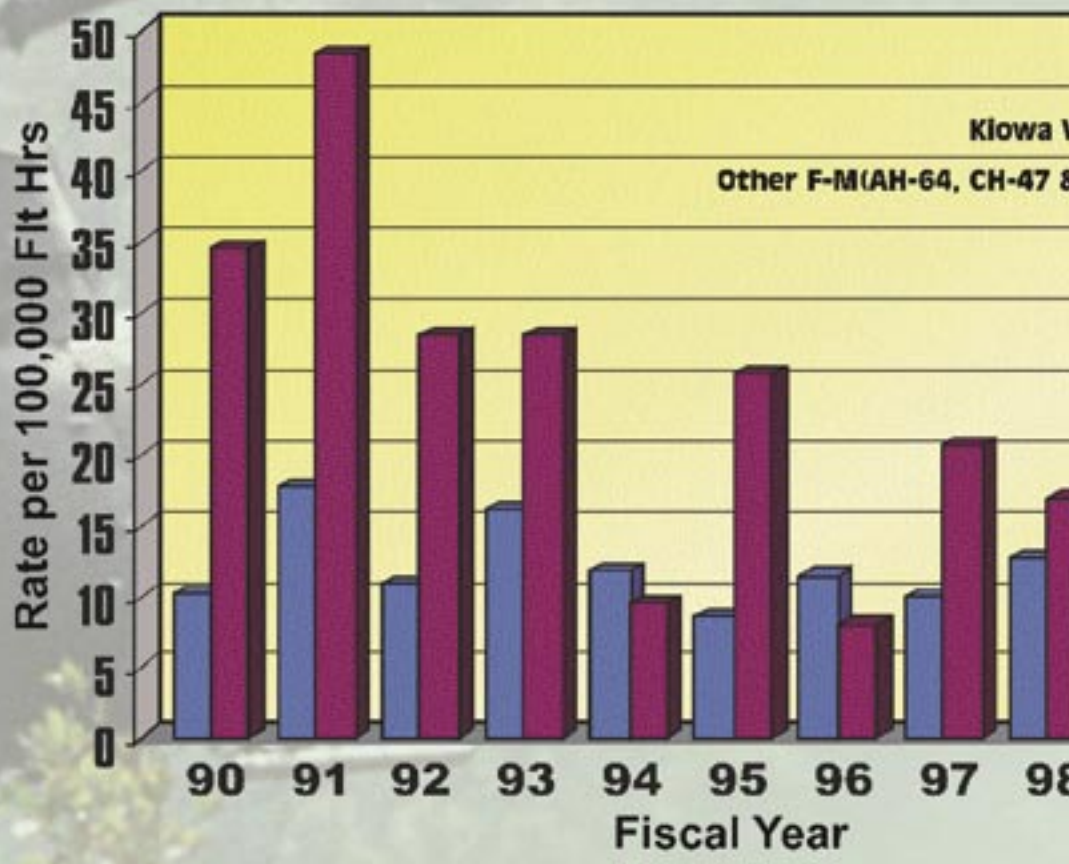
■ Bottom line: Although commanders and supervisors are responsible for heat injury prevention, every soldier can do his or her part—both by knowing about heat injuries, and by being a an extra set of eyes and ears monitoring buddies for the supervisors and commanders. As mentioned, all heat injuries are preventable, but like everything else, a team effort is always best to beat the heat.

—POC: LTC Robert Noback, Command Surgeon, DSN 558-2763 (334-255-2763), nobackr@safety-emh1.army.mil

Kiowa Warrior Revisited

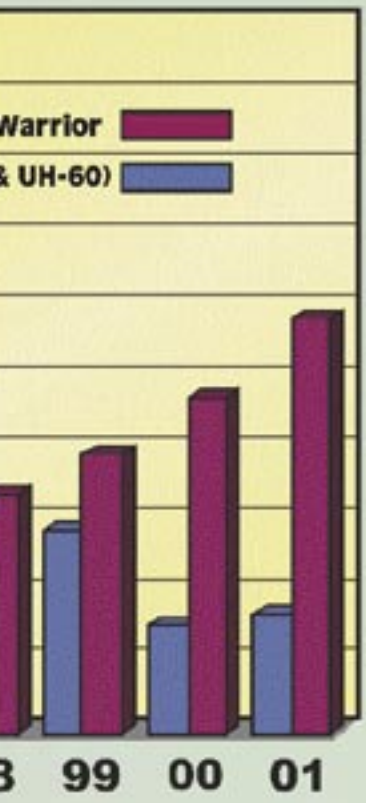
The November 2001 issue of *FlightFax* asked the question "Is there something wrong with the Kiowa?" Here we provide an update based on the KW Aviation Safety Investment Strategy Team (ASIST). This should not be construed as

Class A-C Flight Accident Rates



operational guidance, but is simply intended to keep the KW community informed of progress underway. Specific requirements will be communicated through operational channels as the actions mature. The KW ASIST Team will provide additional highlights in future *Flightfax* articles.

As with most aircraft, the KW flight accident rate changes considerably from one year to the next. Figure 1 shows this variation, as well as the rate for other Force Modernized helicopters (ie, AH-64, CH/MH-47 and UH-60) since Fiscal Year 1990. The KW accident rate peaked during FY90-91, as operations built toward Desert Shield/Storm. The KW rate has risen progressively over the last six years, and currently is the highest in the last decade. In response to this upward trend, the Commanding Generals of the Aviation Center, Aviation and Missile Command, Program Executive Officer–Aviation, and the Safety Center collectively chartered KW ASIST to analyze operational experience and develop a coordinated proposal to enhance KW safety.



KW ASIST conducted a risk-based, systems analysis to define hazards and potential controls to reduce KW losses, using FY 94-01 Class A-C accident reports as the baseline. ASIST goes beyond the traditional 'pilot error' approach and defines the hazards built into the overall system, and the controls that could be applied from all DTLOMS (Doctrine, Training, Leader Development, Organization, Materiel and Soldier). The overall system used for the ASIST analysis is depicted in Figure 2.

ASIST analysis is exhaustive and typically identifies over 100 separate hazards. This was true in the KW analysis. The top nine hazards contributed to a majority of the overall losses as prioritized in Figure 3. Unlike traditional analyses that focus on mistakes, these hazard statements describe conditions, built into the operational culture, to which KW crews are exposed. For each hazard, this chart depicts the number of accidents in which each hazard was identified (shown by the top number in the columns for FY94-98, FY 99-01 and total). ASIST assessed the risk associated with each hazard by calculating its contribution to overall KW losses, and combining accident frequency, number of casualties, and annual cost of each accident. Figure 3 depicts the contribution of each hazard

Kiowa Warrior System Characteristics

- **Doctrine**
  - Typically operated at near max gross weight and power
- **Training**
  - Only force modernized aircraft w/o simulator
  - OH-58D(R) not initially fielded in schoolhouse
- **Leader Development**
  - Typical of other aviation
- **Organization**
  - Two diverse missions with one platform (recon - Cav squadrons and light attack - Attack batallions)
  - Unit transitions to OH-58D(R)
- **Materiel**
  - No designated Integrator
  - "Interim system", with no funded sustainment program
  - Early 60's technology on airframe & drive (in common only with CH-47/MH-47)
  - Glass cockpit (multiple pages)
  - No buffer between –10 and –23 limits
  - Power management
    - Only single engine, force modernized aircraft
    - Reduced inertia main rotor
    - Engine responsiveness
    - Varied Modes (FADEC aircraft revert directly to manual mode, while ESC reverts to analog backup)
- **Soldier**
  - Typical of other aviation platforms

Prioritized Hazards

ID	Hazard Statement	FY94-98	FY99-01	Total
318	Selective enforcement of standards may result in damage to aircraft or injuries as a consequence of available controls not used (published standard not the same as the accepted standard)	25 (6.7%)	13 (14.1%)	38 (9.4%)
206	Hovering operations under high workload environment (eg, close proximity to obstacles, NVG or gunnery) may result in loss of situational awareness, damage or injury	13 (27.1%)	7 (2.0%)	20 (17.1%)
212	Crew ability to perform a successful autorotation significantly degraded due to inherent undesirable autorotational characteristics.	10 (1.5%)	7 (1.1%)	17 (1.3%)
238	Loss of situational awareness caused by poor division of attention (focus inside cockpit, fatigue and stress) may result in incorrect flight control input at critical flight phases and aircraft damage	11 (8.5%)	5 (2.9%)	16 (6.5%)
201	Task saturation during simulated engine failure may result in inability to adequately perform tasks (throttle position/power available), resulting in unplanned autorotative landing and aircraft damage.	9 (1.9%)	2 (1.1%)	11 (1.5%)
316	Commanders lack experience or seasoned leadership to manage risks with that unit	6 (2.0%)	3 (1.1%)	9 (1.7%)
327	Manual throttle operation can result in aircraft damage (overtorque, overspeed, hard landing)	0 (0%)	8 (2.6%)	8 (1.2%)
218	In accident sequence, aircraft structure may transmit loads that exceed human tolerance in otherwise non-injurious environments	1 (4.2%)	7 (43.4%)	8 (17.3%)
234	AAAR does not provide enough information for proactive risk management	6 (1.7%)	28 (11.3%)	34 (6.1%)

to overall losses by the bottom number in each of the columns (in parentheses). Figure 3 indicates that the top three hazards in KW operations have remained relatively constant over the last eight years, while two hazards (item numbers 201 and 316) have significantly decreased, and three hazards (items 327, 218 and 234) have significantly increased during the most recent period.

Next, ASIST identified over 150 controls that could reduce the risks associated with KW hazards. The KW ASIST Team documented near term, mid-term and long term actions in all elements of DTLOMS, and prioritized them from the standpoint of their potential impact on risk reduction. The ASIST analysis took a '*resource unconstrained*' perspective in defining these potential investments, regardless of current funding levels.

Working in partnership, the Aviation GOs then considered resource constraints to optimize the return on investment within the remaining KW operational life, with a target to bring KW losses in line with other force-modernized helicopter fleets. This target defined a reduction in KW accidents of approximately 58 percent. Using this target, the Aviation GOs mutually developed a consensus of the actions required, reflecting accident cost return on investment, as well as other operational considerations. These actions were documented in an Aviation Safety Action Plan (ASAP) for KW.

The KW ASAP lays out a mutually agreed upon set of immediate, mid-term and long term actions required to address the most critical hazards. ASIST concluded that hazards associated with FADEC and SEFT contribute

to, but are not the only driver of, the recent upward trend. Other hazards have contributed to greater losses long term – and continue to do so as shown by the items in Figure 3. Actions to address near term issues have been initiated by the Aviation GOs. Highlights of some actions currently being implemented or under development are:

■ Enlist the support of the senior Army leadership to elevate command emphasis to enforce standards in all areas of aviation development, training and operations. This is not intended to be a 'UCMJ blitz', but a campaign to promote mentorship and apprentice programs, as well as realistic risk assessments providing feedback to commanders as operational conditions change.

■ Advocate an interim change to AR 95-1 to require (DTC/DTM) data collection devices (if available) be installed for all flights.

■ Modify the ATM to increase the minimum entry altitude for initiation of simulated engine failure training.

■ Initiate an ASAM to incorporate a throttle index mark on the right hand collective.

■ Deploy DES mobile training teams to every OH-58D(R) unit to train and assess FADEC manual throttle operations. Until the R model IPC is established at USAAVNC, require newly assigned IPs in an R model unit to receive their R model qualification from DES. In the meantime, the Aviation GOs will consider a moratorium on manual throttle operations pending the DES or MTT assistance visit.

Mid-term KW ASAP identified actions required, to include: improvements to ANVIS; more frequent SEF training; minimum operational experience for selection as an aviation commander; broadened Pre-Command Course training; modifications to the KW MFD; link the ASIST database to AKO to provide field access to risk management information; expand the Army's accident investigation process to include 'hazards-based investigation'; enhance the Army's Crew Coordination Training programs; fully fund the KW Safety Enhancement Program; and field a reversionary governor for FADEC. Some, but not all, of these actions are funded (as well as longer term actions identified by the KW ASAP.) Full implementation of the KW ASAP will require additional funding support.

Even though the original purpose, simply stated, was to develop the KW ASAP for funding consideration at HQDA, it became clear that the resulting information on hazards, risks and controls would also be of use in risk managing operations at a unit level. Some important enhancements in ASIST data base management were developed during this KW analysis. Working in concert, the ASIST agencies will explore linking risk management information through Army Knowledge Online (AKO).

One issue of immediate operational interest is the quality of Aviation Abbreviated Accident Reports (AAAR's). The ASIST analysis noted a dramatic recent increase in the frequency of AAARs received from field investigations that did not provide enough information for identification of the hazard(s). In some categories of accident events, 50% of all AAAR's were below the quality needed to support proactive risk management. Previous ASIST analysis of other platforms demonstrates that this shortcoming is not confined to the KW. Unit ASOs can significantly assist risk management efforts at the Department of Army level by ensuring all accident investigations are reported using the guidance provided by AR 385-40 and DA Pam 385-40.

In conclusion, rising risks in Kiowa Warrior operations threaten to jeopardize the OH-58D as a platform in cavalry and attack formations. Aviation GO's have initiated actions needed to ensure safe operations in the immediate future. In the longer term, KW safety investments will need to be synchronized in step with Aviation Transformation. As resourcing decisions are made at HQDA, the Aviation GOs have directed that the ASIST analysis will be continued and followed up through the KW System Safety Working Group.

—Walter M. Garner, US Army Aviation Center; I. Russell Peusch, Jr., US Army Aviation & Missile Command; Carl Turner, RAM Inc

Ready for the future— the ARNG High Altitude Aviation Training Site

Aviation operations are currently being conducted throughout the world in austere mountainous terrain, including Afghanistan, Yemen, and the Philippines. Are you prepared to fly and fight above 8,000 feet? Most of our aviation forces are operating at, or near sea level, where aircraft have abundant power and controllability. Operating at high-density altitudes, in rugged unforgiving terrain, facing both human, and environmental enemies will require training to ensure your unit is prepared and capable. Modernized aircraft succumb to the effects of density altitude, do not be overconfident; technology alone will not ensure your success!

The High-altitude ARNG Aviation Training Site, (HAATS) exists to train your aircrews to succeed in this challenging environment. The HAATS has been conducting graduate level flight training since 1987, at the Eagle County (Colorado) Airport. The training area includes nearly one million acres. Operating from 6,500 feet MSL to 14,000 feet MSL provides insights into the planning and judgment process that simulation cannot replicate. Using an objective power management process known as "Target Torque" which supplements all Aircrew Training Manuals, commanders and crews quickly discover, and correct existing training deficiencies.

Use Ours or Bring Yours

The primary training aircraft at the HAATS are the venerable UH-1 and OH-58, both of which are excellent trainers for the power management process. However, HAATS is capable of training in the UH-60 and CH-47 provided the attending units bring their own aircraft. The current Program of Instruction is one week in length for the initial qualification course. Approximately 20 hours of ground instruction, and 7.5 hours of flight instruction per aviator, provides relevant insights that expand the conceptual frame of knowledge. A one-week Instructor Pilot (IP) course is also offered, and serves to establish basic instruction capabilities for unit level training. The course consists of approximately 13 hours of individual flight instruction, and 20 hours of ground instruction.

The HAATS Power Management Mountain Qualification Course (HPMMQC) focuses on individual and crew competencies requisite to safely prepare and conduct operations in power limited mountainous environments. Individual competencies must be understood prior to collective training. To date, the environmental enemy in Afghanistan has claimed more lives than the human enemy. Take action before your unit is deployed. Being trained in a truly power limited mountainous environment will allow for local training to refine the concepts learned at HAATS. In a resource constrained environment, it is impossible to become an expert in mountain operations in one week with 7.5 hours of flight time; however, once learned, the power management and planning processes can be incorporated into your local and tactical SOPs.

HAATS stands ready to help you with your training needs. For more information, or to contact HAATS go to Coloradoguard.com and look for the High-altitude ARNG Aviation Training Site link; or contact HAATS Operations Officer CW4 Such, or the Operations NCO, SFC Kipferl at DSN 877-8180 x 2915 or Commercial 970-524-7702. HAATS ATRRS School code is 961A.

As we move to transform to a capabilities-based force, we must possess the ability to respond rapidly anywhere in the world with trained and ready tailored forces. Forces capable of operating in any environment day or night, in desert or mountainous terrain. Remember, we can't win wars if we crash getting to the fight!

—LTC Joel Best, CO ARNG, Commander, HAATS, DSN 246-0950 (970) 524-7702, Joel.Best@co.ngb.army.mil

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class A
A model

■ Accident aircraft was trail in a flight of four when the remaining crews determined that contact had been lost. Aircraft was subsequently located. One crewmember sustained fatal injuries, one crewmember injured. Aircraft was totally destroyed.

Class C
A model

■ Prior to takeoff, aircraft's OIL HOT transmission No.1 light and caution light illuminated. When PC attempted to start Auxiliary Power Unit, a loud whine was heard, followed by an explosion from the transmission area. Emergency shutdown was performed without further incident. Postflight inspection revealed damage to No.7 drive shaft, APU PTO clutch, mast support brace, and adjacent wire bundle.

D model

■ Postflight maintenance inspection confirmed NR peak of 199% during engine shutdown. Throttle had inadvertently been placed in the ECU lock-out position during shutdown.

C-12

Class D
R model

■ On take off, prior to 65 knots, aircraft struck several birds. Take off was aborted with no further incident. On postflight inspection the crew noted that one bird went through right engine propeller. Second bird struck radome, resulting in several cracks.

CH-47

Class A
D model

■ Trail aircraft in multiship flight struck a sand dune. Front gear separated, rear gear pushed up and back, aft ramp separated, right main fuel tank pushed in, floor buckled, stringer damaged. Crewmember injured.

■ Aircraft was parked when winds in excess of 70 knots caused blades to come unfastened. Damage to static stops, a tube near the transmission and the forward rotorhead.

E model

■ Trail aircraft in flight of two descended into ocean waters. Lead aircraft observed the trail aircraft impact the water, buckle and disintegrate. A huge fireball was observed after the aircraft impacted the water. Aircraft lost. Ten fatalities.

Class C
E model

■ While aircraft was disconnecting from refueling aircraft, refueling hose contacted the main rotor blades. Two were damaged.

OH-58

Class E
DR series

■ During termination of an NOE hover deceleration, aircraft vertical sink rate was arrested with collective application. Audio tone for high torque sounded for less than 1 second. Collective was lowered to reduce torque. Engine monitor page 1 indicated a max mast torque of 120%, page 3 indicated >103% for 2 seconds and >116% for no time. Mast torque of >116% requires a visual inspection. The inspection was completed with no damage noted.

TH-67

Class C

■ Aircraft was in cruise flight with a student at the controls for IERW training. Crew heard a loud bang and vibrations were felt in the pedals. IP initiated emergency procedure for loss of tail rotor control. Aircraft was landed in an open field. Postflight inspection revealed that a section of the tail rotor driveshaft and hangar bearings had separated.

UH-1

Class E
H model

■ During the engine start sequence, as N1 passed through 5%, N1 accelerated to 48.8% and then froze in place. All other engine indications were normal. Crew aborted the start sequence and terminated the flight. Maintenance personnel replaced N1 Tach, performed MOC and released aircraft for flight.

UH-60

Class C
A series

■ Aircraft contacted a tree during terrain flight. High frequency antenna, stabilator, tailwheel access panel and lower anti-collision light damaged.

L series

■ Crew discovered damage to four main rotor blades during postflight inspection after aircraft day air assault training into confined area.

Class E
A series

■ During flight, crew observed the #1 engine oil pressure level momentarily indicated below normal limits. On the landing phase of the flight, the #1 engine oil pressure level dropped below the minimum of 20 PSI, requiring the crew to perform an emergency engine shutdown of the #1 engine. Crew terminated the flight and performed a normal aircraft shutdown without further incident. Maintenance inspection revealed the #1 engine lost its entire quantity of oil and an engine internal seal had apparently blown. Engine replaced.

Mobile Training Teams Come to You…And the Price is Right

Do your soldiers need training on Risk Management and other important safety related force protection issues? If your answer is "yes", then we have the courses for you! The NCO and Junior Officer Professional Development Mobile Training Team (MTT) is a group of Officers and Senior NCOs that travel around the world to Army locations to teach soldiers on the following topics:

- The Army Safety Program
- Unit Safety Programs
- Accident Investigation and Reporting
- Risk Management
- Weapons and Range Safety
- Tactical Safety
- Army Motor Vehicle Safety, Occupational Safety and Health
- Privately Owned Vehicle Safety.

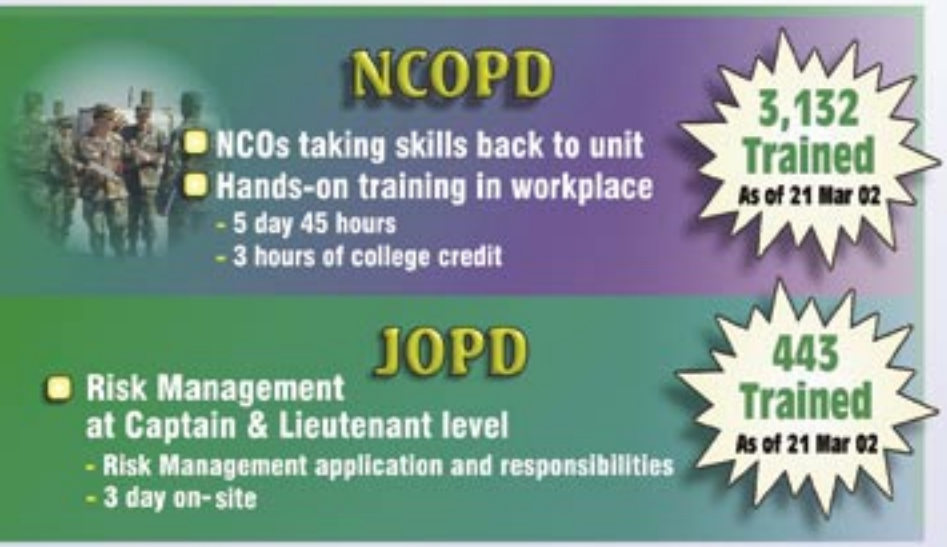
This is great training for those leaders that are down on the ground, doing the Army's business day in and day out.

The first course is a five-day session that consists of 45-hours of safety related subjects. The target audience is NCOs. The class will have homework, multiple practical exercises, complete an Army Occupational Safety and Health Survey (SAOSHI), and undergo a 50-question exam. Upon completion of the course, the soldier will receive a certificate from the US Army Safety Center, a greater knowledge of the Army Safety Program, and three hours of college credit. The course is accredited by the American Council on Education through Texas A & M University.

Junior Officers, Too

The second course that we offer is geared toward young officers and Warrant Officer technicians. This 25-hour course is focused on hazards identification, risk management, the Army Safety Program, and leader responsibilities. The Junior Officer course will also go through a SAOSHI survey. This course typically runs from Tuesday-Thursday for three days.

The best part about these two courses is that it is free training to all command levels, to include Active Army, National Guard, and Reserve Component personnel. The U.S. Army Safety Center will provide these services at no monetary cost to Corps, Division, or Brigade-sized units and installations. The only cost to the unit is a commitment of time and selected personnel for three days or a single week, based on the course selected. The goal is to have at least 40 personnel attend the training. The Safety Center will do everything possible to accommodate the unit's training schedule and any other issues that the unit may have. If you have any questions please visit our website at, **http://safety.army.mil** and select the On-Site Training icon. Or give me a call and we can go over your questions in more detail.



—CW4 Anthony Kurtz, MTT Team Chief, USASC, DSN 558-2908 (334-255-2908) Anthony.Kurtz@safetycenter.army.mil

Creatures of the Night—

Tricking the aviator's body into night alertness

The issue of working reverse cycle in aviation is a complicated one. While aviators may be restricted by crew rest guidelines in how many hours they may fly, there is no restriction on *when* these hours may be flown. Many times aviators and other air crewmembers are required to fly or work at various times in the 24-hour day where they may need to reverse their work hours from typical duty day times to nights, early mornings, or late evenings. When this rotation occurs, aviators and crew members become "shift workers" in that they no longer work set hours, and may change their work hours every week, every 2-3 days, or possibly even on a daily basis, whether for the short-term or the long-term. When this happens, all the physiological symptoms typically experienced in shift work occur -- fatigue, sleepiness, insomnia, moodiness, etc. Along with these symptoms come performance problems and mistakes that can have disastrous consequences when flying.

The feelings of fatigue that people have when they rearrange their schedule (trying to stay awake at night and then sleeping during the day) are not unique. Almost everyone who works varying schedules feels sleepy or tired

during the night, when they need to be alert and working. In addition, they experience difficulty sleeping during the day, when trying to recoup from a night of work. This is a normal feeling because night activity and day sleep are in opposition to the body's natural programming, or circadian rhythm.

The rhythms of wake and sleep, hormonal secretions, performance, and core body temperature, rise and fall in predictable patterns over the 24-hour day. As the day begins, body temperature, alertness, and performance are rising. This continues into the day, with a slight dip in the mid-afternoon, and then begins to fall as the day ends and night begins. In contrast, sleepiness declines as the day begins, has a small increase in the mid-afternoon, and then steadily increases as the day ends and night begins. The ability to go to sleep and stay asleep becomes increasingly difficult as the day progresses. One can readily determine why it is so difficult for shift workers to remain awake while on night shift, and sleep during daylight hours.

A host of activities—work, safety, health, family and social life—are affected when an individual experiences a constant change in schedules. So, what can the aviator or crewmember who works shifts do to make life easier and minimize feelings of irritability and tiredness? These suggestions can help:

■ Avoid caffeine 4-6 hours before bedtime.

■ Avoid sunlight after a night shift by wearing dark sunglasses while driving home.

■ Stay indoors and avoid sunlight as much as possible until your sleep period is complete.

■ Relax before sleep time. Avoid stimulating activities, such as house and yard work.

■ Avoid alcohol for at least 3 hours before bedtime.

■ Avoid strenuous exercise at least 3 hours before bedtime.

■ Get a minimum of 6 hours of sleep; take naps if you cannot get enough sleep at one time.

The above strategies are very good at promoting sleep. However, other strategies may be needed to stay asleep.

■ Sleep in your regular bedclothes and in your usual bed.

■ Have a comfortable mattress and pillow.

■ Make the bedroom cool and very dark.

■ Remove the phone from the room and discourage daytime visitors.

■ Disconnect the doorbell and hang a sign indicating a shift worker is sleeping.

■ Use earplugs and a masking noise like a fan to cover outside distractions.

■ Develop a sleep schedule.

■ Communicate with family and friends your need to sleep and your sleep schedule.

Although sleeping as well as possible during the day is a great start to being alert during the night, sleepiness at night will continue to occur. One cannot completely trick the body into being alert during the night, because there is a strong physiological drive for sleep at night. The human body can adapt somewhat to staying awake all night, but it takes many days of strict schedules before it adjusts, and most shift workers are off the night shift by the time this occurs. However, there are some strategies that can improve alertness at night.

■ Use caffeine carefully; wait until you need a boost.

■ Eat low carbohydrate, low fat, high protein foods.

■ Use social interactions and physical activity/postural changes to help stimulate your environment.

■ Stay cooler than usual.

■ Prepare in advance for changes in sleep schedules by gradually adjusting your sleep time.

■ Use naps to obtain as much sleep as possible before the night's work begins.

It's important to be aware that adjusting to rotating schedules and reverse cycle is not easy. However, taking care of some of the manageable variables will lead to improved safety on the ground and in the air, better work performance, better relationships with family and friends, and better general health.

—Dr. Lynn Caldwell, USAARL J. Lynn Caldwell, Ph.D. U.S. Army Aeromedical Research Laboratory Fort Rucker, AL 36362-0577

NEWS & notes

Remove before flight

Please ensure your maintenance personnel are inspecting all maintenance equipment (rigging pins, plugs, etc.) that have safety streamers/"Remove Before Flight" flags for serviceability. We recently heard of another example of a maintenance catastrophe due to a safety streamer either not being installed or coming off the piece of equipment while it was in use. Also, plugs are being missed after completion of the maintenance tasks.

In one particular case, a vent plug was inadvertently left installed after fuel cell maintenance. During subsequent refueling operations, an overpressure condition resulted in catastrophic failure of the fuel tank. It comes back to the basics of following the -23 for fuel cell repair operations.

—Steve Vacula, AASF#2, TNARNG, DSN 266-4602
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Small Unit Guide

It's here—the latest version of DA Pam 385-1, *Small Unit Safety Officer/NCO Guide*. It provides guidance for commanders and additional duty safety officers and NCOs to apply policies, procedures and information to develop and execute a unit safety program. The publication, dated 29 Nov 2001, is being distributed Army-wide. The electronic version can be found at the Safety Center web page: **http://safety.army.mil**; click: Guidance, then: Safety, and scroll down to find the link to DA Pam 385-1.

Useful Safety Center tools

Seen a copy of *Countermeasure* lately? That's the ground safety publication produced here at the Army Safety Center. Many safety issues addressed in *Countermeasure* also pertain to aviation unit ground operations. Sometimes we tend to think of certain topicsas ground or aviation issues. Many safety problems apply to both arenas. So check out *Countermeasure*. You'll find it useful.

If your unit doesn't receive *Countermeasure*, contact Sharrel Forehand, DSN 558-2062 (334) 255-2062 to be placed on distribution. Her e-mail is **Sharrel.Forehand @safetycenter.army.mil**

And don't forget the other handy tools available to you on the Safety Center website, such as the new POV country music videos. Just go to **http://safety.army.mil** and check out the quick view tool bar, or press the MEDIA button.

HELICOPTERS versus airplanes

The thing is, helicopters are different from airplanes.

**An airplane by its nature wants to fly,
and if not interfered with too strongly by unusual events
or an unusually incompetent pilot,
it will fly.**

**A helicopter does not want to fly.
It is maintained in the air by a variety of forces and controls
working in opposition to each other,
and if there is any disturbance in this delicate balance
the helicopter stops flying,
immediately and disastrously.**

There is no such thing as a gliding helicopter.

**This is why being a helicopter pilot
is so different from being an airplane pilot,
and why, in generality,
airplane pilots are open, clear-eyed, buoyant extroverts
and helicopter pilots are brooders, introspective anticipators of trouble.**

**They know if something bad has not happened,
it is about to.**

—Attributed to Harry Reasoner: Feb 16, 1971, Courtesy of Woodcrafters, Level Plains, Alabama

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

May 2002 ✦ VOL 30 ✦ NO 5

Aviation Life Support Equipment

How important is ALSE?

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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POV FATALITIES through 31 March

FY02	FY01	3-yr Avg
54	41	53

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Combined Arms Training

We must always prepare for the next fight—not the last fight. The Army wins wars by conducting successful campaigns, which are made up of successful battles and engagements. Engagements have always been the key to battlefield successes. Engagements are where the combined arms of the Army come together.

Our training must focus on employing all of the combined arms assets in a live-fire environment. Infantry and Armor captains must understand how to safely employ their own direct-fire weapon systems, their own crew-served weapon systems, their organic and indirect fire systems and how to employ supporting artillery, attack helicopter, and close air support assets.

Likewise, our aviation captains must understand how the Infantry and Armor formations at battalion and brigade fight, as well as integrating their fires into the close fight at the company and platoon level. Our aviators must understand what they are seeing as they maneuver about the battlefield, from both the friendly and enemy sides.

We have already had too many fratricide incidents in the current war. While these have not involved the AH-64, the potential exists for us to have fratricide in the close fight as we did in Desert Shield/Desert Storm. Structured field training is the best way to mitigate the risks. Senior leaders, battalion and above, must be in the field observing and controlling the actions of their units and, most importantly, provide resources to include time to retrain to standard.

For too long, many of our attack units have focused on the deep fight. Except for selected units, we have lost the skills necessary to integrate the critical fires of the AH-64 into the close fight. As we have already seen in Afghanistan, we are going to be employed in a close fight role. We must get busy training for that mission if we are going to be successful at killing the enemy and avoid inflicting casualties on our friendly forces.

Communications and TTP are critical in the employment of all of the combined assets. You would not play a football game on Saturday without practicing all week on the plays you plan to use. We should not enter into the fight without having worked out our critical procedures on the training field.

Train Hard

—BG Simmons
Director of Army Safety

Aviation Life Support Equipment

How important is ALSE?

Like the Safety program, the Aviation Life Support Systems (ALSS) program is the commander's program. A lack of command emphasis on ALSS sets the stage for equipment failure and increased levels of injury in the event of an unplanned incident. Equipment failures or inadequate training could reduce chances for survival and rescue.

Several recent accidents investigated by the US Army Safety Center (USASC) have highlighted some disturbing issues about Aviation Life Support Equipment (ALSE) at the unit level. Invariably there is least one finding addressing the operation or maintenance of ALSE. While the most recurring issues involve crewmembers flying with ALSE that is overdue inspection, others involve injured crewmembers unable to access/use the equipment in their survival vests, or those who were unfamiliar with the location of the components within the vest, or those not trained in the proper use of the equipment.

Overdue Inspections.

The most frequent ALSE finding is that one or more crewmembers are performing aviation duties with helmets and/or survival vests that are overdue inspection. The typical aviator is very diligent about preflighting an aircraft and not accepting an aircraft that has overflown a scheduled inspection. So why does the aviation community routinely tolerate our crewmembers using ALSE that is past its inspection date?

ALSE inspections are not arbitrary. They are mandated by the Department of the Army. They are regulatory just as aircraft and airframe component inspections are. What if there is an accident or you are put in a position in combat where your ALSE is needed? Neither the individual crewmember nor the aviation commander has the authority to arbitrarily ignore ALSE inspections.

While it is an individual responsibility to ensure that your individual ALSE is current, there are methods that the unit ALSE Officer/ technician can use to ensure that crewmembers do not overfly inspections. It has been my observation that simply sending a memo to the commander or ASO will not ensure that crewmembers turn in their gear for inspection. It is not that uncommon for the Commander himself to be in violation of ALSE inspection requirements. Commanders can make it known they will not tolerate crewmembers using equipment that is overdue inspection.

Another method that seems to work well for many units involves the reading file and

requires the cooperation of flight operations. If the ALSE officer/technician makes a crewmember "red" for an overdue inspection, when the PC/PI turns in the mission brief sheet and signs for the aircraft ignition key, flight OPS personnel must then take the time to look at the reading file. If any crewmember on that mission is "red", then the aircraft key isn't signed out unless either the "red" crewmember is taken off the flight, or the situation is corrected that made the crewmember "red" in the first place.

Standardization of vest components location.
Should vests be loaded differently for combat versus peacetime? I think not. We should train as we fight. I believe that holds true for survival vests also. That doesn't mean that an AH-64 unit will configure their vests the same as an OH-58D unit. Vests, however, should be standardized within organizations. Should one crewmember need to get an item from an injured crewmember's vest, he needs to be able to find what he is looking for.

Familiarity with ALSE components.
A crewmember must be familiar with the contents, location and operation of the various components of their survival vest. Commanders must make it clear that it is OK for crewmembers to open their vests and use the components, if needed, in peacetime.

There is a perception in the aviation community that our survival vests are off limits and should not be opened or used. Crewmembers who can recite from memory vast and minute details about their aircraft are at a loss to describe the various components of equipment and their location in the survival vests. ALSOs and ALSE technicians should take the initiative and conduct opportunity training during monthly aviator classes or periodic Safety stand down days. Commanders should program into their ALSE budgets a few extra components to be used in periodic demonstrations (for example, the pen flares and combination smoke/flare found in the new AIRSAVE vest). Commanders must support their ALSOs and ALSE technicians in educating the unit about the importance of ALSE.

Vest component packaging.
The final ALSE trend noted by USASC investigators is the barrier packaging of individual components within the various survival vests. Whether your unit uses the AIRSAVE, SARVIP or SRU–21, the components located in the various compartments must be configured so that an injured crewmember can reach, open and use them. Increasingly, units are using vacuum sealers to shrink wrap the components of the vest. While PM ACIS supports the use of shrink-wrap, a recent message emphasizes that corners of shrink-wrap be notched to permit easy opening by an injured crewmember. The benefits of shrink-wrap are clear: reduced bulk and volume, water and dustproofing, and it makes accountability of the components by ALSE personnel easier.

The drawback is that the thickness of the material being used may make it extremely difficult to tear open the package if you are injured, even if properly notched. I propose that a simple test by our aviation commanders, ALSOs and ALSE technicians be conducted to determine the availability of your units' vest components to an injured crewmember who can only use one hand due to injury or by being pinned in the wreckage. On your 120-day and special inspection, when you are required to open the packages to inspect the contents, try to open the package one handed and/or by using your teeth. Can you do it? If not, it may be time to reconsider your packaging methods; use zip lock bags, or go to a thinner material for shrink-wrapping. As you conduct this test, ask yourself these questions: How important is ALSE to my organization and how much value do I put in the prevention/reduction in the severity of injuries to the personnel in my organization? *Command emphasis* is the key to a sound ALSS program in your unit.

—MAJ David E. Schoolcraft and SFC Dawayne D. Piper, US Army Safety Center Aviation Accident Investigation and System Safety Division, DSN 558-9858, (334) 255-9858, david.schoolcraft@safetycenter.army.mil

The effects of the Communication Ear Plug (CEP) on crew coordination

Currently, Army Aviation faces a number of challenges with balancing the need for equipment with limited resources. One particular problem of note exists in aviation cockpits. Several aircrew members, especially in the UH-60 community, are unable to hear members of their crew, due to the use of the Communication Ear Plug (CEP). It appears that when one or more of the aircrew members, but not all, wears the CEP during flight, it is difficult for those who are not equipped with the CEP to hear his or her fellow aircrew members. Therefore, the partial fielding of the CEP significantly degrades aircrew coordination and the overall effectiveness of the U.S. Army Aircrew.

The CEP is designed to enhance hearing attenuation while providing increased hearing protection for Army Aviators. To prevent hearing loss and improve hearing conservation, most aircrew members wear additional hearing protection in the form of foam or flanged fitted earplugs. While this solves the problem of eliminating most harmful ambient noise levels, it creates the additional problem of degrading speech interpretation. The CEP was developed by the U.S. Army Aeromedical Research Laboratory (USAARL) as a low cost, highly effective method of additional hearing protection, while enhancing voice communications and speech intelligibility.

Several aviation units are currently issuing the CEP to aircrew members, and in some cases issuing the HGU-56/P with the CEP already installed. However, not all aircrew members in Army aviation, both Active and Reserve have been fielded with this valuable piece of equipment. In fact, several aircrew members purchase the CEP locally with personal funds.

The Army purchased 7,400 CEP sets to be fielded in early 2002. This is good news. However, it appears that not all aircrew members will get the CEP in a timely manner, especially in National Guard and Reserve units. Because of this, it is important that the Army and its commanders recognize and address the negative effects of not having all aircrew members equipped with the CEP, and most importantly, how that potential decrease in crew coordination effectiveness can impact the safety of the aircrew.

A significant number of Army Aviation accidents are a result of crew coordination errors. Most crew coordination errors are avoided through crew-level training. However, some crew coordination errors are due to a series of errors resulting from either equipment failure, adverse environmental effects or misinterpretation by one or more crewmembers. *Communicate positively* is the first and most important element in successful crew coordination. Without positive, concise communications between aircrew members, all elements of crew coordination are significantly degraded, and can place the aircrew in jeopardy.

If aircrew members are unable to clearly hear their fellow crewmembers, or external radio transmissions, the ability to communicate positively is severely reduced. Aircrew members have to fix, adjust or adapt to the problem at their level. This creates increased pilot or crewmember workload

throughout the mission. The problem can be separated into two categories. One is the effect the CEP has on the ability to hear radio transmissions. The second is the effect the CEP has on the ability to hear fellow crewmembers. For example, in the UH-60 airframe, the first problem usually exists when one of the crewmembers is wearing the CEP and the rest of the crew is not. Because of the effectiveness of the CEP transducer, the person wearing the CEP can hear the FM, UHF, and VHF radios well and tends to turn down the volume on the radio control head. This reduced volume causes the other crewmembers to have difficulty hearing radio transmissions being sent to the aircraft. They can react to this problem in a number of ways. The crewmembers without the CEP can turn their Internal Communications System (ICS) volume down, take out additional hearing protection, ask another crewmember to repeat the radio transmission, or do nothing at all and inevitably lose situational awareness. All of these actions severely interfere with positive crew cockpit communications and crew coordination, which increases pilot/crewmember workload.

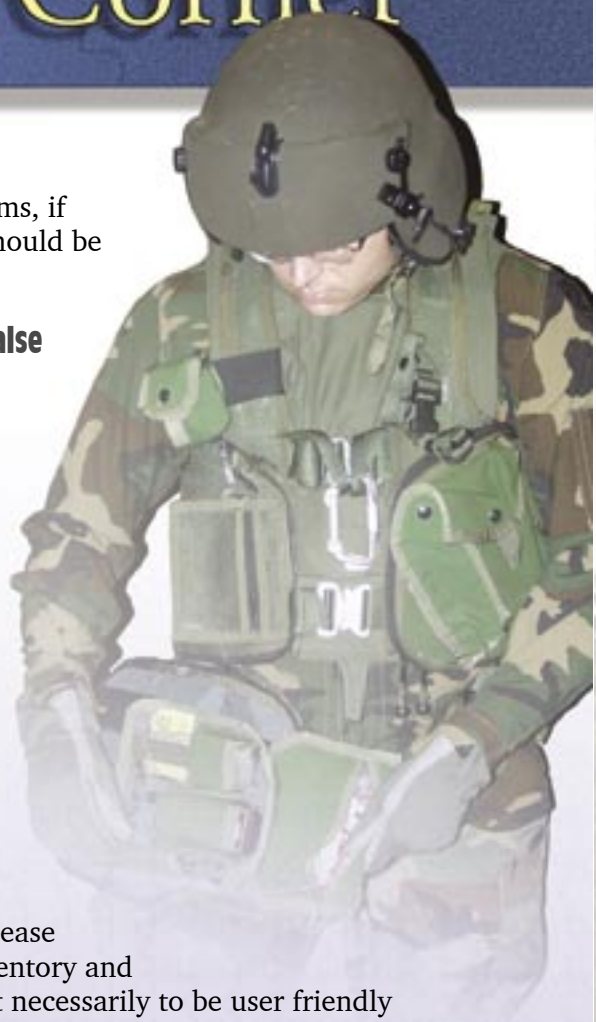
The second problem occurs when the crewmember wearing the CEP speaks. Studies have shown that there is an effect of wearing hearing protection on both the listener and the speaker. Assume that crewmembers not wearing the CEP are forced to turn their individual ICS box volume up, or remove, either partially or fully, their earplugs in order to hear the external radio transmissions. Because the external radios are now louder to the non-CEP equipped crewmember, they are exposed to significantly great ambient noise, which equates to nearly the same decibel (dB) level as not wearing any hearing protection at all. Interestingly, in a noisy or heavy task loaded environment, individuals wearing hearing protection tend to speak 2 to 4 dB more softly and 25 percent faster. Therefore, the inability to hear the person with the CEP is doubled. This creates a nearly insurmountable environment for crewmembers without the CEP to try to hear their softer speaking fellow crewmember over louder radios or additional external noise.

Due to limited resources, the Army is currently unable to provide CEPs to 100% of its aircrew members. The Army may eventually be able to provide Aviation units with this highly effective piece of equipment, but until then, unit commanders are faced with a tough decision: "Do they allow aircrews with mixed hearing protection capabilities to fly with one another, risking degraded crew coordination, increasing aircrew workload, and inherently increasing the overall risk of the flight? Or do they restrict the use of CEPs until all members of the aircrew possess this piece of equipment?

When it comes to providing resources to today's Army, a lot of analysis must occur and tough decisions are made. The fact is that those decisions almost always directly affect the individual soldier, or in this particular case the aircrew member. Increased technology, contrasted against a lack of resources causes the soldier to react to, rather than gain benefit from a piece of equipment that was designed to improve communications. Because of this, Army leaders must either train the soldier, or establish restrictions in order to protect the soldier from harm. Today's Army aviators and aircrew members must identify that there is a potential risk with using the CEP with less than fully equipped aircrews. Today's Army Aviation leaders must be able to recognize this CEP issue, and consequently establish control measures that will reduce the risk to the aircrew. It would be extremely unfortunate if an accident occurred because we failed to properly outfit our personnel.

—CPT Heather Hennessy, Aviation Captain's Career Course, Class 02-01

Investigator's Corner



ALSE vest check

You are a crewmember in a Black Hawk that just crashed in a confined area, at night, in blowing snow with temperatures hovering at 19 degrees Fahrenheit. You manage to successfully egress the aircraft and realize that except for your other crew members, you are all alone. You are in shock, cold, fingers numb, and you need to contact your sister ship which is 10 miles away. You try your AN/PRC 112 survival radio, but no response. You remain calm, and decide to send up a few warning flares from your survival vest. You reach around to your right in the SRU-21-P vest to get your flares and flare gun. The problem is, you can't manage to get the Velcro pocket open because you cannot reach it to pull it apart. This is not good—no flares and a long wait until someone realizes you are missing and sends out search and rescue.

This sounds like a tall tale but it really took place in a secluded area in Wyoming. Fortunately, there was a happy ending. The crew was rescued by another UH-60 crew in the area who heard the distress call, and knew the area well enough to find their downed wingmen.

Could have been worse

It might have been a lot worse. The pocket that holds the flares on the SRU-21-P is placed too far in the right rear for quick access. It is almost impossible to reach this pocket without taking the vest off. In the dark, in the snow, it may not be a good idea to remove your vest. You probably don't want to risk losing any other items in it.

What can be done to correct this? PEO Soldier Systems can expedite the fielding of the new CWU-33/P22P-18 Vest, but that will take some time. In the meantime, ALSE personnel should inform aviation crews of this potential problem. Individual Crewmembers should inspect and review all items in the vest prior to a flight and have a plan to retrieve those items, if and when they should be needed.

That's what the alse gear is for

All too often, we operate under the premise that the ALSE gear is not to be touched unless it's a "real emergency", so to prevent loss or theft, our ALSE Techs have devised new and inventive ways to package much needed items, to ease them in their inventory and maintenance, not necessarily to be user friendly for the crewmember to access. Having the most likely required items readily available, in easy open packages, zip-lock bags vs. shrink-wrap, might be the difference between minor or severe injury.

As a former Battalion Commander, I assure you that there isn't one thing in that vest that can't be replaced. If you're in the field or deployed downrange and cut your finger, use a band-aid... get a headache...take some aspirin...that's what the ALSE items are there for. The only caveat here is that once you return to home station, it is now your responsibility to take your vest back to the ALSE shop to have the used items replaced. Remember, it's Your Vest, learn it...know it...care for it...it just might save your life!

Fly Safe!

-LTC Keith Cianfrani, USAR Liaison Officer USASC, DSN 558-1186, (334) 255-1186, keith.cianfrani@safetycenter.army.mil
-LTC Scott G. Ciluffo, Deputy Director of Operations, USASC

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Aircraft-Ground

■ Civilian employee was performing OH-58 maintenance during engine run-up when his hair became entangled in the tail rotor driveshaft. Employee sustained extensive head injuries including severed hair and skin layers.

AH-64

Class C

D model

■ Following HIT check, Pilot attempted to take off with one of the two engines at idle.

AH-6

Class C

J model

■ While at a hover in preparation for a Pre-100 hour inspection test flight, the MP noticed a drop in indicated torque and engine oil pressure. Aircraft was landed and MP conducted emergency shutdown. Oil was observed on the parking pad following aircraft shutdown.

M model

■ During autorotational landing assessment on an experimental flight test, the main rotor blade struck the SATCOM and GPS antenna at touchdown. Three of the six blades were damaged, as well as the SATCOM antenna and tail skid

CH-47

Class C

D model

■ Aircraft was landed following low reading on hydraulic fluid indicator. Postflight inspection revealed hydraulic line contact with No. 9 drive shaft and hole in hydraulic line. Scouring damage to No. 9 drive shaft.

■ Crew executed emergency landing following severe vibration. Postflight inspection confirmed separation of aft rotor damper from the blade, subsequent blade contact with, and damage to, the fuselage.

MH-6

Class C

J model

■ During cruise flight, chalk one in flight of three made a precautionary landing due to smoke in the vicinity of the engine compartment. Postflight inspection revealed evidence of fire in the engine compartment.

OH-58

Class B

D-I model

■ During refresher training, while conducting a simulated engine failure, SP noticed aircraft's rotor RPM reaching a critical point and initiated a power recovery. Overtorque of mast and engine. Damage to tail rotor, three main rotor blades and the four upper droop stops.

Class C

C model

■ During start sequence, aircraft's TOT reached overtemp condition. During the Start abort procedure, crewmember's finger slipped off idle detent, preventing him from rolling off the throttle. TOT reached 1000 degrees. Engine replaced.

D-R Model

■ During landing aircraft's transmission experienced 120% overtorque for four seconds. Transmission replaced.

UH-60

Class A

A model

■ During approach to confined area in white-out condition, aircraft drifted AFT and struck a tree. Minor injuries to two crewmembers. Aircraft destroyed.

Class C

A model

■ Following mission conducting hoist operations in a confined area surrounded by trees, postflight inspection revealed damage to two of aircraft's tail rotor paddles.

■ Postflight inspection revealed damage to SATCOM antenna and intermediate gearbox cover, as well as minor damage to four main rotor blades.

K model

■ During MOC for engine replacement, engine oversped to 120%. Engine was shutdown without further incident.

L model

■ Crew noted a loud report (pop) and vibration from aircraft upon completion of a roll-on landing to a field site. Postflight inspection revealed that the tail wheel strut had separated from the mounting point and contacted and damaged the tail rotor drive shaft.

ALSE User's conference

Commanders, ALSE Officers, and other interested personnel are invited to mark your calendars for August 20-22 and make plans to attend the 2002 Army ALSE User's conference in Huntsville. A block of rooms has been set aside at the Huntsville Hilton at the per diem rate of $70.

Anyone interested in making a presentation to this meeting should contact the Program Manager, Aircrew Integrated Systems, no later than 1 June.

PM ACIS Points of contact are: Melanie BARKSDALE, (256) 313-4255, E-MAIL: MELANIE.BARKSDALE@PEOAVN.REDSTONE.ARMY.MIL; OR John Jolly, (256)313-4262, E-MAIL: JOHN.JOLLY@PEOAVN.REDSTONE.ARMY.MIL

Risk management and flight risk assessment worksheets

Sometimes there is confusion over the proper procedures for implementing risk management with respect to flight operations. When we complete a unit-generated, flight risk assessment worksheet, and have it signed by the appropriate approval authority have we accomplished risk management? Not always.

When should we use unit worksheets, the risk assessment matrix, or risk assessment codes in determining the level of risk for a particular operation? These questions can be simplified by reviewing the risk assessment process and evaluating the operations we are attempting to risk manage.

Risk assessment encompasses the first two steps of the risk management process (identify and assess hazards). Hazards exist due to the interaction of man, machine, and environment, and may be related to operations or conditions. The process of assessing hazards is often subjective, but is usually based on a comparison of probability and severity.

The tools to use for assessing hazards are not dictated in any regulation. However, recommendations do exist. For assessing hazards associated with base operations activities, the risk assessment codes discussed in AR 385-10 are most appropriate. This process provides a method to identify and prioritize each hazard for correction. Hazards can then be eliminated on a worst case first basis.

The risk assessment matrix depicted in FM 100-14 is designed for military and tactical operations. Therefore, this matrix would be more appropriate for flight activities. So how do unit-generated worksheets correlate with the matrix in FM 100-14? In order to answer this question we need to explore some concepts of risk management integration.

Risk management is most effective when integrated into all aspects of planning and operations. One method to implement controls is during pre-mission briefings. A more effective method is to integrate controls in regulations, technical or field manuals, and SOPs. The use of unit-generated worksheets is one technique to integrate risk assessment in the planning process for routine missions. Cumulatively, the numbers on these worksheets represent a subjective assessment of the overall mission risk level.

Therefore, a typical day, cross-country mission, with already established controls, may yield a lower risk level than other missions. However, a crew with minimal local area experience may generate a higher numerical value for “crew selection” indicating a higher risk level. If used properly, this should bring attention to the increased risk level and cause the approval authority to focus on that area.

In order to reduce these risks, additional controls should be put in place. In this case, perhaps cross-matching experience level is an adequate control. If so, the assessment should be amended as necessary and re-evaluated.

Another method is to use the matrix out of FM 100-14. With this matrix we might initially assess the same routine mission as “moderate” based on the fact that, even though unlikely, a catastrophic event could take place. This could be viewed as the initial risk level before the implementation of controls. What controls could be used to reduce the risk for this

routine mission? You could cross-match crew experience level. You could also provide for:

- Positive radio contact
- Emergency and rescue support
- Current and qualified crewmembers
- Pre-mission planning requirements
- Appropriate life support equipment

There are obviously other measures that could be taken. The point here is that most of these controls are already established and in place, but maybe not all. The controls that are already in place could be viewed as "integrated risk management." The last step in the risk management cycle includes evaluating the effectiveness of controls. This brings you back to the initial step of "identifying hazards." In this case, perhaps crew mix was not considered or addressed. Therefore, that becomes the new hazard for which controls need to be developed.

With all the new controls in place, a re-evaluation of the mission should be accomplished to determine the "residual" risk. Do the new controls affect the probability of an accident? Severity? Both? This requires another subjective response for which you must carefully consider.

The unit-generated worksheet incorporates standard assessments (numerical value) for common hazards and is used to save time and effort. If we have already identified and assessed particular hazards common to routine missions, there may not be a need to formalize the same assessment process each time.

The matrix is used to identify the level of risk associated with the hazards most likely to occur in a particular mission or operation. As risk managers we can use both tools to identify and assess mission related hazards. Obviously, catastrophic events, such as component failure, may still occur. This does not mean, however, that every flight mission is necessarily a "moderate" risk.

Is it possible that lightning could strike my house today? Yes, it is possible, but not likely. Therefore, I will not assess that hazard on a daily basis. Is it possible that a routine day flight could suffer a catastrophic event? Absolutely! More so than the lightning scenario perhaps, but not as likely as a night, tactical mission. The evaluation of the likelihood of a particular event is subjective and must be based on experience, historical data, and any other sources available. If you determine the risk to be "moderate" with all the controls in place, then so be it. Hopefully, you will either identify additional controls to lower the risk, or elevate the risk decision to the appropriate authority.

Historically, we are much better at the first two steps of the risk management process (identify and assess hazards) than we are with the rest (develop controls and make risk decisions, implement controls, and supervise and evaluate). Often, an effort is made to artificially reduce the numerical value of the overall risk level in order to avoid having to elevate approval authority to the appropriate level. When we do this we are denying critical information to the appropriate decision maker. Even "bad news" is important when making informed and critical decisions. Part of the safety professional's responsibility is to provide all information to the commander. Only then do they have the opportunity to make informed decisions.

The flight risk assessment worksheet in and of itself is neither good nor bad, but becomes so by how we use it. If we use it as a tool to help us identify and assess hazards it can be beneficial. If we use it as a "rubber stamp" for mission approval, and think we have accomplished risk management, we are deceiving ourselves. When was the last time you evaluated your unit's Risk Assessment worksheet? Is it accurate? Is it up to date? Does it identify all the recurring hazards?

Risk management is used to enhance mission accomplishment by reducing or eliminating risks. Not all risks can be eliminated, but most can be reduced. Proper risk management ensures that informed decisions are made at the appropriate level.

—CW4 (R) Don Wright, COBRO Contractor, US Army Safety Center, DSN 558-2919 (334) 255-2919, william.wright@safetycenter.army.milL

A view from the cockpit

As pointed out in the February 02 *Flightfax* article *(Is the glass cockpit safer?)*, the Longbow shares challenges with other 'glass cockpit' aircraft. There were no surprises in this article for the Longbow community—that the potential exists for accidents in a tactical scenario. This is because crew attention is continuously diverted into the cockpit for system interaction. This "in cockpit" orientation most often is greater during the most demanding modes of flight (i.e. while NOE maneuvering or hovering in a firing position during tactical scenarios), when the crew's attention should be focused outside for obstacle avoidance or enemy activity. If we do not manage these challenges, they can lead to the acquisition and fielding of cockpit systems that are not suitable for Army helicopter missions and flight profiles.

While the 64D has several enhancements to station keeping (altitude & position hold modes) and flight symbolic (plus audio) cues over the 64A, the drawback is that the CPG must still focus attention into the cockpit to manipulate systems via MPDs (Multi-Purpose Displays). In comparison, during NVS tactical live fire gunnery in a 64A, a crew can essentially complete the entire mission with very few glances into the cockpit for system switchology. This is because once a crewmember is familiar with a typical analog switch location, position combinations, and functions, he/she can interact with that switch by tactile touch/feel; hence there is no need to visually locate, read, and interpret switch position as in a glass cockpit.

Additionally, blind cockpit type scenarios and switchology can be trained and enhanced through repetition drills in the 64A (with its analog cockpit). Unfortunately, in a glass cockpit where an MPD button does numerous functions, the crewmember must always first locate the desired button, read the current mode/function, switch it to the desired function, enable the function, perhaps type/enter new data, then read/verify that the appropriate action was completed, all while visually oriented inside the cockpit.

Bottom line, someone has to be flying the aircraft. If crewmembers are constantly distracted into the cockpit for otherwise simple system interaction, sooner or later the aircraft *will* strike an obstacle. This situation can be called a 'system-level hazard', because it's built into the combination of the man-machine-environment system. Even though some would 'blame' an obstacle-strike accident on pilot error, the system-level perspective suggests that the pilot is the last line of defense against the hazard. The pilot's performance is therefore simply one control to reducing the risk, and the occurrence of an accident simply demonstrates that this procedural-based control cannot be perfect.

The current glass cockpit trend is somewhat analogous to driving your car at night, lights out, while negotiating a residential neighborhood at high speed and typing an E-mail on your laptop at the same time. Oh, and by the way, if you happen to be in an Apache

pilot, close one eye and shoot that bad guy hiding in the bushes several blocks away as well. Not the case you say? Why is the auto accident rate higher for cell phone users than not?

What are the solutions to these challenges? We all recognize that the technology built into the 64D, and other modern aircraft, can be a huge combat multiplier. Taking full advantage of that technology requires that we manage the assets as a total system. Considering the flight crew as an integral part of the system is taught by textbooks - but is easier said than done! A full and complete understanding of the challenges, by all parts of the Aviation community, is an important piece of the solution.

At the local unit level, it is important that operational planners factor these hazards very carefully into their mission risk assessments. Training and standardization pilots must address the full range of controls available to them, including emphasizing items within crew coordination training programs, and perhaps considerations for standardized cockpit management techniques and operating procedures.

A full and complete understanding of the challenges, by all parts of the aviation community, is an important piece of the solution

From the 'big Army' perspective, enormous hurdles associated with organizational, cultural and resource issues have impeded progress, by channelizing our focus away from the total system, even though that fact may not be evident from our individual 'foxholes'. Bringing the entire Army Aviation Team to the table, with a common mission objective, is the key. The Commanding Generals of the Aviation Center, Aviation & Missile Command, PEO-Aviation, and the U.S. Army Safety Center have begun this process by chartering the Aviation Safety Investment Strategy Team (ASIST). The Army Chief of Staff laid out a goal to reduce aviation losses by 50% over the next ten years. In response, the Aviation GOs chartered ASIST to recommend investments across the POM that would achieve that goal at the least cost. ASIST has developed a risk-based process to analyze Army Aviation from a total "man-machine-environment" viewpoint.

This process has brought IPs, SIPs, MTPs, IFEs and other operators face to face with materiel PMs, systems engineers, airworthiness authorities, bio-medical specialists and accident investigators. The result was a profound magnification of the Army's ability to manage the hazards associated with glass cockpits, and other system-level hazards, through improved communications and an understanding of the system-level issues. During the work group sessions, comments were commonly heard such as a systems engineer saying, "I didn't know you trained that way!", and from SIP's, "I had no idea the aircraft was designed that way!" As the results get reported back to the Army's senior leaders, it won't not be surprising to hear comments such as; "We didn't know that investment should be a priority for the POM!"

The improved communications and understanding gained through ASIST should expedite fielding of M/TADS, M/PNVS and other critical safety-related features, while at the same time providing insights back to the operational community of the full scope of the fielding challenges.

As a member of the Apache ASIST team, I am hopeful that this process will be continued for Comanche and other future systems. This systems perspective will be critical to prevent fielding another over-weight, under-powered Army airframe while expecting gun crews to salvage accidents waiting to happen on every mission.

These observations are my own and do not necessarily reflect the opinions of the United States Army or the Aviation Center. I offer these perspectives in the spirit of increasing the dialogue among the operational, training and materiel communities, to assist in setting pilots up for success by focusing on the total system. What is the view from your cockpit?

—Greg Turberville, CW4, USA, Aviation Training Brigade Standards AH-64A/D, United States Army Aviation Center, Fort Rucker AL.

The 7 habits of highly effective aviators

Recent issues of *Flightfax* documented more fatal breakdowns in crew coordination. There are no new accidents. Over and over we stress the lesson "Recurring crew coordination training will reinforce the need for thorough communications among the crew."

An enhanced, computer-based Aircrew Coordination Training program is currently being field-tested and it is our hope that it will soon be available Army-wide. In the interim, we at the Army Research Institute (ARI) feel it would be helpful to put out this reminder.

Stephen Covey's *7 Habits of Highly Effective People* were developed for the business environment but can be applied directly to the cockpit. When we practice these principles in the conduct of our daily training and operations, so that they become habitual, we coincidentally apply the Risk Management (RM) process. Simultaneously the Crew Coordination Objectives of Aircrew Coordination Training (ACT) are achieved, which enhances greater safety and effectiveness as aircrew members and leaders.

***Habit 1:* Be Proactive.** *Highly effective people take the initiative to improve their own situation proactively. Their behavior is a product of conscious choice, rather than a product of their conditions.*

The first step in the RM process directs us to identify hazards and potential threats, prior to their occurrence, so that we can effectively anticipate situations and coordinate appropriate responses. Proactive pre-mission planning challenges crewmembers to think through contingencies and actions for difficult segments, tasks, or unusual events associated with the mission, and to develop strategies for coping with those contingencies. In the case of a recent AH-64 mishap, the Instructor Pilot (IP) and the Pilot (PI) might have discussed how their workloads would be re-distributed in the event that they were required to move into a different gun position. In-flight re-planning involves taking advantage of low workload periods to review and rehearse upcoming segments and to identify any required adjustments, to ensire that planning consistently stays ahead of critical lead times.

***Habit 2:* Begin with the End in Mind.** *Highly effective people understand where they want to go before they start, and then commit to a plan to get there.*

For businesses, a mission statement that reflects a shared vision creates unity and commitment. In aviation, effective pre-mission planning accomplishes this goal by creating a shared mental model among crewmembers. Each must understand the mission requirements and his or her role in accomplishing the mission. This understanding is reinforced by mentally rehearsing the entire mission, and by visualizing and discussing potential problems, contingencies, and responsibilities. The effective leader ensures that each crewmember is actively involved in the mission planning process, able to adopt a common understanding of mission intent and operational sequences.

Habit 3) Put First Things First. *Highly effective people establish priorities and honor them on a moment-by-moment basis.*

Effective crewmembers are consistently able to identify and prioritize competing mission tasks. They attend to flight safety and other high-priority tasks while delaying low-priority tasks until they will have no impact on performance or safety. They avoid distractions from essential activities and maintain their focus by distributing workload, especially during critical phases of flight. An AH-64 mishap resulted when the PI tuned the radio while the IP focused on the Target Acquisition Designation System. "The primary concern of the pilot on the controls is flying the aircraft."

***Habit 4:* Think Win/Win.** *Highly effective people seek solutions in which all parties feel positively about the decision and are*

committed to the action plan.

Aircrews are teams with a designated leader and clear lines of responsibility, but effective leaders do not operate without the participation of other crewmembers and a healthy respect for their competencies. When crewmembers disagree on a course of action, the effective leader recognizes that the input of the entire crew provides a greater range of decision options than those generated by the individual alone. On average, decisions that consider crew recommendations will be better than decisions made by the pilot alone.

***Habit 5:* Seek First to Understand... Then to be Understood.** *Highly effective people learn to be good listeners. They make an effort to understand a problem before rushing to fix it, diagnosing before they prescribe, and then present their ideas clearly and specifically.*

In an AH-64 mishap, the PI assumed that a request to tune the radio implied a transfer of controls. Research has found that aircrews receiving high performance ratings consistently practice good listening skills. They attend to the sender of communications, ask questions when they're unsure of the message, restate the message if necessary, and acknowledge the message both verbally and through their actions. Then, as the sender, they use standardized terminology and concise brevity while delivering statements and directives in a timely manner, seeking feedback from other crewmembers.

***Habit 6:* Synergize.** *Highly effective people work with the individual strengths that team members bring with them, so that the resulting team is stronger than the individual members. A leader who practices synergy learns to orchestrate individual members into a symphony of effective results.*

Effective aircrews are composed of assertive crewmembers that consistently engage in situational leadership, helping each other without request. They participate as a team in the planning, execution, and after-action review phases of missions. Every crewmember is responsible for actively contributing to the team effort, by monitoring changes in the situation and being assertive when necessary, while maintaining an attitude of professionalism. Some key leadership principles from FM 22-100, Military Leadership, are: "keep your subordinates informed", "build the team", and "employ your unit in accordance with its capabilities".

***Habit 7:* Sharpen the Saw.** *Highly effective people renew themselves on a regular basis. They realize that to deny the need for preserving and enhancing their skills is to become stale, destructive, and ineffective.*

In recent years, a lowering of experience levels and atrophy of skills related to reduced flying hours, in concert with the development of new cockpit technologies, have led to a Congressional recognition of the need for a revitalized crew coordination training program in Army aviation. The Army Research Institute, Rotary Wing Aviation Research Unit at Fort Rucker, with Dynamics Research Corporation, has developed an enhanced Aircrew Coordination Training Program to revitalize Army Aviation's ACT skills. The new web-based ACT program has been positively received as realistic and relevant, improving mission effectiveness and safety, as reflected in feedback from unit leaders, instructor pilots, and crewmembers completing field testing. Effective aviators continually "sharpen the saw." Accordingly, the enhanced ACT program builds on the original exportable training package, enhancing it to a dynamic, relevant program that is continuously updated and improved.

Stephen Covey's *The 7 Habits of Highly Effective People* advanced the position that effective people develop habits that influence the direction and choices of their lives. These same principles can enhance our ability to establish and maintain safety and effectiveness in the cockpit. As recent mishaps remind us, understanding crew coordination skills is important, but practicing them in our daily operations, at every level of leadership, is critical.

—Dr. Larry Katz, Research Psychologist, Army Research Institute Rotary Wing Aviation Research Unit, Fort Rucker, AL 36362, DSN 558-2385, katzl@rwaru.army.mil

It is impossible to accurately measure the results of aviation safety.

No one can count the fires that never started, the aborted takeoffs that do not occur, the engine failures and the forced landings that never take place.

And one can neither evaluate the lives that are not lost, nor plumb the depths of human misery we have been spared.

But the individuals with the flight controls, fueling hoses, tools, radar, or clipboards can find lasting satisfaction in the knowledge they have worked wisely and well, and that safety has been their first consideration.

(author unknown—adapted from *Flightfax*, May 1995)

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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Mid-Year Review

featuring

aviation accident safety performance

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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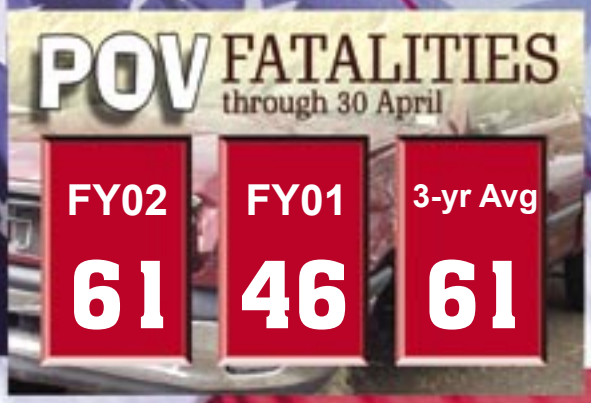

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Let's Make it a Safe Summer

So much has changed since we last focused our energies on summer activities. Many things taken for granted before last September have now acquired a deeper meaning, perhaps making us more reflective and mindful of how quickly danger can surface.

Our nation and world may have changed since the days of previous summers, but many of the hazards our soldiers face both on and off duty have not. Our civilians and soldiers are not only lost to terrorists and hostile fire, they die in accidents as well.

Accident rates traditionally rise when summer's fast-paced, high-energy activities are in full swing—both on and off duty. Field training activities intensify, basic training expands, Reserve Components accomplish their annual unit training, and units capitalize on improved training opportunities and flying weather. Increased exposure to common hazards associated with summertime activities must be met with a corresponding increase in our efforts to manage the risks associated with those hazards more effectively.

Off-duty POV accidents remain the number one killer of soldiers, and the summer months are the deadliest. From Memorial Day through Labor Day last year, we lost 37 soldiers in POV accidents. This summer, we have some new risk management tools to help us combat POV accident losses. "Drive to Arrive" POV accident prevention videos, as well as a third edition of our POV Risk Management Toolbox, are now available on the Safety Center website at ***http://safety.army.mil***. Make sure your soldiers see the videos before heading out on the highways for their weekends of off-duty summer fun.

While POV accidents account for the majority of our losses, they aren't the only killers. Every summer, we lose soldiers to all types of hazards: plunging into cool waters to momentarily escape the heat of the summer sun, heat exertion during training activities, boats capsizing, and even insect bites. We need to ensure our soldiers are conscious of even the lesser-known hazards, such as insect/snake bites, and enforce appropriate controls.

The best weapons in this battle to keep soldiers safe during summer activities are your NCOs and risk management. Make sure your NCOs get the word out on common and not-so-common summer hazards, so that your soldiers can, in turn, make informed risk decisions. We must instill in everyone a keen sense of awareness of the tragic consequences of failing to effectively manage risks associated with both their on- and off-duty activities.

As commanders, leaders, and first-line supervisors, we each have a moral responsibility to devote time and attention to ensuring that this summer's activities are accident free. Leadership, training, enforcing standards, discipline, and applying solid risk management principles can help us accomplish this. We must each avoid complacency in dealing with summer's known hazards and be vigilant in identifying new hazards as missions and environmental conditions change.

This summer, let's strive for one more major change: Let's put an end to the summer season's infamous history of being one of the most significant accident-producing periods of the year. Doing so will help us preserve our readiness for combating those who would inflict harm on the people of our great nation and our allies.

Remember that a single word of caution about the hazards associated with swimming and boating activities, hot-weather training activities, drinking and driving, fatigue, road rage, failure to use seatbelts, etc., may save a life or prevent a serious injury. With your commitment, we can make this our safest summer season ever.

Train hard—and play hard, but be safe!

BG James E. Simmons

Safety Center Aviation Mid-Year REVIEW

The events of September 11th have propelled our nation into war. The Army has answered the call in Operation Enduring Freedom by deploying forces in combat missions around the world. On the home front, National Guard and Reserve Component forces have deployed to protect our borders and key nodes of infrastructure. Aviation units have been involved in all these operations and have performed superbly.

Stats

The Army has flown over 403,737 rotary-wing hours in the first half of FY02 in comparison to 367,779 hours during the same time period in FY01. This is an increase of almost 10%. While flying more, the overall number of aviation Class A-C accidents decreased from 65 in the previous year to 62 in FY02. The table below shows the number of Class A-C accidents in the first half of FY01 and FY02.

Class	FY02	FY01
A	9	8
B	10	8
C	43	49
Total	62	65

The severity of accidents has increased during the first half of FY02. The Army lost 13 soldiers in aviation fatal accidents. This is an increase of 18.2% in comparison to the 11 fatalities during this same time period in FY01. In our analysis, we determined that the operating environment was a greater factor than OPTEMPO in these accidents.

Prevention

The Army has taken steps to assist the field in reducing aviation accidents. An initial Safety Alert Notification (SAN) was sent to the field in September 2001 addressing OH-58D problem areas and corrective recommendations. Since then, the Army Safety Action Team met and has outlined immediate, short and long-range goals to address preventive measures for the Kiowa Warrior. Funding requirements have been defined and are now at Department of the Army level for approval and resourcing. These actions, coupled with an increased awareness in the field of the risks, have decreased OH-58D Class A-C accidents from 14 in FY01 to 11 in FY02. While we still have work to do, we need to continue this downward trend in the OH-58D. For more details on the OH-58D, see *Flightfax*, April 2002 edition.

Proactive

Army Aviation leadership has integrated risk management into the Aviation Transformation. This plan for the future ensures the operational needs of the Army are met, while simultaneously inculcating safety in all aspects of planning, coordination, and execution.

Further, in April 2002, the Safety Center deployed a team forward in Southwest Asia. Their mission is to provide proactive safety assistance to the Theater Army Commander in support of Operation Enduring Freedom. In conjunction with the Army Central Command staff, this team is assisting the force in accident prevention and risk management integration.

Bottom line

Leaders set the conditions for their soldiers to succeed. Whether that is accomplishing a tactical mission in Afghanistan or a training flight in Wyoming, hazards need to be identified and controls put in place to mitigate the risk of those hazards. Incorporating the 5-Step Risk Management Process into all operations will assist not only in accomplishing the mission, but also getting it done safely.

—MAJ Dave Hudak, Operations Research and Systems Analysis Division, DSN 558-2075 (334-255-2075), dave.hudak@safetycenter.army.mil

Deck Landings Revisited

Ships are a tactically sound and readily available launch platform for Army helicopters. Commanders are using these joint assets to complete today's challenging missions. Operations from a ship's deck allow tactical commanders to focus on the mission with less concern for things like force protection and local security, as well as alleviate the unit's footprint in a potentially hostile land-base area. The OH-58D is the perfect platform from which to conduct many ship-based missions such as armed reconnaissance; limited security operations; raids; small boat interdiction; Rescue Escort (RESCORT); Visit, Board, Search and Seizure (VBSS) cover; naval gunfire direction, close air support, and ship takedown cover. The frigate is a prime launch platform with agility, speed, self-defense systems and integrated hangars.

Deployment preparation

Our deployment, Joint Shipboard Helicopter Integration Process (J-SHIP) Dedicated at Sea Test (DAST) 9B, was DoD directed and scheduled, so we had a bit of prior notification that allowed us to properly prepare. The primary mission of the test was flight envelope expansion, but the J-SHIP folks also wanted to check their products and get user feedback. They wanted to see if a landlocked unit could pick up their tools and use them to successfully deploy and conduct missions from a ship. Mindful of that, we used the tools made available by the J-SHIP office at www.JSHIP.jcs.mil, where there are a host of things there from pre-sail checklists, to NATOPS manuals, to Army FMs. We also used the base risk assessment form located at http://safety.army.mil under the TOOLS button. With only limited deck landing qualification (DLQ) experience, these tools provided invaluable insight into how we should prepare for a full live-aboard deployment.

The preparation that paid the greatest dividend for us was deck-handling training for our personnel. We took the Navy's Ship's Resume', looked up the class ship we would be working aboard, and painted a complete, to-scale deck with our hangar doors replicating the ships hangar deck doors. By conducting training on the mock up saved us a great deal of time on the deck through increased efficiency of movement. There is no substitute for a rolling deck, but being familiar with the necessary geometry helped immensely.

Under way

Our deployment took place on an Oliver Hazard Perry Class (FFG-7) Frigate. We deployed three OH-58Ds with a complement of seven pilots, four crewchiefs, and three armament personnel. A word of advice: pack light, the frigate has limited space.

Frigates are built with flight hangars and are therefore prepared to accept all the associated equipment (toolboxes, ground handling wheels, etc.), but personal space is at a premium. The hangar deck is equipped with a small office that allows for ULLS-A computer and printer use. PLL was packed for seven days, which was ample for our deployment. Extended operations would have been taxing and delivery of major end items (rotor blades, etc.) would have been challenging if needed.

Lessons learned

Be prepared to work closely with Navy personnel and to have them become an integral part of your team. Flying day/night or continuous operations will require you to rely on Navy personnel to accomplish your mission. Be patient, they are eager to learn about the way we do business...and we do operate differently.

Maneuvering aircraft is the most taxing operation. With deck pitch/roll angles at a conservative 2 and 4 degrees respectively, it will take 11 personnel to maneuver one OH-58D on the deck. With the seas pitching the deck greater than 2/4, it will take no less than 17 personnel to maneuver. Here's the math: one

director (Army PSG), two tail holders, two wheel operators, four chainmen, two skid riders (four-blade fold), four pushers, and two chalkmen. Chalkmen, you ask? If you've pushed a "58," you know the wheels take a few seconds to fully lower. The Navy has adjustable wheel chalks that can be positioned around the wheels to stop movement immediately, rather than waiting for the chalks to lower. These came in very handy, to say the least.

We ran into a problem with the maneuvering crew not being able to hear the deck director's commands. Units may want to provide the director with a bullhorn, or devise whistle signals that communicate movement techniques. The Navy regularly uses whistles; the Landing Signal/Enlisted (LS/E) director or deck safety officer can easily sound a command that is clear to all personnel.

Another way to make life easier for your detachment is to talk with the Captain (CAPT) of the ship or the Officer of the Deck (OOD). Let him know that smooth seas make your job much easier. Even with a high sea state, the CAPT or OOD can maneuver the ship to reduce the pitch and roll of the deck, which in turn lessens your workload and lowers the excitement level.

Standard flotation devices were an initial issue for us. Flight crews landed on the deck, then began to ground handle aircraft with only their LPU-10s for flotation. NATOPS requirements state that flight crews may wear their in-flight flotation devices when on deck, but we may want to further clarify that. If a pilot is about to take off, then no problem. If the pilot has just landed and now becomes part of the ground crew, a float-coat should be worn. A float-coat is a wonderful piece of equipment. It inflates automatically when introduced to a large volume of salt water, floating the wearer face up and has a good deal of reflective tape attached. These features come in handy if one becomes unconscious between falling off the deck and entering the ocean.

Another issue is the refueling of aircraft. The Navy does not regularly use or carry OH-58 compatible CCR nozzles, so that leaves it to the flight section to provide them. Once provided, the grapes (Navy refuelers) must be shown how to operate the nozzle. An initial training session for all refuelers will be much more effective than trying to train each refuel crew individually on the deck during operations.

Our armament operations were carried out smoothly, despite the fact that the Army operates

a forward area rearm/refuel point (FARP) much differently than the Navy. The Navy does not hot-rearm aircraft or tube load rockets, so there was a bit of tension when we began to do those tasks. The tension level subsided after a run-through with inert ammo and TTPs were developed to increase efficiency. A word of caution: the deck-marking paint is slick when wet. Our armament personnel, who were moving everything from .50 cal to K-model Hellfire missiles around the deck and under the tail of the aircraft, found traction to be a problem on the landing reference lines painted on the non-skid deck. It wasn't a major problem, just something personnel should be aware of before beginning operations.

It's not just a job

Our deployment ended on a high note. The experimental test pilots (XPs) documented their data, the J-SHIP folks validated their tools, and our commanders saw that we could work effectively aboard ship. Most importantly, we trained seven aviators and seven crewmen in a totally new environment and did it safely. We were able to do this through effective preparation.

The tools are there for you, check them out:

- http://safety.army.mil/TOOLS/
- www.JSHIP.jcs.mil
- FlightFax, March 2001 and June 2001
- FM 1-564, Shipboard Operations

—CW3 Chris Chance, Aviation Safety Officer, 3rd Squadron, 4th Cavalry, Wheeler Army Airfield, Hawaii, DSN 456-1355

Special Electronic Mission Aircraft Qualification Course

The Army's mission of aerial observation claims a history as old as aviation itself. During the Civil War, the U.S. Army Balloon Corps pioneered the mission of airborne reconnaissance, directing artillery fire against enemy positions. The tactical benefits of aerial reconnaissance were recognized immediately and the mission kept pace with early advancements in aviation.

As the aircraft fleet expanded throughout the 20th century, airborne mission systems were developed specifically for intelligence gathering operations. Since the early 1960s, the Army operates an extensive fleet of highly-modified helicopters and fixed-wing aircraft to perform the mission of aerial reconnaissance. The term SEMA (Special Electronic Mission Aircraft) is used in reference to these aircraft.

The U.S. Army Intelligence Center at Fort Huachuca was designated as the TRADOC proponent for both aircraft and systems related SEMA training. The "Airborne Radio Direction Finding Qualification Course" was one of the first SEMA-related training programs conducted at Fort Huachuca as early as 1972. In fact, the Intelligence Center has conducted nearly 40 years of SEMA pilot and crewmember training in a variety of aircraft including the OV-1 "Mohawk," RU-21 "Guardrail," EH-60 "Quick Fix," and Unmanned Aerial Vehicle (UAV)

collection platforms.

Today, the Intelligence Center conducts SEMA qualification courses in both the RC-12D and RC-12N "Guardrail/Common Sensor" aircraft. Although the section is composed of less than a dozen instructors and only six aircraft, it supports approximately 70 aircraft series qualifications annually. Course graduates are assigned to one of only five Aerial Exploitation Battalions (AEB) worldwide: 1st Military Intelligence (MI), Wiesbaden, Germany; 3rd MI, Camp Humphreys, Korea; 15th MI, Fort Hood, Texas; 224th MI, Hunter AAF, Georgia; and 204th MI, Fort Bliss, Texas.

RC-12N (Guardrail/Common Sensor)

Each aircraft qualification course consists of three phases including Common Core, Phase I, and Phase II flight and academic training programs. During Common Core, student pilots are exposed to a variety of military intelligence subjects including National Intelligence Structure; Collection Management; Operations Other Than War (OOTW); Army Airspace Command and Control (A2C2); and both concept and structure of the Military Intelligence Brigade. In addition, students learn the capabilities and organization of other SEMA platforms including the RC-7 "Airborne Reconnaissance Low" and the Hunter UAV.

During Phase I, students receive flight and platform instruction from designated aircraft instructor pilots. Course subjects include aerodynamics; regulations and airspace (IFR/VFR); aircraft performance; and airframe systems. Student pilots conduct a variety of terminal area, local, and cross-country flight training profiles during normal and emergency operations. Due to the increased crew workload associated with the specialized aircraft, crew coordination, flight hazard identification, and risk management techniques are taught and emphasized throughout this phase of training.

During Phase II, students receive flight and platform instruction from designated aircraft unit trainers. Course topics include training in aircraft navigation (INS/GPS); survivability (ASE); communications; weather avoidance; and associated Intelligence and Electronic Warfare (IEW) system operations. Students conduct local, cross-country, and simulated Sensitive Reconnaissance Operation (SRO) mission flight training. Students learn the operation and theory of the highly advanced Signals Intelligence (SIGINT) collection platforms, capable of providing emitter intercept and direction finding (DF) data, at a level of speed and accuracy unmatched by any other system in the field today.

Upon completion of the course, graduates receive an additional skill identifier (ASI). Graduates of the RC-12D course receive the F3 designator, while RC-12N course graduates receive the F4 designator. The designators assist branch managers with both initial and follow-on assignments within the SEMA community.

SEMA represents a unique relationship between the Military Intelligence and Aviation branches. Although the relatively small program is not widely known within either community, it has a proud and distinguished history in Army Aviation.

Editor's note: For more information on SEMA history, system descriptions, and locations, go to: http://nasaa.npoint.net/users/buley

—CPT Troy Lambeth, E Company, 305th MI Battalion, U.S. Army Intelligence Center and Fort Huachuca, DSN 879-6335 (520-538-6335/4354); Troy.Lambeth@hua.army.mil

Transforming The Force

Today's men and women in Army Aviation have transformed into a team of technicians required to understand the complexities of modern rotary-wing aircraft and the aviation mission. The sophisticated avionics, electrical and armament systems incorporated in the AH-64D Apache and OH-58D Kiowa Warrior helicopters are coupled through data bus technology. However, the sophisticated avionics and electrical systems are not just restricted to the aircraft and their crews.

TAIS

The Tactical Airspace Integration System (TAIS) will support the A2C2 element by providing Corps (G3 Air) and Division (G3 Air) automated and digitized A2C2 planning, coordination, and execution of the three-dimensional battle space.

ATNAVICS

The Air Traffic Navigation, Integration, and Coordination System (ATNAVICS) are fully instrumented radars consisting of surveillance, and capable of providing precision approaches with positive control to aircraft in combat and non-combat missions. The introduction of aviation onto the battlefield affords the Army a fighting force that is highly mobile, intelligent, and well-informed with lethal capabilities able to take on many diverse missions. As our focus shifts to the future, the Aviation Branch is working hard to implement other systems to enhance aviation capabilities.

Aviation Modernization Plan

The Aviation Modernization Plan will help bridge the gap between the Active, National Guard, and Reserve Components. The Modernization Plan will cascade modernized aircraft from Active Army units to National Guard and Reserve units. This will allow the retirement of many legacy aircraft. The modernization of the National Guard and Reserve fleets will allow Army Aviation to have a larger percentage of its aviators and aircraft repairers with comparable aircraft and skills.

Task Force XXI

Task Force XXI presented a proposal to the Chief of Staff of the Army that would require a single numerical branch identifier to align the Officer, Warrant Officer and the Enlisted Branches. Aviation Enlisted soldiers who are in career management fields (CMFs) 67 and 93 will have their CMF numerical identifiers changed to CMF 15. Documentation containing new MOS codes has an e-date of October 04 (FY05). Personnel will be reclassified to the new MOS from 1 June through 30 September 2004.

Air Warrior

The Air Warrior ensemble provides long-term solutions to many aviation life support equipment (ALSE) problems. This ensemble will provide the aircrew and aviation commanders a highly flexible, modular, state-of-the-art system that will provide every aviator the ability to perform under all conditions. The Air Warrior ensemble can also support either unit training or combat missions in an over-water scenario.

Flight School XXI

Training the aviation force will reflect many changes. Flight School XXI will afford Aviation Branch the opportunity to train more pilots in less time, making the best possible use of resources on hand. One element in the future will be the ability to incorporate realistic simulations into training. The objective of simulation development is to challenge the student's mental and physical abilities. This will allow the students to train under dangerous and hazardous scenarios that will enhance the students' flying skills without damaging aircraft or endangering lives.

Distance learning

Distance learning concepts are also important issues in training the force of the future. Aviation is working to develop training modules like Class Room XXI, Internet, and Interactive Multimedia courseware for a wall-less classroom. All these concepts will enhance and optimize training for the next generation of aviation soldiers, ensuring a higher skilled and lethal force for future employment.

—Ray Garza, Aviation Branch Proponency Office, DSN 225-1920 (334-255-1920), garzar@rucker.army.mil

Safety Is Our Shared Mission

Senior Army leadership and civilian employees at Fort Bragg, North Carolina and Watervliet Arsenal, New York have been participating in the Defense Employee Work Safety Demonstration Program (DEWSDP) since its introduction last November.

So, what is the DEWSDP? This pilot program has been mandated by Congress to introduce private industry's proven best safest work practices into DOD sites. The Army selected Fort Bragg and Watervliet Arsenal for participation in the pilot program which runs through September 2002. These two installations will evaluate whether these practices can improve DOD-wide civilian work force safety standards and reduce accident and injury rates and the resulting human and fiscal costs. Concurrent programs are being implemented by the other DOD services—Navy, Marines and Air Force. Results will be reported to Congress in December 2002.

This work safety program is different. Instead of traditional classroom-style training, its aim is to change—with your active involvement—the safety culture at your workplace and in the Army generally. Through the program, you will learn how to recognize unsafe behavior—your own and others'—and how to negotiate changing those behaviors. You'll also learn how to make identifying and reporting unsafe conditions part of the way you go about your daily business.

Safety is our workplace priority

The Department of Defense and the U.S. Army are committed to workplace safety. Currently, civilian employee occupational injuries and illnesses cost the Army in the vicinity of $169 million each year in direct costs (Federal Employee Compensation Act, 2001) and an Armywide daily average of 33 civilians injured on the job (OSHA, 2000). Department of Defense costs for workplace accidents and injuries are estimated at $600 million per annum, based on FECA figures.

The Army program has three integrated components:

■ **Safety training.** The DuPont Safety Resources-developed discovery-learning module is tailored to a range of onsite responsibilities that helps employees engage with safety issues in a solutions-focused manner. Developing observation and negotiation skills is a key element of this training. Ongoing coaching is also offered.

■ **Data collection.** A sophisticated database, originally designed for Intel®, records safety observations and tracks accident and injury case management with customized real time data and analysis. The system—known as the Environmental Health and Safety Data Management System—also tracks employee observations and perceptions as a means of involving the total workforce in maintaining and developing safe practices. Server space for this web-based system is being provided by the U.S. Army Center for Health Promotion & Preventive Medicine.

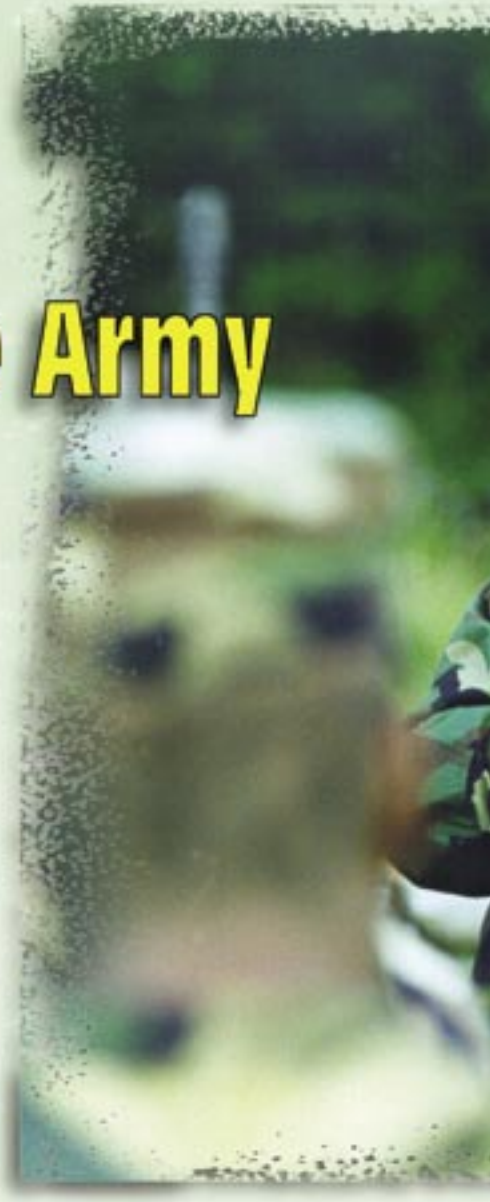
■ **Communications**. With the help of a range of onsite news media, management, and employees at participating installations, information is being disseminated throughout the command structure about progress of the pilot program. Information regarding the DEWSDP is now available through Army publications, television news services, and websites.

Army implementation of the DEWSDP is being managed by James Gibson, Office of the Director of Army Safety, and COL Mary Lopez, U.S. Army Center for Health Promotion & Preventive Medicine at Aberdeen Proving Grounds. DuPont Safety Resources (DSR), a division of the historic Delaware-based corporation DuPont, has been contracted to provide program implementation services to the Army.

POC: Ruth Riddick, Communications Program, Army Implementation Team, Defense Employee Work Safety Demonstration Program, (202) 365-3038, RiddickR@aol.com

NCO CORNER

Sergeant Major of the Army Sends . . .



I wish each of you could have been with me earlier this month when I spent a week visiting our great soldiers serving in Afghanistan and other corners of that area of operation. All of us should be proud of them and the work they're doing in support of America's war on terrorism. No matter if they were pulling force protection duties in Qatar, providing logistics support out of Oman, or fresh from the fight we're calling Operation Anaconda, all of these soldiers were pumped up about what they were doing for their country.

I told them their country and their fellow soldiers were proud of them. I ask each of you to keep them in your prayers as often as possible.

NCO business

From talking to sergeants who were on the ground in the Afghanistan highlands during Anaconda, I came away again impressed with the importance of the basic fundamentals of soldiering. Their time on the rifle range paid off, as their basic marksmanship skills and the M-4 rifles allowed them to consistently hit targets more than 400 yards away.

Their physical and mental stamina also served them well in the steep, barren terrain where the air was thin. One movement by soldiers of the 187th Infantry Regiment was expected to take as long as two days, but these Rakkasans soldiers did it in about eight hours. Equally impressive to me was the fact that there were minimal cold weather injuries reported during Anaconda, despite temperatures that plunged as soon as the sun went down and the minimal amount of cold weather gear carried by the soldiers.

All of these things—physical conditioning, marksmanship, and cold weather injury prevention—are NCO business; if Operation Anaconda is any indicator, our sergeants know their business quite well.

I was especially proud of the performance of our younger soldiers for another reason. Some have been quick to criticize the soldiers who have joined the Army in recent years, saying they somehow don't measure up to their predecessors. I wish anyone believing that could have been with me on that trip, both to hear stories of their performance and see the fire in their eyes. Today's soldiers are as good as any that have ever worn our Army's uniforms. Period!

Other leaders and I recognize that our troops in Afghanistan aren't the only ones working hard these days. Many soldiers are

If our interim brigades were online, they would be carrying much of the frontline load in Afghanistan right now. Once they are ready, they will play a critical role both in future missions and in developing the objective force.

Exceptional Family Member Program

No doubt because my own family has been enrolled in the program for years, I try to stay involved with the military's Exceptional Family Member Program (EFMP). Based on personal experience, I can tell you that it means a lot to the parents of a special needs family member when the chain of command understands EFMP and takes time to occasionally ask about EFMP families in their units. That little bit of knowledge and concern can go a long way toward helping EFMP families feel like they are truly understood and cared for. I ask leaders—especially at battalion level and below—to reach out to these families, get to know them, and learn what the program offers in their respective area.

putting in incredible hours at their home stations on force protection duties and supporting the war on terrorism. Additionally, thousands of our troops are deployed far from home in places other than Afghanistan and the Philippines. Their contributions are vital to our country's interest, and I hope leaders at all levels are expressing that to them as often as possible.

Army Transformation

I also spent time this month at Fort Lewis staying abreast of the Army's Transformation. I bought into this process a long time ago; but the more I learn about it, the more convinced I am that it's absolutely the right thing for our Army.

Army Soldier and NCO of the Year

I'm getting excited about the rapidly approaching Army Soldier and NCO of the Year competition, which will bring our MACOM's finest to Washington, DC, for the final competition.

This is the first time in institutional memory this has been done, and I ask for your assistance in looking for ways to publicize this event. You can help by ensuring your unit and installation soldiers and NCOs of the year receive publicity in your command's newspapers, web sites, and other internal media outlets. Also, if your unit's

best are among the MACOM finalists coming here, ensure your public affairs offices are publicizing that story as well, both on and off the installations.

This is a good news story for all of us, and the personal involvement and availability of senior NCOs in publicizing this new program will only serve to increase the honor going to the individuals who win, as well as their MACOMs, posts and units.

Basic courtesy

It could be that I'm old-fashioned, but for years much of my initial impression of a person or an organization has been based on how polite and courteous they are. Some might call this military courtesy; but to me, it's basic courtesy and doesn't necessarily have a lot to do with a person's place of employment or job title.

Little things like simply saying "hello" to another person crossing a parking lot, standing up when you're doing business with your co-workers, and maintaining a positive, professional outlook have always been important to me. And, more importantly, I believe these acts of good manners do something for morale and impact how an organization perceives itself.

Leader involvement is key to reducing accidents

We've lost several soldiers this month in several accidents, and I hope these tragedies will motivate each of us to put safety at the forefront of every plan we make and all we do throughout the day. I remain convinced that leader attentiveness and involvement are the keys to reducing accidents.

Complacency can cost an organization in areas beyond its safety statistics. The events of last year demonstrate that we have enemies who wish to destroy us. They watch us, probably more often than we want to believe, in hopes of discovering weaknesses that can be exploited. All of us—at all levels—must guard against complacency.

"I remain convinced that leader attentiveness and involvement are the keys to reducing accidents."

This is especially key as the war on terrorism begins to lengthen and deployed units begin a rotation schedule. Just as good soldiers work constantly to improve whatever fighting position they occupy, I hope leaders will constantly review and refine their force protection procedures. This could save more lives than we could possibly know.

Housing allowance surveys

I noted recently that housing allowance surveys have been mailed to more than 17,000 overseas service members who don't live on military installations. The surveys collect information on costs associated with utilities, trash disposal, heating fuels, security fees, and a number of other routine maintenance costs. The results are then used to determine how much overseas housing allowances will be increased in the coming years.

Typically, less than half of the surveys are completed and returned, and that could cost some of our soldiers money. I ask you to remind your formations that these surveys are on the way, encourage recipients to complete them, and remind them that they can be done via the Internet.

Veterans

I'd like to leave you—as I often do—with a note about our great veterans. For those of you who haven't made it a point to get to know the veteran groups in your area, I suggest that you are missing out on opportunities that are both rewarding and motivational.

I recently accepted an invitation to travel and speak before a small American Legion Conference. Just having a senior, active-duty NCO talk about today's Army seemed to mean a lot to them. I'd like to remind you that our veterans are a group that we can never do enough for.

Again, I appreciate everything you're doing for our country, our Army, and our soldiers. God bless!

—Adapted from Sergeant Major of the Army's April Thoughts-n-Concerns

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class A
A model

■ While flying as Chalk 2 in a flight of two at 150 to 200 feet above ground level (AGL), crew felt something and made the radio call "We are going down." The PC of the lead aircraft observed the accident aircraft entering a large dust cloud in a nose high altitude. The aircraft impacted the ground, rebounded into the air and traveled approximately 30 yards before contacting the ground a second time. Aircraft slid about 15 yards before coming to rest upright. Right wing stores were ripped from the wing. The landing gear collapsed, both crewmembers seats stroked, the tailboom boom separated, and both engines and the transmission were displaced. Both crewmembers seriously injured. Aircraft was destroyed. (Investigation continues.)

C-12

Class E
D model

■ During run-up (on runway), prior to take-off, Number 2 engine would not accelerate past low idle. Crew taxied back to parking, shut down, and notified maintenance.

C-23

Class E
B model

■ The aircrew was conducting training in the airport traffic area at 2000 ft. and 140 knots. While on vectors for the ILS 14 approach; the pilot on the controls began reducing power from 3,000 to 2,000 pounds of torque when the aircrew heard a loud report from the right side of the airplane. Subsequently, torque indications went from 3,000 to 1,200 pounds of torque instantaneously, then stabilized at 2,000 pounds. No other observations were observed. Airplane landed without further incident.

CH-47

Class C
D Model

■ Right aft landing gear collapsed during post-landing taxi. Aircraft settled on its right side, sustaining damage to the landing gear drag base, other associated components, and to the fuselage (sheet metal).

Class E

■ During cruise flight, beep trim was discovered to be inoperable. Aircraft landed without further incident. Replaced N2 Actuator.

OH-58

Class A
D-R model

■ Aircraft was at 50 knots about 40 feet above ground level when audio warning sounded. IP reduced collective and began a cross check of the instruments in the belief it was a high TGT warning. He detected Rotor RPM decreasing and reduced collective further. Aircraft landed hard in an upright position. Tailboom, mast-mounted sight, and all four main rotor blades separated from the aircraft during landing. Crew sustained minor injuries, aircraft was destroyed.

■ Aircraft reportedly contacted wires during training flight and landed hard on a major thoroughfare, coming to rest on its side (rolled 90 degrees). Crew was able to egress unassisted and notified the local Chain of Command. Damage initially assessed as Class B. Pending further ECOD, potential exists for Class A damage to the airframe.

Class B

■ Aircraft was conducting J-ship flight envelope testing with winds reported at 30 knots. The accident aircraft was secured to the ship at flight idle when another aircraft was cleared to a position to its front. The combination of rotor wash and wind over the deck caused the OH-58DR to experience excessive rotor blade flapping resulting in damage to three rotor blades, the wire strike protection system, tailboom, and two aircraft mooring points. Crew was uninjured.

Class C
A model

■ N1 and TOT peaked during engine start-up, requiring the crew to execute Hot Start procedures.

■ TOT exceeded prescribed limitations during engine start.

C model

■ TOT peaked at 1000 degrees Celsius (hot start) during engine start up. Aircraft contacted the ground in a tail low attitude during a "deploy to cover" demonstration. Post-flight inspection revealed damage to aircraft's vertical fin, aft cross tubes (spread), and potential K-flex/isolation mount strike.

UH-60

Class A
L model

■ Aircraft landing gear touched down in a hole during landing. Main rotor blades struck ground and separated from aircraft. One passenger sustained minor injuries. (Investigation continues.)

Class C
A model

■ During landing in a snow covered LZ, aircraft's Doppler was punctured by an unidentified object.

■ Crew experienced engine fire indications (Master Caution, oil pressure segment, and TGT-red instrumentation readings) during shutdown procedures. Emergency procedures were in effect until fire-out was confirmed.

■ Crew chief sprained his ankle while de-boarding the aircraft to secure the doors while engines were in operation. Injury resulted in lost workday.

NEWS & notes

Aviation Branch Gets New Position

MG John M. Curran, Commanding General of the U.S. Army Aviation Center and Chief of the Aviation Branch, has named CW5 Stephen T. Knowles II as the branch's first chief warrant officer. Knowles will be Curran's principal adviser on all aviation warrant officer issues. As part of his duties, he will assess the status of warrant officer training, professional development, morale, recruitment, retention and any other topics impacting readiness. Knowles will represent the more than 10,000 aviation warrant officers in the Army. Warrants currently account for 75% of all Army aviators.

FOD Nightmare

Take a look at the dead blow hammer in your aviation footlocker. It takes a beating when you're working on aircraft rotor heads or doing other prescribed maintenance. It takes more of a beating if you hit sharp surfaces with it. These blows can cut or crack the hammer—and small cracks eventually become big cracks. If it takes too much of a beating and cracks open, the result is a FOD nightmare—lead BBs spilling everywhere. If that happens during work around the rotor head, you've got a FOD problem that could take weeks to clean up.

Follow TM instructions and use the hammer only where a maintenance procedure calls for it. Then inspect the hammer periodically for cracks before using it. Make sure BBs aren't showing through the rubber.

—PS Magazine

Farewell

The entire staff here at the U.S. Army Safety Center would like to bid a fond farewell to Ms. Judy Wilson, Managing Editor of *Flightfax* for the past 2½ years. Ms. Wilson has returned to her "roots" and accepted a promotion as a Public Affairs Officer with the Jacksonville Corps of Engineers in Jacksonville, Florida. We wish her the best of luck in all future endeavors, and thank her for her tireless efforts to produce a quality monthly magazine dedicated solely to the safety and well-being of the aviation professional.

Hello

We also take this opportunity to welcome Ms. Paula Allman as the new Managing Editor of *Flightfax*. Ms. Allman is no stranger to the Safety Center, as she is currently the Managing Editor of *Countermeasure*, our monthly magazine dedicated to the safety and well-being of the ground soldier and related systems. We look forward to her fresh approach and are confident that Paula will attack aviation issues with the same tremendous energy she has poured into *Countermeasure* over the last 5 years.

Thanks

I would also like to say thanks to You, the readers and aviation professionals, for your continued, unwavering support and dedication to Aviation Safety.

Although I'm leaving to attend the War College in July, it has been my distinct privilege to serve as the Publishing Supervisor of both *Flightfax* and *Countermeasure* magazines over the past 11 months. Throughout the period, it has remained our mission to provide you with quality, well-written, informative and relevant coverage of safety-related issues, TTPs, DOs & DON'Ts, and accident analysis with one end-state: Accident Prevention. I challenge each of you to continue your vigilance; you Can, Have, and Do make a difference every day. You cannot let your guard down...because the loss, injury, or damage to a single soldier or piece of equipment in a preventable accident could mean the difference between success and failure on the next battlefield.

Safety First, Soldiers Always!

—LTC Scott G. Ciluffo, Deputy Director of Operations & Publishing Supervisor, DSN 558-2801 (334-255-2801), scott.ciluffo@safetycenter.army.mil

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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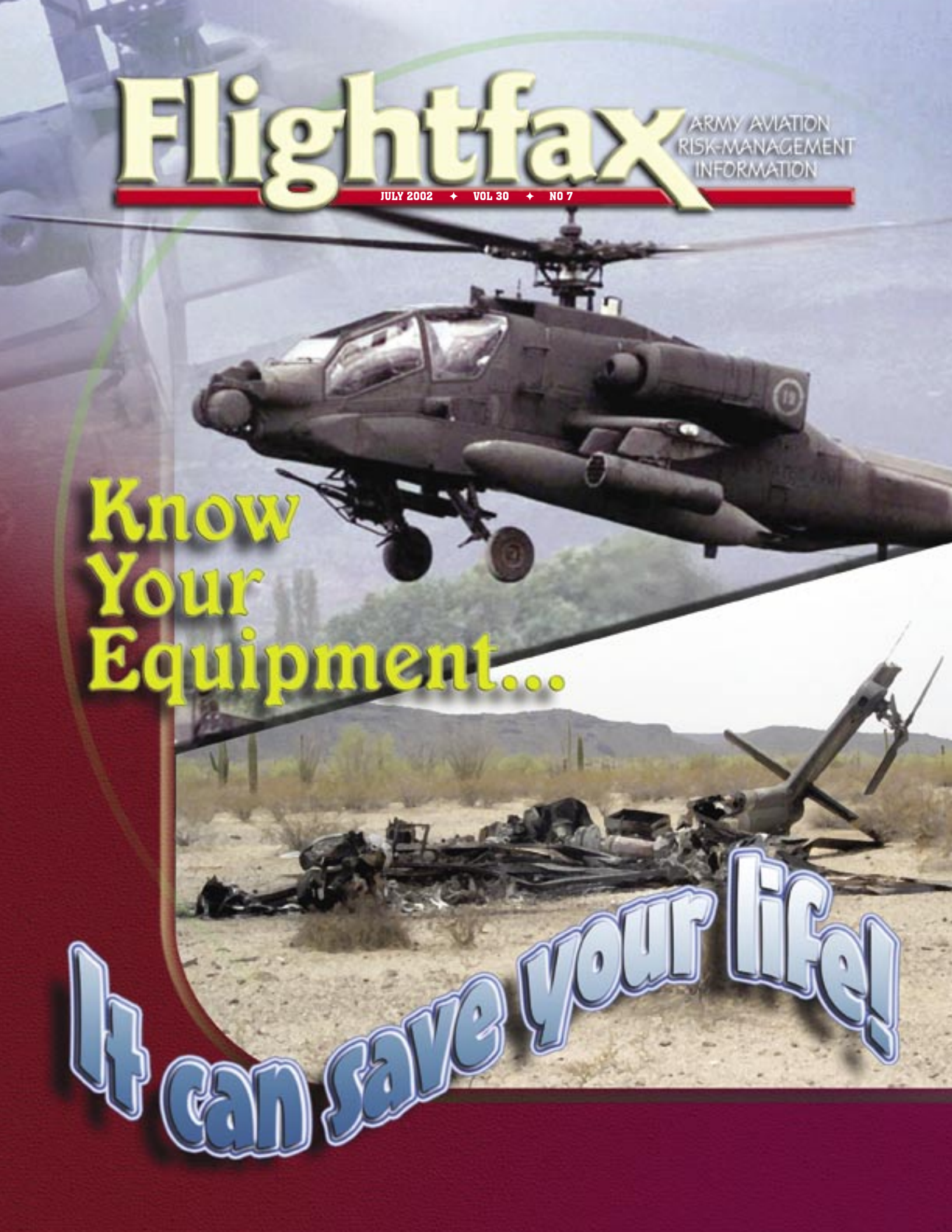

Know Your Equipment...

It can save your life!

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Enjoying Summer Activities—Safely

July 4th, 1776, marked one of the greatest beginnings in history: an experiment in democracy that has stood the test for more than 225 years. With the signing of the Declaration of Independence, 13 American colonies formed a nation founded on the belief that every individual has the right to "life, liberty, and the pursuit of happiness."

Following the signing of the Declaration of Independence, John Adams wrote to his wife: "I am apt to believe that this day will be celebrated by succeeding generations as the great anniversary festival. It ought to be commemorated as the day of deliverance, by solemn acts of devotion to God Almighty. It ought to be solemnized with pomp and parade, with shows, games, sports, guns, bells, bonfires, and illuminations, from one end of this continent to the other, from this time forward forevermore."

By the early 1800s, the tradition of parades, picnics, and fireworks was established as the way to celebrate America's independence. Unfortunately, many of these and other summer outdoor activities are not risk free.

Fireworks displays; swimming, boating, and other sporting events; backyard barbeques; and particularly traveling with family and friends can be high-risk activities without proper risk management. Accidents resulting in serious injury and death too often mar Independence Day celebrations and summer fun when hazards are not properly identified and controlled.

The Army recently lost three soldiers in an off-duty boating accident, and another soldier died when he fell down a cliff in the backyard of a residence he was visiting. While swimming and boating and other outdoor activities continue to take soldiers' lives each summer, POV accidents remain the number one killer, with fatalities almost 21 percent higher than last year. To help us combat this killer, five new "Drive to Arrive" POV accident prevention videos and a revised POV Risk Management Toolbox are now available on the Army Safety Center's website at **http://safety.army.mil.** These short video clips are great dialogue starters on some of the hazards associated with operating a vehicle. And the toolbox provides commanders with an array of risk management POV accident prevention tools.

It's critical that commanders and NCOs talk to soldiers frequently about how hazards such as fatigue, speed, and alcohol are risk multipliers. More importantly, we have to make sure soldiers understand that control measures such as seatbelts, child safety seats, personal flotation devices, helmets, etc., can greatly reduce the possibility of accidents and injuries. We each have a responsibility to instill in soldiers a keen sense of awareness of the tragic consequences of failing to effectively manage risks in both their on- and off-duty activities.

As we celebrate our independence and enjoy a variety of summer activities, I urge each of you—soldiers, civilians, and family members—to pause and reflect on the real meaning and value of freedom. I personally thank you for all that you do in defense of America's freedom.

Let's all strive to make celebrations and summer activities as accident free as possible.

Train hard and play hard—but be safe!

James E. Simmons

Investigator's Forum

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

Two Minutes to Live or Die

The theme of this month's Flightfax is "Know your equipment." When you see a title like that, most of you expect to open the magazine and see a series of stories of how various aircrews managed to bend or break their aircraft or themselves by not knowing their limitations or the flight characteristics of the aircraft. The Safety Center has plenty of those stories, but this won't be one of them. This is a story of a flight crew, specifically the pilot in command, who, when faced with an unknown but potentially catastrophic materiel problem, reacted in a manner that not even a DES Standardization Pilot could question.

The incident aircraft and crew were second in a flight of six AH-64s executing a hasty attack mission over desert terrain. Mission briefs, pre-flights, run ups, and movement to a holding area had all gone as briefed and without incident. Orders came down from higher to execute the attack, and the flight took off towards the attack-by-fire position.

Shortly after establishing 100 knots true airspeed (TAS), at 100 feet above ground level (AGL), the pilot in command (PC) of Gun 02 realized there was something wrong. His first indications were a grinding noise from behind him and a high frequency "rumble" in the anti-torque pedals. He checked his caution panels and saw there were no advisories, cautions, or warnings. He announced to the flight and to the pilot in the front seat of his aircraft that he had a strange noise in the aircraft and he was going to land. The front-seater looked inside and saw no cautions or warning, and only then began to hear the grinding noise.

The PC immediately began a descending right turn out of formation toward a relatively level, obstruction-free part of the desert. He heard Gun 04 call, "Gun 02, you have smoke coming from the aircraft!" followed by flight lead calling "You're on fire!" There were still no cockpit indications, so the PC knew he had a serious problem, but could not diagnose it any further.

This is where the "know your equipment" part comes in. The PC now knew he had a grinding noise, a vibration in the pedals, visible smoke, and perhaps an onboard fire. With no cockpit indications of where the problem was, he realized he could not effectively fight the fire with the onboard systems. On the other hand, he remembered that the most important single action that could be taken by the aircrew for an in-flight fire is to land the aircraft.

The fire could have been in either engine, the Auxiliary Power Unit (APU), the tail boom, or in the transmission area or "Turtle Back." Not knowing what he had, he chose a course of action that gave him the greatest opportunity for a successful landing regardless of where the problem was.

He continued his descent with the intention of conducting a roll-on landing to the unimproved surface of the desert floor. He maintained his airspeed at 60 knots TAS until he was approximately 20 feet AGL, where he began a deceleration for landing.

Almost simultaneously, the front-seater announced "APU fire light!" The PC continued the descent, touched down at 45-50 knots, and rolled to a stop 70 feet after the main gear touched the ground. He then executed an emergency shutdown of the main engines and fired the fire bottles into the APU compartment in accordance with the published emergency procedure.

The crew then exited the aircraft and moved outside the rotor disk to safety. The PC retrieved the portable fire extinguisher to try to fight the fire, but decided otherwise when flames erupted. As a side note to how well he executed the landing, neither the tail wheel locking pin nor the tail wheel strut was damaged.

The estimated total time from the initial indications of a problem to the crew moving away from the aircraft was less than two minutes. One hundred and twenty seconds of critical decision-making ensured the safety of the crew, even though the fire eventually destroyed the aircraft.

The PC made at least four critical decisions after the onset of the emergency.

First, when he heard the noise and felt the vibration, he immediately decided to land the aircraft despite not having any cockpit indications. He knew that the grinding noise was not normal and that a high frequency vibration could mean any of a number of problems. No one could question that decision.

Second, after having reports of smoke from the other aircraft in the flight, he decided to execute a roll-on landing despite the nature of the ground surface. Because there were no cockpit indications, he didn't know the source of the smoke. It could have been from an engine that might fail at any moment. The grinding and high frequency vibration could

have come from a tail rotor driveshaft problem, as well as other high-speed rotating parts. By executing the roll-on landing, he maintained single engine airspeed, maintained enough airspeed to control the aircraft if he lost tail rotor authority, and gave himself the best chance of putting the aircraft on the ground prior to something else going wrong.

Third, when the front-seater announced "APU fire," the PC decided to continue landing prior to executing the emergency procedure. He knew that the APU fire light could indicate either a fire in the APU compartment or a fire in the transmission area. The -10 states, "If the fire is in the transmission area, pulling the APU FIRE PULL handle and discharging the fire bottles may have little or no effect on the fire." He also knew that the emergency procedure could only be conducted from the backseat, and that 15 feet AGL and 50+ knots TAS was not an appropriate time to execute a transfer of the flight controls. By continuing the approach to landing, he gave the crew the best opportunity to survive.

Fourth, after executing the emergency procedure, followed by shutdown and retrieving the handheld fire extinguisher, the PC considered trying to fight the fire. Again, knowing the equipment that he had available, he realized that a 5-pound fire bottle stood no chance against an ever-increasing fire. He wisely decided to move away from the aircraft.

The fire that started while in flight eventually destroyed the aircraft as you can see in the picture. The Accident Board believes that the aircraft's ability to fly was compromised within five minutes of the onset of the emergency. Had the aircraft still been airborne at that time, the outcome would have been tragic. Fortunately, the flight crew was able to watch the fire rather than be a part of it. This was possible because the crew did everything right when faced with a difficult situation and the PC knew his equipment.

Editor's note: The cause of the fire is still under investigation and will be discussed in future articles.

— Aviation Systems and Accident Investigation Division, DSN 558-9552 (334-255-9552)

This article on proper crewmember restraint is one of a series of articles on Aviation Life Support Equipment (ALSE) that will appear in *Flightfax* throughout the coming year.

It has been said that the ability to use proper restraint in life's daily situations is a virtue. In Army Aviation, it is a necessity. A recent accident investigated by the U.S. Army Safety Center involved a Flight Engineer (FE) who was ejected out of the aircraft during the crash sequence. Due to the nature of the accident and a bit of good luck on the FE's part, he sustained only minor bruising and abrasions from the ejection. The FE had left excessive slack in the safety restraint strap on his "monkey harness," or rather his safety restraint assembly.

In addition, the FE used an attachment point on the aircraft that was not designed to restrain a 500-pound horizontal pull. While the FE did remain attached to the aircraft, he was fully ejected. The next enlisted crewmember who is involved in an accident and improperly

restrained may not be so lucky.

Aircrew Integrated System (ACIS) Advisory Message AIS01-02 states that the safety restraint assembly must be adjusted so that the soldier cannot fall from the aircraft. The attachment point in the aircraft must be designed to restrain a minimum of 500 pounds horizontal pull. This attachment point must be located so that the soldier can move about the aircraft freely, but not reach a point where the soldier can fall out of the aircraft.

In addition, the message states, "The safety restraint strap will be connected to the safety restraint assembly and the aircraft attachment point as per the unit ALSE SOP." Normally in utility and cargo aircraft, unit SOPs dictate that the attachment point is on the floor of the aircraft to an approved cargo tiedown ring. Whether the attachment point procedures are in the ALSE SOP or a Safety and Standards SOP is irrelevant, as long as it is addressed, taught to standard, and enforced by leaders.

In this accident, the CH-47D FE attached his restraint strap to a ring at the top of a passenger seat next to the cabin door. The point here is that the unit did not teach, demonstrate, or approve of this attachment point in the aircraft to enlisted crewmembers. Flight Engineer Instructors and Standardization Flight Engineer Instructors must make a point of ensuring that their enlisted crew training programs stress the importance of proper crewmember restraint while operating the aircraft.

If you don't have AIS01-02, units can obtain copies of this message, as well as other ALSE messages by logging on to **https://www.peoavn.redstone.army.mil/acis/index.htm.** If not currently registered at the site, request a user ID and password by following the instructions on the web page. Once registered, log in and select the link "ALSE messages" under quick pick on the right side of the page, then you can view and print all current messages.

Does your unit now use the AIRSAVE vest as your safety restraint assembly? If so, message AIS02-05 is for you. Proper crewmember restraint procedures have been designed to minimize the potential for injury in the advent of an aircraft mishap. Leaders at all levels must enforce these standards.

— Aviation Systems and Accident Investigation Division, DSN 558-9858 (334-255-9858), david.schoolcraft@safetycenter.army.mil

ALSE User's Conference

Commanders, ALSE officers, and other interested personnel are invited to attend the 2002 Army ALSE User's Conference in Huntsville, AL, on 20-22 August 2002. A block of rooms has been set aside at the Huntsville Hilton at the per diem rate of $70.

—POCs: Melanie Barksdale, 256-313-4255, melanie.barksdale@peoavn.redstone.army.mil or John Jolly, 256-313-4262, john.jolly@peoavn.redstone.army.mil

Know What You're Taking

Almost every flight physical has a stamped block on it that is signed by an aircrew member that states that he or she has read and understands AR 40-8, *Temporary Restrictions due to Exogenous Factors*. Unfortunately, we have evidence from some recent accident investigations that shows that some aviators have either been signing the block without really looking at AR 40-8, or ignoring what the reg says. Just in case you are one of the rare individuals who falls into either of those categories, this will bring you up to date.

Although AR 40-8 is a bit dated (a complete revision is in the works), it is to the point and doesn't contain anything that should be a surprise to any aircrew member. The most important day-to-day points are summarized below:

- "Army aircrew members must have optimal physiological and psychological fitness in order to perform their duties."
- "Apart from pathological conditions, fitness may be adversely affected by a variety of exogenous factors, the effects of which may be hardly perceptible and therefore negligible in everyday activities; however, these same factors may have a considerable effect on aircrew efficiency."
- "Aircrew members will inform their flight surgeon when they have participated in activities or received treatment following which flying restrictions may be appropriate."
- "Aircrew members receiving any substance or procedure likely to provoke a systemic reaction shall be restricted from flying duties until declared fit by a flight surgeon."
- "All drugs and medications will be dispensed by or with the knowledge of a flight surgeon."

There are other things in the reg (like the bottle-to-throttle rule) that you need to know, but the aforementioned five points cause the most problems.

Bottom line of 40-8: If you take any kind of medication, prescribed or over-the-counter (OTC), you need to tell your flight surgeon or Aeromedical Physician Assistant (APA). Just to make things clear, this reg does not apply only to FDA approved drugs, but also to "…any substance…likely to provoke a systemic reaction." This includes all types of dietary aids, dietary supplements, and "performance enhancers."

OTCs

Let's talk about OTCs for a minute. We in the aviation medicine world are not totally unrealistic. If you are on leave far from a flight surgeon or APA, and you get a cold or something similar, we don't expect for you to drive 500 miles to see a flight surgeon or APA. It's the same thing if you are a Reserve Component aviator and the flight surgeon/APA is clear across the state. You can take OTC medications that have been approved and published in the Medication Waivers Aeromedical Policy Letter (Class 1: Over the Counter Medications). The approved medications are listed on page 10.

Okay, you take the Sudafed™, but it isn't helping; so you take some Actifed™, but it isn't on the list. What do you do? When you get off of leave, go tell your flight surgeon/APA what you took, when and why, and get an upslip, and/or your records annotated. Be sure to save the medicine boxes or bottles and take those with you, because often OTCs are combinations of medications (that is, they have two or more drugs in one pill, capsule, or liquid), and are acceptable only if each component in the combination is separately acceptable. Any prohibited component makes the combination a prohibited medication.

If you are an RC aviator and the flight surgeon or APA is still across the state, and there is no way to get there—at a minimum, call him or her, and see if you can get approval. It is really this simple. Remember, if you are in an accident and the toxicology is positive for some drug, even if it had absolutely nothing to do with the accident, if there is no record of your having taken it or being cleared to fly, it may be a finding against you.

I know somebody is about to say, "Hey, wait a minute! Diet aids, supplements, and performance

enhancers aren't drugs, 40-8 doesn't apply." Yes, it does! It is true that common OTC diet aids, supplements, and performance enhancers are not regulated as drugs by the FDA, but remember this is from the reg: "…any substance…likely to provoke a systemic reaction…" If you didn't expect any of these things to produce a systemic reaction, whether it be losing weight or building muscle, you wouldn't be taking them.

In addition, many of the common components may provoke serious side effects or adverse interactions with prescribed medications. Some examples are:

- **Ephedra and ma huang:** Cardiac arrhythmias, increased risk of heat injury, muscle breakdown, strokes, and heart attacks. They can interact with common decongestants like Sudafed™ and may interfere with high blood pressure medications.
- **Guarana extract:** This is basically caffeine, and can add to the effects of ephedra and ma huang. It may also interfere with high blood pressure medications.
- **Gingko biloba:** This has been associated with increased bleeding times and spontaneous bleeding. If you are taking something similar to aspirin or Motrin™ which can also increase bleeding time, the effect can be worse.
- **Vitamin E**, ginger, and garlic: All have been associated with interfering with platelet function and may increase bleeding time.

One of the biggest problems with all the supplements/enhancers is that you may be inadvertently "overdosing" on one or more of the components, especially if you are taking more than one product. (Of course, there are some people who deliberately overdose using the "if one is good, then eight are better" philosophy.)

Another problem can be quality control. Although some manufacturers have voluntarily submitted to having inspections so that they can get certification from the United States Pharmacopoeia, most haven't. So there is no guarantee that you are getting the dose listed on the bottle. You may be getting more or less; matter of fact, you may not be getting what is listed on the bottle at all!

Oh yeah—one more thing—ephedra has been reported to make some people positive for amphetamines on urinalysis. In the final analysis, these products may not be totally benign, and are not allowed under AR 40-8.

The REAL bottom line

If you are taking any medication that has not been prescribed by a flight surgeon or APA; if you are taking an OTC medication not on the list of approved medications; or if you are using any kind of dietary aid, supplement, or performance enhancer, you need to go see your flight doc or PA BEFORE your next flight.

Self-medication, it's not just a medical issue…

The pilot, a CW5, had gone home on leave to see his parents in a very rural part of the country, far from any military facility, let alone a flight surgeon. A couple of days before the end of leave, the pilot came down with a headache that just wouldn't go away, despite aspirin and Motrin™. Becoming desperate, the pilot took a pill his mother, who had occasional migraines, offered. His headache went away. Two days later, he drove back to duty without ever asking his mother what he took.

However, being less than lucky, the pilot arrived back at his home station just in time to take part in a company 100% urinalysis. A short time later, the pilot was called into the commander's office and read his rights, because he had come up "hot" for opiates. Because there was nothing in his medical records or anywhere else to explain why he had the positive urinalysis, he was well on his way to a flight evaluation board (FEB) or worse.

Fortunately, he remembered that he had taken something at home. Unfortunately, his mother didn't remember which of her headache pills she had given him. One of them did contain codeine, which could have accounted for the urinalysis.

In the end, the pilot was saved because he was given the benefit of the doubt because of his impeccable reputation. Had it been a different commander or a different pilot, the ending might not have been so happy.

Moral(s) of the story

1. If you don't know what you are taking, don't take it.
2. If you do take something, write down what, when, where, and why you took it.
3. Tell your flight surgeon or APA you took it.
4. Self-medication isn't just medical; it's a legal issue as well.

—LTC Robert Noback, USASC Flight Surgeon, DSN 558-2763 (334-255-2763), robert.noback@safetycenter.army.mil

Approved Over-The-Counter Medications

Approved OTC medications may be used by soldiers only for short-term use and only when a flight surgeon or APA is not available.

A primary concern with frequent or chronic use of any of these medications is that their use may mask serious underlying problems, or even cause problems, such as overuse of aspirin causing an ulcer. A flight surgeon or APA must be consulted if using the following OTC medications frequently.

■ **Antacids (Tums™, Rolaids™, Mylanta™, Maalox™, Gaviscon™, etc.):** When used occasionally or infrequently.

■ **Artificial tears (saline or other lubricating solution only):** Visine™ or other vasoconstrictor agents is prohibited for aviation duty.

■ **Aspirin/ acetaminophen:** When used infrequently or in low dosage.

■ **Cough syrup or cough lozenges (Guaifenesin {Robitussin™ plain}):** Many OTC cough syrups contain sedating antihistamine or Dextromethorphan (DM) and are prohibited for aviation duty.

■ **Decongestant Pseudoephedrine (Sudafed™):** When used for mild nasal congestion in the presence of normal ventilation of the sinuses and middle ears (normal valsalva).

■ **Kaolin and Pectin (Kaopectate™):** If used for minor diarrhea conditions and free of side effects for 24 hours.

■ **Multiple vitamins:** When used in normal supplemental doses. Mega-dose prescriptions or individual vitamin preparations are prohibited.

■ **Nasal sprays:** Saline nasal sprays are acceptable without restriction. Phenylephrine HCL (Neosynephrine) may be used for a maximum of 3 days. Long-acting nasal sprays (oxymetazoline {Afrin™}) are restricted to no more than 3 days. Use of neosynephrine or oxymetazoline for longer than the above time must be validated and approved by a flight surgeon. Recurrent need for nasal sprays must be evaluated by the flight surgeon. Use requires the aircrew member to be free of side effects.

■ **Psyllium Mucilloid (Metamucil™):** When used to treat occasional constipation or as a fiber source for dietary reasons. Long-term use (over 1 week) must be coordinated with the flight surgeon due to possible side effects such as esophageal/bowel obstructions.

■ **Throat lozenges:** Acceptable provided the lozenge contains no prohibited medication. Benzocaine (or similar analgesic) containing throat spray or lozenge is acceptable. Long-term use (more than 3 days) must be approved by the local flight surgeon.

VFR or VMC? Let's Be Clear About What We Mean!

I've just returned from another international symposium during which the spatial disorientation (SD) hazard in military and civilian aviation was discussed. For days, I listened as reports of SD research findings were presented. Being a "seasoned" instructor pilot, I was, and continue to be, dismayed by the synonymous use of the abbreviations: VFR (visual flight rules) and VMC (visual meteorological conditions). The terms "visual flight rules" and "visual meteorological conditions" are the essence of their definitions. One refers to rules we must follow, the other to meteorological conditions we fly in. Sounds easy, but apparently, it's not. It's bad enough that pilots say VFR when they mean VMC and vice versa, but countless SD researchers from various agencies (military and civilian) are doing the same by using these terms indiscriminately and interchangeably.

So what's my problem with this and why does it bother me so much when these terms are used so loosely? Because, it's very important to know the difference between VFR and VMC when compiling research data in order to develop conclusions about "SD-attributable" or "pilot error" findings. It's *even more important* to understand and apply these terms during the conduct of a flight. It's crucial when you're the pilot-in-command of an aircraft and are responsible for the safety of the aircraft and its occupants. It's imperative you know the difference when you are responsible for avoiding those conditions that make SD more likely to occur.

Every symposium (and safety center) is filled with accident reports attributed to SD that were caused by pilots continuing their missions into deteriorating weather and/or visibility. Why? Because, instead of maintaining VFR, they were actually maintaining only VMC. Having listened to the countless reports, I have come to the conclusion that, if the aviation community could make a clear distinction between VFR and VMC, we could save some lives and aviation assets.

It's very probable that most pilots could easily define VFR and VMC during a table discussion. However, during an actual flight, I challenge instructor pilots to ask their less experienced unit pilots if they are maintaining VFR or VMC. Chances are good that if the pilot can see the ground, the response will be VFR. They will come to that conclusion without considering what class of airspace they're in and without considering cloud clearance and visibility requirements in order to maintain "VFR" in that airspace classification.

It seems that pilots tend to forget that the "R" in "VFR" stands for "rules." We, as Army pilots, must comply with these rules, and in order to comply, we must be able to apply these rules during our pre-mission planning and during the actual flight. In a peacetime environment, there are usually three options available if, at any point during the flight, weather conditions change and the VFR (visual flight rules) can no longer be complied with:

1. Land (if possible);

2. Return to or proceed to an area or class of airspace that allows compliance with the VFR, or;

3. Request an Instrument Flight Rules (IFR) clearance.

During wartime, SOPs must address minimum weather requirements and recovery options must be established and complied with.

We need to do a better job in applying these VFRs during our flights, and that begins with understanding and using the proper terminology. Let's be clear about VFR and VMC. It will pay dividends in saving lives and assets.

References: DOD FLIP General Planning, AR 95-1, FAR Part 91.

The opinions, interpretations, conclusions, and recommendations are those of the author and are not necessarily endorsed by the USAARL or the U.S. Army.

—Art Estrada, Research Helicopter Pilot, U.S. Army Aeromedical Research Laboratory, DSN 558-6928, (334-255-6928), art.estrada@se.amedd.army.mil

Familiarity Can Breed Overconfidence

Moments before the aircraft crashed in mountainous terrain, it was flying about 50 feet above the ground at an indicated airspeed of 60 knots. After flying over basically flat terrain, the pilot of the aircraft had initiated a right descending turn into a valley. Surface winds, as reported by the tower, were 150 degrees at 30 knots, which created a right quartering tailwind condition for the aircraft just before the descent into the valley.

When the pilot cleared the leeward side of the valley, he encountered a downdraft condition. He had noticed just before he crested the valley wall that the air was becoming a little bumpy and the winds were beginning to pick up, indicators that excessive turbulence and downdraft conditions existed in the vicinity of the southwesterly wall of the valley. With the combination of at least a 30-knot quartering tailwind, a planned descent, entering a downdraft condition, and an initiated right turn, rate of descent increased so rapidly the pilot was unable to keep the aircraft from crashing.

Having flown in the mountain environment for 2 years without difficulty, the pilot believed he was fully capable of coping with the environment. But he was unprepared for the effect of turbulent wind conditions when he began his descent into the valley.

Aviators cannot take for granted the capability of their aircraft to perform, even when flying missions have been routinely accomplished in the past.

Another pilot, experienced in mountain flying, placed his helicopter in a position where power required exceeded power available because he incorrectly computed his performance planning card data, computing a higher available torque for out-of-ground-effect hover than the engine was capable of producing. As this pilot was making an approach to land downwind along the right side of a steep valley, the low rpm audio sounded and the light came on. Sensing he was not going to make the selected landing area, the pilot, at an altitude of about 100 feet, began a left 180-degree turn with the airspeed below effective translational lift. The helicopter crashed and came to rest at the bottom of a ravine.

The pilot, during his pre-mission planning, incorrectly computed maximum torque available, torque required to hover in-and out-of-ground effect, predicted out-of-ground effect hover torque, and maximum allowable in-ground-effect and out-of-ground-effect gross weight. Also, before taking off from his field site, the pilot performed an out-of-ground-effect hover check which indicated more torque available than he had predicted, thus reinforcing a feeling of overconfidence by seeming to verify the erroneous performance data he had computed.

Aviators cannot take for granted the capability of their aircraft to perform, even when flying missions have been routinely accomplished in the past.

If pilots, who are trained and experienced in mountain flying, can have accidents like these, anyone can.

Where performance planning is concerned, “close” isn’t good enough. Pilots must plan carefully and accurately, and they must take into consideration any changes encountered from initial takeoff to final landing.

—Reprint from Flightfax

"Why So Many Aviation Accidents?"

Whether it's perception or reality, media reports can lead most people to believe that the accident rates are going up and statistics are off and running in the wrong direction. It takes only a few high-profile accidents in a short period of time to ring all sorts of alarm bells. This is when we start looking at statistics.

For the purpose of this article, I asked and obtained basic aviation accident statistics for the past 5 years, which were provided by our Operations Research/Systems Analysis (ORSA) staff. I asked for the total number of Class A-C aviation accidents per aircraft, per year, and their potential causal factors.

Although we're only halfway through 2002, it is being perceived as a really bad year. The Army has increased flying hours 10% this year in comparison to the 5-year average, but has experienced a 46% increase in the Class A accident rate over the 5-year average. Part of the reason for the increase is the harsh environmental conditions that we have flown in this year in comparison to previous years. However, we have been able to maintain a similar Class A-C accident rate as last year, which tells us that while we are experiencing approximately the same accident rate as last year, the accidents are more severe.

Considering the advances in manufacturing and reliability of the equipment, the human is often the weakest link in the accident chain. Analysis of the FY02 severe (Class A-B) flight accident reports reveals that adverse environmental conditions and/or crew coordination errors were present in nearly half of the accidents. Another significant factor was the lack of sound risk management before and during the tasks being executed. Leader failures in risk management and individual errors in indiscipline or overconfidence were present in over one-third of the accidents. Poor decision-making has to rank number one in the "issues" we should strive to address. Small decisions can have a big impact on mission success. For example, selecting the right crew(s), weather decisions, and weighing the risks versus benefits for a given mission all need to be taken into consideration.

Aviation Class A-C Accidents & Rates FY97–FY02

FY	Hours	Class A	Rate A	Class B	Class C	Class A-C	Rate A-C	Fatals
97	620155	8	1.29	9	44	61	9.83	7
98	568070	9	1.58	3	46	58	10.21	2
99	560345	13	2.32	4	45	62	11.09	13
00	606060	4	0.66	2	46	52	8.62	2
01	616438	9	1.46	7	52	68	11.04	11
02	653266	14	2.14	11	47	72	11.03	13

Figures are through 31 May of each year.

FY02 Aviation Class A-B Accidents by Type Aircraft

Aircraft	Class A	Class B	Total Class A-B	Military Fatals
OH-58D	2	5	7	0
AH-64	4	2	6	2
C/MH-60	3	1	4	2
C/MH-47	4	0	4	8
UV-20A	1	0	1	1
Other	0	3	3	0
Total	14	11	25	13

Conditions Present in Majority of FY02 Class A-B Flight Accidents*

- Adverse Environmental Conditions 45%
- Crew Coordination Errors 45%
- Leader Failure/Risk Management 40%
- Individual Error (indiscipline, overconfidence) 35%

* The fact that the numbers do not total 100% is due to there being more than one present and contributing factor in many of the accidents.

Why are we having so many aviation accidents? Better questions are, "What can we do to prevent the next accident?" or What can you do to help your unit achieve "Mission first, Safety always?" Let's start with each one of us doing our part... Use proper risk management tools, be professional in your actions and your thinking, know your aircraft—its limitations and its strengths, and emphasize proper power management when you are on the edge.

—Paula Allman, Managing Editor, Flightfax, DSN 558-9855 (334-255-9855)

WAR Stories

Risk management lessons learned

Don't Be Afraid to Say No

It was a nice summer day, perfect for flying. My guard unit was tasked with taking an aircraft part to another unit out of state, and picking up a replacement part. I was the lucky one chosen to be the co-pilot on the UH-1 going on the mission.

My PC was a very experienced ex-Vietnam pilot with many hours behind the stick of a UH-1, so I had no reason to feel any uneasiness about flying with him.

We took off in the late morning with one crew chief on board. The first portion of the flight went without incident; in fact, it was a little boring as visual flight rules (VFR) cross-country flights can be.

About midway through the flight, I noticed some cumulus clouds forming and they looked a little less than 500 feet above us. I told my PC that I was descending from 1500 to 1200 feet to give us a little more clearance. He said not to worry about it, that the aircraft could fly just as well through the clouds.

I maintained my altitude as he had instructed and did my best to fly around the clouds. We landed at our destination, exchanged our parts, and then went to file our return flight back home.

While the PC was filing, I noticed the weather radar looked quite nasty along our route back home. I mentioned this to the PC and he had little or no concern. It was now early afternoon, and he mentioned he didn't want to get stuck there.

After a short conversation with the crew chief about it, I mentioned it again to the PC. There were quite a few thunderstorm cells very near our route back home, and I didn't think we should take off until the weather cleared a bit more. The PC said we could make it back without going through the storms, so we were off.

As soon as we took off, I could see cumulonimbus clouds on the horizon. Before I knew it, we were right in the middle of a torrential rainstorm. I was, and had been, on the controls and had to slow down to near zero airspeed because visibility was zero.

The PC took over navigation at this point and was telling me which way to go to try to avoid the huge rain cell we had gotten into. I was flying purely by what treetops I could see out of my side window. Not fun!

It was getting dicey since we were not familiar with the area and had become disoriented trying to dodge the rain cells. At one point, we almost hit wires that weren't visible until the last minute.

I was doing my best to get out of the heavy rain while listening to my PC's directions. I became aware that we were nearing a small airport that we had passed on the first leg of our flight, and we needed to make an advisory call.

I was still flying the aircraft at this time, and I asked my PC what the frequency was for the airport because we needed to make a call.

I heard nothing in response. I asked two more times for the frequency and received no response.

At this point, I felt the aircraft make a wild bank to the right and then I heard the PC make an advisory call to the airport. I then realized that the PC had taken the controls and performed a wild evasive maneuver, which by the way was totally unnecessary since there was no traffic at the airport.

I asked him what happened and he began to chew me out for not making an advisory call to the airport. I asked if he had heard me call for the frequency three times, and he said nothing. The PC started giving me a hard time, telling me not to get all pissed off. I knew the cockpit was no place for an argument, so I didn't say anything.

Crew coordination problems arise when the less experienced aviator is afraid to question the actions of the more experienced aviator for fear of reprimand. Whenever you are in the cockpit, the entire crew must pull together as one unit.

We finally escaped the rain and landed at another small airport for re-fuel. It was then that I had a discussion with the PC about why he had not considered my input throughout the flight. We both had been through the Army Crew Coordination Course, so I knew he was capable of being part of an integrated crew. After I asked him why he hadn't given me the frequency, he seemed to realize he had acted inappropriately and apologized. The rest of the flight went without incident.

Lessons learned

Our mission was accomplished, and I learned a valuable lesson: whenever you are in the cockpit, the entire crew must pull together as a unit.

It's true that hindsight is 20/20. I was a brand new WO1 and didn't want to make waves; besides, who was I to tell an ex-Vietnam pilot with thousands of hours what to do. I'll tell you who I was. I was a viable, valuable part of the crew with a duty to do the right thing no matter how unpopular.

Now that I have more experience, I can look back and see what I should have done. I should have been more assertive about taking off in questionable weather. In my case, everything turned out okay, but the potential for disaster was very much present. I can't change what I did or didn't do; but, I can share it with other inexperienced pilots so they can learn from my mistakes.

—CW3 Catherine R. Luncinski is attending the Aviation Safety Officer Course, ASOC-02-004, U.S. Army Aviation Center, Fort Rucker, AL, catherine.r.luncinski@us.army.mil

Learned a lesson lately?

We don't have to learn our lessons the hard way—through accidents. We can also learn from close calls, near misses, and minor mistakes—both our own and those of others. In fact, we must do so, because the cost of accidents is paid in lives, dollars, and readiness.

Share your lessons learned with all of Army Aviation by sending your "War Story" to *Flightfax*:

- U.S. Army Safety Center, ATTN: *Flightfax*, Bldg. 4905, 5th Ave., Fort Rucker, AL 36362-5363
- **flightfax@safetycenter.army.mil**
- Fax DSN 558-3003 (334-255-3003), ATTN: *Flightfax*

SAFETY ALERT NOTICE

Water Safety Trend

The Army is well into the season of water activities, and early indications are that this is likely to be a bad year. Soldiers are drowning at more than double the normal rate, and the hottest months are just beginning. Drowning has become the second most likely cause of accidental death for Army soldiers, surpassed only by POV accidents.

At present, 10 soldiers have drowned during water-related recreational activities. Commanders and senior NCOs can control this trend by reaching into the off-duty behavior of their soldiers, and teach and enforce the requirements for safe swimming, boating, and use of flotation gear.

Seven of the ten soldiers that drowned went overboard. In all cases, the soldiers had not planned to enter the water at all, but were caught off guard and went overboard from a small fishing boat or similar watercraft. Accident reports on hand indicated that life jackets were rarely in use. The other three drownings involved swimming and scuba diving in both a pool and open water.

By looking at accident statistics for the last 10 years, a pattern of drowning situations can be determined. In that timeframe, 141 incidents occurred, some involving more than one fatality. The most significant fact is that only 1 death occurred at a pool with Army lifeguards present, while unguarded pools were the setting in 9 deaths.

By far, the most dangerous environment is the open water or shoreline. Forty-one percent of the drowning incidents were on lakes and rivers, while sixteen percent were ocean swimming fatalities. Military training operations accounted for 11% of the drownings; another 9% drowned when they drove their vehicle into the water.

Consistent factors in Army drownings include overconfidence in swimming ability, alcohol involvement, and breakdown of the buddy system. In recreational settings, these failures sometimes work together, setting a soldier up for a tragedy. Often the victim was not alone, but no one was able to control the situation or complete a rescue.

Command water safety programs should target these threats. Emphasize the requirements for operational risk management, individual training, use of personal flotation devices, and responsible alcohol consumption. Survey recreation areas in your command area of operation using a risk management approach to determine if off-limits prohibitions are warranted. Above all, leaders must recognize their responsibility for the readiness of their soldiers, both on and off duty, and implement controls to mitigate risk and prevent soldier injury or death. The Army's mission depends on it.

JAMES E. SIMMONS
BG, USA
Director of Army Safety

U.S. ARMY SAFETY CENTER

Get Your Cold Weather Equipment NOW

Don't wait until the last minute. Start thinking about it now before it gets cold to prepare for the winter months ahead. Are you prepared? Do you have the proper equipment on hand? Are you trained to use the equipment?

Improper operation of space heaters is normally the start of big problems. Proper operation begins by identifying a soldier to operate the heater, followed by heater-specific training that results in licensing the soldier.

AR 600-55, *The Army Driver and Operator Standardization Program*, provides guidance on selecting, training, and licensing heater operators. Unit personnel should use the appropriate technical manual for heaters to develop lesson plans for training. A hands-on performance evaluation is the best way to determine the skill level before licensing.

—POC: MSG Shane Curtis, Aviation Systems Division, DSN 558-9859 (334-255-9859), shane.curtis@safetycenter.army.mil

The following are the most common types of heaters that are used today:

NEWS & notes

Air Traffic Controllers To Use Next Generation Doppler Radar

As part of its efforts to modernize the national airspace system, the Federal Aviation Administration (FAA) has installed a system at air traffic control facilities that will bring highly accurate weather information directly to controller displays. For the first time ever, air traffic controllers will be able to see advanced Doppler weather information on the same screen as aircraft position data.

The Weather and Radar Processor (WARP) will enhance safety by allowing controllers to reroute air traffic to avoid severe weather areas. Air traffic controllers at the Fort Worth, Texas Center started using WARP on their displays the second week of June.

FAA recently replaced outdated controller displays with state-of-the-art equipment. The capabilities of the new display systems enable WARP to provide real-time aviation weather data on the same screen as aircraft position data, using different colors to show varying intensities of precipitation.

WARP also shows precipitation at three different altitudes, allowing controllers to concentrate on the weather appropriate to the precise location and altitude of a particular aircraft. The weather information is shown as background graphics to the aircraft data on the display. This configuration gives the controller a more accurate view of localized precipitation and supports quicker evaluation of the current weather's impact on a particular airspace sector.

—FEDtechnology.com, Federal Weekly Technology Email Newsletter for Federal and Military Managers and Employees, June 11, 2002

A Call For Articles

Looking for your stories for the upcoming September-November issues on the following subjects:

- Cold Weather Operations (Whiteout, aviation maintenance in a cold environment, physiology of cold weather flying.
- GPS/Weather radar, cockpit commo (task overload, aircrew coordination)
- Your in-flight emergency stories.

Don't worry if you think you can't write. That's why we have editors. The benefit of your story is what matters. Send your stories to Paula Allman at **flightfax@safetycenter.army.mil**.

Every Drive Counts

What does jumping out of an aircraft and driving a vehicle have in common? Safety must be the first concern for both at all times. There is never a time when safety shouldn't be the first thing considered—whether driving to and from work or jumping out of an airplane. Just like every jump counts, every drive counts. This is the central message in an unconventional safety film produced by the U.S. Army Safety Center in conjunction with the Airborne School at Fort Benning, Georgia.

In the safety film, "*Every Drive Counts*," the Safety Center offers a new perspective concerning off-duty traffic safety aimed directly at young soldiers. The MTV-style movie has a sound track with Grammy-award winning music and a clear safety message delivered during orientation by the Command Sergeant Major—

1. What are the hazards?

2. What can I do about them?

3. Am I disciplined enough to make the right choice at the right time?

Each soldier's success is based on his ability to make the right decision when confronted with hazards on- and off-duty.

Due for release in time for Labor Day safety presentations, the video will be available at installation safety offices and local Training Service Centers. When released, it will be advertised on the website **http://safety.army.mil**, where you can place an online order for your own copy.

POC: Rebecca Nolin, Media and Marketing Division, DSN 558-2067 (334-255-2067), rebecca.nolin@safetycenter.army.mil or Al Brown, Strategic Programs, DSN 558-3421 (334-558-3421), james.brown@safetycenter.army.mil

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class E
A model

■ While conducting a ground-controlled approach (GCA) (straight and level at 3700 feet MSL, 100 KIAS) with copilot-gunner (CPG) on the controls, the aircraft began to gyrate. The PIC began to check the hydraulics and digital augmentation stabilization equipment (DASE). He then assumed control of the aircraft and prepared for an emergency landing. They executed a roll-on landing at home station. After conducting a maintenance test flight, it was determined that the altitude and heading reference system (AHRS) was the fault and was replaced. The aircraft was returned to service.

■ Flying straight and level at 500 feet during multiship operations in the day when #1 engine NP went to 98% on instruments and TQ went to 0%. TGT and NG had normal and steady indications. PC decided to do roll-on landing at nearby AAF with no further complications and performed normal engine shutdown. Determination was made to safely do a one-time flight back to home station. Troubleshooting determined that the ECU was the fault, and MOC was completed okay. Test flight was performed and the aircraft was released back to service.

OH-58

Class A (Potential)
D-R model

■ Acft contacted wires during a training flight and landed hard on a major thoroughfare, coming to rest on its side (rolled 90°). Crew was able to egress unassisted and notified the local CoC. Damage initially assessed as class B. Pending further ECOD, potential exists for class A damage to the airframe. Mast-mounted site intact, but crystal cracked. Local USAREUR team will investigate.

Class E
D model

■ While in fwd flight at 10 KTS, aircraft experienced a decrease in power with LOW ROTOR audio and warning message. Immediately after this, the aircraft experienced an increase in power with HIGH RPM ROTOR audio and warning message. MAST TORQUE TIME LIMIT warning, ENG OVER TORQUE warning and XMSN OVER TORQUE warning. Aircrew landed aircraft in place and performed a normal shutdown. The aircraft was returned to home station for maintenance.

UH-60

Class B
L model

■ Aircraft sustained damage during an air assault (exfiltration) landing iteration. Rotor blade flexing resulted in damage to the main rotor blades and possibly the hub, ANALQ 144, tail rotor drive shaft, and the intermediate gear box. ECOD still pending.

Class D
L model

■ While in flight heading 180 degrees, 100 KIAS, 125 feet AGL, the UH-60L aircraft cut through three sets of electrical wires. The aircraft still had controllability and no visual damage (while in flight); therefore, flight was continued to an approved helicopter landing zone to the west of the wire strike location.

Class E
A model

■ Aircraft was day VFR at a hover, transmission experienced fluctuation from 45 PSI to 30 PSI, and down as low as 0 PSI. PC landed and shutdown the aircraft. The mission was aborted. Maintenance troubleshooting determined that replacement of the transmission main module is required.

CH-47

Class A
D model

■ The number one engine surged to 110-111% during (MOC) engine checks; aircraft became airborne as crew attempted to control it during the surge. Subsequent hard landing resulted in major structural damage, requiring depot-level maintenance.

MH-47

Class C
D model

■ Aircraft sustained damage to the aft right landing gear during touchdown/roll-out to desert HLZ in brown-out conditions.

E model

■ Right front landing gear of MH-47E set down into an eroded area on the DZ during landing. Damage to landing gear & fuselage (sheet metal).

T-34

Class B
C model

■ T-34 returned to Pope following a photo chase mission on Normandy DZ. The T-34 landed safely and was returning to parking on yellow ramp. While on the taxiway, the left brake failed and the T-34 departed the taxiway to the right and came to rest in a concrete drainage ditch. No injuries to the crew. The aircraft was recovered from the ditch and is in the ABNSOTD hangar. ECOD: $250K

ALSE

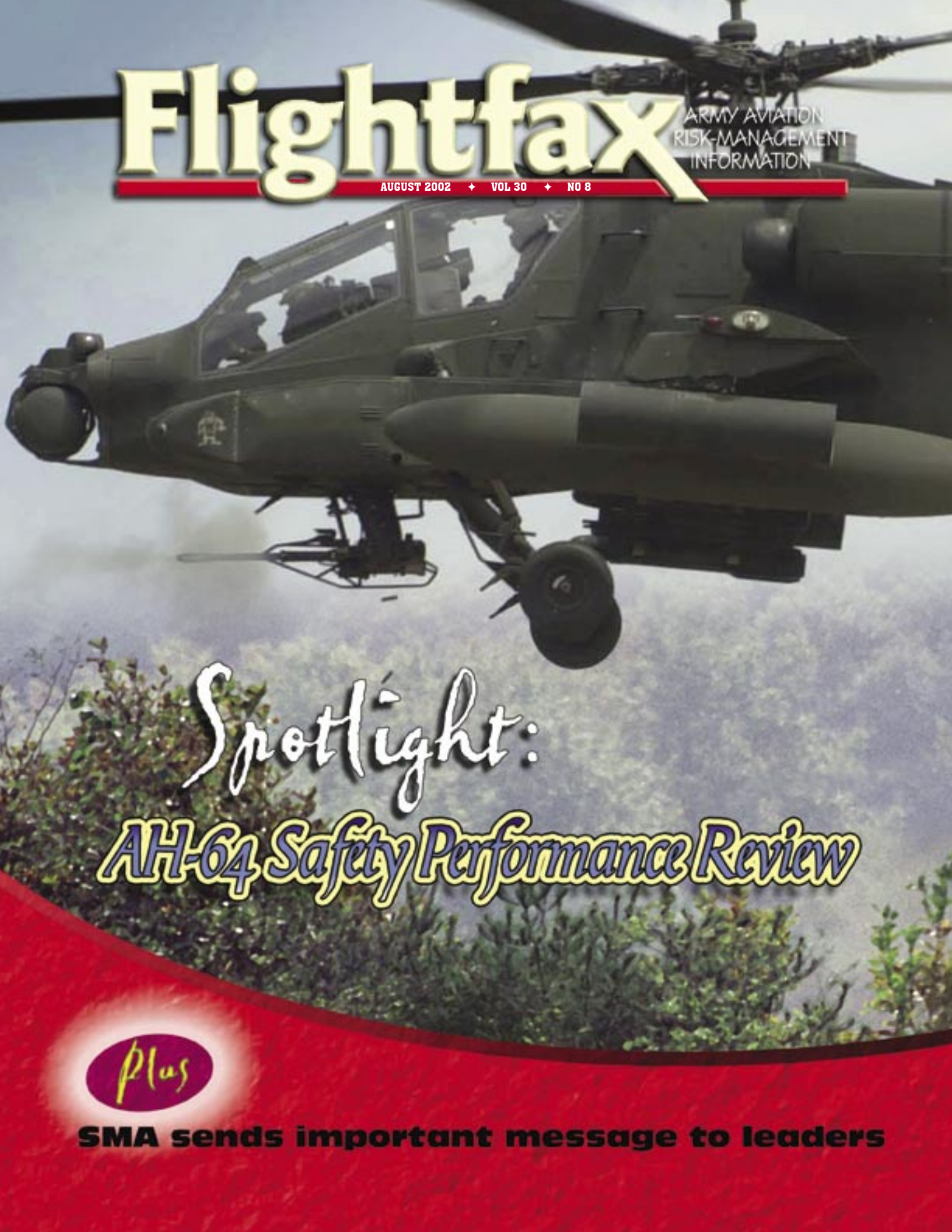
It won't save you if you can't reach it.

Check your ALSE gear... can you get to it?

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

AUGUST 2002 ✦ VOL 30 ✦ NO 8



Spotlight:

AH-64 Safety Performance Review

Plus

SMA sends important message to leaders

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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POV FATALITIES through 30 June

FY02	FY01	3-yr Avg
89	70	83

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Recognizing Outstanding Soldiers and Civilians Is Important

I have used this forum many times to share my personal philosophy with you: **Units that participate in tough, realistic training—with technically and tactically proficient leaders present—have significantly fewer accidents.** Those technically and tactically proficient leaders across our Army are doing a great job in integrating risk management to help us ensure that we have combat-ready battalions capable of going out and conducting tough, realistic training without hurting or killing soldiers before crossing the line of departure.

You have practiced risk management every day, during every training mission. Now that we have deployed into actual combat conditions, risk management is an integral part of how each of you think and maneuver your way through situations as battlefield conditions change instantaneously.

You have repeatedly proven that risk management works and carries forward into combat. Our fellow soldiers continue to hold the torch high and execute real-world missions around the globe, fighting and winning this war on terrorism.

It is time to recognize our units and our outstanding soldiers and civilians who integrate risk management and safety into our tactical operations and garrison support missions. Their perseverance in identifying, assessing, and controlling hazards saves countless injuries and fatalities and prevents costly damage to our equipment.

Two shining examples come immediately to mind: the 101st Airborne Division, Air Assault, and Tobyhanna Army Depot. Thanks to the care and guidance of some dynamic leaders and NCOs, the 101st Airborne Division, Air Assault, has deployed 1,411 soldiers during Operation Enduring Freedom and brought them all home—alive!

Over the last 9 years, Tobyhanna Army Depot, where overhaul and repair of essential warfighting equipment takes place, reduced the amount of Department of Labor compensation chargeback costs by $8 million to cover civilian injury claims. Additionally, with great support by the chain of command and our civilian and military workforce, Tobyhanna Army Depot achieved Star Site status as a member of the Occupational Safety and Health Administration's Voluntary Protection Program.

The Chief of Staff and I would like to recognize your units, soldiers, and civilians—both at home and deployed abroad—for their efforts to incorporate risk management into plans and operations, and thus significantly enhance readiness by reducing accidental losses. We all know the loss of any soldier or damage to any piece of Army equipment seriously impacts our readiness and ultimately our ability to fight and win this war. For those units and individuals who excel in preventing this from happening, we owe them recognition for a job well done.

Review the criteria found in Army Regulation 672-74: *Army Accident Prevention Awards Program* and nominate your units and individuals for either of the two Chief of Staff Safety Awards or any of the four Director of Army Safety awards. Make time to do the small amount of paperwork necessary to ensure our great soldiers and civilians get the long-overdue recognition they have earned and deserve.

Train hard and play hard—but be safe!

JAMES E. SIMMONS

Spotlight: AH-64 Safety Performance Review

Note: This review covers fiscal years 1998 through 2002 (as of 12 Aug 2002)

Since FY 1998, there have been 96 AH-64 Class A through C accidents. These accidents cost the Army $235,931,196 and resulted in eight fatalities and four serious injuries (the most recent accidents are still being investigated and will be covered in later articles). Highlights of the accidents follow.

Flying in close proximity to obstacles

There were 10 accidents involving a tree strike during flight. Six occurred at night and four during the day. The majority of these occurred during terrain flight. In three of these accidents, the crew was landing the aircraft. A hazard associated with this aircraft is the loss of visual cues due to aircraft landing attitude; i.e., nose-high attitude, particularly for the backseater. When the aircraft nose is pulled up, the crew loses sight of the intended touchdown point.

Controls to help mitigate this hazard include having the frontseater clear the aircraft, or having the frontseater fly the approach, and using available aircraft systems to enhance visibility; e.g., the helmet display unit [HDU], using the monocle during the day. Also, there are flight techniques that will allow the backseater to see the touchdown point. Manually driving the stabilator down will drive the nose down. Kicking the aircraft slightly out

of trim, just enough to see the landing point, is another technique.

Scenario 1

During a night (0% illumination) training mission, the AH-64A crew, using the night vision system (NVS), was flying at 100 KIAS and 70 feet above ground level (AGL), when the aircraft struck several tall pine trees. The aircraft descended through the trees to the ground. The aircraft was destroyed, and both crewmembers received major injuries.

Scenario 2

During the conduct of NVS training for annual proficiency and readiness test (APART) requirements, a tree strike occurred at 60 feet AGL as the aircraft descended vertically from an 80-foot out-of-ground effect (OGE) hover for landing in a large confined area. The descent continued to impact with numerous additional blade strikes. The aircraft was destroyed and the two crewmembers received minor injuries.

Inadvertent hover drift

Five accidents involved the hazard of inadvertent hover drift during high cockpit workload conditions, in all cases battle position operations. In two of these accidents, the instructor pilot (IP) was instructing the pilot (PI) in target acquisition procedures, which further escalated the workload.

Conditions contributing to this hazard were darkness, which limits peripheral cues, and a breakdown in crew coordination. The aircraft either descended or drifted rearward into trees or the ground. These accidents involved the AH-64A model, which is not equipped with altitude and position hold modes (as is the Longbow).

Avoiding inadvertent drift during stationary hovering operations requires positive coordination between the crew and use of onboard systems to assist in drift detection. Use of the monocle during the day will help provide drift information. If possible, allow adequate room to safely accommodate for drift.

Scenario

While at a sustained OGE hover in steep, sloping mountainous valley terrain at night, the aircraft inadvertently drifted to the rear and made contact with trees on a steep slope, causing damage to the aircraft. Both crewmembers were focused inside the cockpit, the PI on a target engagement sequence and the IP on instruction.

In-flight part/component detachment

There were 10 accidents where an aircraft component or part came loose from the aircraft during flight. Seven of the ten incidents (70%) resulted in foreign object damage (FOD). There were three possible causes for this: materiel failure of the component: 5 (50%); improper maintenance, which induced a materiel failure of the component: 3 (30%); or inadequate pre-flight/through-flight inspection by the aircrew: 2 (20%). In the latter case, pilots failed to detect unsecured panel doors (engine cowling door) prior to flight.

Bird strikes

There were eight bird strikes. Six of these occurred in cruise flight, one during NOE flight, and one during descent for approach.

Wire strikes

There were six wire strikes. These accidents were evenly split between day and night. Five of the six (83%) occurred during multiship operations (four were in formation flight at the time). In two cases, the aircrew failed to update their hazards map with available hazard information. In another two cases, the aircrew descended below an established "hard deck" (minimum descent altitude). In four of the cases (67%), the aircrew was flying multiship in the center of a valley or directly across a river.

A control to prevent wire strikes in this type of environment is the "Right Hand Rule," which prescribes that, unless tactical considerations dictate otherwise, helicopters are to fly on the right hand side of routes, valleys, and any other line features.

Wires are difficult to see with AH-64

NVDs and forward-looking infrared (FLIR). Equipping copilot-gunners (CPGs) with ANVIS-6 NVGs during the en route phase of missions would enhance detection of wires and other hazards during darkness, particularly in combat situations where hazard reconnaissance may not be possible.

Scenario

The mission was a day local-area orientation flight. The pilot of the lead aircraft reversed course due to poor weather. He established a course in the center of a narrow valley, flying approximately 210 feet AGL and 80 KIAS directly into the sun.

The aircraft then struck two 5/8-inch power lines that crossed the valley floor along the flight path. The wire strike caused extensive damage to three main and all tail rotor blades, and severed the air data subsystem (ADS). The crew successfully landed the aircraft without further damage or injury.

Power management

There were two accidents (both Class A's), which involved improper power management. Both occurred while the crew was attempting to establish and maintain an OGE hover at high gross-weight, high altitude conditions. Power demand exceeded power available and the aircraft descended in a settling-with-power condition to ground impact. These accidents demonstrate a lack of understanding for operating in high gross-weight, high altitude conditions.

Scenario

The night accident initiated as the PC in the rear seat, using his PNVS, attempted to establish and maintain a 170-feet OGE hover for an overwatch position. The PC did not anticipate the power needed to establish and maintain the OGE hover at the high gross weight, high altitude, downwind, hover conditions using a significant 30-degree deceleration. The aircraft descended in a settling-with-power condition to ground impact. The aircraft was destroyed and the PC received minor injuries. The crew had been operating with lower gross weights and at lower altitudes prior to deployment.

Simulated engine failure

There were five Class C accidents in which the pilot, performing a simulated engine failure (SEF), failed to maintain torque within single engine limits. Three of these accidents involved pilot trainees in Apache transition; however, in the other two cases, a pilot undergoing unit proficiency training relied exclusively on engine torque information provided by the HDU. The HDU torque display will only provide a maximum indication of 120%. Therefore, when operating at or near this value, torque must be referenced from both the HDU and the aircraft torque gauge to prevent an inadvertent over torque of the aircraft.

Scenario

While executing ATM task 1054 (perform simulated engine failure, OGE hover), the frontseat PI failed to maintain torque within single engine limits. He attempted to attain 122% torque while using his HDU as a sole reference for torque; however, an over torque of 135% occurred for one second on the #2 engine.

Materiel failures

Twenty-nine percent (28) of the Apache accidents were caused by definite or suspected materiel failure. Of note, a quarter (7) involved Power Takeoff (PTO) clutch assembly failures, which resulted in collateral aircraft damage and/or in-flight fires. There is no way for the crew or maintenance personnel to diagnose an impending failure. The first indications to the crew of a clutch assembly failure may be vibration and/or a grinding noise. Engineering investigation is ongoing to determine corrective action. In the interim, a Safety-of-Flight message (AH-64-02-08) was disseminated specifying inspection procedures for the PTO clutch assembly. ■

—Charisse Lyle, Operations Research and Systems Analysis Division, DSN 558-2091 (334-255-2091), charisse.lyle@safetycenter.army.mil

Tactical Risk Management

In practice, Army Aviation has looked at risk management as the assessment of risks associated with accident producing hazards. This mindset is demonstrated in our risk assessment worksheets. We fill out the worksheet, arrive at a numerical value, seek the appropriate level of mission approval and off we go. Don't take me wrong, the risk assessment worksheet is a valuable tool to organize information required to make accident risk decisions, but it doesn't consider tactical risks and then only takes you through the first two steps of a five-step process.

Standard operating procedures (SOP), operations orders, and leader experience cover the third step; executing the plan with discipline implements the controls; and tough, thorough after-action reviews complete the fifth step. The risk management application process is not complete until the lessons learned are applied and new hazards identified are reintegrated into the process at step one.

The often unconscious portion of risk management is the mitigation of tactical risk. The mitigation of tactical risk is generally not viewed as risk management, but as the development of a sound tactical plan. A tactical plan is not developed in a vacuum by the commander and S3; it's an integrated process that involves the entire staff. Without the application of a defined process, success will often be based on the experience of the leaders involved, skill of execution and chance. Leaders who are comfortable with risk management principals consciously apply them to the military decision-making model. This conscious use of risk management principals in the planning process establishes a common base of hazard assessment for both tactical and accident risks.

Although we take advantage of the synergistic effect of weapons systems on the battlefield, how often do we consider the synergistic effect of accident and tactical risk? Do medium accident risk and medium tactical risk result in a high-risk mission? This question cannot be answered without a common method of identifying, assessing and controlling hazards.

Combining the mitigation of accident and tactical risk requires close coordination between the safety and operations sections of the staff. Safety personnel must be tactically sound and operations personnel must be able to apply risk management principals; only when both are competent in the safety and operational disciplines will an organization be able to identify the synergistic effects of tactical and accident hazards. ■

—CW5 Larry R. Kulsrud, Aviation Division & Accident Investigation Division, DSN 558-2534 (334-255-2534), larry.kulsrud@safetycenter.army.mil

Why Crew Mission Briefs Are Essential

Crew mission briefs are an essential part of pre-mission planning because of their role in the development of good crew coordination, allowance for continued risk analysis, and instrumental in building strong working teams.

Have you heard the brief that assumes all crewmembers are aware of their areas of responsibility? Regardless of your experience, you probably have. The following is an example of that brief: "We're running short on time, so listen up. Our mission is to pick up some passengers at point A and move them to point B. The weather looks good and we've all flown with each other before. Got any questions? Good, let's go." This brief obviously does not give the crew enough information to operate a good mission or offer alternative methods for a mission if faced with situational conflicts.

Crew mission briefs develop good crew coordination by assigning duties and responsibilities to each participant prior to the flight. It is important to know if each crewmember is familiar with putting the transponder to emergency or how to perform an emergency shutdown of the engines. These seem like simple tasks, yet I have observed crewmembers having difficulty

manipulating engine-power control levers or forgetting that the transponder has an emergency position.

Assigning duties for different situations that may occur is another good crew coordination technique. Of course, we cannot foresee every circumstance; but as a team, we can cover most situations that seem more likely to exist. An example would be during marginal weather, it is important to cover specific airspeeds and climb rates if inadvertent IMC is encountered. The pilot not on the controls would know just by looking at the instruments if the pilot on the controls has truly transferred to instruments or is having difficulty with spatial disorientation.

Another approach could be to brief whoever is not on the controls during slow airspeed flight. It is important to place his or her hand on the jettison switch until single engine airspeed is attained during external load/store operations. It is a proven fact that a crew that works as a team has a higher survival rate than one that doesn't. The lack of a good crew brief before and during an in-flight emergency situation could mean your life. Are you willing to bet your life for a few extra minutes of your time?

Crew mission briefs also provide the crew time to focus on the mission and continue risk assessments. The crew brief can give the crew an opportunity to voice concerns about the mission. The outcome of these concerns may provide insight to potential risk factors that were overlooked during the mission-planning phase. With the understanding of our current operation tempo (OPTEMPO), one person can't see all the potential risks involved when he or she is tasked with numerous responsibilities prior to flight. To avoid these risks, the crew brief should focus on risk considerations. Perhaps your crew chief observes a potential hazard that you missed and recommends a safer way to complete the mission.

It is a proven fact that a crew that works as a team has a higher survival rate than one that doesn't.

If you are the Pilot in Command, ensure the work environment is one that allows feedback. As a leader, focus on getting your crew beyond just checking the risk assessment block. Risk assessment is an ongoing process that requires leader emphasis.

Finally, the crew mission brief is a tool in building a strong working team within the aircraft. A typical crew mix has a wide variety of experience from as low as zero flight hours to a master aviator with multiple aircraft qualifications and thousands of hours. The only way to mate the duties with the proper experienced crewmember is to assign specific duties and responsibilities to each member.

It is important to take a moment and discuss mission specifics. Examples include scanning sectors, clearing the tail verses the nose or cockpit, or set up for the type of mission (VFR or IFR). Are you flying goggles or night systems? What procedures need to occur during in-flight emergencies for the person on the controls or the person not on the controls? What about specific duties for the crew chief during an in-flight emergency?

Crew mission briefs convey a significant amount of information and the individual presenter must tailor each presentation. As a crew mission briefer, it is important to ensure that your presentation techniques build crew coordination, allow feedback for continued risk analysis, and build your crew into a strong working team. These factors are mandatory for a successful flight. You may not see the results of a good crew brief; however, the Safety Center has many records of poor crew briefs. Don't be a statistic; take the time and brief your crewmembers right. ■

—CW2 David L. Pearson attended the Aviation Safety Officer Course, ASOC 02-004, and is currently stationed with F Company, 1-212th Avn, Fort Rucker, AL, as an SP; david.l.pearson@us.army.mil

The Care and Feeding of the CEP

The Communications Earplug (CEP) augments Army flight helmets by dramatically improving communication while simultaneously reducing noise exposure in rotary-wing aircraft. It consists of miniature transducers closely coupled with an expandable-foam earplug (Figure 1) that connects to the helmet communication system by an interface cable between earphone in the right earcup and the helmet shell (HGU-56/P and SPH-4B) or a connector attached to the communications cable (IHADSS).

The CEP has undergone extensive qualification testing as well as objective laboratory study and product evaluation by hundreds of U.S. Army aviators. Airworthiness Releases (AWR) have been issued for the use of the CEP in all Army rotary-wing aircraft and a National Stock Number (NSN) has been assigned (5965-01-474-5654). The CEP has proved to be a resounding success and enjoys nearly universal acceptance by U.S. Army rotary-wing aircraft crewmembers. The purpose of this article is to remind CEP users of the proper care and use of the foam ear tips used with the CEP. (Some of these instructions differ from those provided by the manufacturer of the foam ear tips.)

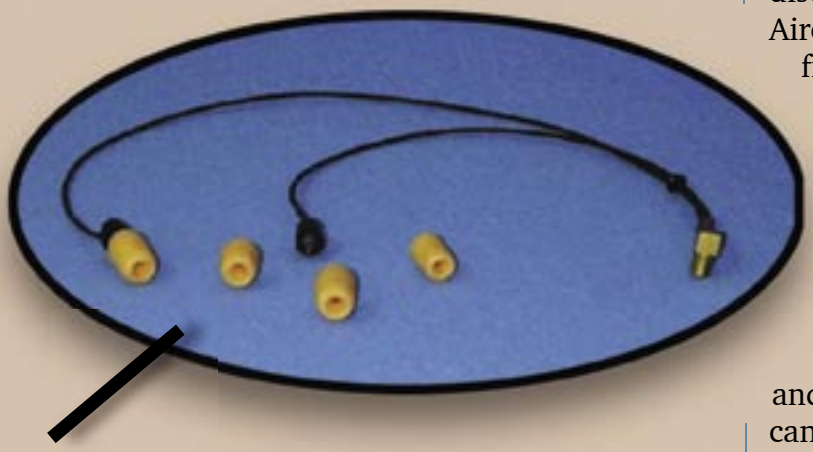


Figure 1. The Communications Earplug and three sizes of Comply™ ear tips.

Sizing

The Comply™ Canal Tips (0 vent), manufactured by Hearing Components, Inc.[1] were initially designed to prevent hearing aid feedback, but have been found to function effectively as hearing protectors, having a Noise Reduction Rating (NRR) equivalent to the well-known yellow expandable-foam earplug (NRR = 29 dB). They are available in three sizes: Standard, Slim, and Short, one of which will fit most Army aviators.

Approximately 80-90% of Army aircrew should be using the Standard size, with the remaining using the Slim size. We strongly discourage the use of the Short canal tips. Aircrew should be sure to use only correctly fitting canal tips. We caution that some ALSE shops may issue the wrong size plugs due to packaging or supply problems.

Cleaning

While the packaging instructions state "Do not wash canal tips," our experience is that the canal tips, when soiled, can be washed *sparingly* with mild soap and water and allowed to air dry. Some aviators wash the canal tips by leaving them in the pocket of their flight suits during laundering, and while this is not advised, we have received no reports of problems with this practice. (Some users report that the tips may not expand quite as well following repeated laundering.)

When cleaned properly and carefully, the foam tips should last for about one month (three or four washings) under normal use. The tip should be discarded if the foam appears to be degraded in any way, if it becomes separated from the plastic insert inside of the foam, or if it fails to expand properly after insertion.

Fitting

The fitting instructions on the package insert are NOT appropriate for use of the Comply™

[1]Hearing Components, Inc., 420 Hayward Avenue North, Oakdale, MN 55128, 800-872-8986 (voice), 651-735-2790 (FAX), http://www.hearingcomponents.com/

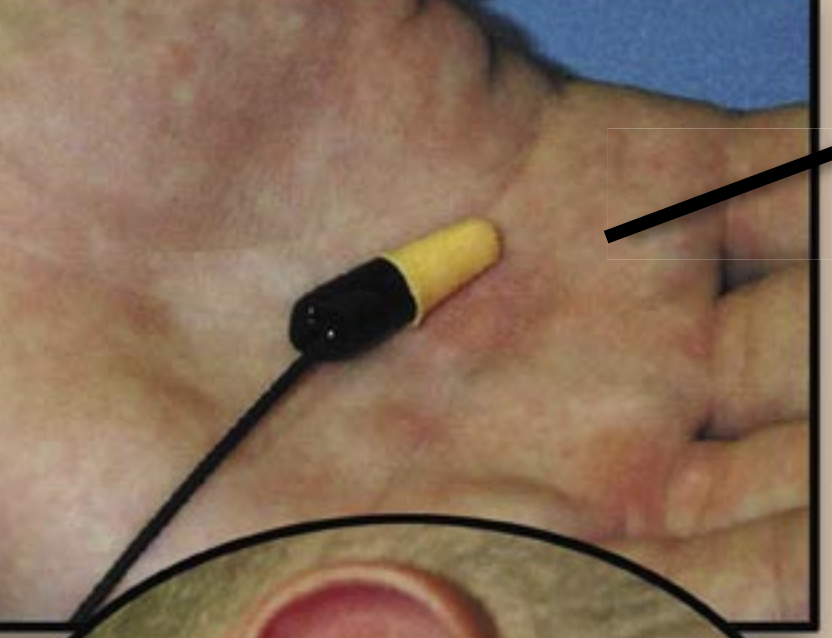


Figure 2. Comply™ Canal Tip correctly compressed prior to insertion into the ear canal.

Figure 3. Correctly inserted CEP. Note that little foam from the canal tip is visible and that the wire is directed downward through the notch in the external ear.

Canal Tip for hearing protection. Rather than flattening the canal tip "like a key" (as is indicated in the packaging instructions) to obtain the proper hearing protection, the CEP canal tip should be *rolled* between the thumb and first two fingers into a small cylinder (see Figure 2). When inserting the rolled foam tip into the ear canal, it is best to use the opposite hand to pull the external ear up and away from the head, thereby straightening the ear canal and allowing for a clear path for the rolled canal tip.

The CEP foam tip should first be threaded onto the transducer and then be inserted deeply into the ear canal such that the foam material is nearly entirely in the ear canal. The noise protection provided by the CEP will be reduced if it is not inserted correctly. In addition, the CEP should be inserted so that the black wire exiting each transducer should exit the "notch" in the external ear (Figure 3).

If care is not taken to compress the foam tip sufficiently, or if the ear canal is not straightened, it is possible that the foam may pull away from the plastic insert in the ear canal and touch or rub against the sensitive tissue in the external ear canal, resulting in significant discomfort. It has been our experience that much of the discomfort resulting from CEP use is from improper insertion of the device into the ear canal. A few seconds of care can make for an extended pain-free flight.

When the foam tip is threaded on to the CEP transducer, care should be taken to tighten the tip snugly onto the transducer. The tip typically will require one full turn to come in contact with the black transducer cover. An additional quarter-turn will seat the base of the plastic insert into the recessed lip of the transducer, providing a tight seal between the transducer and foam tip. If the foam tip remains in the ear canal after pulling on the transducer housing, the tip may not have been screwed on to the threaded adapter. (If the tip remains in the ear canal, it may have to be removed by forceps or similar instrument.) If the canal tip does not require a full turn to be fully attached to the CEP transducer, then return the CEP to your ALSE shop for replacement.

The CEP has proved to be a great success in Army rotary-wing aviation but, as for any other piece of equipment, its performance is dependent on proper use. We recommend that you review the documentation provided with your CEP each time your flight helmet is inspected by your ALSE technician. Proper use of the CEP will protect your hearing as well as greatly improve communications, thereby making flight safer for all Army aircrew. ■

—William A. Ahroon, Ph.D., Research Psychologist, Aircrew Protection Division, U.S. Army Aeromedical Research Laboratory, william.ahroon@se.amedd.army.mil, DSN 558-6828, CML 334-255-6828, http://www.usaarl.army.mil/; Ben T. Mozo, Communications and Ear Protection, Inc., bmozo@cep-usa.com, CML 334-347-1688, http://www.cep-usa.com

The Use of the CEP in the UH-60 Black Hawk

An article appeared recently in the May 2002 *Flightfax* that questions the use of the Communications Ear Plug (CEP) in the UH-60 Black Hawk. The author identified a possible safety problem that may occur in any Army aircraft, but that problem is not caused by the CEP, but rather by improper procedures employed by the pilot in command (PC).

Successful crew communication is important for safe and effective aircraft operations. Communication difficulties can occur from many factors between or among the communicators including impaired hearing. Difficulties communicating may exist whenever crewmembers have different hearing capabilities unless care is taken during pre-flight checks that each crewmember's communication system is set properly.

Consider, for example, a TH-67 with a single communications system volume control, an instructor pilot (IP) with an H-3 hearing profile, and a new flight student without any hearing loss. In this example, either the IP will not be able to hear because the communications system volume is set too low to accommodate the flight student or the flight student will be forced to communicate in a system with the volume set too high consequently distorting the communications signal.

The Black Hawk helicopter has two adjustments for the communications system. Each crewmember has a volume control for his intercommunication system (ICS), and there is an overall gain control on the radios. There is a risk that some crewmembers will have difficulty hearing the radios if the PC sets his ICS level to full volume and then adjusts the radios at an appropriate level for him. The proper procedure is to reduce the ICS level at the PC's location and increase the overall radio gain (to accommodate the PC's hearing). This would permit other crewmembers to adjust their ICS levels for effective communications.

The previous *Flightfax* article suggests that the CEP should not be used by any of the crewmembers unless all crewmembers are wearing the CEP. While the author has identified a problem associated with the use of the CEP, the solution is not to remove this safety technology from the aircraft, but for the aircraft crew to work together to deal with the difference in hearing capabilities—just as would have to be done when crewmembers suffer differing amounts of noise-induced hearing loss. The problem is not in the equipment, but rather in the procedures followed by those employing the equipment. ■

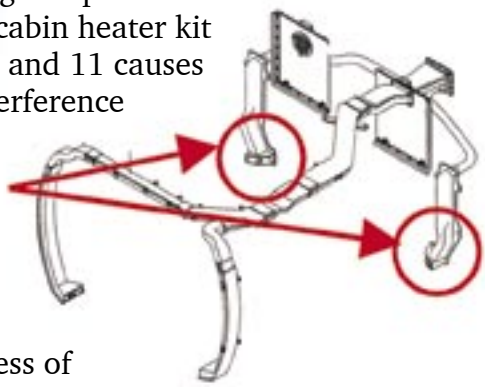
The problem is not in the equipment, but rather in the procedures followed by those employing the equipment.

—COL Brian S. Campbell, Commander, U.S. Army Aeromedical Research Laboratory, DSN 558-6917, CML 334-255-6917, brian.campbell@amedd.army.mil, http://www.usaarl.army.mil

Auxiliary Cabin Heater Duct Interference with Troop Seats

A potential hazard has been identified that precludes the installation of the two aft outboard forward-facing troop seats when the auxiliary cabin heater duct system is installed. The auxiliary cabin heater kit (P/N 70073-95004-011) is an approved aircraft modification kit designed for use on MEDEVAC aircraft, but has been installed on non-MEDEVAC aircraft.

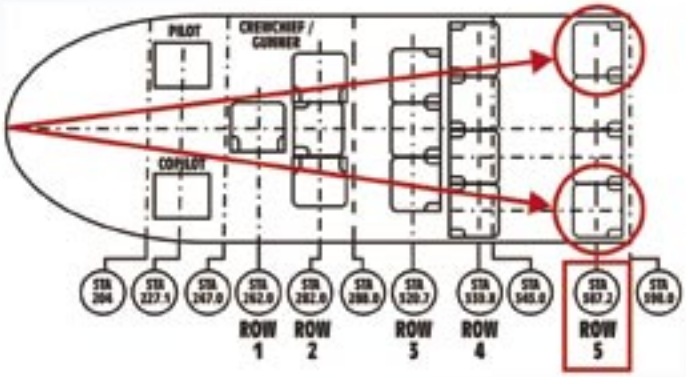
Concurrent installation of the aft outboard forward-facing troop seats and the auxiliary cabin heater kit ducts Nos. 10 and 11 causes a physical interference between the seats and the ducts. This interferes with the crashworthiness of the seats by limiting the seat attenuation in the event of a hard landing or crash.



UH-60-MIM-01-001 (070907Z Nov 00), Subject: Additional Warning for Heater Duct Installation and Aft Outboard, Forward-Facing Troop Seat added a warning to the TM 1-1520-237-23, para 2-4-46.12.3.

Care should be taken to ensure that if you have the auxiliary cabin heater duct system installed, that the outboard troop seats in row 5 are removed. Failure to do so places occupants of those seats at elevated risk of injury in the event of seat stroking following a hard landing.

—Greg McCann (SAIC), Utility Helicopters PM Safety, 256-971-7253, gregory.mccann@uh.redstone.army.mil



WARNING

Crashworthiness of the aft outboard, forward-facing troop seats will be decreased if the auxiliary cabin heater duct installations at station 398 are present. The duct and diffuser installation near the floor protrudes beneath the troop seat allowing the seat to strike the diffuser and stroke envelope, potentially decreasing the energy attenuation provided by seat stroke action. **DO NOT INSTALL AFT OUTBOARD, FORWARD-FACING TROOP SEATS IF HEATER DUCTS ARE INSTALLED ON THE BULKHEAD AT STATION 398.**

WAR Stories

Risk management lessons learned

Timely Help From a Friend

Some years ago, and long before the Army's crew coordination efforts began in earnest, I was taught an important lesson about cross-monitoring other aircrew members.

I was a fresh WO1 flying OH-58s in Germany. As with most of my missions, I was single-pilot this day and tasked to carry a Corps of Engineer Major from base to base on a facility inspection tour. The Major and I had flown together many times before, and had developed an easy friendship. He was a private pilot back in the States, and routinely helped me in the cockpit with navigation and radio duties. This was our last leg of the day, and we were going back to home base.

With the flight plan filed and weather brief updated, we cranked the aircraft under a broken to overcast sky and called for hover-taxi clearance. The tower cleared us to hover and repeated the previously issued advisory for thunderstorms to the west. With a quick, "Roger," I pulled pitch and headed for the departure pad. On intercom, the Major and I discussed the darkening western sky and the visible rain showers beneath. We agreed they appeared to be isolated enough for us to remain VMC as we followed our westerly course home.

We were cleared for takeoff to the east with a right downwind departure. As I departed traffic to the west and as the Tower radioed, "Frequency change approved," the aircraft was engulfed from above in a heavy downpour. I was instantly IMC and disoriented! I felt like I was in a dream-like state, unable to make sense of the instruments in front of me or respond to the seemingly far-off radio calls from Tower asking if we were okay.

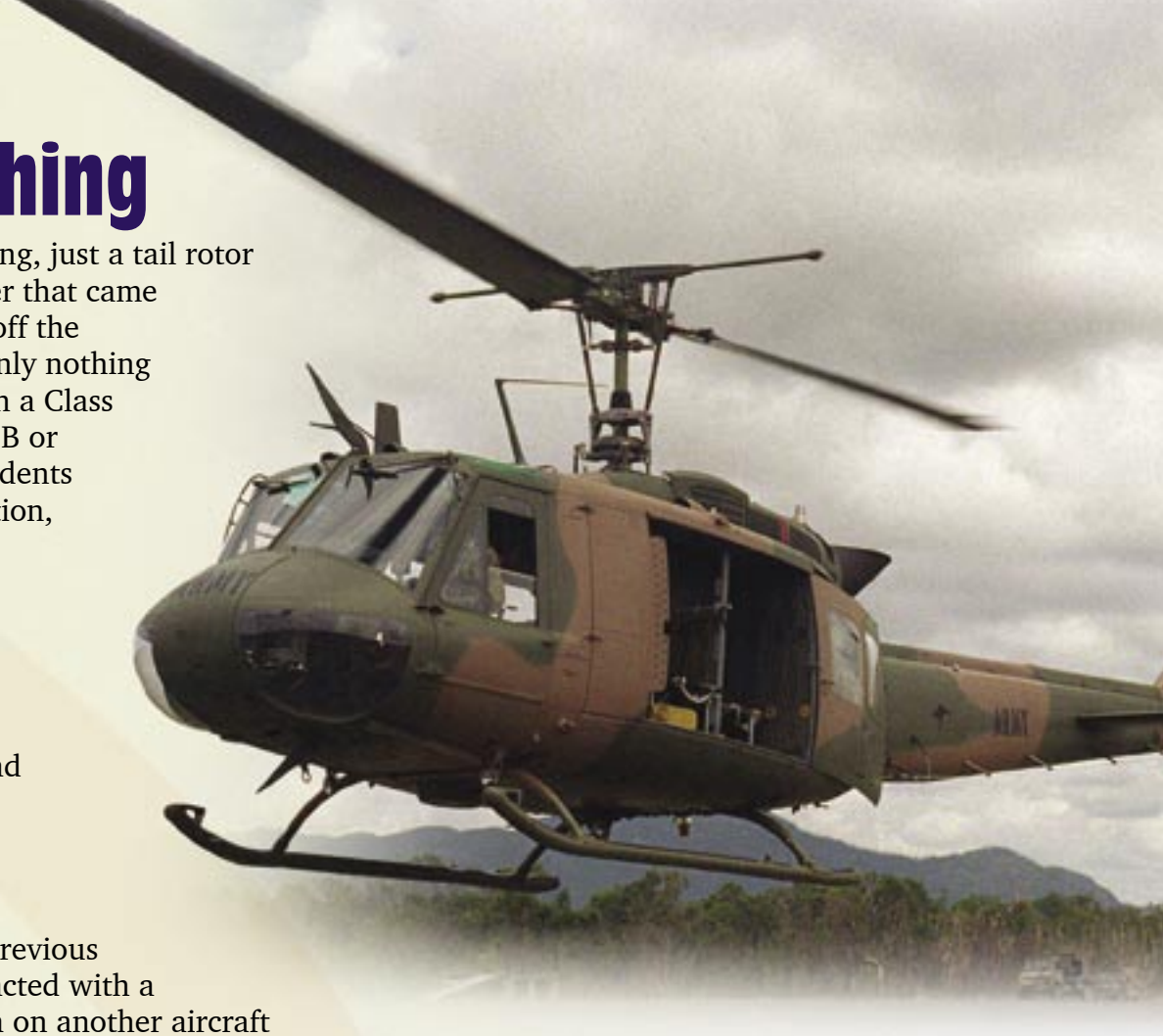
After what seemed like hours, the urgent tone of the Major's voice asking if I was all right penetrated the fog. With sudden clarity, I was able to interpret my aircraft instruments and see we were in a steep right turn, nose low, with airspeed and rate of descent increasing. Not knowing how long I'd been confused, I managed to level the aircraft and red-lined the TOT to stop the descent.

As the aircraft transitioned from descent to climb, we broke out into VMC and saw we were only about 200 feet AGL from hills, trees, and the biggest concrete communications tower I'd ever seen. Adjusting our flight path, I radioed the Tower, saying we were okay, in the clear, and changing frequency. For the remainder of the flight, the Major and I discussed the incident in detail.

Come to find out, he had received some flight instruction in instrument flying and had been taught the fundamentals of inadvertent IMC recovery. By cross-monitoring my performance and applying that little bit of training he'd had, he could see that I was in trouble. He spoke up in the nick of time, and I am grateful to be able to write about it today. ■

—CW4 Joel W. Buller, Commander, Detachment 3, Company A, 249th Aviation (TA), South Dakota Army National Guard, DSN 747-8368 (605-737-6368)

No Big Thing



It was no big thing, just a tail rotor drive shaft cover that came open and flew off the aircraft. Certainly nothing to compare with a Class A accident, or even a B or C. Those are the accidents that should get attention, right? True, but the failure to follow up that caused this mishap could also cause one of the big ones. We have to treat every Class D and E as a potential A-C, and so do you.

The crew chief had performed the daily inspection the previous day, but he was distracted with a maintenance problem on another aircraft and he failed to secure the fasteners on the tail rotor drive shaft covers between the 42-and 90-degree gearboxes.

The pilot who performed the preflight inspection noticed the covers weren't fastened, but he thought another crew chief might still be doing maintenance. He made a mental note, however, to check with the crew chief after he finished the preflight.

After finishing the preflight, the same pilot was taking a fuel sample when a fuel drain stuck in the open position. By the time he and the crew chief got the drain closed, they were both soaked with fuel. After washing and changing clothes, the pilot had forgotten about the unsecured drive shaft covers and he took off in the UH-1.

The aircraft was about 2,000 feet mean sea level (MSL), at 90 KIAS, when the pilot felt a thump. He decelerated and checked control responses. When normal cruise flight was resumed, the crew felt vertical vibration and the IP took the controls and headed for the nearest airport under reduced power. The aircraft made a shallow approach and landed with no further problems.

The IP hadn't been involved in preflighting the aircraft, but the crew chief and the pilot were aware the drive shaft covers weren't fastened—they just failed to follow up. The crew chief should have written up "drive shaft covers unfastened" in the logbook before going to work on the other aircraft. The pilot should have used the checklist during his preflight inspection and he should have found out why the drive shaft covers were unfastened, as soon as he discovered them, and made an entry in the logbook.

No big thing, only a lost drive shaft cowling, but next time the cowling might go through a rotor. Or it could be a drained gearbox that doesn't get written up. There just aren't any small things when it comes to safety. ■

—Reprint from Flightfax

NCO CORNER

Keep Our Soldiers Safe and Straight

The past several months have continued to be busy times for the Army, but despite this hectic pace I ask each of you to increase your focus on safety and standards. We cannot allow ourselves to be lax on either—soldiers' lives depend on both.

I am especially concerned about accidents so far this year. Our fatalities are up and more than 60 percent of accidental deaths involve either tactical or privately owned vehicles (POVs).

We have to ensure that our soldiers, civilian employees, and family members are wearing their seatbelts, helmets, road guard vests, and other safety equipment. These simple devices save lives only if they are used. They don't help anyone if they are tucked in a closet or not wrapped over a shoulder. Risk assessments, safety briefings, spot checks, and corrections are vital to keeping our troops alive.

On a recent trip, I left a battalion run to make a soldier—in uniform and in a government vehicle—put on his seatbelt. What was even more troubling was that there was an NCO in the passenger seat who was not enforcing standards.

This is not an anomaly; any of us could stand at an intersection at any post and spot dozens of soldiers driving by not buckled in. I need your help to ensure that first-line supervisors all the way up to post commanders continue to stress safety.

Our soldiers are our most valuable resource. We can't afford to lose them because we didn't try hard enough to ensure people put safety first. This starts with enforcing standards. As I have said before, we cannot lead from behind a desk. You can't mentor via E-mail. You have to be out front showing soldiers what "right looks like."

It's our job as NCOs to lead in every aspect. Soldiers deserve nothing less. We have outstanding leaders out there. Don't let complacency detract from those qualities. We must energize our efforts and not disregard mistakes. Deficiencies need to be corrected. Training needs to be realistic and hard. Soldiers need to be inspected. Height and weight standards must be met. Force protection must remain rigid.

I'm not talking about a revolutionary way of doing business. These are the basics. If we don't keep our soldiers safe and straight, lives will be lost. Soldiers will die in accidents that could have been prevented or because we were lax on standards. We cannot afford to pay that price. America has given us their brightest and best.

Lead. It's that simple. ■

—Adapted from SMA Jack L. Tilley's Message to MACOMs/Corps Leaders, 9 August 2002

POV

Gasoline and Static Electricity—A Bad Combination

Static electricity can make sparks fly—literally. Produce those sparks while pumping gas in your car, and both you and your car can go up in smoke and flames!

Researchers at the Petroleum Equipment Institute (PEI), as well as several other companies, are working on a campaign to try and make the public aware of fires as a result of static electricity at gas pumps. Out of an estimated 16 to 18 billion fuelings a year in the United States, most are safe non-events that pose no danger to consumers. However, PEI has documented more than 150 incidents of static electricity related fires at fuel pumps nationwide, with more than half occurring since 1999. Even though incidents related to static electricity at retail gasoline outlets are extremely unusual, all motorists should be aware of the potential that re-entering their car creates static electricity that could cause a fire.

A buildup of static electricity can be caused by re-entering a vehicle during refueling, particularly in cool and dry climate conditions. If customers return to their vehicle's fill pipe when refueling is complete, the static could discharge at the fill point and cause a brief flash fire with gasoline vapors. To greatly minimize the likelihood of any buildup of static electricity, motorists should not get back into their vehicles during refueling. Customers who cannot avoid re-entering their car should always touch a metal part of the vehicle away from the fill point, such as a door, before removing the nozzle.

The following tips will help to keep you and your family safe at the gas pump year-round:

- Keep gasoline away from ignition sources such as heat, sparks, and flames.
- Don't smoke around gasoline, either at the pump or at home.
- Shut off the vehicle's engine when refueling and disable or turn off any auxiliary sources of ignition (i.e., camper/trailer heaters, cooking units, or pilot lights).
- Only store gasoline in containers with approved labels, as required by federal or state authorities. Never store gasoline in glass or unapproved containers.
- Place portable containers on the ground during filling, and keep the nozzle in contact with the container to prevent buildup and discharge of static electricity. Never fill a container in or on a vehicle.
- Manually control the nozzle valve throughout the filling process. Fill a portable container slowly to decrease the chance of static electricity buildup and minimize spilling or splattering.
- Fill containers no more than 95% full to allow for expansion.
- Place cap tightly on the container after filling—do not use containers that do not seal properly.
- If gasoline spills on the container, make sure it has evaporated before you place the container in your vehicle.
- When transporting gasoline in a portable container, make sure it is secured to protect against tipping and sliding, and never leave it in direct sunlight or in the trunk of a car. ■

Adapted from PEI and American Petroleum Institute press releases. More information can be found at www.pei.org and www.api.org.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

Class C
A model

■ No. 1 engine cowling was found to have been unsecured upon shutdown from flight and damage was identified.

Class E

■ While exiting refuel pad number two with CPG on the controls, aircraft struck a taxiway light while turning the corner to the right for refuel pad number one. Aircraft taxied to parking without further incident. No damage occurred to the aircraft.

■ While performing a confined area takeoff at 40 feet AGL, the engine out audio and light for No. 1 engine sounded. No. 2 engine TQ doubled to 117% before the PC reduced the collective and began an immediate descending right turn. All other engine indications were normal except for TQ on No. 1 remaining at 15% TQ. PC continued to fly the aircraft to a spot immediately behind the initial takeoff point. The aircraft landed in a large open dirt area without further incident.

Class A
D model

■ Aircraft crashed north of Camp. The aircrew was able to egress the aircraft with no serious injuries reported. Post-crash fire reportedly destroyed the aircraft. (Investigation continues.)

CH-47

Class A (Tentative)
D model

■ Tail section of aircraft contacted the ground during deceleration for fast-rope exfiltration. Damage to aft landing gear, ramp, aft main rotor system, and fuselage. (Investigation continues.)

Class B (Damage)

■ Five of six CH-47D aircraft moored at the Century Airpark sustained damage during unforecast heavy winds associated with thunderstorm activity. All aircraft were moored/tied down.

Class C

■ Left-side cockpit door separated during maintenance check flight. Door has not been located to date.

■ While conducting RL progression training under NVGs, aircraft was descending from an 80-foot hover to land in an unimproved LZ. At 10 feet, pilot asked the crew if the aircraft was clear and the response was yes. The non-rated crewmembers were at the two side doors/windows and the third was on the aft ramp. At 7 feet, the aircraft struck a training sling load (block) and damaged the underside of the aircraft just aft of the center cargo hook. Aircraft returned to home station without incident and the damage reported. ECOD: ~$24,000

MH-47

Class B (Damage)
D model

■ Aircraft main and aft right landing gear settled into unforeseen depression during landing to desert terrain in brown-out conditions. Subsequent inspection revealed structural damage, as well as damage to the landing gear and the right side main fuel cell. Initial ECOD: $200-300K.

Class C
E model

■ During offload of an engineer vehicle to a sloped LZ, bucket of vehicle contacted the interior of the aircraft resulting in the following damage: damaged FADEC Control Unit No. 2, airframe stringers vicinity station 400, Nos. 6 and 7 hangar bearing and drive shaft. Aircraft flew to home station to conduct detailed post-flight inspection.

OH-58

Class A
A Model

■ While conducting a counter-drug mission, aircraft developed a vibration and made a landing. Crew inspected the aircraft and noted no damage. Crew spotted a fire in the adjacent valley and decided to depart the area. Following take-off, the crew observed a downed power line. Aircraft was flown four miles to a sheriff station without incident and shut down. Post flight inspection revealed damage to main rotor system from a wire strike. Property damage to be determined. ECOD: $50,000 to aircraft; property TBD.

Class C
C Model

■ PI was on the controls performing a confined area approach when aircraft began to settle. PC took the controls in an attempt to arrest descent. Aircraft was overtorqued to 120% for 3-4 seconds. ECOD: $35-40K.

Class C
DI Model

■ While reboarding the aircraft following fire-guard duties for refuel, the right-side pilot's left knee contacted the cyclic. Subsequent abrupt movement resulted in damage to all four of aircraft's main rotor blades (MRBs), the WSPS, and FM homing antennas. Initial ECOD: $155K.

Class C
DR Model

■ While performing manual throttle operations (FADEC) at altitude, the engine had an overspeed of 125%. The IP took control of the aircraft and performed an autorotation to an open field. Unknown damaged components. ECOD: Pending.

■ Run-up and hover checks were completed; crew was taxing to runway when aircraft experienced a FADEC failure and engine over speed. Crew landed the aircraft immediately. ECOD: ~$48,000.

TH-67

Class C

■ The 90-degree gearbox and vertical fin separated from the aircraft during simulated engine failure touch-down attempts (IERW training).

■ Aircraft experienced low rotor RPM during a standard autorotation procedure. Dynamic tailboom resonance, "spike knock," and "pylon whirl" conditions ensued, and the tail rotor assembly, 90° gearbox, vertical fin, and aft (2-ft) section of the tailboom separated from the aircraft. ECOD: Pending.

UH-60

Class E

A model

■ During a service flight, the intermediate transmission oil hot light illuminated. The flight was terminated at the local airport. The IGB chip detector was replaced. Further troubleshooting revealed a bent pin on the filter adapter.

Class B

L model

■ Aircraft MRBs struck a vehicle positioned on the airfield as it taxied by. Two soldiers seated in the rear/bed of the stationary AMV (LMTV) sustained injuries (cuts) from debris from the MRBs' contact with the canvas cover and support beams. Aircraft sustained damage to all four MRBs, two of which require replacement. Driver of the LMTV had temporarily exited the vehicle. Aircraft cleared the vehicle and a controlled shutdown was made.

Class C

■ Interval maintenance revealed damage to all four MRBs and the AN/ALQ-144. Aircraft had been flown the night prior. Suspect damage may have occurred during roll-on landing during dust conditions. No indications of MRB contact with the –144 were detected by the crew during flight; nor did postflight inspection reveal the damage.

RC-12

Class C

F model

■ Aircraft sustained lightning strike while in flight. Post-incident inspection revealed sufficient damage to ground the aircraft for repair.

C-26

Class C

■ Upon engine start-up and initiation of ground taxi from the passenger ramp, the courtesy red carpet was blown up into the propeller and subsequently struck the left side of the aircraft fuselage. Structural dent was deemed to have been "out of tolerance," requiring repair, and propeller and propeller gearbox both require replacement. ECOD: $68,241.

RC-7

Class C

B model

■ Aircraft sustained lightning strike during cruise flight. Aircraft was returned to home base and landed without further incident. Post-flight inspection revealed a hole in the "radome." ECOD: Pending.

Class E

■ During maintenance operational check (MOC) for a No. 2 engine and prop removal and installation, ground personnel discovered fuel leaking from the No. 2 engine wheel well on both sides of the nacelle. Aircraft was shut down and spill response was activated. Maintenance personnel found a loose fuel line connection.

RC-12

Class E

D model

■ During traffic pattern flight, on final, landing gear would not extend. Flight crew executed a go-around, departed the pattern and requested airspace for holding to conduct the required emergency procedure. The gear was manually lowered to the full down position. Landing was completed without further incident.

UC-35

Class C

■ Aircraft was at FL 430 on last leg of their mission. IP on board reported encountering some light to moderate turbulence. IP asked ATC if they were near any storms. ATC indicated they were south of any stormy weather. Upon landing, some nose diverter strips were found to be missing. Subsequent maintenance inspection revealed both COM antennas and four static wicks had positive indications of lightning strike. Crew reported no lightning in their vicinity. ECOD: Pending.

For more information on selected accident briefs, call DSN 558-9552 (334-255-9552). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

It takes more than tanks and guns and planes to win. It takes more than masses of men. It takes more than heroism, more than self-sacrifice, more than leadership. Modern war requires trained minds.

The days of unthinking masses of manpower are over. Individual intelligence, individual understanding, and individual initiative in all ranks will be powerful weapons in our ultimate success.

General Brehon Somervell, Public Addresses, 1941-1942

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

SEPTEMBER 2002 ✦ VOL 30 ✦ NO 9

Sometimes the Envelope Pushes Back

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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Flightfax is published by the U.S. Army Safety Center, Building 4905, Fifth Avenue, Fort Rucker, Alabama 36362-5363. Questions about the editorial issues addressed in Flightfax should be directed to the editor at DSN 558-9855, commercial telephone (334) 255-9855 or flightfax@safetycenter.army.mil. Distribution questions should be directed to Media and Marketing at DSN 558-2062, commercial telephone (334) 255-2062.
James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

The Basics of Accident Prevention

Executing our missions in support of Operation Enduring Freedom requires a high state of readiness that, in turn, makes it even more imperative that we not allow accidents to degrade our ability to accomplish those missions.

Every day we expose our soldiers to hazards in uncertain and complex operational and training environments. Increased mission optempo, leader inexperience, constant changes with personnel resource issues in terms of time, equipment, etc., are all present. None of these elements alone is the inherent cause of accidents. However, when left uncontrolled, seemingly low-risk hazards can collectively raise risk to an unacceptable level. The cumulative effect of these risks may create breakdowns in leadership, discipline, training, and standards, which in turn can quickly set the accident chain of events in motion.

In fact, an analysis of FY02 Class A accidents reveals that breakdowns in discipline, leadership, training, and standards were the main contributing causes of these accidents. Data also supports that, in many cases, the accident didn't just happen on the day of the helicopter crash or the tank rollover. Sometimes the sequence of events that culminated in the accident started days, weeks, and even months before—and not always at the accident unit level.

If we understand what is causing our accidents, the logical follow-on question is, "How do we prevent them?" The preventive answer doesn't lie in the development of some new program with a catchy slogan. The answer lies in what I call "the basics." As I've stated many times, my personal belief is that *"Units that participate in tough, well-disciplined training—with technically and tactically competent leaders present—have significantly fewer accidents."*

Today, I'm more convinced than ever that leadership (theater, corps, division, brigade, battalion, and company) involvement while executing aggressive, realistic training and real-world missions—combined with effective risk management and strict enforcement of discipline and adherence to standards—are the primary tools that can prevent accidents and save lives.

Our great Army is built on a tradition of discipline and clearly defined standards. Good leaders who are responsible and accountable have no trouble enforcing either. Risk management is the bedrock of our safety culture. Good leaders not only enforce discipline and standards, they understand and apply risk management effectively—and they ensure the soldiers in their command can do so as well.

Risk management is the tool that helps us identify hazards and reduce risks to our soldiers, thus allowing us to successfully operate in high-risk environments with minimal

losses. For maximum effectiveness, it has to be a closed-loop, cyclic five-step process: identify hazards, assess hazards, make the right risk decisions, put controls in place, and supervise. The process must start with planning and continue throughout execution and the after-action reviews.

As an Army, we are fully engaged in prosecuting this war on terrorism and, at the same time, continuing to transform our Army into a more agile, lethal, and deployable force. Recently signed by the Secretary of the Army and Chief of Staff of the Army, the Army Safety Strategic Plan **(http://safety.army.mil/StrategicPlan2002.pdf)** is our roadmap for ensuring that, in conjunction with transforming our Army, we are safely transforming our Army by fully integrating risk management and safety into each of the 14 lines of operation within the Army Transformation Campaign Plan.

Today, I'm more convinced than ever that leadership (theater, corps, division, brigade, battalion, and company) involvement while executing aggressive, realistic training and real-world missions—combined with effective risk management and strict enforcement of discipline and adherence to standards—are the primary tools that can prevent accidents and save lives.

From the Army strategic level to the individual level, risk management is the accepted process for preventing accidents. On the individual level, I challenge all of you—every soldier and civilian alike—to make a renewed personal commitment to thoroughly understand and practice risk management until it becomes intuitive. Risk management is probably the most important five-step process that any of us will ever learn. Embrace it and practice applying the entire process in everything you do, both on and off duty. The more you practice risk management, the easier it becomes.

Risk management is a solid accident prevention program. It affords us the capability to conduct those tough, realistic training missions that replicate combat conditions while minimizing losses due to accidents. It is incumbent upon each of us to apply the process to all that we do and execute every mission to the risk management standard—an informed decision at the appropriate level.

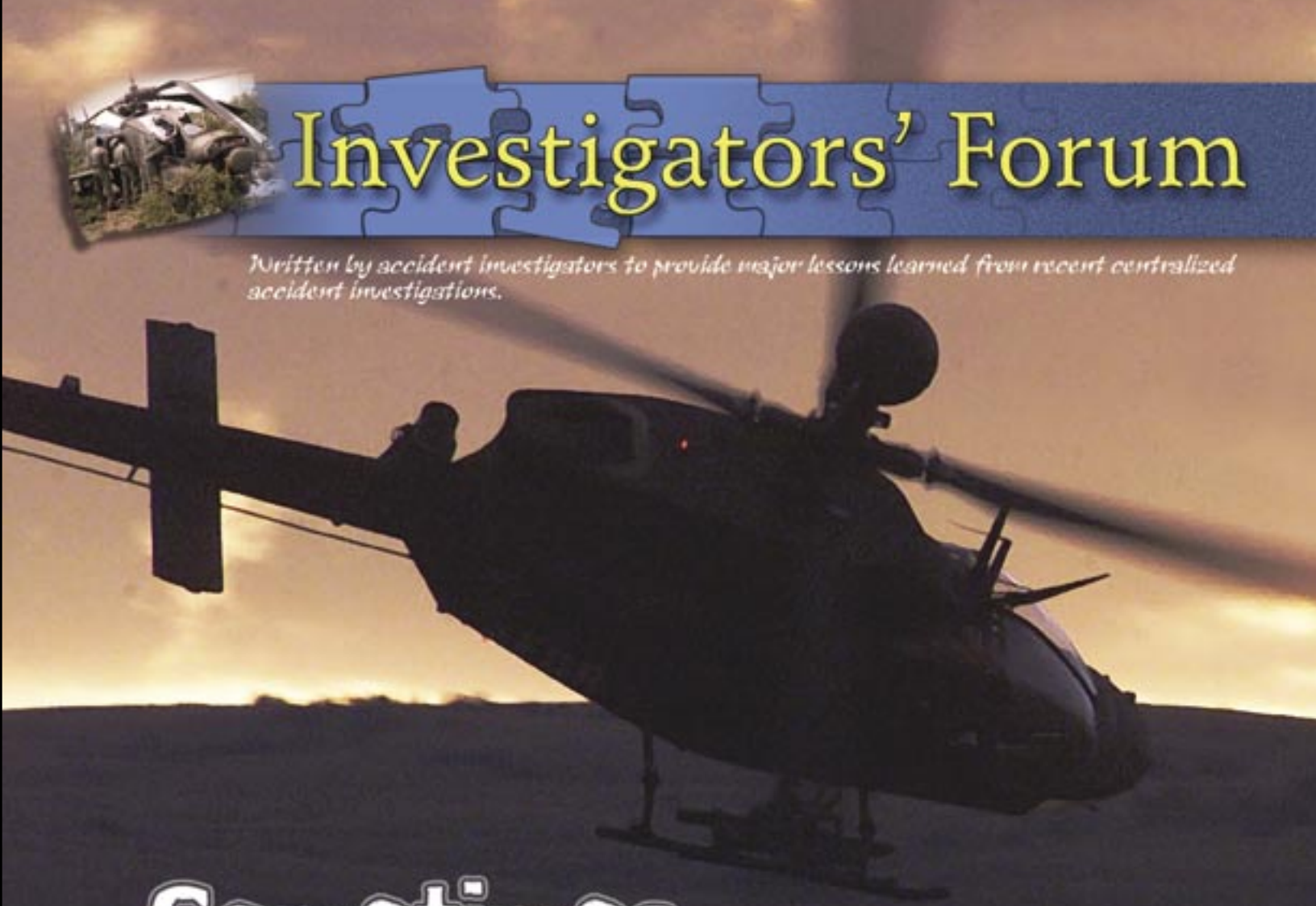
I recognize that there is some concern that junior officers and NCOs lack experience in the application of risk management. We are currently working with TRADOC to ensure we have embedded risk management education from pre-commissioning through the Division Commander's Course, and to make certain that we have embedded appropriate levels of risk management education and training in NCOES from PLDC through the Sergeants Major Academy.

If you need help in the form of risk management training at the unit or MACOM level in integrating risk management into operational plans to execute the objectives within the Army Safety Strategic Plan, the Safety Center team is standing by to assist. Contact our risk management mobile training team at DSN 558-9854/3790 (334-255-9854/3790) or our Army Safety Strategic Plan coordination team at DSN 558-3367 (334-255-3367).

Any failure to manage risks at either the strategic, operational, tactical, or individual level could well result in a much higher price than we are willing to pay. The payoff of doing it right will be accidents avoided and lives saved.

Train Hard, Be Safe!

James E. Simmons



Investigators' Forum

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

Sometimes the Envelope Pushes Back

There I was 10,000 feet, upside down, Air Medals dangling in my face…. Many of us have used this line as we begin a story about one of our flying experiences. Our stories of "daring do" are intended to relate our proficiency and ability to deal with the circumstances that we have encountered in flight or our plain dumb luck in getting out of a bad situation. Unfortunately, many of those circumstances are created by the pilots themselves, though few would admit it. This story is of one such circumstance where the crew of an OH-58D Kiowa Warrior put themselves in a bad situation several times and on the last time of the flight, it caught them.

The air cavalry troop was executing a situational training exercise (STX) lane in support of a ground force of Bradley fighting vehicles and Abrams tanks. There were three Kiowa Warriors supporting the ground platoon in a movement to contact. As the exercise progressed, the Warriors began to rotate through the forward arming and refueling point (FARP) with the air mission commander (AMC) rotating through second of the three aircraft. As he returned to the maneuver box to continue the mission, the third aircraft headed for the FARP, and the ground force was rolling through the OPFOR. The observer controllers called ENDEX shortly afterward. The after-action report (AAR) location was announced and the small ground force executed a hasty decontamination exercise before moving out.

The two Warriors in the maneuver box began a sweep of the area to ensure all the ground vehicles were moving. The AMC decided to follow the line of armored vehicles to the AAR site because the coordinates given in the past had not always correlated to where the AAR was actually held.

He began to fly down the line of vehicles opposite their route of march. When he reached the last vehicle, he began a right turn to follow behind it. He later described the turn as not very steep and his copilot said it was "nothing special." In the middle of the turn, the aircraft began to lose altitude.

The pilot on the controls quickly leveled the aircraft and attempted to arrest the rate of descent. The tell-tale bells, whistles, and bongs of low rotor RPM, engine overtemp, and control augmentation failure all followed quickly. The pilot raised the nose and attempted to cushion the aircraft, but it landed hard, dipped its nose and tumbled prior to coming to rest upside down.

The crew exited the aircraft through the broken windscreens and brushed themselves off. They determined that other than bruises and small cuts on their shins, they were virtually unhurt. The aircraft, however, was a total loss. Everyone who looked at it couldn't believe that the two crewmembers walked away. It had all the makings of another "There I was" story.

When investigators from the Safety Center and the Directorate of Evaluation and Standardization arrived, they anticipated a lengthy investigation into an engine problem. All the technical experts were called in and the recording devices on the aircraft were immediately shipped for download. The aircraft was recovered to the airfield and a complete analysis of the engine was begun.

When this analysis was complete, no significant mechanical defects could be found in the engine. The onboard devices also indicated that there had been no faults in the engine. The board was at a loss to explain what had been described by the crew as an engine failure. Then the data transfer module (DTM) download arrived and a clearer picture developed. The data from the DTM revealed that the engine was operating as designed throughout the accident. The problem was

DTM depiction of flight conditions.

that the engine was not capable of the power requirements placed on it by the aircrew. I will explain this in the next few paragraphs.

The DTM revealed that the "nothing special" right-hand turn was in fact a 180-degree, 65-degree angle of bank turn at an altitude of less than 125 feet above ground level (AGL). This angle of bank was coupled with an airspeed reduction to less than 20 knots due to the turn being an uncoordinated maneuver. Lastly, in the middle of the turn, the aircraft was in a tailwind condition.

All of these things contributed to the aircraft experiencing a rapid sink rate in the middle of the turn. The rate of descent was determined by the board to have exceeded 2000 feet per minute for 1.13 seconds. It was during this side slip that the pilot in command began to level the aircraft and apply collective.

When he made the collective input, he went from a very low power setting to a very high power setting in less than one second. The engine "spooled up" but was unable to provide the power required by the maneuver and rotor RPM dropped. Thus, the bells and whistles the crew associated with an engine failure.

This crew had demonstrated the aerodynamic principle that an aircraft in a 60-degree angle of bank requires twice as much power to maintain altitude as an aircraft in straight and level flight. We all know that the OH-58D doesn't have that much power. The aircraft was going to descend in the turn, allowing the airspeed to drop below 20 made it happen quicker, and the engine and rotor system could not save the crew from the mistake.

The most important learning point from this accident concerns the margin for error that the crew allowed themselves. The DTM data showed two previous turns that exceeded 60 degrees and three others that exceeded 55 degrees. Obviously, there was no accident at the end of those turns.

The primary difference in the previous turns and the one that led to the accident was that airspeed dropped off significantly in the final turn because the crew failed to account for a 20 knot wind and they allowed their airspeed to drop as the turn began. That's all it took to make the difference between "flying aggressively" and creating a Class A accident. Numerous accidents over the last 12 months include aircrews that were pushing the envelope in tactical training or routine flights. They weren't necessarily violating limitations or regulations, but put themselves in situations that they couldn't recover from. In this case, no one was seriously hurt. In others, that hasn't been the case.

So the next time you're thinking about "yanking" it around a little harder than necessary, just remember—sometimes the envelope pushes back! ■

—Aviation Systems and Accident Investigation Division, DSN 558-9552 (334-255-9552)

"We're INADVERTENT IMC!"

Few phrases elicit as much instant anxiety to Army rotary-wing aviators as do those three words. Regardless of the aviator's status—master aviator, instructor pilot, instrument flight examiner, commander, or newbie—accidentally bumping into a cloud presents many problems not typically encountered during a planned instrument flight rules (IFR) flight. An analysis of inadvertent IMC-related accidents provides some insight into the significance of these accidents.

From January 1974 through August 2002, the Army experienced 60 Class A through Class C rotary-wing accidents involving inadvertent instrument meteorological condition (IMC). Of these 60 accidents, 54 (90 percent) were Class A's. In the last 8 years, the Army has experienced 10 rotary-wing inadvertent IMC accidents. The aircraft involved were four AH-64s, three OH-58s, one UH-1, one UH-60, and one MH-47. All but two occurred at night.

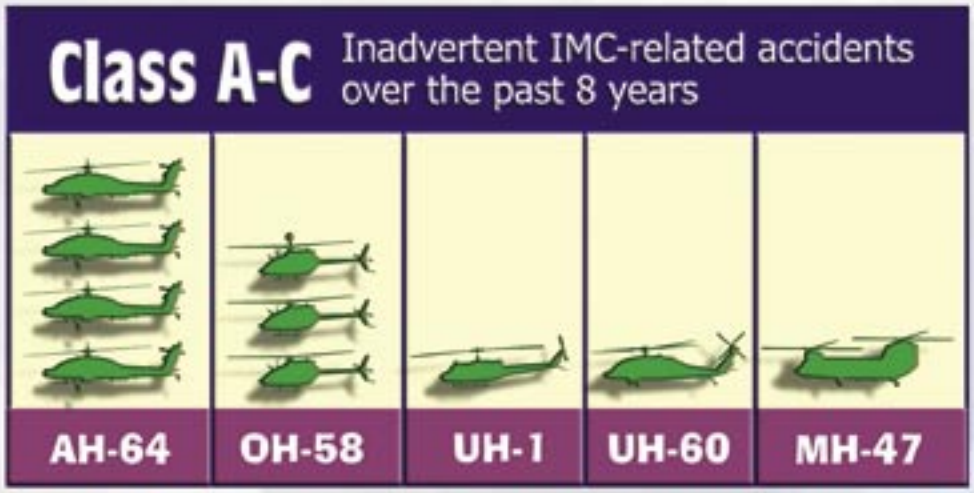
The seriousness of the outcome of these accidents serves to make aviators all the more anxious when encountering these conditions.

Prevention measures/techniques

What can be done to eliminate this type of accident? The solution probably requires action at several levels—individual aviator, instructor pilot/instrument flight examiner, and commander.

Individual aviators should—

- Maintain "very good" instrument flight proficiency instead of minimal proficiency.
- Practice instrument flight until they are very confident in their abilities.
- Be familiar with and practice local inadvertent IMC procedures. Commit to memory altitudes, headings for procedures, ATC frequencies, and NAVAID frequencies and identifiers. Back it up with an approach plate.
- Realize when accomplishing the hazard assessments that combinations of hazards may increase risk beyond the sum of individual hazards.
- Avoid routes over areas of low contrast and definition, particularly at night.
- *Not continue flight purely on aided-flight visibility during night-aided flight with either NVGs or night vision systems. During any given flight, periodically evaluate unaided visibility (look under the tubes or the system). If restrictions to visibility deteriorate below the required minimums, make a weather decision; don't just continue.*
- Maintain situational awareness while in flight, particularly regarding flight visibility and ceilings. Be willing to turn around when the weather begins to deteriorate.
- Be willing to land the aircraft and wait the weather out if turning around doesn't resolve the problem.
- Not push the weather in mountainous terrain. There is no guarantee the weather on



the other side of a pass will improve.

■ Have NAVAIDs tuned to navigation radios as opposed to commercial radios.

■ Never attempt to reestablish VMC if you bump into a cloud. Commit to IMC! This is probably the most important recovery measure/technique. You have been trained to accomplish a recovery. Execute!

Instructors/instrument flight examiners should—

■ Conduct instrument training in the aircraft at night. This forces good cockpit organization and eliminates peripheral visual cues that may help aviators retain orientation with other than the flight instruments.

■ Initiate instrument renewals using inadvertent IMC scenarios, particularly in observation and attack aircraft.

■ Require proficiency in full approaches, as well as vectors to final.

■ Exercise the local inadvertent IMC procedures. Aviators and controllers get the benefit of the training.

■ Make instrument evaluations challenging but realistic. Promote aviator confidence. The old "instrument checkrides from hell" aren't very useful in developing aviator confidence.

■ Teach aviators and nonrated crewmembers to make flight-visibility estimates; for example, what is the difference between ½-mile and 1-mile visibility?

■ Reinforce good crew coordination and crew interaction.

Commanders should—

■ Require aviators to fly hooded training scenarios at night.

■ Ensure their unit aviators don't push the weather. Ensure aviators know the weather limits and have a plan for what to do if they encounter inclement weather.

■ Ensure the unit risk management process includes considerations for the type of IMC recovery procedures available.

■ Include instrument training as part of training scenarios when possible. That is, at the end of a unit METL training session, plan to have some or all aircraft recover with an instrument approach.

■ Never send aircraft out on "weather checks."

■ Require crews to brief specific responsibilities when weather is marginal.

■ Establish procedures for multi-ship operations in reduced visibility conditions.

■ Not demean aviators who identify weather below minimums.

■ Evaluate aviator experience. Does the local weather criteria match the experience level of the unit's crewmembers? If it doesn't, consider increasing ceiling and visibility requirements for all night missions.

■ Be a good example. If you push weather, you set the standard for every other aviator to also take chances with the weather.

■ Maintain "very good" instrument proficiency instead of minimal proficiency. Commanders who are technically competent are looked at differently than those who are only marginally competent.

As previously stated, the majority of the inadvertent IMC accidents occurred at night. Over the years, the amount of night/night vision devices as a percentage of our total flying hour program has increased and continues to rise. As night operations increase, we as an aviation community must continually do all we can to reduce these deadly and costly accidents.

Think of inadvertent IMC as a "come as you are party." We are either proficient and prepared—or we aren't. All of us know if we are ready or not. Don't wait until you're inside a cloud to promise yourself (or a higher being) that you will practice more inadvertent IMC if only you could get out of *this* predicament. ■

Editor's note: The material presented in this article is just a start. Many other aviators have experienced inadvertent IMC that did not result in an accident. If you have experiences, ideas, or training methods that have proven beneficial, send them to Commander, U.S. Army Safety Center, ATTN: *Flightfax*, Fort Rucker, AL 36362-5363, fax DSN 558-3003 (334-255-3003), or E-mail them to **flightfax@safetycenter.army.mil**. We'll work those ideas into another article in *Flightfax*.

—Robert A. Brooks, Operations Division, USASC, DSN 558-9860 (334-255-9860), robert.brooks@safetycenter.army.mil

WAR Stories

Risk management lessons learned

Surviving a Crash... and Confronting the Cold

Imagine being so cold that you can't feel your fingertips or your toes. Imagine a night so dark, so wet, and so cold that it takes two people to operate a simple jacket zipper. If you can imagine all of that, then you have only a glimmer of understanding of what it was like for an AH-64 crew on a snowy night after they crashed into the side of a mountain. Despite the fact that this accident occurred several years ago, the hazards never change and the lessons learned from this incident are many.

It was a routine night recon into the mountains, and the accident crew was Chalk 3 in a flight of four AH-64s flying in staggered-right formation. They had been airborne for 32 minutes when they encountered unforecasted snowshowers. The air mission commander announced that he was starting a 180-degree left turn to return to station. As Chalk 3 turned left to exit the weather, it crashed at the top of a 7,000-foot mountain.

Their story

The following is an account by CW4 Franklin C. Harrison and CW2 Daniel R. Smee of what happened after the crash and the crewmembers' actions until they were rescued more than 2½ very cold hours later. At the time of this incident, the crew was assigned to Company A, 2d Battalion, 229th Aviation Regiment, Fort Rucker, AL.

CW4 Harrison, PC:

"I'm alive" was my first thought when the aircraft stopped rocking from side to side. I tried to call Dan, my front-seat pilot. No answer. During the crash sequence, his helmet mike cord had come unplugged. He was trying to call me, I was trying to call him, and neither of us could hear the other. Obviously, some very unpleasant thoughts about each other's condition flashed through our minds in those first few seconds.

I immediately shut down the engines. As I was exiting the aircraft, I saw Dan. When the aircraft had started vibrating and rocking from side to side, Dan had ducked down as low as he could in the seat to avoid any rotor blades that might come through the cockpit. He could hear the fuel escaping from the ruptured auxiliary tank that had been mounted on the right wing, and he climbed out through the opening where his left canopy had been broken away.

Much relieved to see each other, we quickly moved about 25 feet away from the aircraft and did a quick appraisal of our physical condition. I thought I had broken my left arm on the armor seat during the impact. However, on examination we found that it wasn't broken, just banged up pretty good. Dan

had a small cut on his right cheek and scratches on his right arm. All in all, we were in great shape considering what had just happened.

Assessing the situation

I was told when I started flying helicopters that "if it's not on you at the time of a crash, chances are you won't get it out of the aircraft." We were lucky. There was no postcrash fire, and we were able to return to the aircraft and retrieve our Gore-Tex® parkas and sleeping bags from the wreckage.

By then it was snowing very hard on the mountaintop and the wind was blowing at 20 knots or more. We heard an aircraft circling to our south clear of the snowshower. It was our lead aircraft—the company commander. I attempted to contact them on my PRC-90 survival radio to let them know we were down safe, but the aircraft was destroyed. I got no reply, so I changed over to the beacon mode. Still no reply.

We assessed our situation and realized that due to the weather conditions on the mountain, it was going to be difficult for a rescue aircraft to get to us. Knowing that we would not be rescued where we were until hours later when the weather cleared, we decided to climb down to the valley floor about 700 feet below to improve our chances of being picked up sooner. We did a quick inventory of what we had and decided to take our sleeping bags and wear our survival vests under our Gore-Tex® parkas. I had two flashlights and Dan had one. I was wearing my Nomex gloves; Dan had a pair of inserts he could pull on over his Nomex gloves.

Descending the mountain

Prior to flight school, Dan had been an Army Ranger School instructor with extensive mountain training. He led out. I felt that if anyone could get us down that mountain, he was the guy who could do it.

As we started down, the going was very slow due to the steepness of the terrain. It was still snowing, and we were soon soaking wet. As we moved, Dan would throw his sleeping bag down the path about 20 feet and I would keep my flashlight on his path. He would stop, I would throw my sleeping bag down to him, and he would keep his light on me until I caught up with him. We knew that just one misstep could mean a broken ankle or worse, and then it might be all over.

The cold was really starting to take its toll on me by the time we reached the halfway point. I could no longer feel my fingertips or toes. I would take my wet gloves off, wring the water out of them, place my hands inside my parka until the feeling returned, and then I would put my gloves back on.

No turning back

At each stop, we would try both of our PRC-90s. We still got no reply. Then we came to a dropoff of about 25 feet. It was like a kick in the chest. I just didn't think we could make it back up the mountain, and it looked like we couldn't continue down. The terrain was too steep to even allow us to set up our sleeping bags.

Things were looking pretty grim. Just as I was thinking that I was going to die on that mountain after surviving the crash, Dan casually asked if I had ever seen the movie "Alive" in which the survivors of an airplane crash had been forced to resort to cannibalism to survive. That got me moving!

Dan surveyed our location and found that if we moved laterally about 15 feet, we could hang from a ledge and drop only 7 feet and continue down. Before we had a chance to talk ourselves out of it, Dan's sleeping bag was over the edge. We were committed. Dan reached his bag with no problems, and then it was my turn. I threw my bag to Dan and started. It took only a couple of minutes, but it seemed more like an hour. I was physically drained. Fortunately, the terrain shallowed out and we wandered into a small streambed and followed it to the valley floor.

It had been 2 hours since we started down. It was still snowing, the wind was still blowing as hard as ever, and we were soaking wet and cold. This was it; we weren't going any further. We would set up camp and wait for rescue.

For want of a fire

Our first priority was to get a fire going. As Dan surveyed the area for possible landing sites for rescue aircraft, I gathered sagebrush to build a fire. We knew we had matches in our vests because the vests had been inspected before our deployment. The problem was locating them and getting them out of the vests. My hands were so cold it took both of us to operate the zipper on my parka. Using paper I had torn from my kneeboard, we

tried every match in both vests—none ignited. Next, we tried the emergency fire starter kit; it ignited, but the wood and paper were too wet to burn. Next Dan tried the magnesium fire starter, using his survival knife to shave it and to strike the sparker—too windy.

About that time, I would have given a hefty price for a cigarette lighter. Bad timing; I had stopped smoking just 3 months before.

A welcomed flash of light

Lucky for us, an Air Force UH-60 search-and-rescue bird had seen the flash from our attempt to start a fire and headed our way. When we heard the aircraft, we called them and asked them to flash their landing light twice if they could hear our emergency transmission. They responded with two flashes of light that were about the prettiest sight we had ever seen. We used my two flashlights to mark our position. By the time we were extracted, it had been more than 2½ hours since our aircraft went down—2½ of the coldest and wettest hours we had ever known.

Lessons learned

In retrospect, I know we made the right decision when we decided to move down the mountain. The crew of the rescue aircraft (and this crew was trained and prepared for mountain rescue operation) told us that they had twice tried to make it to the top of the mountain to find us, but were forced to turn back due to the low ceilings and snow. It was during their third attempt that they had spotted the spark as we were trying to light a fire.

In addition to learning the benefit of doing everything possible to enhance your chances of being rescued, we also learned the importance of—

- Having a thorough understanding of the weather. What you get in the weather briefing may not be what you encounter.
- Preflighting your survival vest and knowing the location of all components. It's hard to find them in the dark.
- Taking the right equipment (food, water, clothes) with you when operating in adverse environmental conditions so that if you end up on the ground for whatever reason—crash or precautionary landing—you can survive.
- Preparing for the environment you are operating in. It may be hot when you depart, but it can get awfully cold in mountainous terrain at night.
- Coordinating with your ATC personnel to test your survival radios at some distance, not just in the bench test set. Following the accident, we checked 10 of our unit's survival radios and all 10 were good only for a 1-mile range.
- Having good batteries and carrying spares for your flashlight and liplight. During those first few minutes following the crash, the liplight on our helmets was the only source of light we had to help us find our flashlights, parkas, and sleeping bags stored in the cargo bay.
- Testing the matches in your survival kit.
- Making sure your copilot is a mountain ranger instructor—you might need those skills before you get back to station.

CW3 Smee, PI:

When I realized we were going to crash, my immediate thought was very simple: the ORT (optical relay tube) is going to cause pain. I was right. During the crash sequence, my head was thrown forward and that was where I elected to keep it until the engines wound down and the blades were finished beating themselves to death. The ORT hurt, but I thanked God for giving McDonnell Douglas the talent to make the AH-64 a crashworthy machine. That was my religious experience during the crash.

You can only imagine the jumble of simultaneous thoughts racing through my mind. Because of this "chicken" position I was in, my ICS cord had come undone and I was unable to communicate with Frank.

Since Frank and I had crewed together for just short of a month, we had been working together on our communication and our teamwork, even during our spare time. Frank is an experienced aviator with nearly 7,900 rotary-wing hours. I was new to the unit and still learning stateside flying, having been previously stationed in Germany. In my opinion, I couldn't have had a better teacher than Frank. Yet with all the mission planning and all the rehearsals, there I was crawling out through a huge hole where the canopy used to be of what just moments before was a perfectly good aircraft.

Assessing the situation

As I was climbing out of the aircraft, I saw the glow of Frank's liplight and I knew he was at least conscious. My adrenaline was pumping like crazy. I walked

around the aircraft and saw Frank's door open and out he climbed. We walked away from the aircraft and assessed our physical damage. Outside of a couple of scratches and bumps, we were basically intact.

We could hear an aircraft circling to the south and tried to reach them on our PRC-90s, but were unable to establish voice communication. Frank went to beacon. Still no luck.

We were fortunate to have brought our Gore-Tex® parkas and our sleeping bags with us because we knew how cold it could get in the desert at night. We gathered our gear and secured our helmets and kneeboards along with the rest of our gear in our bags and placed them away from the aircraft because we knew the accident board was going to need them. Still unable to raise voice with the other aircraft, we then decided to proceed down the hill.

In my survival training, I had never had a hard time starting a fire when needed. Not now. First the radio hadn't worked, although we had just checked it a few days prior, and now the matches in our survival vests were inop. Our luck seemed to be running kind of thin.

Descending the mountain

The climb down was interesting to say the least. I had been in snow before, but never on top of a mountain in the middle of the night. I knew that this was going to be good. Our objective was to make our way down to where the weather was better and the terrain conducive to safe rescue. For an "old guy," Frank surprised me: he really didn't have any serious problems keeping up on the descent. The going was slow and the distance down to the next drop was hard to judge due to the darkness and the snow.

We would drop our sleeping bags from one level to the next and use them as a reference to judge distance. Slow, but it worked extremely well.

For want of a fire

When we reached a streambed, we followed it to the valley floor and then we decided to build a fire and wait there for someone to pick us up. The weather was still bad, and we were not sure if it would permit a pickup that night or not.

In my survival training, I had never had a hard time starting a fire when needed. Not now. First the radio hadn't worked, although we had just checked it a few days prior, and now the matches in our survival vests were inop. Our luck seemed to be running kind of thin.

Magnesium fire starter was the next weapon of choice. My fingers were pretty cold from the climb down, and we were both wet to the bone. A fire was sure going to feel good, just as soon as I could get one going. Well, the magnesium didn't work either. No matter how hard we tried to build a windbreak, the wind was too strong for it to contain the shavings.

A spark of light

Finally, our luck began to change: an Air Force search-and-rescue aircraft had seen sparks of the firestarter and was able to visually home in on our position. When we heard them, we were able to establish contact with them for pickup, although we still didn't have two-way communication.

Lessons learned

These events took place in a period of 2½ hours; 2½ long, miserable hours and plenty of time to think about pre-mission planning and the importance of it. If we had not brought our parkas and our sleeping bags, it is very likely that we could have been cold-weather casualties to some degree. As it turned out, the search-and-rescue aircraft had made two previous attempts to reach the crash scene and had been forced to turn back. On their third attempt, they had spotted the spark of light as we were desperately trying to get a fire started.

Frank and I both have a better appreciation for the survival vest than we did before the accident. I know that if I'm going to have to wear it, I'm going to ensure that things work as advertised. Regardless of current inspection dates and the presence of matches and other required items, if they don't work or you don't know how to use them, they can't be of much help to you when you really need them. From now on, I'll check *everything*. ■

—Reprint from Flightfax

Aviation Maintenance in the Cold

Army Aviation missions don't change just because the weather does; however operating in cold weather can present many challenges. As a maintenance officer, I can tell you that winter's cold weather can have adverse effects on the aircraft you fly.

It's a time-consuming, patience-tasking job to keep aircraft flying when temperatures plummet and snow, wind, and ice attack. That's why top-notch preventive maintenance on your aircraft is critical in cold weather.

Start maintenance procedures by moving the aircraft inside a hangar or maintenance shelter. Use an approved, ventilated ground heater to warm your shelter. Don't forget to identify and assess any fire hazards associated with operating a ground heater. If you can't move the aircraft inside and you're faced with extended maintenance problems, limit your exposure to the elements.

Electronic systems

Unless you're in subfreezing temperatures for a long period of time, nickel-cadmium batteries will do their job well in cold weather without too much effort on your part. However, every cold start shortens the life of batteries. So, bring batteries indoors or insulate them using heater blankets approved for your aircraft when operation in subfreezing temperatures is expected.

If that's not possible, turn on the landing lights, searchlight, or other equipment for 30 seconds before an engine start. It's always a good idea to use an auxiliary power unit (APU) with the heat on, allowing the black boxes to warm up before hitting them with a power surge. After all, it takes you and me standing around the stove drinking a few cups of coffee to get started. Just remember, give those systems that electric cup of java before asking them to perform.

Mechanical systems

The systems are now up and running and ready to go, right? Wrong! We have done the right thing with our electronic systems; however, what about the mechanical systems?

Mechanical and hydraulic controls become sluggish in cold weather. Transmissions and gearboxes are lubricated by either oil or grease. Both of these lubricants can be affected by temperature, and in cold weather they tend to thicken. We know that thicker fluid means higher pressure on seals. In maintenance lingo, that means lots of blown seals. Simple actions such as wiping down exposed hydraulic pistons and thorough pre-heating of the aircraft help alleviate problems associated with extreme cold weather.

Hydraulic fluid leaks are amplified as the temperature plummets. Hydraulic cylinders and actuators may leak fluid because O-rings, seals, and gaskets are less pliable and become deformed at lower temperatures.

Fuel

Water in fuel can turn to ice that will block fuel lines, filters, and valves. Keep fuel tanks topped off. The gap between the top of the tank and the fuel is full of cold moist air, which causes condensation that drips into your fuel. When taking fuel samples, drain enough fuel to get rid of all the water.

When refueling an aircraft in subzero temperatures, always check the fuel level while outside the hangar. When a full aircraft is moved inside the hangar, the fuel level rises

with the higher temperature. Opening the filler cap inside the hangar could result in a fuel spill to clean up.

The colder the temperature, the drier the air. And the drier the air, the more static electricity becomes a hazard. Be extra careful during refueling. Static can result from the aircraft moving through the air or by brushing frost or snow off the aircraft. Fuel flowing through the filler neck can also generate a spark that ignites fuel.

Aircraft must be grounded. Make sure the aircraft and tanker are bonded together and the nozzle is bonded to the aircraft before removing the cap. When you're freezing while refueling, you might be tempted to neglect a ground. Don't! Follow all grounding procedures; do not take shortcuts.

If you're not using a closed circuit fueling nozzle, put the regular nozzle in all the way. That will keep static down and lessen the chance for a fuel spill. Use extra care if you have to refuel or take fuel out of an aircraft. Spilled fuel can cause instant frostbite.

Tires

Air pressure drops with the temperature, so check your aircraft's tire pressure often. Tires frozen to the ground can be freed with an approved liquid deicer. Move the aircraft immediately to keep tires from freezing again as the slush formed by the deicer refreezes.

Crewmembers

Finally, let's talk about our most important resource: people. When units move from a warm environment to a much colder one, it is important that all personnel carefully review manuals to ensure specific adjustments for the new environment are made (see CTA 50-900 for additional equipment requirements).

Getting soldiers to work in cold climates is a challenge, and it's also a very big responsibility. Take an active role in caring for your soldiers. Small things like having hot coffee and soup available go a long way. Make sure soldiers are dressed for the environment. Poly-pro may be okay for walking around for short periods of time, but for extended periods, it isn't the correct PPE for launching an aircraft or working on a vehicle.

Bottom Line

Operating and maintaining aircraft in cold weather can be physically demanding and hazardous. Regardless of winter's adverse environmental conditions, Army Aviation must continue its mission to defend our Nations' interests around the world. To do so safely requires each one of us taking cold weather training seriously and applying risk management effectively. ■

—CW4 Todd Toth, Risk Management Integration Division, DSN 558-9579 (334-255-9579), todd.toth@safetycenter.army.mil

Better to Stay on the Ground!

So, what is a cold anyway? A familiar scenario: you wake up with a nasty tickle in the back of your throat, and the beginnings of a sniffle. As the day progresses, the tickle becomes an ache, and suddenly your back hurts, you feel flushed, you have a ripper of a headache, and your sinuses are full of cement. You have a cold, and inevitably you will be grounded until you get better.

So, what actually IS a cold? Here are some questions that pop up from time-to-time that may help in understanding just why you feel so bad, why the doctor can't do a great deal to make the damn thing go away, and why you can't fly.

What is a cold?

A cold (or upper respiratory tract infection, aka URI) is a self-limiting viral infection of your upper airways; this includes your throat, nasal passages, sinuses, and larynx. Classically, colds are characterized by inflammation of these passages, with excess sputum production, increased nasal discharge, cough, painful throat, watery eyes, and headaches. Also, you may experience aching muscles and joints, fevers and chills—these symptoms are secondary to your body's fight against the virus.

What causes a cold?

Colds are caused by a number of different viruses. Up to half of all colds are caused by different strains of a virus called rhinovirus. Viruses are not alive like bacteria are, they are small packages of either DNA or RNA, and need to get into living cells, and then use that cell's machinery to reproduce. Some of the cold symptoms come from your body trying to fight off the infection, and some from the damage the viruses do to the cells when they reproduce.

How did I catch a cold?

Cold viruses tend to be fairly robust and can survive in the water droplets produced when you breathe, sneeze and cough, as well as lurking on taps, basins, crockery, etc. They can be transmitted by inhalation, direct contact through kissing, exchanging eating utensils and cigarettes, or by touching contaminated household surfaces. There is usually an incubation period of several days before you will start to show the classical symptoms of a cold.

How come I got a cold, but the fellow sitting next to me at work didn't?

The fellow sitting next to you may not have been exposed to the virus, depending on how well the air circulates around your work space, or whether you partook of any of the things mentioned above! The other possibility is that he is immune to the virus. That is, his body already possesses the defenses to fight the virus off before it gets a toehold.

What happens is this: as you are exposed to a virus, the body mounts an 'immune response' with antibodies being produced to assist in tagging the virus for destruction by the body's natural defenses. Each new virus the body is exposed to will result in a different type of antibody being formed. Once the host has been infected with a particular virus, the next time around the body is far more efficient at reproducing the antibodies required to fight off the invader. Therefore, you won't necessarily get sick, or as sick as someone who has never been exposed to that particular strain before.

Why isn't there a cure for my cold?

Because colds can be caused by any one of hundreds of viruses; there is no single

agent that will work against all, or indeed any, of them. In fact, there are only a handful of effective antiviral drugs in existence, and they are targeted against very different viruses to the ones that cause colds.

But, isn't there a vaccination for colds?

There is a vaccination against influenza, but this is different from the garden-variety 'cold' again. Many people, when they get a nasty cold, will call it the flu, when in reality it is just one of those usual cold viruses doing a particularly good job. On the other hand, influenza is a serious, systemic viral infection caused by variations of one of two viruses: Influenza A and Influenza B. Because the virus is potentially so severe (the epidemic after the First World War killed between 20 and 40 million people worldwide), a vaccination is developed on an annual basis to cover the latest strains of these viruses. The vaccine does NOT protect you against the cold viruses that people casually call the flu.

Why don't antibiotics work?

Antibiotics only act against bacteria, and either kill or stop the growth of bacteria. However, because viruses aren't really alive, all we can do is try to stop them from replicating—this is much harder to do! When you have a simple cold, antibiotics will not aid in your recovery. Indeed, they may work against you, by creating resistance in your body's existing bacteria population against the antibiotic you've been given. When you are prescribed antibiotics, it will be to treat a 'super-infection'; that is, a bacterial infection that has taken advantage of your lowered defenses to attack while you have a cold. They won't decrease the duration of a viral infection.

How long am I going to be sick?

That depends on a variety of factors: how healthy you are normally, what your nutritional state is like, whether you exercise heavily, and whether you are a smoker. Generally, a cold will take up to two weeks to resolve, sometimes longer if sinuses are involved. Things that may prolong your illness include inadequate rest, smoking, heavy exercise, and poor diet.

How should I treat my cold?

First, you should never self-medicate; but if you have to, treat colds with rest, plenty of water, and medication to relieve the symptoms. Such medications include Tylenol® or aspirin, which will relieve aches and pains, and take the edge off any fevers you are experiencing. Medications containing pseudo-ephedrine (Sudafed®) will help stuffy noses and sinuses by decreasing swelling in the lining of the nose and sinuses. Gargles such as Listerine® or Chloreseptic® may reduce sore throat pain.

Importantly, none of these medications will reduce the duration of your cold—no medication your doctor can give you will. To give you the best chance, stop smoking if you usually smoke, don't engage in any heavy exercise or sport, and maintain a balanced diet.

Also remember if you have to self-medicate, follow the approved over-the-counter medications guide in the July 2002 *Flightfax*. If you take anything else, you are grounded until cleared by a flight surgeon or an Aeromedical physician assistant!

I can still perform the Valsalva maneuver—why can't I fly?

You may be able to clear your ears, but a patent Valsalva will not clear your sinuses, which will be swollen and congested with mucus when you have a cold. As you descend from even low altitudes, you will risk a sinus 'squeeze', with resultant severe cheek, eye or forehead pain, and possibly a bloody nose. Even if your sinuses are not congested, the physiological changes that occur when your body is fighting off a viral infection will leave you more vulnerable to fatigue, hypoxia, overload, disorientation and distraction. Better to stay on the ground! ■

Editor's note: If you want to know more about colds or any other issue of aircrew health, contact your friendly medical officer.

—Adapted from Touchdown Safety Magazine

NEWS & notes

Health experts say West Nile Virus preventable

Health officials at Wilford Hall Medical Center maintain people should not panic about the West Nile Virus, says Air Force Print News. "You can get it only from mosquito bites," said Maj. Cynthia Thomas, communicable disease and epidemiology element chief for the 59th Medical Wing here. "The main way to prevent it is to prevent bites." If wearing long sleeves and pants in the summer heat is not practical, experts recommend using insect repellents containing the chemical DEET. Adults should use repellents with no more than 35 percent DEET, and children should use repellents with less than 10 percent DEET.

Mosquitoes are most active at sundown and sunrise, so people should wear repellent, cover up, or head inside during these times. Large items like birdbaths and old tires are popular breeding areas; however, mosquitoes also use areas that people often overlook, like pet dishes, children's toys, and even bottle caps.

People do not usually get sick from the virus, even in areas that have confirmed cases. Only about 20 percent of people bitten by mosquitoes with West Nile Virus develop any signs of infection, said Thomas. Typical symptoms include fever, headache, skin rash, and swollen glands. Most symptoms last less than a week. Less than 1 percent of people infected experience serious health problems. Signs of more serious illness include neck stiffness, high fever, headaches, muscle weakness and changes in behavior. People should contact their primary care doctor if they develop these symptoms and recall a recent mosquito bite.

For more information on West Nile Virus, visit the Centers for Disease Control and Prevention web site: **http://www.cdc.gov** or the U.S. Army Center for Health Promotion and Preventive Medicine web site: **http://chppm-www.apgea.army.mil.** ■

—Military Report, September 10, 2002 Issue

AAFES halts sale of products with Ephedra

Stars and Stripes reports that the Army and Air Force Exchange Service (AAFES) recently began pulling all supplements containing the natural stimulant ephedra from store shelves due to recent concerns from major commands within the military community.

Last spring, a soldier at Fort Hood, Texas, died during physical training from an apparent heart attack. According to a base memo, the soldier was likely taking a nutritional supplement containing a combination of ephedra and caffeine. Another Fort Hood soldier on a similar supplement was recently treated in the emergency room for a heat-related injury during physical training.

Ephedra's safety is widely debated. Ephedra is also known as ma huang and is a natural herb that is supposed to give the body an energy boost by speeding up metabolism, depressing appetite, and increasing heart rate—leading to weight loss. However, use is not without risk. Ephedra has been shown to be associated with cardiac arrhythmias, increased risk of heat injury, muscle breakdown, strokes, and heart attacks. Ephedra can also interact with common decongestants like Sudafed® and may interfere with high blood pressure medications. ■

Clarification

We have received several inquiries regarding the article, "VFR or VMC? Let's Be Clear About What We Mean!" in the July 2002 issue. It has been brought to our attention that due to the FAA's definition of VMC which refers to meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling equal to or better than specified minima, the term "visual conditions" would have been the appropriate term to contrast with VFR in the context of the article, not VMC.

Still, VMC and VFR are not synonymous. VFR are the rules and VMC are the conditions a pilot must operate in to comply with the rules. The rules define the conditions. Special thanks to Mr. John Travers and CW4 Dennis Elliot for the clarification. ■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A model

■ **Class A:** Acft was on a single-ship night VFR training flight. Following departure from an Army airfield where they had been conducting closed traffic pattern training, the crew of the acft failed to relay any further position reports. Overdue aircraft procedures were initiated, and following an intensive ground and air search effort, the wreckage was located 42 hours later. Both crewmembers sustained fatal injuries. Investigation continues.

■ **Class A:** Acft was one of a flight of four conducting a night deliberate attack mission. Moments after occupying their attack-by-fire position, the aircraft began an uncontrollable spin to the right. The PC on the flight controls reduced the collective to slow the spin and execute an immediate forced landing. The aircraft impacted the ground upright on sloping terrain at the edge of a tree line bordering an open field. The aircraft was destroyed and the crew sustained minor injuries.

■ **Class A:** Acft crashed while serving as escort for a MEDEVAC mission and was destroyed. Crew sustained minor injuries. Investigation continues.

CH-47

D model

■ **Class C:** Pilot on the controls executed an abrupt maneuver to avoid an obstacle in their flight path resulting in a suspected overtorque.

EH-60

■ **Class C (Damage):** Two acft collided at approx. 300 feet AGL during IERW training. One acft had just taken off for closed traffic flight; the second had been on "short final" for landing when the crew announced their intention to conduct a "go-around." The tail rotor of the acft that had just taken off contacted the undercarriage of the second acft. Both acft were landed w/o further incident. One crew was using ANVIS-6 NVGs. Damage estimated to be within class C parameters.

MH-6

■ **Class C:** Post-flight inspection following a night live-fire exercise revealed MRB and windshield damage as a result of impact from spent shell casings. ANVIS-6s were in use.

MH-60

L model

■ **Class A:** This flight-related accident occurred when a USN passenger fell from a USA acft while at an approx. 50-ft. hover during the conduct of a FRIES infiltration exercise. The soldier sustained a sprained ankle upon contact with the ground. The USN will lead the joint-service accident investigation; the USA will provide technical representatives and a USASC advisor.

OH-58

DI model

■ **Class A:** Acft had just completed a hot refuel and was circling the field site following takeoff, when it was observed to enter a progressive nose-up attitude until the fuselage inverted in flight. The acft entered the trees vertically prior to ground impact in an inverted, left-side low attitude. Both pilots/crewmembers sustained fatal injuries. Investigation continues.

DR model

■ **Class A (Damage):** Crew experienced FADEC failure to the manual mode. The decision was made to continue flight to nearest airfield. After approximately seven minutes of flight in manual mode, the crew experienced a complete loss of engine power. Both crewmembers survived the acft's impact with the ground and were evacuated to the local medical facility for evaluation. The acft was destroyed. Investigation continues.

■ **Class C:** Acft experienced engine overspeed during approach in tail wind conditions. Engine replacement required.

■ **Class C:** While performing manual throttle operations at altitude, the acft experienced NP/NR overspeed to 125%. FADEC was re-engaged and a precautionary landing was executed w/o further incident.

UH-60

A model

■ **Class C:** Acft attempted to land on uneven terrain during a MEDEVAC pick-up. Post-flight inspection revealed several holes/tears in the undercarriage. NVGs were in use.

L model

■ **Class A (Damage):** Acft crashed following aborted landing approach in dust conditions. All crewmembers and passengers sustained injuries. Investigation continues.

■ **Class C:** Acft was taxiing to VIP pad for drop-off of PAX and contacted a parked civilian acft while negotiating a right turn. Damage to Army acft consisted of two destroyed tail rotor blades and two MRB tip caps. Civilian acft requires sheet metal work to tail section. ECOD total: $120,000.

C-23

■ **Class C:** Upon landing, acft's nose gear collapsed.

Note: For more information on selected accident briefs, call DSN 558-9552 (334-255-9552). Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

IN MEMORIAM

ARMY PERSONNEL KILLED AT THE PENTAGON 11 SEPTEMBER 2001

Spc. Craig Amundson
MSgt. (Ret.) Max Beilke
Carrie Blagburn
Lt. Col. Canfield D. Boone
Donna Bowen
SFC Jose Orlando Calderon-Olmedo
Angelene Carter
Sharon Carver
John J. Chada
Ada M. Davis
Lt. Col. Jerry D. Dickerson
Amelia V. Fields
Gerald Fisher
Cortez Ghee
Brenda C. Gibson
Ronald F. Golinski
Diane Hale-McKinzy
Carolyn B. Halmon
Sheila Hein
Maj. Wallace Cole Hogan Jr.
Jimmie Holley
Peggie Hurt
Lt. Col. Stephen Neil Hyland Jr.
Sgt. Maj. Lacey B. Ivory
Lt. Col. Dennis M. Johnson
Brenda Kegler
David W. Laychak
Samantha Lightbourn-Allen
Maj. Stephen V. Long
Terence Lynch
Teresa M. Martin
Ada L. Mason
Lt. Col. Dean E. Mattson
Lt. Gen. Timothy J. Maude
Robert J. Maxwell
Molly McKenzie
Maj. Ronald D. Milam
Odessa V. Morris
Ted H. Moy
Diana B. Padro
Capt. Clifford L. Patterson
Scott Powell
Deborah A. Ramsaur
Rhonda S. Rasmussen
Martha M. Reszke
Cecelia E. Richard
Edward V. Rowenhorst
Judy Rowlett
Robert Russell
Chief Warrant Officer William R. Ruth
Marjorie C. Salamone
Lt. Col. David M. Scales
Janice Scott
Michael L. Selves
Maria H. Serva
Antoinette M. Sherman
Don Simmons
Cheryle D. Sincock
Lt. Col. (Ret.) Gary F. Smith
Patricia J. Statz
Edna L. Stephens
Sgt. Maj. Larry L. Strickland
Maj. Kip P. Taylor
Sandra C. Taylor
Sgt. Tamara C. Thurman
Willie Q. Troy
Lt. Col. Karen J. Wagner
Spc. Chin Sun Pak-Wells
Meta L. Waller
SSgt. Maudlyn A. White
Sandra L. White
Ernest Willcher
Maj. Dwayne Williams
Edmond Young
Lisa L. Young

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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FLYING BLIND in a cloud of DUST

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

When The Arrows Are Pointing Up...

We didn't experience a good year in Army safety. For FY02 safety performance, the arrows representing increases or decreases in Class A accidents and fatalities are all pointing in the wrong direction—UP!

Shortly after the beginning of FY02, the call came for the Army to execute its primary mission of fighting and winning our Nation's war. This year, overall, our units have performed magnificently on the battlefield fighting this war on terrorism, protecting our installations, executing home station training, conducting training center rotations, and fielding new equipment and formations.

No one could doubt that it's been a busy year in this Army. Our deployment and redeployment rate is up compared to FY01. But hazards abound not only in combat; they are also ever-present in our training environment as well. If left uncontrolled, individual hazards can cumulatively raise risk to unacceptable levels. During FY02, we did experience some breakdowns in risk management, leadership, discipline, training, and standards, and the costly consequence has been lives lost and equipment damaged or destroyed.

A statistical summary

We experienced 206 fatalities compared to 168 last year, an increase of 23 percent. Of those 206 fatalities, 140 soldiers died in off-duty ground accidents (113 of those in POV accidents, which are still our number one killer of soldiers), 49 in on-duty ground accidents, and 17 in aviation accidents. Overall, our Class A accidents are up by about 23 percent this year and by about 17 percent over the 3-year average.

Analysis of ground fatalities reveal—

- A 143-percent increase in fatalities resulting from water activities.
- A 96-percent increase in fatalities related to training activities (11 fatalities from Army motor and combat vehicle accidents, 9 from physical exertion, 9 from explosions/fire, and 1 from a gunshot wound).
- A 53-percent increase in fatalities resulting from motorcycle accidents.
- A 2-percent increase in fatalities resulting from POV (other than motorcycle) accidents.

Analysis of aviation accidents reveal—

- Nine of the twenty-six Class A accidents involved collision with the ground.
- Six involved brownout or whiteout.
- Four involved a materiel failure.
- Four accidents also involved a tree or wire strike.
- In two accidents, crews encountered inadvertent instrument meteorological conditions.
- The majority of the accidents occurred during night and single-ship missions.

Lessons learned

The business of warfighting and training for combat are inherently dangerous. Mistakes happen. Leading soldiers is an awesome responsibility and every day is not guaranteed to be smooth and fun. Mistakes are made as soldiers do their best to execute the mission and tasks we ask them to do. A zero-defects mentality is not a good thing. In fact, it leads to soldiers being hesitant to do tough, realistic training for fear that a mistake could mar their careers. We have to give young leaders an opportunity to grow and learn from their mistakes. It's important that we as an Army be forgiving of honest mistakes that soldiers and leaders make, but there is no forgiveness for irresponsible behavior or allowing hazardous conditions that unnecessarily put soldiers' lives in jeopardy to escalate uncontrolled.

Leaders must be technically and tactically competent and must be involved in the planning, preparation, and execution of missions. If battalion commanders are present during training events, we have fewer accidents. That means the commander must use risk management if he or she is going to avoid the micro-management image. A particular training event may be acceptable for Company A to execute on its own, while Company B is not at a level to train unsupervised.

Understandably, commanders are busy; but E-leadership is not the Army standard! It takes personal involvement and sometimes extending some of that tough love from the "old man." If you can't be present, get your most experienced people out there supervising.

What we can do in FY03

As the remainder of the FY02 field accident data continues to come in over the next few weeks, the numbers will change slightly and we will continue our analysis of the data, searching for additional hazards and developing controls that can be put in place to prevent future similar accidents. But none of our continued research or analysis will find any single silver bullet to stop this unnecessary loss of lives and damage to our equipment and make FY03 safety performance better. Reversing this upward trend in accidents will happen only if we as leaders adhere to the Army standard of informed risk decisions made at the appropriate level of command and enforcement of standards and discipline.

If we as leaders are technically and tactically competent and are aggressively involved in planning, preparation, and execution of assigned missions, we can keep soldiers safe and do the realistic training that replicates combat conditions.

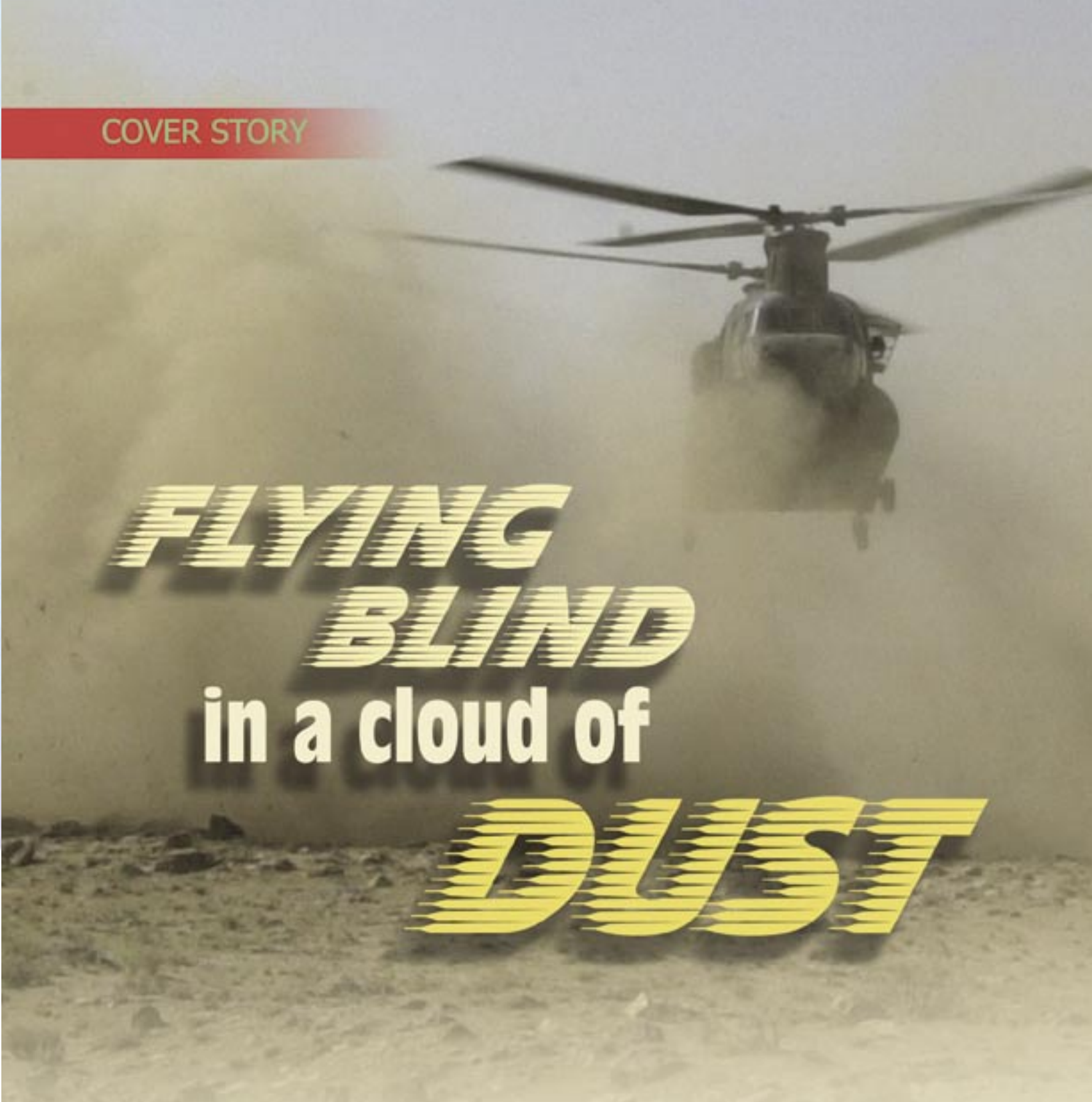
Ruthless enforcement of discipline and standards in our units is critical to improving safety performance. No Kevlar, no seatbelts, out of uniform, speeding, failing to salute a senior officer, flapping canvas—all are signs of indiscipline. A new, lower standard is set every time a leader walks by without correcting it. Increasing demands on our time does not relieve us as leaders of our responsibility to enforce standards and discipline.

We also know very well that flogging leaders doesn't stop accidental losses. That's not the intent here. But as an Army, we do hold leaders responsible and accountable for the safety of the soldiers entrusted to their care. With acceptance of command comes that awesome responsibility. If we as leaders are technically and tactically competent and are aggressively involved in planning, preparation, and execution of assigned missions, we can keep soldiers safe and do the realistic training that replicates combat conditions.

When the FY03 safety performance summary is posted, the arrows will be pointing in the right direction—**DOWN**—if we as leaders have strictly enforced standards and discipline, and have put the proper controls in place to mitigate risks.

Train hard, but train safely by managing risks!

James E. Simmons



FLYING BLIND in a cloud of DUST

While accidents caused by brownout aren't the biggest problem that aviators face, you can just about count on there being at least one or two Class A or B accidents every year. And that doesn't count the Class C, D, and Es that result from encounters with blowing dust.

This isn't just the new guys—the ones not long out of flight school and on their first tactical assignment—that find themselves suddenly engulfed in a cloud of blowing dust or sand. When that happens and the crew loses sight of the ground, even someone with

hundreds of flight hours can allow the aircraft to drift into the nearest obstacle or descend until it smacks into the ground. As a matter of fact, experience can actually become a contributing factor in this kind of accident when an aviator who has flown mission after mission in such conditions becomes overconfident and fails to follow the established procedures.

Generally, these procedures specify that in dusty conditions, aviators should make a running landing. If a terrain doesn't permit a running landing, aviators should plan to make an approach to the ground. Above all, the aircraft should not be brought to a hover. The same is true when taking off. A running takeoff is preferable for wheeled helicopters; but if that isn't possible, the helicopter should become airborne as quickly as possible by making a maximum performance takeoff. That's what the PC in the following case failed to do.

■ The UH-1 was operating in an area that had been heavily used by tanks. The last mission of the day was to conduct an orientation flight of the mock battle area. The crew picked up their four passengers and had completed about one-third of the flight when they spotted a soldier walking along a tank trail. Thinking it strange that anyone would be in what they thought was an impact area, the crew decided to land and investigate.

The aircraft landed about 35 meters from the tank trail, and the crew chief got out to talk to the soldier. The soldier was looking for his helmet that had been lost earlier that day. The crew chief offered him a ride back to the observation point, and the soldier and the crew chief got into the helicopter. The PC, who was flying the aircraft from the left seat, took off. But before the aircraft reached translational lift, it was engulfed by powdery dust blown up from the tank trail by rotorwash.

The aircraft drifted to the right. The PC knew there were trees in front of the aircraft, and he pulled in torque and turned to the right to avoid a 55-foot tree. The aircraft had flown about 380 feet when the blades hit four trees in quick succession, then hit the ground nose-low, rotated on its nose, and rolled onto its left side. The crew and passengers escaped with minor injuries.

The PC had experience flying in both dust and snow, and he knew the area from which he was taking off was dusty—but he didn't expect a brownout. When he took off, he applied forward cyclic instead of using collective to establish a climb, which would have allowed him to fly out of the brownout conditions.

The crew in the following accident was conducting a night-aided flight in a CH-47D when they encountered rotor-induced brownout while landing on a dirt runway.

■ The CH-47 was the lead ship in a flight of seven Chinooks taking part in a tactical training mission. The 3-hour NVG flight to the LZ was unremarkable, and arriving at the LZ, each aircraft proceeded to its pre-designated landing point. On this mission, the aircraft would not be landing to the long axis of the runway. Instead their approach would be perpendicular to the runway. The runway sloped downward 2 degrees from the crown along its long axis and, because the aircraft would be landing at a right angle to the long axis of the runway, this slight slope (which was unknown to the pilots) would be a factor in what happened later. Drainage ditches

paralleled the runway, separating dirt berms on either side from the usable runway surfaces.

The copilot was on the controls as the aircraft approached the south edge of the runway, which was oriented east to west. On short final, he spotted the ditch in the vicinity of his intended touchdown point and elected to extend the approach farther across the runway. As the aircraft touched down past the crown of the runway, the 2-degree downward slope extended the distance for the front main landing gear to touch down, thus extending the point at which braking could be applied. As the front main gear touched the ground during the landing rollout, the helicopter was enveloped in a cloud of dust from the rotors.

Both pilots were looking down and to each side of the aircraft and neither of them saw the earthen berm ahead. No one involved in the mission was aware of the berm, and it hadn't been mentioned during the mission briefing. The berm was the same color as the runway and the surrounding cleared terrain, making it difficult to see at night in the blowing dust.

When it became apparent that the ground roll was excessive and the aircraft was nose low (indicating a downslope), the PC refocused his attention toward the front. Seeing the aircraft's refueling boom pass closely over the berm, the PC took the controls and initiated a go-around. The maneuver was too late to prevent striking the berm and causing nearly $400,000 in damage to the aircraft's underside, lower antenna, and chin-mounted FLIR turret.

The copilot of this aircraft had 4,516 total flight hours, and the PC had 3,836 hours. When aviators with this kind of experience can find themselves in a brownout situation, it should serve as a warning that it can happen to anybody.

Many accidents involving blowing dust and brownout are limited to Class D and E damage. A crew loses sight of the ground and the aircraft lands hard, or a wheel rolls into an unseen hole or hits a berm, or a skid is damaged when it lands on a rock. In other cases, the aircraft drifts into trees or other obstacles because the crew loses visual references.

Some of these blowing dust encounters are caused by operating requirements and not necessarily by something the crew did wrong. For example, aircraft attempting to hook up external loads are particularly vulnerable to rotor-induced brownout. As a result, loads may be turned over as the aircraft drifts or have to be jettisoned when a go-around becomes necessary. These are cases where good crew coordination and communication are particularly important. Often the crew chief is in the best position to spot developing brownout conditions and warn the pilots.

While aircraft sometimes must operate in dry and dusty conditions, many times exacerbated by heavy vehicle traffic, there are two things aircrewmembers should always keep in mind—

■ Be sure you are familiar with the procedures in your aircraft operator's manual and the instructions in FM 1-202, *Environmental Flight*, for operating in these conditions.

■ Treat each mission as if it were your first. Familiarity with an area and overconfidence in ability to operate in dusty conditions have led many an experienced aviator to be a little less vigilant, a little less cautious...and suddenly, he's flying blind in a cloud of dust. ■

Aircrew Coordination: The Year in Review

In the July 2001 *Flightfax*, LTC W.R. McInnis wrote, "We have all been through academic and flight training to enhance crew coordination in the aircraft, but the investigators at the Safety Center continue to find cases where lapses in crew coordination directly contribute to serious accidents." Sadly, this observation is just as true a year later.

The Safety Center recently conducted an analysis of conditions present in FY02 Class A and B aviation flight accidents and found that 45 percent (9 out of 20*) were related to crew coordination failures. The data supports Paula Allman's conclusion that "poor decision-making has to rank number one in the issues we should strive to address" (July 2002 *Flightfax*).

"But we've all had the training!"

The Army Research Institute (ARI) developed the initial, mandatory ACT Exportable Training Package in the early 1990s, but program funding did not provide a mechanism to effectively sustain high levels of aircrew coordination training. So while the aviation accident rate dropped following its inception, and although commanders and aircrew alike acknowledged the benefit of the program, it has not been updated since its original introduction. Meanwhile, operational demands have steadily climbed and military rotary-wing aircraft have become increasingly more complex, necessitating a higher-than-ever level of coordination among all rated and non-rated members of the aircrew.

"So... what do we do about it?"

The U.S. Army Aviation Center (USAVVNC) has convened an aircrew coordination working group at Fort Rucker to provide continual guidance and oversight of a multi-phase effort to develop interactive, computer-based and instructor-facilitated training modules that make ACT realistic and relevant.

This superior exportable training package will—

■ Include Internet-based training, so that it can be easily accessed and updated regularly to remain current with changing Army needs.

■ Develop "aircraft-specific" training support packages so that individual units can access training modules that are directly relevant to their mission.

■ Utilize the computer technology to allow for an engaging level of interactivity with the user, which is more in line with adult learning models than paper-based instruction.

For now...

In the interim, we would like to remind you to make safety your daily priority by adhering religiously to crew coordination basics:

■ Maintain team relationships that demonstrate a healthy respect for crewmembers' competencies. Encourage active participation in decision-making, regardless of rank, personalities, or experience levels.

■ Be proactive by identifying hazards and potential threats and plan accordingly. Remember that effective risk management involves anticipating, reviewing, and rehearsing contingencies for difficult segments or unusual events.

■ Manage workload levels by ensuring that all crewmembers understand mission requirements, responsibilities, and contingencies.

■ Identify and prioritize competing mission tasks. Attend to flight safety and other high-priority tasks first, and avoid distraction from essential activities. This is supported through diligent cross-monitoring of one another's performance, and through the most critical crew coordination task, communication.

■ Listen carefully and communicate clearly. Effective aircrews attend to the sender of communications, ask questions when unsure, restate the message if necessary, and acknowledge the message both verbally and through their actions.

These are the principles that allow us to establish and maintain safety and effectiveness in the cockpit. As recent mishaps remind us, understanding crew coordination skills is important, but practicing them in our daily operations is critical. ■

—Dr. Larry Katz, Research Psychologist, Army Research Institute Rotary Wing Aviation Research Unit, Fort Rucker, AL 36362, DSN 558-2385, katzl@rwaru.army.mil

*Of the 25 Class A-B accidents, 3 were materiel-related and 2 are currently under investigation.

Investigators' Forum

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

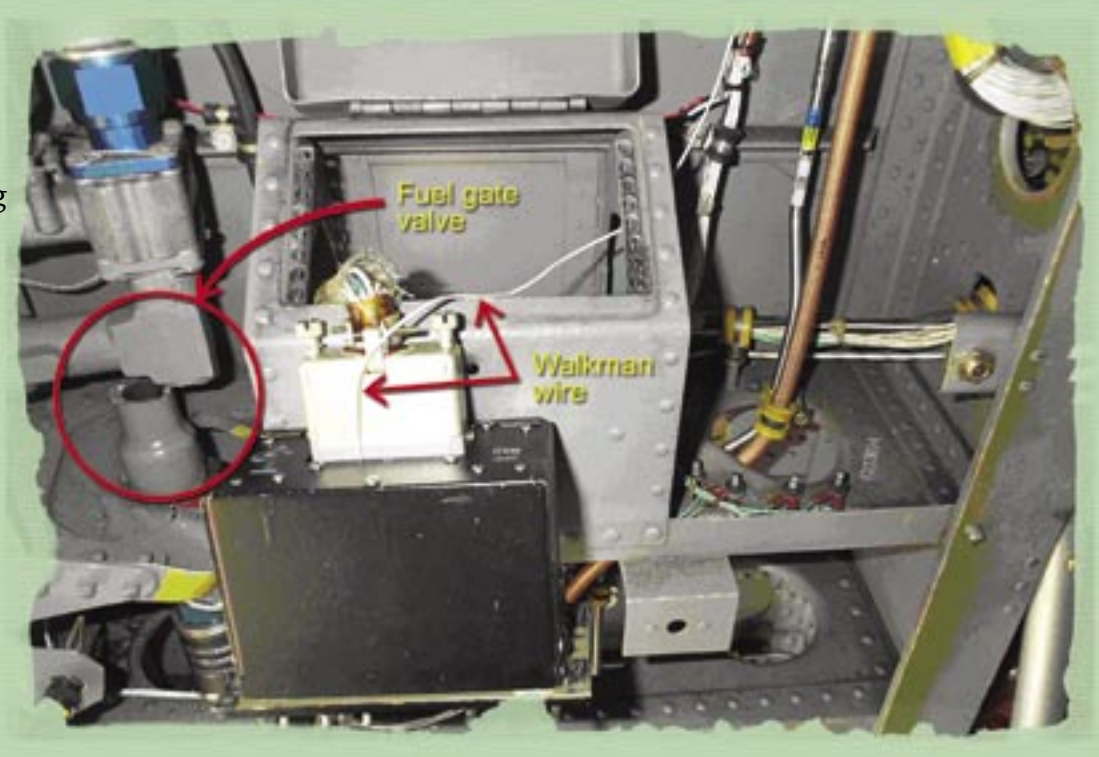
Unauthorized Aircraft Modifications

The investigation revealed an unauthorized "Walkman" radio-type modification to the accident aircraft's wiring and aft intercommunications system (ICS) box. While it seems like a harmless modification, listening to music during flight operations may impede mission success.

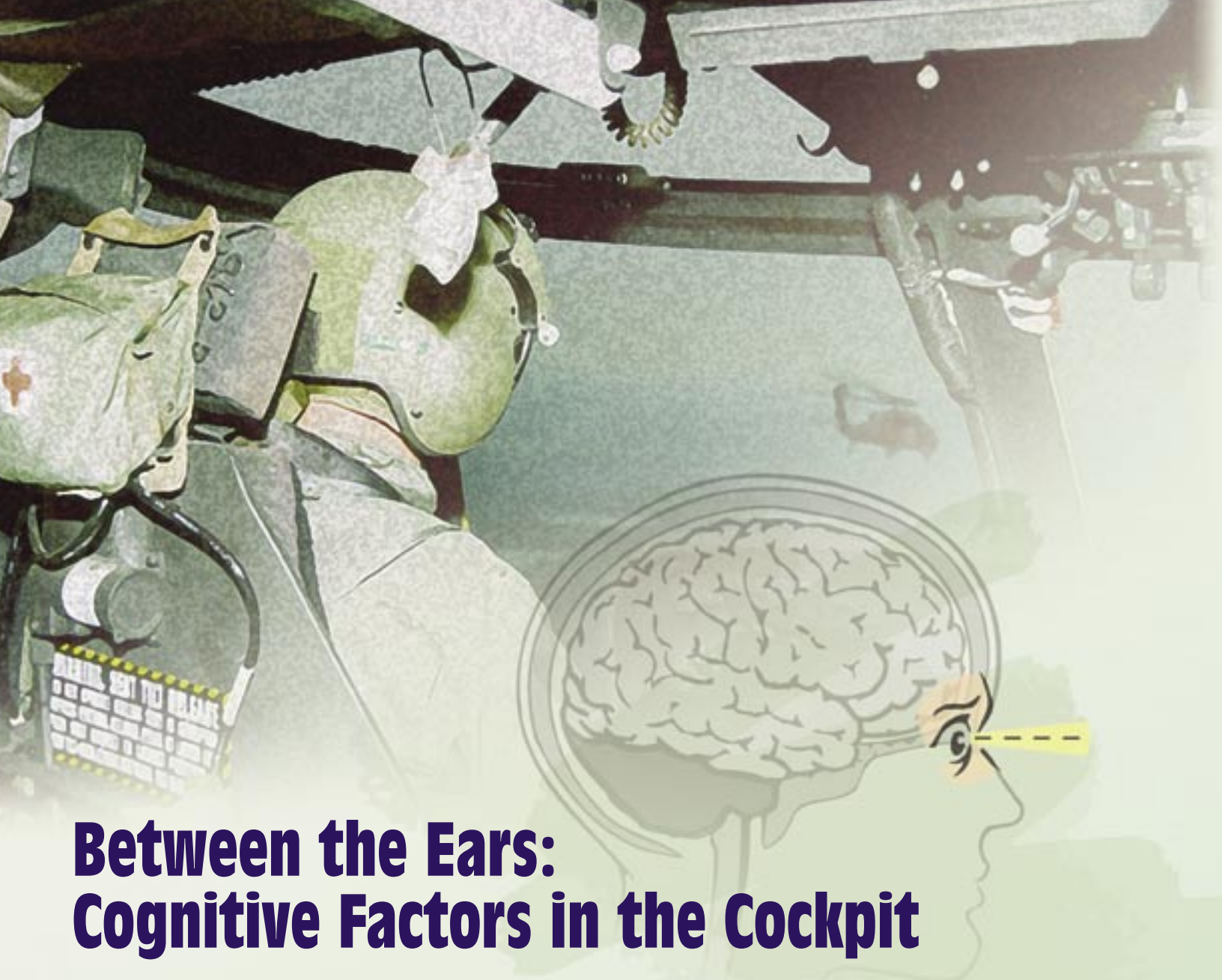
This unapproved modification allowed the crewmembers to hook up a CD player, radio, or cassette tape player to the #4 HF radio volume control knob and listen to music during missions. While seemingly a harmless modification, listening to music during flight operations may impede critical radio transmissions, ATC clearances, or crewmember-to-crewmember communications during critical flight phases such as clearing the aircraft from obstacles.

Additionally, the unauthorized installation could have allowed stray voltage from the ICS box to ignite fuel vapors when the #1 engine fuel gate valve broke during the accident sequence. The Board could not determine if the modification affected (reduced) the overall volume level of the ICS. The ICS box and wiring installation is being sent to CCAD for teardown analysis, volume testing, and stray voltage analysis. ■

—Aviation Systems and Accident Investigation Division, DSN 558-2194 (334-255-2194)



The general WARNING page of TM 55-1520-240-10(a) states: "No electrical/electronic devices of any sort, other than those described in this manual or appropriated Airworthiness Release and approved by AMCOM, are to be operated by crewmembers or passengers during operation of this helicopter."



Between the Ears: Cognitive Factors in the Cockpit

Do you wonder how your brain functions to enable you to fly your aircraft? Do you wish you knew more about what causes human error in aviation accidents? Do you marvel at how much information you can process while handling your aircraft?

Well we wonder, wish, and marvel all the time. In fact, that's what the Army pays us to do. You see, the U.S. Army Aeromedical Research Laboratory (USAARL) has a cognitive factors research team. That means we study learning, memory, language, and communication as they relate to aviators and their actions in the cockpit.

How does cognition relate to aviation?

Workload, situation awareness, and crew coordination are terms with which every aviator is familiar. These concepts are all vital to successful aviation operations and are all related to the cognitive abilities of aviators. The ability to remain aware of the aircraft and battlefield situation around you is highly related to the changing workload state and how well you and your crew can coordinate your actions.

As Army Aviation progresses to more advanced aircraft with increasing mission capabilities and computerized cockpits with multifunction displays (MFDs), the need for better

understanding of the cognitive components of aviation tasks and their cognitive demands on aviators increases substantially.

Our research goal is to develop a better understanding of how these three essential components in aviation are increasingly intertwined on the modern battlefield and in advanced cockpits. This research involves several approaches. A brief overview of some of the chief concerns follows.

Accidents happen. . .

. . .and we should learn from them. Every month, we read in these pages about recent accidents, many of which are deemed due to human factors. Part of this work involves reviewing accident reports in order to determine what types of individual failures are being made most frequently. For example, are accidents most related to lapses in crew coordination or are they due more often to overwhelming workload? In addition, this research is examining differences in accident causes related to aircraft with different cockpit styles (traditional versus MFD-equipped).

What can the eyes tell us?

Humans are information processors. We take in information through our senses and use that information to understand the world around us. In the aviation domain, visual workload can be very high (e.g., instrument scanning, maintaining awareness of aircraft and ground relationships), but can also be affected by other cockpit events such as increases in auditory workload (e.g., communications, warning sounds). Eye-tracking technology enables researchers to record detailed eye movements in order to determine where in the cockpit aviators are looking and attending at any given time. New research is emerging that will utilize eye-tracking to determine basic information about visual scan patterns, as well as how scans change as workload levels change and how scans are used in cockpits with MFDs.

Youth versus experience

Experience with any complex task invariably improves that individual's performance. The same is often considered true in aviation. Yet little is known how new aviators differ from those more experienced when it comes to handling workload and cockpit tasks. Conversely, the introduction of MFDs into Army aircraft leads some to suggest that young aviators who have more computer experience may be better able to learn the complexities of MFD-equipped aircraft than their older, more aviation-experienced but lesser computer-experienced counterparts. New research will be investigating the differences and similarities as well as strengths and weaknesses of newly trained and highly experienced aviators.

How can you help?

This has been a brief overview of some of the research concerns the cognitive factors team has. If you have comments, concerns, or questions regarding the research discussed in this article, please call, write, or drop by. Also, you may see requests for volunteers or receive surveys. Please participate. Research is much improved with a large number and variety of participants. Finally, keep your eye out for more research news...this research exists to benefit aviators!

—POC: CPT Gina E. Adam, Ph.D., USAARL, DSN 558-6806 (334-255-6806), gina.adam@se.amedd.army.mil; visit the USAARL website: www.usaarl.army.mil

Lead-the-Fleet Leads the Way

Imagine walking to the flight line one bright and beautiful day. You're thinking to yourself, "It's a good day to fly." Visibility is excellent, everything is running according to schedule, and you just feel good. Then, at your pre-flight briefing, your commander tells you that today, you're going to fly double your regular flight hours, pack and wear gear at least twice as heavy as what's used for a standard flight, and then come back and be dissected to determine what all those extra hours and weight did to your body. And, oh, by the way, you've got to come back and do it again tomorrow.

Welcome to the life of a Lead-the-Fleet (LTF) aircraft pilot. LTF, a flight test program vital to the mission of Army Aviation, was reinstated recently after a lapse of nearly a decade. The LTF program, which enjoyed almost 10 years of success in the late 1980s and early 1990s, is bound to continue paving the way for future aircraft fleets in all aspects of Army Aviation, including safety. What better place to conduct such an innovative program than the "Home of Army Aviation," Fort Rucker, Ala.?

The organization behind LTF's past and future success is the U.S. Army Aviation Technical Test Center (ATTC), located at Cairns Army Airfield, Fort Rucker. As the Army's premier aviation flight test facility, ATTC has a long and colorful history in evaluating all aspects of aircraft before they ever hit the field. A talented and highly trained staff of experimental test pilots, uniquely qualified to meet the requirements and risks of developmental testing, carry out ATTC's mission to optimize the Army's warfighting capability by conducting air qualification and handling qualities testing on aircraft, aviation systems, and associated aviation support equipment throughout the acquisition life cycle.

ATTC, previously the U.S. Army Aviation Development Test Activity (ADTA), historically has conducted reliability and logistical evaluations for fleet-representative Army aircraft before and following fielding. In years past, ATTC executed an accelerated flight program that resulted in the aircraft "leading the fleet" in terms of flight time. These tests were valuable in identifying reliability, availability, and maintainability (RAM) issues and other vulnerable areas before they adversely affected the fielded fleet.

The LTF program was officially conceived in early 1986 when the Commander, U.S. Army Materiel Command (AMC), directed the U.S. Army Aviation Systems Command (AVSCOM) (now the U.S. Army Aviation and Missile Command (AMCOM)) to establish a "lead-the-fleet"

program. At the request of AVSCOM, the U.S. Army Test and Evaluation Command (TECOM) (now the U.S. Army Developmental Test Command (DTC)) tasked ADTA to execute the new program later that same year.

The original LTF program encompassed all rotary-wing aircraft that would be utilized through the 1990s. Aircraft included were the UH-1H Iroquois, AH-1F Cobra, UH-60A Black Hawk, AH-64A Apache, and CH-47D Chinook. The OH-58C Kiowa and the OH-58D Kiowa Warrior were added to the program during fiscal year (FY) 1991; the AH-1F, UH-1H, and OH-58C were removed from the program in FY93; and the UH-60L was added to the program in FY94.

Although the LTF program ran smoothly for nearly 10 years, it was terminated in February 1995 because of funding issues. While the benefits from previous LTF flight testing were apparent for two or three years, fleet-wide difficulties with several aircraft systems surfaced in following years. After LTF's suspension, an increase in the number of aviation safety action messages and safety of flight actions, sometimes restricting aircraft use and requiring special inspections, maintenance procedures, and reporting, was also observed.

As a result of growing concern over the operational readiness of Army rotary-wing aircraft, as well as other aviation sustainment issues, AMCOM and the Program Executive Office-Aviation (PEO-AVN) re-initiated LTF discussions in early 2000. The information gathered was presented to the Aviation Task Force (ATF) General Officer Steering Committee (GOSC) later in spring 2000. The ATF GOSC identified LTF as a key element in supporting fleet readiness and recommended re-establishment of the LTF program to the U.S. Army's Vice Chief of Staff in July 2000. Less than a month later, ATTC was tasked to execute the LTF program and begin testing on the AH-64A/D, UH-60A/L, CH-47D, and OH-58D, with the CH-47F, UH-60M, and RAH-66 (still in the engineering and manufacturing development phase) to follow in future years. Funding for the program was provided following the FY02 midyear review. The "maiden" flight for the first LTF aircraft of the new millennium was conducted in May 2002.

Like before, the main objective of the LTF program is to operate Army fleet-representative aircraft at an accelerated operational tempo to acquire engineering and operational data to be used for providing a continuous evaluation of RAM issues facing aircraft and their associated aircraft survivability equipment (ASE) suites. LTF aircraft will accumulate flight hours at double the rate of aircraft in field units, and will carry extra weight to approximate the effects of normal ammunition combat loads and internal and sling loads. The controlled conditions and flight profiles planned for LTF testing will provide the opportunity for experts to examine how the aircraft and its systems and hardware endure over an extended period of time in different operational scenarios.

In addition, the LTF program is designed for the timely collection of engineering flight test data for the AMCOM Aviation Engineering Directorate (AED), who will use the data for baseline comparison purposes. When these data indicate a design flaw, AMCOM engineers will begin working to develop a fix before the issue becomes a major problem.

Just as in the past, the LTF program is sure to continue its legacy of providing the data needed for the Army to provide a more affordable, reliable, and safer fleet for our aviators and soldiers. ■

Editor's note: *I'd like to welcome Julie Shelley to the Safety Center. She comes to us from ATTC where she was a technical editor and acquired detailed knowledge of the LTF program. This is the first of many feature articles from Julie that you can look forward to.*

—Julie Shelley, Countermeasure Managing Editor, DSN 558-2688 (334-255-2688), julie.shelley@safetycenter.army.mil

When Do The Rules Change?

As experience in previous and current operations confirm, there is a strong focus on the part of the unit to get the job done. While this attitude is desirable and should be encouraged, leadership oversight should be exercised to ensure that the desired end state does not allow an erosion of standards en route to mission accomplishment. To accomplish the mission, the Army maintains the doctrine "Train as we fight."

Training to accomplish any task or mission is based on approved published standing operating procedures (SOP); tactics, techniques, and procedures (TTP); regulations; and training manuals. These documents reflect what is to be trained, the minimum training hours required, who can conduct the training, and the evaluation requirements. If the training plan is not followed, the training received will not be to standard, which risks not only the lives of the crew, but jeopardizes mission accomplishment. If the training plan does not support the mission, then it should be changed as required by the appropriate authority and incorporated into the literature for future use.

As an integral part of aviation operations, risk management should not become a casualty of the desire to accomplish the mission. The briefing officer training program established in garrison should continue to be followed, as well as the garrison risk assessment form. If the form does not support the deployment, then it should be revised to cover all contingencies as necessary by the appropriate authority and then incorporated as the unit standard.

During times of conflict (hostile fire or mission load) when resources are scarce, the sense of urgency is heightened and there is an overwhelming desire to succeed. This desire is often manifest in a tendency to stray from the way the unit normally conducts business. This trend not only undermines the training status/readiness of the unit, but it is also inherently dangerous. We undermine the core principles of our training plan when we cut corners in the execution of our mission.

As an integral part of aviation operations, risk management should not become a casualty of the desire to accomplish the mission.

If the established training literature (SOP, TTP, ATM, AR, or FM) does not support current requirements, then change the literature and subsequently the way we do business. These changes should be made by the appropriate proponent for the document to be changed. If the proponent change cannot be made, then utilize the procedures that currently exist to handle the situation. By following established procedures (or revised procedures approved by the appropriate authority), we will ensure that the right training is taking place and that our training literature is always the most current available. This practice will ensure that we do not continue to "reinvent the wheel" with every deployment.

When do the rules change? When necessary to accomplish the training mission, but only after approval by the appropriate authority. The rules should never change just to accomplish the mission. Remember, if it is not okay to do it that way at home station, then it is not okay to do it that way when deployed.

Within us as Americans, and especially within the American fighting man, there is a strong "can do" spirit. No American fighting man wants to tell his superiors that HE cannot do it. There are commanders who count on this spirit when they know what they are asking of their men is wrong, but they persist because they do not want to tell their superiors that THEY cannot do it. At all times and especially in combat, we rely on commanders at all levels to stop the madness and say no when necessary, and only say yes after all the principles of risk management have been applied. ■

—CW5 Noel C. Seale, DES Cargo Branch, DSN 558-3475 (334-255-3475), sealen@rucker.army.mil

Commander's Safety Course: The Road Ahead

Every commander is the safety officer for his unit and is personally responsible and accountable for the safety of soldiers and the safe conduct of unit activities in operations and training. As the Army Safety Officer, the Chief of Staff, Army (CSA) has repeatedly emphasized the importance of aggressive involvement of commanders in the safety of their units.

The CSA directed the development of a Commander's Safety Course (CSC) to ensure commanders have the knowledge and the tools to effectively manage their unit safety programs and to incorporate risk management into all unit planning and activities. Specifically designed to provide safety tools to assist in creating and implementing an effective safety program, commanders now have available, through the online CSC, risk-management tools that can help them reduce accidents among soldiers and civilian employees, both on and off duty. The course leverages multimedia, web-based distance-learning technology and is accessible and easily retained for everyday use. Alternately, the course is available as a CD-ROM.

The CSC incorporates refresher risk-management training using three tools—Resource Navigator, Risk Management, and the Unit Safety Program (USP)—for commanders to use in implementing a safety program and managing risk within their units. Equivalent to 30 classroom hours, the courseware contains five modules: Army safety, driving safety, unit safety, resource navigator, and risk management. The courseware includes progressive checks on learning and tests for each module that certifies the student as having completed the course.

The tools may be downloaded and used as risk management resources in the unit. The Resource Navigator enables the commander to quickly access risk management and safety resources from internal and external sources such as Army Knowledge Online (AKO) and the U.S. Army Safety Center (USASC).

The Risk Management Tool automates the risk management process described in FM 100-14: *Risk Management* and uses a database of shared risk-management worksheets that allow the exchange of knowledge and experience Armywide. Risk management worksheets will be shared by the TRADOC Distance Learning web site and the USASC Risk Management Information System (RMIS).

The USP Tool transfers conceptual information for drafting a USP into practical applications in the unit. This particular tool also allows users to access guidance from internal and external sources through the Internet and to check their USP against a model safety program and checklist.

On 1 October 2002, the CSA directed that company-grade officers complete CSC before assuming command (Implementing Message from HQDA WASH DC//DAMO-TRZ//141224ZAug02, Subject: Commander's Safety Course). Brigade commanders will certify successful completion. Brigade- and battalion-level commanders must complete the CSC before attending the Fort Leavenworth Pre-Command Course.

Commanders may register for the course at **https://www.aimsrdl.atsc.army.mil** or **https://www.atrrs.army.mil**. Some 1,200 students are currently enrolled. When completed, students will be awarded a certificate of completion as their course record.

All Army leaders are encouraged to complete CSC and use the tools. First sergeants and other non-commissioned officers, enlisted personnel, safety officers, facility managers, shop chiefs, and other federal civilian employees are encouraged to enroll in the CSC for self-development at **https://www.atrrs.army.mil**.

Future plans include incorporating the CSC into the U.S. Army Sergeants Major Academy (SMA) curriculum. This action will support the existing three common core tasks that have been revised for the Sergeant Major of the Army (SMA). ■

—Dr. Brenda Miller, Chief, Training Division, USASC, DSN 558-3553 (334-255-3553), brenda.miller@safetycenter.army.mil

Safety Messages:

Recap of selected 3rd & 4th Qtr FY02

The following is a listing of selected aviation safety action messages (ASAMs) and safety-of-flight (SOF) messages issued by Aviation Missile Command (AMCOM) from 1 Apr 02 through 30 Sep 02. Complete copies are available on the AMCOM web page at http://www.redstone.army.mil/sof.

AH-64

■ **AH-64-02-ASAM-05** (TB 1-1520-238-20-126), 042000 Apr 02, maintenance mandatory, RCS CSGLD-1860(R1), all AH-64 series aircraft, initial and recurring inspection of the fire extinguisher check valves for corrosion. ***POC: Joseph Creekmore, DSN 897-2090.***

■ **AH-64-02-ASAM-06**, 292025Z Apr 02, informational, RCS CSGLD-1860(R1), all H-60 and H-64 series aircraft, torque factor charts discrepancy. ***POC: Ron Price, DSN 788-8636.***

■ **AH-64-02-ASAM-07** (TB 1-1520-251-20-05), 291130Z May 02, maintenance mandatory, RCS CSGLD-1860(R1), AH-64D series aircraft, replacement of the auxiliary power unit (APU) lifting lug. ***POC: Joseph Creekmore, DSN 897-2090.***

■ **AH-64-02-ASAM-08**, 071230Z Aug 02, maintenance mandatory, RCS CSGLD-1860(R1), all AH-64D series aircraft, inspection of the pilot ardd bonding jumper. ***POC: Joseph Creekmore, DSN 897-2090.***

■ **AH-64-02-SOF-05** (TB 1-1520-251-20-07), 301430Z Apr 02, operational, RCS CSGLD-1860(R1), all AH-64D series aircraft, removal of flight restrictions. ***POC: Joseph Creekmore, DSN 897-2090.***

■ **AH-64-02-SOF-06** (TB 1-1520-251-20-07), 151830Z May 02, operational, RCS CSGLD-1860(R1), revision to AH-64-02-05, all AH-64D series aircraft, removal of flight restrictions. ***POC: Joseph Creekmore, DSN 897-2090.***

■ **AH-64-02-SOF-07** (TB 1-1520-238-20-127), 032300Z Jun 02, technical, RCS CSGLD-1860(R1), all AH-64s, revision AH-64-02-SOF-04, initial and recurring inspection of the tail rotor blades. ***POC: Joseph Creekmore, DSN 897-2090.***

■ **AH-64-02-SOF-08**, 261700Z Aug 02, technical, RCS CSGLD-1860(R1), all AH-64 series aircraft, auxiliary power unit (APU) clutch. ***POC: Joseph Creekmore, DSN 897-2090.***

CH-47

■ **CH-47-02-ASAM-03** (TB 1-1520-240-20-147), 121715Z Jun 02, maintenance mandatory, RCS CSGLD-1860(R1), CH-47 series aircraft, inspect for improperly manufactured/assembled fuel control relay boxes. ***POC: Russell Peusch, DSN 788-8632.***

■ **CH-47-02-ASAM-04** (TB 1-1520-240-20-149), 241630Z Jul 02, maintenance mandatory, RCS CSGLD-1860(R1), all H-47 series aircraft, inspection for untested critical safety item (CSI), P/N 114C3044-2, aft yoke support shaft. ***POC: Russell Peusch, DSN 788-8632***

■ **CH-47-02-SOF-06** (TB 1-1520-240-20-148) 190015Z Jun 02, technical, RCS CSGLD-1860(R1), all CH/MH-47D/F series aircraft, inspection of combining transmissions. ***POC: Russell Peusch, DSN 788-8632.***

OH-6

■ **OH-6-02-ASAM-02** (TB 1-2840-256-20-06 & TB 1-2840-263-20-04), 241640Z Jul 02,

maintenance mandatory, RCS CSGLD-1860(R1), all OH-58 and H-6 series aircraft, oil pressure reducer assembly. ***POC: Ron Price, DSN 788-8636.***

OH-58

■ **OH-58-02-ASAM-07** (TB 1-1520-248-20-65), 151402Z May 02, maintenance mandatory, RCS CSGLD-1860(R1), OH-58D, inspection and overhaul interval change for engine to transmission driveshaft. ***POC: Ron Price, DSN 788-8636.***

■ **OH-58-02-ASAM-08** (TB 1-2840-241-20-23, TB 1-2840-256-20-06, and TB 1-2840-263-20-04), 241640Z Jul 02, maintenance mandatory, RCS CSGLD-1860(R1), all OH-58 and H-6 series aircraft, oil pressure reducer assembly. ***POC: Ron Price, DSN 788-8636.***

■ **OH-58-02-SOF-03**, 261700Z Sep 02, technical, RCS CSGLD-1860(R1), all OH-58D aircraft with model 250 C30R/3 or 250 C30R/3M engine, electronic control unit (ECU). ***POC: Ron Price, DSN 788-8636.***

UH-60

■ **UH-60-02-ASAM-06** (TB 1-1520-237-20-252), 181430Z Apr 02, maintenance mandatory, RCS CSGLD-1860(R1), all H-60 series helicopters, collective and yaw boost servo assemblies swage pin collars. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-ASAM-07**, 292025Z Apr 02, informational, RCS CSGLD-1860(R1), all H-60 and H-64 series aircraft, torque factor charts discrepancy. ***POC: Ron Price, DSN 788-8636***.

■ **UH-60-02-ASAM-08** (TB 1-1520-237-20-256), 121720Z Jun 02, maintenance mandatory, RCS CSGLD-1860(R1), UH-60 series aircraft, inspect AN/ARC-220 wiring for chafing. ***POC: Ron Price, DSN 788-8636***.

■ **UH-60-02-ASAM-09** (TB 1-1520-237-20-257), 131345Z Jun 02, maintenance mandatory, RCS CSGLD-1860(R1), all H-60 series aircraft, tail rotor quadrant hardware installation. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-ASAM-10**, 251700Z Jun 02, maintenance mandatory, RCS CSGLD-1860(R1), MH-60K and MH-60L series aircraft, aerial refuel probe nozzles. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-ASAM-11** (TB 1-1520-237-20-261), 241955Z Sep 02, maintenance mandatory, RCS CSGLD-1860(R1), UH-60 series aircraft, revision to UH-60-02-ASAM-08 (TB 1-1520-237-20-256), inspect AN/ARC-220 wiring for chafing. ***POC: Ron Price, DSN 788-8636***.

■ **UH-60-02-SOF-07**, 012230Z May 02, technical, RCS CSGLD-1860(R1), all UH-60A/EH60A/UH-60Q series aircraft, main module planetary carrier assembly. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-SOF-08** (TB 1-1520-237-20-255), 041815Z May 02, technical, RCS CSGLD-1860(R1), all UH-60A/EH-60A/UH-60Q series aircraft, main module planetary carrier assembly. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-SOF-09** (TB 1-1520-237-20-258), 221415Z May 02 technical, RCS CSGLD-1860(R1), UH-60A/EH-60A/UH-60Q, main module planetary carrier assembly. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-SOF-10**, 080115Z Jun 02, technical, RCS CSGLD-1860(R1), UH-60A/EH-60A/UH-60Q series aircraft, main module planetary carrier assembly. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-SOF-11**, 092245Z Aug 02, technical, RCS CSGLD-1860(R1), all H-60 series aircraft, one-time inspection of main rotor blade cuff assembly. ***POC: Ron Price, DSN 788-8636.***

■ **UH-60-02-SOF-12**, 122015Z Aug 02, technical, RCS CSGLD-1860(R1), all H-60 series aircraft, revision to UH-60-02-11, one-time inspection of main rotor blade cuff assembly. ***POC: Ron Price, DSN 788-8636***.

Point of contact for SOF/ASAM message distribution, compliance reporting, and administrative matters is the AMCOM Safety Office. Technical or logistical questions should be addressed to the points of contact indicated in the messages. AMCOM Safety Office representatives: (256) 842-8620 or 313-2097 (DSN 788); E-mail: safeadm@redstone.army.mil.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A model

■ **Class A:** Acft was conducting an annual flight evaluation in the local training area when the aircraft entered the trees at 10,700 feet MSL. Initial reports do not specify if there were any caution, warning, or other malfunctions present at the time of the mishap. Aircraft was destroyed. The two injured crewmembers were transported to a local hospital via MEDEVAC.

■ **Class C:** Upon taxiing to parking pad for student change, the APU was started for shutdown. The power controls levers were retarded to idle, the APU fail lights illuminated, and the aircraft experienced a hard electrical shutdown. The crew attempted to restart the APU without success. The IP then waived the mechanic over to the aircraft where the mechanic instructed the IP to shut down the aircraft because fluid was coming out. After shutdown, damage was discovered to the APU clutch, driveshaft, anti-flail device, and bi-pod mount.

■ **Class D:** Aircraft had completed hot refuel and relocated for shutdown and crew change. During through flight, two holes were found on the left side of the stabilator, one on top and one on bottom. Also a .120" dent was found on the #1 inboard T/R blade, leading edge, two inches from the tip. Aircraft received temporary repair and was authorized a one-time return flight to home base by a maintenance pilot. The damage was caused by an unknown foreign object. Aircraft was repaired and returned to service.

D model

■ **Class B (Damage):** Acft experienced engine overspeed/overtemp during ECU lock-out operation. Acft was landed without further incident. Engine main rotor blades/hub and tail rotor blades/hub have been condemned and must be replaced.

■ **Class C:** Acft had just departed AAF when the #1 engine chip light illuminated. As the pilots were bringing the engine off-line, the #2 engine overtorqued. Acft returned to the AAF without further incident.

CH-47

D model

■ **Class A** (Avn Gnd): During a 50-hour maintenance ground run-up inspection, the aft swashplate failed (seized) causing negative pitch to be put into the blades. The left and right rear struts collapsed from this downward force. Acft rotor blades struck the tunnel cover and control tubes.

■ **Class B:** While in flight, at approx. 40 feet AGL, CE jettisoned the M119 Howitzer external load after suspecting that it struck the ground. The M119 sustained approx. $262K worth of damage.

MH-47

D model

■ **Class D:** During external load long-line operations, sling got wrapped around the aft left tire assembly and ski. The crewmember calling the load failed to notice this. When the load was lifted off the ground, the weight broke the tire assembly and ski.

E model

■ **Class A:** During a night vision goggle overwater formation flight in deteriorating weather conditions without a visible horizon, the co-pilot of the trail acft became spatially disoriented and rapidly closed on the lead acft despite repeated warnings from the pilot-in-command (PC) about his position. The PC took the controls and executed an abrupt evasive maneuver to avoid contact with the lead acft and lost control. As a result, the acft descended and impacted the water in a 16-degree, nose-down attitude at 157 knots airspeed. The acft was destroyed and all 10 personnel onboard were fatally injured.

OH-58

DI model

■ **Class C:** Aircrew was performing an SEF to an improved area (task 1053). The maneuver was initiated at 1500 feet on runway 33. Collective was lowered and autorative descent commenced. Low rotor warning occurred at 500 feet. Prior to this, the collective was raised to maintain RPM. At 500 feet, the collective was lowered again. At 100 feet, decel was initiated. At 60-70 feet, low rotor warning recurred and the IP took the controls. At 10-15 feet, initial was applied and acft impacted the ground in a level attitude. Skids spread and lower fuselage and antennas were damaged. Throttle was at idle the entire time.

DR model

■ **Class C:** Crew initiated emergency procedures after experiencing "FADEC FAIL" cockpit instrumentation warnings and a lack of RPM response in the manual mode. Crew executed an autorotation w/partial power and acft touched down in an open field. Main rotor blade (MRB) contacted the driveshaft cover and GPS antenna during touchdown.

■ **Class C:** During a simulated engine failure, acft experienced an engine overtorque and subsequent hard landing.

■ **Class D:** During a Force on Force screening mission at NTC, the crew decided to conduct ridgeline OP operations. The crew selected this OP so they could see the battlefield and extend their station time by landing and conserving fuel. As the PC attemped to land, the aircraft started an excessive nose pitch-up attitude and sliding rearward motion. The PC corrected with forward cyclic, whereby causing the main rotor blades to contact the right FM homing antenna.

■ **Class E:** During demonstration of hovering auto recovery techniques on the airfield, SP increased throttle to recover from demonstration maneuver resulting in an engine overtorque. Crew performed precautionary landing IAW operator's manual. The following limits were extracted from the pilot's and co-pilot's MFD: Engine Torque-130% for 1 second, mast torque-130% for 2 seconds, NG-105% for 0 seconds, TGT start 714 degrees, TGT run 800 degrees. Required visual drive train inspections complete with no aircraft damage. Aircraft released for flight.

UH-60

A model

■ **Class A:** Acft was taking-off from an unimproved landing area when it encountered brownout conditions. The PC instructed PI not to increase power further during the take-off; however, the PI increased power to TGT limiting, causing engine and rotor RPM to decrease, resulting in aircraft impacting the ground. Initial ECOD reflected Class D damage, but has since been upgraded to Class A damage.

■ **Class C:** The MRB tip made contact with trees while landing to a confined area for MEDEVAC (MAST) pick-up. Acft was cleared for one-time flight back to AAF following inspection.

■ **Class C:** The MRB sustained damage as acft was undergoing a maintenance test flight (engine run-up as part of a 100-hour inspection). The metal plug required to seal the "bleed-air" tube during the inspection ejected and flew into the MRB. Acft was shut-down upon detection of an air leak, and damage to the MRB was noted.

■ **Class C:** During an approach to a pinnacle, all four main rotor blades contacted a tree.

L model

■ **Class C:** Acft sustained damage and troop passenger sustained injury during air assault insertion. Acft struck two engineer pickets protruding from the ground while descending to touchdown and was subsequently raised back to a 20-foot hover. Soldier experienced ankle injury (suspected fracture) upon exiting the acft prior to touchdown. After observing the injured soldier, the crew landed the acft and a MEDEVAC was called in. Acft continued to staging base following inspection and release for one-time flight, sustaining sheet metal/undercarriage damage (4 holes).

■ **Class C:** M/R tip caps contacted tree during confined area operations.

■ **Class E:** During cruise flight, the pilot saw blood on the outside of the right windshield. He suspected bird-strike and returned to home airfield. Maintenance inspected the aircraft and inside of the No. 2 engine and found no damage. Aircraft released.

UC-35

■ **Class C:** While descending from FL410 to FL370, the pilot on the controls advanced the engine power levers to arrest the descent rate and increase the decaying airspeed. Both engines oversped to approximately 102.7%. The engine data recorder indicated the overspeed was 108%.

UV-20A

■ **Class A:** While descending from 3,500 feet AGL following a paradrop operation at an uncontrolled civil airfield under daylight visual meteorological conditions, the UV-20A collided with a Cessna 182 climbing to altitude for a paradrop. The UV-20A departed controlled flight and started a near-vertical, nose-down, spiraling right turn until ground impact. The UV-20A came to rest in a brushy, dry riverbed. There was no postcrash fire. The UV-20A was destroyed and the pilot-in-command was fatally injured. The jumpers aboard the Cessna exited safely after the collision, and the pilot landed the aircraft at the airfield.

C-23

B model

■ **Class D:** On takeoff roll, a seagull impacted right wing of aircraft. Takeoff was aborted and an external inspection of the impact area was done with no damage noted. During post flight, it was discovered that one propeller tip was slightly bent, approximately 1/4 of an inch. Propeller blade replaced.

Editor's note: For more information on selected accident briefs, call DSN 558-9552 (334-255-9552). Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

Avoid BROWNOUT

- Pick terrain / landing point to minimize dust
- Land into the wind
- Utilize correct landing techniques (FM1-202 & ATM)
- Avoid hovering in dusty conditions

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ARMY AVIATION RISK-MANAGEMENT INFORMATION

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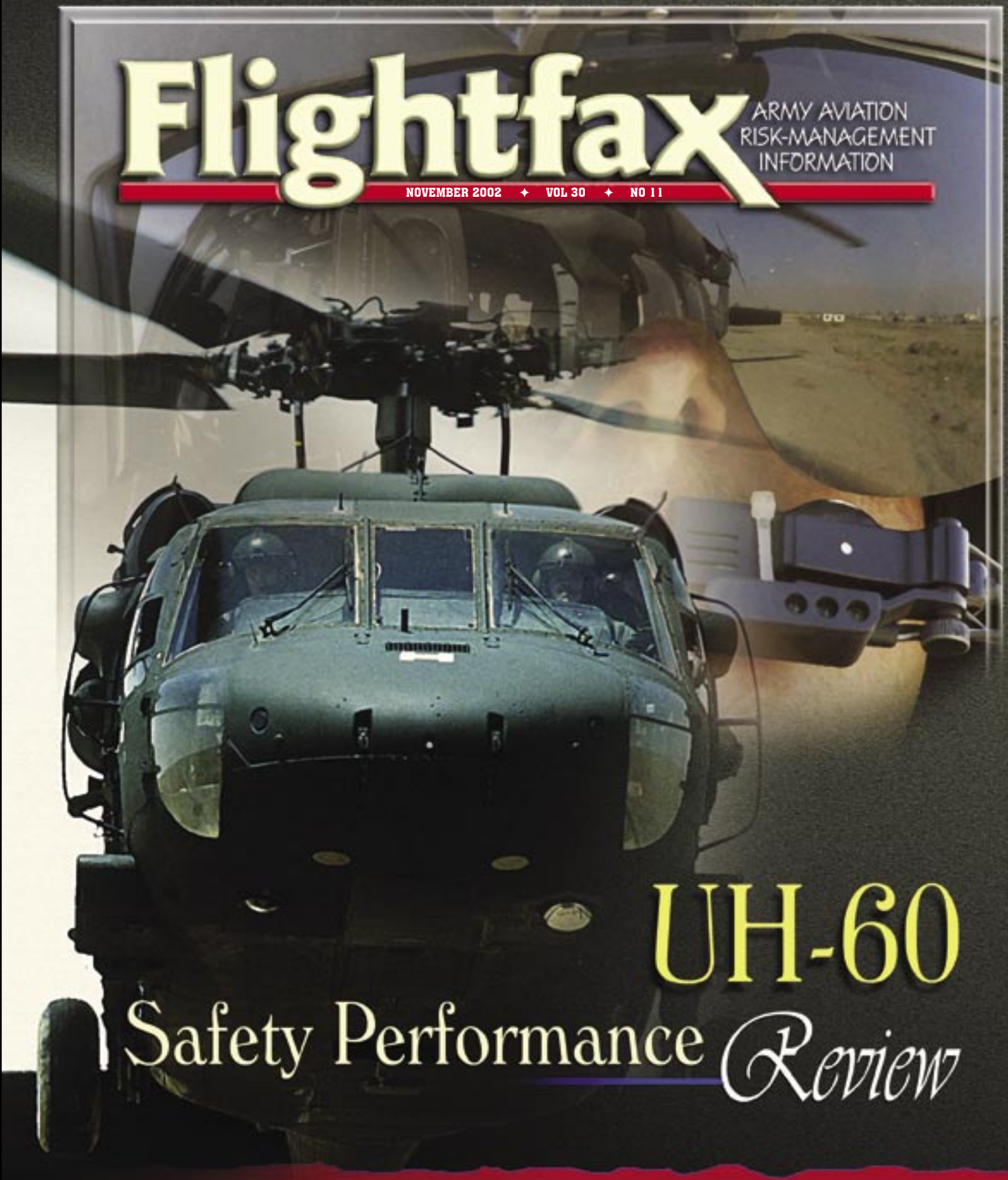

UH-60 Safety Performance *Review*

PLUS: Apache pilots talk about HMD issues.

Flightfax

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

The Holiday Season and Reflection

We are each privileged to serve in the finest Army our country has ever known. For more than 220 years, this great Army has existed to fight and win our Nation's wars. Today we are more than a year into this war on terrorism, and I can tell you—without any hesitation—that all of our soldiers and units have performed magnificently both on the battlefield and in training as we prepare for combat.

As we enter this holiday season, reflecting on the events of the past year gives us an even greater appreciation for the tremendous job you do every day. We have prosecuted this war in some of the most dangerous terrain on the face of the earth, in possibly the most unforgiving aviation environment the Army has ever encountered. Because of your efforts and skills, our Army has been successful where others before us have failed. We have succeeded and will continue to succeed because great soldiers like each of you were able to effectively manage risks involved in those operations. Your skills in identifying and assessing hazards and being able to define and implement controls to reduce risks helped us to be successful with minimal losses.

I personally thank you for your willingness to serve and for the great job you are doing. And, I would be terribly remiss if I failed to also thank the families and friends who support you and allow the Army to use your skills and talents as we continue to prosecute this war on those who wish us harm.

Many of you will enjoy the comforts of home and the joys of being with family this holiday season. If you are traveling, I urge you to be extra cautious, as POV accidents are still the number one killer of our soldiers. Be extra vigilant in identifying, assessing, and controlling hazards. A moment's lapse in awareness can easily result in tragedy.

For those who are deployed in support of Operation Enduring Freedom or to any of the many other points around the world with an American Army presence, know that our thoughts and prayers are with you.

To all of you who each day put your life on the line to defend this great country, have a safe and happy holiday season and know that we, as a Nation, are truly grateful for your service.

Train hard and play hard, but be safe!

James E. Simmons

COVER STORY

Spotlight: UH-60 Safety Performance Review

Since FY98, there have been 147 UH-60 Class A through C accidents. These accidents cost the Army $101,952,516 and resulted in 25 fatalities and 5 permanent disabling injuries. Highlights of the accidents follow.

Tree strikes

There were 24 accidents involving tree strikes during flight. The majority of the tree strikes occurred during terrain flight, and over half involved night vision goggle (NVG) flight. Low illumination, fatigue, high workload, scanning, and crew coordination breakdowns were contributing factors in some of these accidents.

A hazard associated with the UH-60 is

airframe vision blockage. The windscreen structure is such that it significantly blocks the aircrew's direct and peripheral vision for detecting obstacles in several quadrants. This hazard has contributed to accidents involving mid-air collisions and tree strikes.

Mid-air collisions

There were two accidents involving mid-air collisions during this timeframe, and both occurred during night NVG flight. One of these was a Class A accident that resulted in six fatalities, numerous injuries, and two destroyed aircraft. The latter accident involved multi-ship, sling load operations under NVGs with degraded visibility due to rain showers and zero percent moon illumination (see scenario below).

Controls to mitigate these hazardous conditions include having all formations adopt a straight trail formation at the release point before attempting the turn to final; reducing the formation's airspeed (the aircraft with the heaviest load should be lead); increasing the distance between serials to allow more reaction time; or, if feasible, delaying the mission until the weather clears. Thorough planning and mission rehearsals should be conducted. Control measures and abort criteria should be established and understood by all concerned. Emphasizing the need to scan repeatedly beyond the door post for converging aircraft also will help prevent these types of accidents.

Scenario: During a night NVG terrain multi-ship air assault mission, a flight of four UH-60L aircraft were executing a 180-degree right turn to final while in a staggered right trail formation. The crew of the trail aircraft failed to maintain separation from the lead aircraft. The trail aircraft (sling loading an M998 HMMWV) collided mid-air with the lead aircraft. Both aircraft crashed and were destroyed. All 6 occupants on board the trail aircraft were fatally injured, and 5 of 11 personnel on board the lead aircraft sustained survivable injuries.

Brownout or whiteout

There were 15 accidents involving spatial disorientation resulting from rotor-induced brownout or whiteout conditions. Of these, 80 percent involved night NVG missions, and 77 percent involved single-ship operations. Briefing the procedures and crew responsibilities for brownout or whiteout conditions before takeoff will mitigate this hazard.

In-flight part or component detachment

There were 11 accidents where an external aircraft component or part came loose from the aircraft during flight. All of these incidents resulted in foreign object damage (FOD). Seven of these incidents were caused by materiel failure of the component, and three of these seven involved the de-ice cable on the tail rotor. In the remaining four accidents, improper maintenance procedures and/or inadequate preflight inspections by the aircrew caused an unsecured access cover or door to open in flight. In one case, auxiliary power unit (APU) readings were taken after the pilot-in-command (PC) completed the preflight inspection, but were not annotated in the logbook. The crew chief had closed the APU access cover but had not secured the latches.

FOD

There were 10 accidents attributed to FOD (excluding those mentioned in the previous paragraph). Half of these accidents were caused by a lack of tool accountability during maintenance. The other half were caused by rotor wash blowing unsecured items outside the

aircraft (e.g., parachute deployment bag).

Hard landings

There were 10 instances of hard landings that caused the main rotor blades to flex and strike external aircraft components and the fuselage. These accidents were evenly split between day and night. Pilots were conducting roll-on landings to an unimproved, dusty surface in half of these cases. Seven of the 10 accidents involved the ALQ-144 antenna. The height of the ALQ-144 antenna and its location on the aircraft makes it susceptible to main rotor blade strikes during hard landings and/or excessive aft cyclic inputs while landing.

Power management

Army aviators have become conditioned to the benefits of seemingly unlimited power from modern multi-engine aircraft often operated at low pressure and density altitudes and temperatures. Many units are deployed to areas very different environmentally from home base, operating in both high pressure and density altitudes and temperatures.

These conditions, along with the high gross weights associated with many mission profiles, often increase demand for power beyond engine capability. The process of confirming power requirements with power available requires continual awareness and constant performance planning. However, performance planning is not enough. Aviators also must fully understand how power-limited aircraft will perform during all phases of the mission. Only through a thorough knowledge of the aerodynamics of maneuvers, coupled with good knowledge of the PPC, can a pilot make an effective decision when presented with a power-critical situation. Understanding how wind, descent rate, temperature, turbulence, and other factors influence regular maneuvers is one of the best defenses against this hazard. (The "Power Matters" video on the U.S. Army Safety Center Web site, **http://safety.army.mil**, is a good educational tool.)

There were seven accidents in this timeframe (including four that were either Class A or B) that were caused by lack of proper aircraft power management procedures. Total flight hours for the instructor pilots (IPs)/PCs involved in the Class A and B accidents ranged from 1,567 to 5,028. The recency of mountain flying experience was a factor in Scenario 1 below. The IP was qualified, but not current, in the mountain environment. One of the seven accidents involved settling with power (see Scenario 2). Conditions conducive to settling with power are a vertical or near-vertical descent of at least 300 fpm and low forward speed (FM 1-203). The accident described in Scenario 2 replicates these conditions.

Scenario 1: Due to a last-minute cancellation of the planned mission, the IP decided to take advantage of the downtime and conduct mountain qualification training. Due to the compressed schedule, there was insufficient time to plan thoroughly and execute the opportunity training. The IP did not account for extra equipment in the cargo and transition sections of the aircraft. In addition, he incorrectly computed the arrival fuel weight by failing to accurately compute the en route time and fuel consumption estimate. The IP made the decision to fly the route in reverse to give thunderstorms time to clear. The modified plan was to fly directly into the mountains, conduct the required takeoffs and landings, and then fly the course in reverse. The miscalculation of departure weight, compounded by the error in the amount of fuel that would be expended en route to the landing zone (LZ), resulted in the aircraft weighing

over 1,000 pounds more than predicted. In addition, the power required to hover in ground effect (IGE) was one percent more than the maximum torque available. During the approach to the 10,800-foot mean sea level (MSL) LZ, the rotor rpm began to decay and the aircraft descended into trees approximately 50 feet short of the intended landing point. The aircraft sustained moderate damage, and the crew was uninjured.

Scenario 2: The PC initiated a downwind vertical descent from a 500-foot above ground level (AGL) out of ground effect (OGE) hover, with the intent of maintaining a 100 fpm rate of descent. He directed his attention to maintaining his position over the ground, to the exclusion of monitoring his rate of descent. The descent increased to about 300 fpm and the aircraft continued to ground impact. The aircraft incurred major damage, and the crew and passengers sustained minor injuries.

Wire strikes

There were four wire strikes. The accidents were evenly split between day and night, and half involved multi-ship operations. In three of the four, the aircrew was flying low level at airspeeds ranging from 70 to 100 knots indicated airspeed (KIAS). In one case, the aircraft was on approach to an LZ and hit wires that were obscured by trees. In another, the aircrew was flying multi-ship in the center of a valley (scenario below). Controls to mitigate this hazard include negotiating wires at or near the stanchions or at an altitude to safely clear the wires.

Scenario: During conduct of a day multi-ship aerial reconnaissance at approximately 95 KIAS, the lead aircraft flew down the center of a valley. The pilot of the accident aircraft attempted to cross over high-tension wires at mid-span in the middle of the valley, rather than at or near the poles on the hilltops. The pilot initiated a gradual climb to clear the three high-tension wires, but the main rotor blades struck one of two 3/8-inch diameter static discharge lines that were about 70 feet above the high-tension wires. The aircraft descended to impact in a right spin through the trees, coming to rest on its left side. The aircraft was damaged extensively and all six occupants were injured.

Inadvertent IMC

There was one accident during this timeframe that was attributed to inadvertent instrument meteorological conditions (IIMC), which resulted in three fatalities. It is suspected that the crew attempted to maintain visual flight rules (VFR) rather than executing one of three options: filing and executing an instrument flight rules (IFR) flight plan; modifying the route of flight to ensure VFR flight conditions; or landing the aircraft at a suitable area and waiting for improved weather.

IIMC-related accidents are deadly. The September 2002 issue of *Flightfax* ("Sometimes the Envelope Pushes Back") lists specific controls that individual aviators, IPs, and commanders can implement to mitigate this hazard. The U.S. Army Aeromedical Research Laboratory (USAARL) at Fort Rucker has developed spatial disorientation (SD) awareness training scenarios for VFR in the UH-60, AH-64, and CH-47 simulators. These scenarios replicate the conditions and events that have occurred in actual SD accidents. (Scenarios can be obtained from USAARL, DSN 558-6936, **http://www.usaarl.army.mil**.)

Risk management

In three of the UH-60 accidents, a deviation from the original plan occurred due to time constraints or weather, which resulted in procedural shortcuts. The individuals involved had good intentions—they were just trying to accomplish the mission. Mission changes are necessary and a daily fact of life; however, they must be risk managed. Realistic training requires a "crawl-walk-run" approach and thorough planning to prevent needless casualties and loss of equipment. ■

Editor's note: This review covers fiscal years 1998 through 2002 (as of 16 Sep 02).

—Charisse Lyle, Operations Research and Systems Analysis Division, DSN 558-2091 (334-255-2091), charisse.lyle@safetycenter.army.mil

Investigators' Forum

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

Been There, Done That

We've all heard this saying over and over again when someone brings up something we've already done. Unfortunately, when my phone rang one night in August, I had to say it as well. The phone call was part of the notification process that goes through the leadership of the Safety Center when a Class A or B accident occurs anywhere in the world. In this case, the "been there, done that" was another UH-60 NVG brownout accident.

The August accident was the third in a series of eerily similar Class A accidents involving UH-60s in desert conditions in a little over two years. Each accident involved a crew from a rotational unit. Each crew was comprised of a very experienced aviator, in two cases an instructor pilot, and a first-tour aviator. Each accident occurred while using night vision goggles. Each occurred when the crew failed to properly respond to the dusty conditions of the desert. Each resulted in a totally destroyed UH-60 and some very painful injuries. Fortunately, the crashworthiness of the UH-60 kept everyone involved alive.

A review of the three accidents revealed that though there were the similarities listed above, there were distinct differences between them. Additionally, these three accidents are representative of three trends we are seeing across the Army over the last two years: crew coordination failures, recency of training experience shortcomings, and lack of adherence to standards.

Accident #1

The PI had been flying for almost an hour doing dust landing qualifications. The highly experienced IP told him to take a break and decided to demonstrate a crosswind approach and takeoff. He executed the approach without any problems and began the takeoff with a stiff right crosswind. Several factors led him into a shallow left turn as he began the takeoff. This put the aircraft in a tailwind condition and the power applied was insufficient to continue a climb. The aircraft never cleared the dust cloud, struck the ground, bounced, rolled, and came to rest on its side. The IP and one of the crew chiefs were hospitalized for significant injuries.

Interviews revealed that the PI and both crew chiefs knew that the aircraft was in the shallow left turn, but none of them said anything to the IP. They all knew him very well and had complete faith in his flying ability. They assumed that the turn was intentional even though he had not announced it. This CREW COORDINATION FAILURE is commonly referred to as excessive professional courtesy. In this case, the PI and the two CEs trusted the IP to the point of allowing him to crash the aircraft. No one said a word as an unannounced left turn led to the accident.

"The PI and the two CEs trusted the IP to the point of allowing him to crash the aircraft."

Accident #2

The battalion SP and a PI were conducting sling load operations in the desert at night as part of reception, staging, onward movement, and integration (RSOI). Although the crew had not executed night sling loads during their home station training, the SP went out himself to execute the first iterations.

After having significant difficulties getting

over and hooking up the load, the crew prepared for takeoff. As they began the takeoff, they unintentionally began a turn into a crosswind condition. The power applied was not sufficient to clear the sling load and it struck the ground. This started a chain of events that led to complete destruction of the aircraft. As part of the crash sequence, the PI was ejected—seat and all—from the airframe and was discovered by rescue crew over 75 feet from where the seat left the fuselage. Once again, the crew was fortunate and everyone survived, though two crew members required extensive surgery.

In this case, the SP and his crew attempted a maneuver in which they HAD LIMITED RECENT EXPERIENCE in extremely difficult circumstances. The OPTEMPO of the unit at home station had not allowed for a thorough training program to prepare for executing night sling loads in the desert. Then during RSOI, because of an intense desire to accomplish all the missions during the rotation, the crew attempted to go from a "crawl to a run" in a very difficult environment.

"The PI was ejected—seat and all—from the airframe and was discovered by rescue crew over 75 feet from where the seat left the fuselage."

Accident #3

This accident, the one that caused the "been there, done that" response mentioned before, happened as the UH-60 crew was returning from a night downed aircraft recovery team (DART) mission. After dropping off the DART, the crew was headed back to the assembly area when they realized they needed to go through the FARP prior to shutting down. The PI was on the controls as they approached the FARP and executed an approach to a hover that overshot the intended landing point. The PC came on the controls and attempted to hover backwards in brownout conditions. He lost visual references and then attempted to fly out of the conditions. The aircraft struck the ground, rolled over, and eventually came to rest on its side. Once again, the crew was extremely lucky to have survived, though there were broken bones and a punctured lung among them.

"The crew attempted to hover in brownout conditions instead of executing a go-around when they overshot their intended landing point."

In this case, the crew FAILED TO ADHERE TO ESTABLISHED STANDARDS by not executing a go-around when they overshot their intended landing point. By attempting to hover in brownout conditions, they put themselves in a situation from which they could not recover. Hovering backwards just made it that much worse.

These accidents are unfortunate examples of what the Safety Center sees around the world. All three of these Black Hawk accidents happened within 20 miles of each other over a period of 26 months. One of the three problems mentioned before (improper crew coordination, inadequate recent experience, or failure to adhere to established standards) contributes to almost every human error accident we investigate. Each of these three areas requires command involvement and enforcement.

Commanders must ensure aircrews practice crew coordination routinely. They must also have a complete understanding of the capabilities and recency of experience of their crews, and be willing to turn down any mission for which the unit is not prepared. Lastly, enforcement of standards at every level is a responsibility that we all have, to not only prevent future accidents but to ensure we are ready to execute our primary mission of fighting our Nation's wars when called upon. ■

—USASC Aviation Systems and Accident Investigation Division, DSN 558-9552 (334-255-9552)

Avoiding Droop Stop Pounding in the Black Hawk

The UH-60 main rotor is equipped with droop stops and flap restrainers to prevent extremely high or low blade flapping at low rpm. As rotor speed is increased to approximately 70 to 75 percent rpm, the droop stops rotate from their "static" to their "dynamic" position. The audible knocking of droop stops during engagement or shutdown, as they are rotating between the static and dynamic position, is a good indicator to the pilot of droop stop pounding (DSP).

To avoid DSP during rotor run up or shutdown, the cyclic must be centered or displaced very slightly into the prevailing wind. The collective should be raised no more than one inch above full down and pedals centered. If possible, shutdown should be avoided until adjacent helicopters are at flat pitch.

DSP can also occur with the droop stops in their dynamic position, usually with excessive aft cyclic, low collective, and with all wheels on the ground. Although DSP can occur during rearward taxi (prohibited by the operator's manual) and downslope landings, the maneuver that is most likely to produce DSP is the roll-on landing. Aerodynamic braking with cyclic is permissible while the tail wheel is on the ground before main gear contact.

Once the main wheels contact the ground, the cyclic must be centered, collective lowered (center cyclic before lowering the collective), and brakes applied as required. (A complete description of the maneuver is given in TC 1-212.) Initiate all cyclic control input on the ground with sufficient collective input to maximize the effect of cyclic input, thereby minimizing cyclic displacement.

If a pilot attempts to slow the aircraft after main wheel contact by using extreme aft cyclic as he lowers collective, he will hear an audible 4/Rev knocking. This is the first indication of DSP. With more rear cyclic, severe DSP and contact with the ALQ-144 may result. Severe DSP can cause dynamic components to be stressed beyond design limits.

To avoid DSP during a roll-on landing:

- Keep speed in accordance with TC 1-212 (60 knots or below) before touchdown. Effect termination by making the tail wheel touchdown above effective translational lift (ETL), but below 60 knots ground speed.
- Be aware of the tip path plane—excessive aft cyclic will place the tip path unusually high in your field of view.
- After landing, neutralize (center) the cyclic before lowering the collective.

Excessive forward cyclic during taxiing can lead to DSP. If a pilot habitually places his tip path too low during ground taxi, he may encounter DSP during right turns because of the Black Hawk's longitudinal-to-yaw control mixing. A good rule for cyclic placement during ground operations is to keep the tip path plane about one hand-width below the top of the windscreen. ■

FOD—Find It!

We've all heard stories of surgeons leaving forceps or some other instrument enclosed in a patient's abdominal cavity following an operation. Well, if true, the medical profession is not the only party guilty of this practice. Here are some recent foreign object damage (FOD) incidents:

■ A 9/16-inch socket was found on a UH-60A aircraft during preflight in the vicinity of the intermediate gearbox. This caused a 100 percent FOD check to be completed on the tail pylon, main drive shaft area, and the hydraulic and engine decks prior to flying 2.0 NVG hours. The next day, the aircraft flew 1.8 hours on a day multi-ship mission. Upon completion of the mission, a 10-hour inspection was initiated. A breaker bar was found in the tail rotor drive shaft access compartment on a tail pylon support bracket. Damage was discovered to the right hand tail rotor cable guide, a hyloc rivet, and a doubler hole.

■ While performing a tail rotor radar alphanumeric display system (RADS) maintenance operational check (MOC) on a OH-58DR and with the aircraft at idle, the PC heard a faint noise followed by mild feedback in the flight controls. Ground personnel heard a loud noise, witnessed a decrease in tail rotor RPM, and the MOC was aborted. Post-flight inspection revealed that a can of dye-penetrate was inadvertently left under the tail rotor drive shaft after a tail boom nondestructive inspection. This caused an 8-inch section of the tail rotor drive shaft to shear. The aft section of the tail rotor drive shaft was replaced and the aircraft was released for flight.

■ During a landing approach, the crew felt a binding or ratcheting in cyclic. The OH-58DI aircraft landed and a normal shutdown was performed. Maintenance personnel found a piece of safety wire wedged in the uniball assembly. The wire was removed and the uniball inspected and checked. The aircraft was then released for flight.

■ While performing a HIT check on the #1 engine of a UH-60A during an MOC, the crew heard a low aerodynamic "hum," followed by a shudder in the aircraft, a loud "pop," and the aircraft lurched. The PC performed an emergency engine shutdown. The #1 engine Np reached 130 percent for 1 or 2 seconds prior to collective full down. The #1 engine was shutdown, followed by the #2 without further incident. Inspection revealed damage to the #1 engine, high speed shaft, L/H input module, and inlet guide vanes.

FOD has been and will continue to be a major player in aircraft damage. We must all take an active approach to limit the destruction which is caused by inadvertently leaving tools, nuts, bolts, safety wires, and other objects on or near our aircraft. The above instances point out the fact that we all must become FOD finders. We must perform those 100 percent FOD inspections when we perform maintenance actions in order to eliminate this type of damage. The moral is if you accidentally drop an object, whether it is a nut, bolt, tool, shop towel, or whatever, or if you can't locate an item you know you had with you while performing maintenance, FIND IT—before you button up the aircraft. ■

Before you button up the aircraft—

■ Ensure all tools, hardware, and other equipment are properly accounted for at the end of each maintenance operation (AR 385-95).

■ Require an entry on maintenance paperwork that a FOD check was conducted and tools are accounted for prior to releasing an aircraft after maintenance. (Someone other than the individual performing maintenance should sign off on the paperwork.)

■ Mark tools for ease of accountability (AR 385-95). Etch tools by toolbox number for quick and easy identification. Ensure duplicate toolbox numbers do not exist (AVIM and AVUM). Paint tools a bright color to aid in identifying tools left on an aircraft.

■ Conduct toolbox inventories.

TCAS Tragedy

Collision in Germany is the first of the TCAS era.

A recent commercial airline accident in southern Germany illustrates the need for Army fixed-wing pilots to closely adhere to correct procedures when replying to a Traffic Alert and Collision Avoidance System (TCAS) Resolution Advisory (RA).

On 1 July 2002, a Bashkirian Airlines Tupolev TU-154 collided mid-air with a DHL Boeing 757 near the town of Ueberlingen, Germany. Both airplanes were equipped with TCAS II equipment and operating at flight level (FL) 360 (36,000 feet).

The TU-154 had been instructed by ATC to descend to FL 350 for separation purposes, but did not respond to the first ATC transmission for some unknown reason. The controller reissued the descent clearance and the TU-154 began a descent. Simultaneously, the TCAS in the TU-154 issued a CLIMB advisory and the TCAS in the B-757 issued a DESCEND advisory (31 seconds prior to the collision). The crew of the B-757 correctly initiated a descent; the TU-154 crew ignored the TCAS advisory and continued to comply with the instructions issued by ATC. The aircraft collided in visual meteorological conditions (VMC) at FL 354. Both aircraft were destroyed with no survivors at approximately 2235 local time.

Air traffic control radar

To understand how this accident happened, let's look at the limitations of ATC radar. When a "loss of separation" between aircraft is likely to occur or has occurred, the ATC controller has to: detect the conflict using radar, assess the situation, develop a solution in a very short period of time, and communicate this solution to the aircrews as quickly and clearly as possible.

The ATC radar displays are usually provided with data by a radar data processing system (RDPS), whose inputs come from secondary surveillance radars (SSR) with an update or refresh rate (antenna sweep) of several seconds (4 to 10 on average and as high as 12 seconds). Altitude data is in 100-foot increments. Sudden vertical maneuvers may not be displayed immediately; altitude readouts may lag as much as 500 feet. The displayed vertical tendency may be erroneous in some cases.

Visual separation

You may wonder why the crews did not "see and avoid" each

TCAS test pattern on a C-12U cockpit display

other since the accident occurred in VMC. The visual assessment of traffic can be misleading especially at night and high altitudes.

■ At high altitude, it is difficult to assess the range and heading of traffic as well as its relative height.

■ At low altitude, the attitude of a heavy aircraft at low speed makes it difficult to determine whether it is climbing or descending.

■ Nighttime vision is prone to many illusions and the presence of the night blind spot makes target and traffic acquisition difficult.

■ Two aircraft can be in relative positions that make visual contact highly improbable.

■ Visual acquisition does not provide any information about the intent of the other traffic.

■ The traffic in visual contact may not be the threat that triggers the RA. A maneuver relative to the wrong visual traffic may degrade the situation against the real threat.

The crew of the B-757 correctly initiated a descent; the TU-154 crew ignored the TCAS advisory and continued to comply with the instructions issued by ATC. The aircraft collided in visual meteorological conditions (VMC) at FL 354. Both aircraft were destroyed with no survivors.

TCAS advantages

■ Interrogates the transponders of other aircraft twice per second, computes the bearing and altitude of the other aircraft, displays their location and relative altitude on the TCAS display in the cockpit, and provides aircrews with commands to avoid other Mode C transponder equipped aircraft.

■ De-conflicts multiple threat targets simultaneously. Typical TCAS systems track up to 150 intruders and will display 30 with the highest threat potential.

■ TCAS mode S transponders communicate with each other to mutually coordinate evasive actions.

■ Inhibits descent maneuvers when close to the surface to prevent controlled flight into terrain (CFIT) related to a TCAS RA.

TCAS cannot correct the situation when aircrews ignore advisories or perform maneuvers contrary to TCAS instructions. A delay in responding to the TCAS advisory causes the required evasive maneuver rate to increase.

U.S. Army procedures

The U.S. Army operating procedures in the fixed-wing ATMs and approved supplements clearly make TCAS RAs higher priority than ATC clearances or instructions. When there is an apparent conflict between the two, respond to the TCAS RA. Federal Aviation Administration (FAA) procedures in Advisory Circular (AC) 120-55A state: "For TCAS to work as designed, immediate and correct crew response to TCAS advisories is essential. Delayed crew response or reluctance of a flightcrew to adjust the aircraft's flightpath as advised by TCAS due to ATC clearance provisions, fear of later FAA scrutiny, or other factors could significantly decrease or negate the protection afforded by TCAS. …Even if a TCAS RA maneuver is inconsistent with the current clearance, respond appropriately to the RA."

Fixed-wing aircrew members are reminded that Army TCAS operating procedures mandate that:

■ Crewmembers are authorized to deviate from an ATC clearance and will do so in order to correctly respond to an RA. Crewmembers will utilize the TCAS as the primary means of collision avoidance.

■ When IMC, flight crews will respond to an RA, and report to ATC as soon as workload permits with "Call Sign, TCAS Climb/ Descent."

■ When VMC, flight crews are authorized to disregard an RA if, and only if, both crewmembers have absolutely identified, beyond any doubt, the traffic which caused the RA. If either crewmember has any doubt, then respond to the RA.

No one thing causes an accident; it is always a chain of events. If any one of the links in the chain is broken, the accident is avoided. In the absence of other information, it appears that if the TU-154 crew had followed their TCAS advisory instead of the ATC clearance, the accident would have been averted. ■

—CW4 Rick Williams, DES Fixed-Wing Branch, DSN 558-2453 (334-255-2453); richard.williams@rucker.army.mil

Internet Survey Results:

Apache Pilots Talk About HMD Issues

In a previous issue of Flightfax, the U.S. Army Aeromedical Research Laboratory (USAARL) asked Apache pilots to fill out an Internet survey that asked about their experience with the AH-64 Apache's helmet-mounted display (HMD), known as the Integrated Helmet and Display Sighting System (IHADSS). A total of 216 aviators responded to the survey. The survey primarily addressed HMD-related visual problems and helmet fit, which is critical in HMD use.

The IHADSS is a monocular HMD design that presents forward-looking infrared (FLIR) imagery and symbology to the right eye only. There has always been concern that this design could cause some visual performance problems related to eye dominance and binocular rivalry. Of the 216 pilots responding to the survey, 84.3 percent reported preferring their right eye (right eye dominant). When asked if their better (preferred) eye is the same as it was prior to AH-64 experience, 63.4 percent felt there had been no change, but over one-third (35.6%) felt the vision in their preferred eye had changed.

When the IHADSS is in use, the right eye views the HMD imagery and the left eye views the outside world. In the survey, most pilots (74.5%) reported no problem in alternating between their two eyes during flight. Almost half (44.9%) have developed methods to assist in switching their visual inputs when required. However, 64.4 percent reported that during flight, their visual input sometimes unintentionally alternates between the two eyes.

Prolonged flight with HMDs, coupled with the unique characteristics of the monocular IHADSS, can result in increased visual workload. This can show up as visual discomfort, headaches, blurred or double vision, or afterimages. These symptoms can occur both during and after flight. In addition, static and dynamic illusions, such as poor distance estimation and perception of false motion, also can occur.

The most common visual symptom reported during flight was visual discomfort (81.5%), followed by headache (60.6%). The most common complaint reported after flight was also visual discomfort (74.1%), followed by headache (62.5%). The most frequently reported degraded visual cue was decreased resolution (90.3%), and 84.7 percent reported experiencing impaired depth perception. Of the static and dynamic illusions reported, 80.1 percent reported faulty slope estimation, and 78.2 percent reported undetected drift.

The critical crew action to avoid these anomalies is to ensure they have a properly-fitted helmet. Helmet fit is critical to the pilot's ability to effectively use the IHADSS. When asked about satisfaction with their current IHADSS fit, 68.1 percent reported being somewhat or completely satisfied with their helmet fit, while 17.1 percent were either somewhat or completely dissatisfied with their current fit.

What to do

If you or a fellow crewmember in your unit has a helmet-fitting problem, see your ALSE technician or flight surgeon. If problems cannot be corrected locally, contact USAARL for a referral or further evaluation. ■

Editor's note: The full USAARL Report No. 2002-02 can be viewed in the Technical Reports section at **http://www.usaarl.army.mil**.

—Clarence E. Rash, Research Physicist, U.S. Army Aeromedical Research Laboratory (USAARL), DSN 558-6814 (334-255-6814), clarence.rash@se.amedd.army.mil

Reported Visual Symptons

	During Flight			After Flight		
	Never	Sometimes	Always	Never	Sometimes	Always
Visual discomfort	18.5	76.4	5.1	25.5	66.2	7.9
Headache	38.9	59.7	0.9	36.1	61.1	1.4
Double vision	93.5	6.0	0.5	93.1	4.6	0.5
Blurred vision	66.2	33.3	0.5	63.0	36.6	0.5
Disorientation	57.4	42.1	0.0	88.4	9.7	0.0
Afterimages	70.4	27.3	1.9	51.9	41.7	5.1

USASC Announces New Interactive Feature

A new feature is now available for searching words or phrases in the Army Safety Management Information System (ASMIS) accident database. This capability utilizes several search techniques within the database description/narrative fields. The narrative fields for ground reports include the sequence of events, tasks and errors, corrective action, materiel failure, and environmental text. The narrative fields for aviation reports include the synopsis, summary, analysis, findings, and recommendations text.

To access the search option, simply go to the Risk Management Information System (RMIS) web page, **(http://rmis.safety.mil)** and enter your RMIS user ID and password. If you do not have an account, you can apply for one with the "Request ID" button.

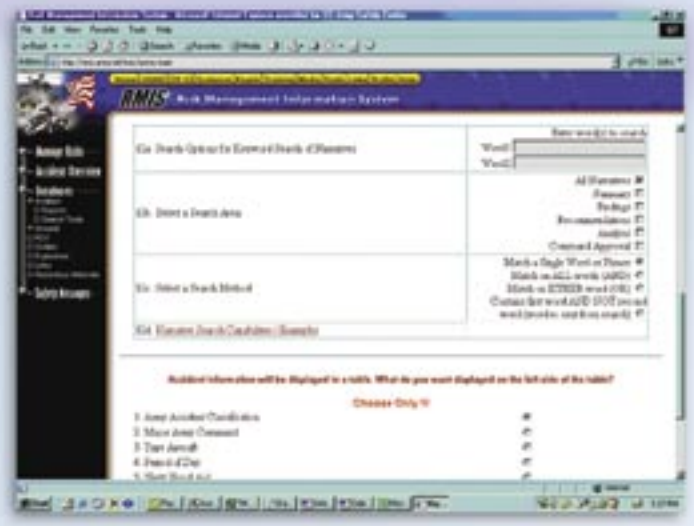
Once you are on the RMIS main web page, click on the "Databases" field on the left side. Next, select "Aviation" or "Ground" on the list, and then click on "Search Tools."

The "Search Tools" option allows you to search either a parameterized-type query or a broad word search on all accident records. The first screen of the "Search Tools" selection displays the query options that are available. Default options are shown for each question and can easily be changed by selecting a different item from each drop-down box. By carefully choosing the answers to define your search, you can improve the response time of your query and obtain better results.

The last question shows the word search capability and the bottom half of the query screen shows the display options for your result.

You can enter a word or phrase in the first box, or you can enter two separate words in each box that describe what you are looking for. The database provides a variety of query types with unique capabilities for effective text retrieval. For example, the phrase "power management" matches the narrative text that contains both words together. Also, the last section of the search question includes a help feature with examples. After you have made your selections, click on "Retrieve Information" at the bottom of your screen.

This database search engine is not case sensitive; for example, you can enter "tank," "Tank," or "TANK." You also can use wildcard matches, such as the "%" sign. In addition, the system can normalize known misspellings and uses word derivations such as "destroy," "destroys," or "destroying." The third part of the search question allows for compound or Boolean-type queries such as "and," "or," or "not" ; e.g., "rollover" and "roll over" using the "OR" query for either of these two words to be found in the narrative text.



The second part of the query question allows you to select what type of narrative to use for the search; the default is "All Narratives." You can select more than one type of narrative when not selecting "All Narratives." Be aware that if you select all narratives, the result time may be quite long. Additionally, the query may return a case where the text was found in one type of narrative (i.e., analysis) and the narrative type is not currently displayed on the web report form on the screen. Future improved web accident forms will include more blocks and narratives from all of the various accident reports. The groups of records returned from the search are then displayed on the next page in a matrix format based on the options you selected on the previous screen. You can subsequently narrow down to specific accident records of interest by selecting the number in the matrix box for "Accident Count."

The next screen displays the case number and a short description of the accident. The text search occurs on the database narrative fields, not on the short description displayed or the actual blocks on the accident forms. Once you click on the case number, the actual accident report case will be displayed. You can search the screen display with the Windows Explorer "find" tool to look for the word or phrases you searched on. You can also save the file to your local computer or print out the report.

We are always looking for new ways to deliver accident data in a well-designed format that reflects the breadth and depth of the ASMIS database. We welcome your feedback. If you have any questions or need assistance, please call our Help Desk at (334) 255-1390 or send e-mail to helpdesk@safetycenter.army.mil.

—LTC Mike Reed, Director, Support Directorate, U.S. Army Safety Center, DSN 558-9280, (334-255-9280), mike.reed@safetycenter.army.mil

POV

Accident Prevention: Changing Attitudes and Behavior

The majority of Army fatalities still result from privately owned vehicle (POV) accidents. Our Army's senior leadership has repeatedly challenged all of us to redouble our efforts and get our arms around this needless drain on readiness. Across the Army, we've made valiant attempts with good success in some units. But, overall, we've all found that this has proven to be a difficult mission to accomplish.

Of the 206 total Army fatalities in FY02, 113 were the result of POV accidents. This figure represents an unacceptable 14-percent increase above the 99 POV fatalities recorded in FY01. Causal factors continue to include aggressive driving, speed, fatigue, and failure to wear seatbelts.

The biggest increase in fatalities is attributed to motorcycle accidents—a 54-percent increase over last year. Motorcycle-specific accident causes include aggressive driving, speed, alcohol, and failure to wear a helmet. A major contributing factor is that many of these soldiers did not attend the Motorcycle Safety Course. As leaders, it is incumbent upon us to mandate that any soldier riding a motorcycle complete this course BEFORE they operate a motorcycle.

Although the Army's traffic fatality rate is about 20 percent less than the Nation's, past POV accident analysis shows that the Army's accident experience closely mirrors the Nation's when it comes to age, gender, and types of accidents. For example, Army male drivers under the age of 25 are the most likely age group to become involved in fatal accidents because they often tend to underestimate the hazards and overestimate their personal abilities. It's that "I'm young, I'm invincible, I'll live forever" mentality. Sadly, young soldiers often are not as invincible as they think they are.

The big difference between the Army and the general public, of course, is that we, as Army leaders, can exert more control over soldier behavior.

We owe it to our soldiers to work diligently to change their attitudes and behaviors regarding POV safety, and the individual in the best position to effect that change is the squad leader.

The squad leader knows which soldiers are out late at night, which soldiers are always rushing, and what kind of cars they drive. The squad leader also knows that those soldiers are taking risks. He or she has to get in the head of that soldier and intervene.

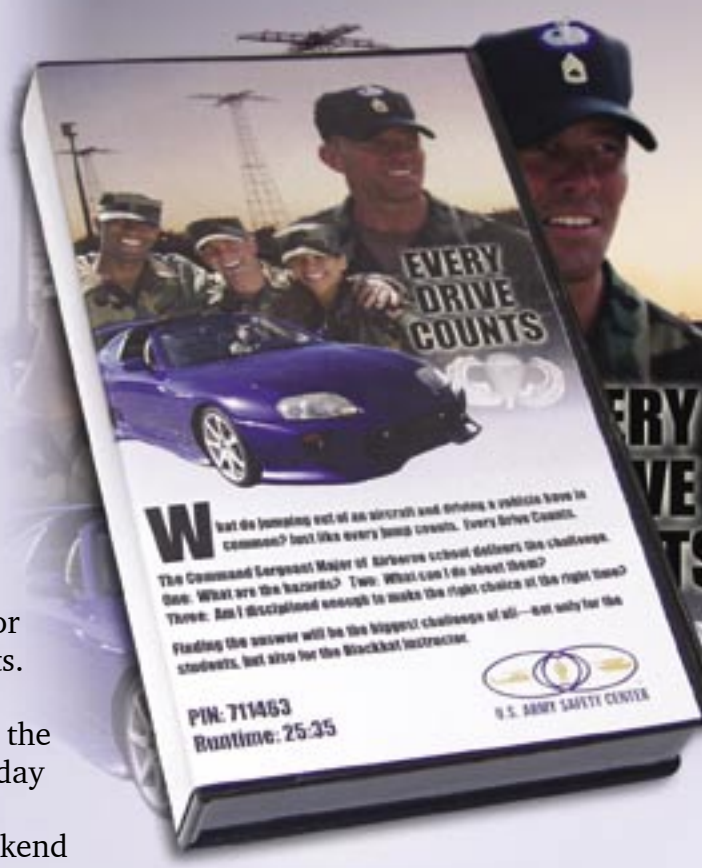
Attitude and behavior will not be changed with unit safety briefings alone. Policies may state that safety briefings are mandatory, but that doesn't change behavior. At safety briefings, soldiers may not be paying attention. Sometimes they are thinking about other things. Changing attitudes and behavior will happen only through education, training, and intervention.

There are a lot of intervention measures that leaders can use in units. One example: when bringing soldiers in from the field, clean up the equipment and hold soldiers overnight before releasing them. Soldiers are tired from stress and little sleep while in the field. As a commander, you can hold the unit for a rest and recovery period so that your soldiers won't be fatigued when hitting the highways. It may not make the soldiers happy, but it could prevent an accident.

It isn't just fatigue from a long week in the field that is a major cause of POV accidents. Another is soldiers rushing to get back to the PT formation on Monday morning. They often depart from their weekend destination late on Sunday night or in the early morning hours on Monday. Focused on getting back in time, they sometimes push it a little too hard and end up killing themselves at 0200 or 0300. The squad leader should know which of his or her soldiers will do this and has a moral responsibility to help change these soldiers' behavior.

The biggest increase in fatalities is attributed to motorcycle accidents—a 54-percent increase over last year. Motorcycle-specific accident causes include aggressive driving, speed, alcohol, and failure to wear a helmet.

"Every Drive Counts" is a new video that links the macho event of jumping out of aircraft and driving a vehicle. The central message is that just like every jump counts, every drive counts. Produced by the Army Safety Center, in conjunction with the Airborne School, this additional intervention tool is available now at installation safety offices and local training service centers.



In the Army team, trust is critical. We, as leaders, have to build trust with soldiers; but communication in the form of lip service will not cut it. Soldiers quickly discern the leaders who truly care. Using intervention techniques such as holding the unit accountable may not make you a popular commander, but that is acceptable as long as you are respected as a commander. We must never forget that soldiers will judge us not by our words, but by what we do. Sometimes tough love is necessary, but it is well worth your being a bit unpopular if it saves a life.

—BG James E. Simmons, Director of Army Safety

ASOcorner

Aviation Safety Officer Training

The Army Safety Center is responsible for training aviation safety officers for worldwide deployment and utilization. There are three safety programs offered for resident training. The first is the six-week Aviation Safety Officer (ASO) Course. The second is a two-week program preceded by a correspondence Phase I course. The third is a one-week ASO Update Course. The two and six-week courses are Military Occupational Specialty (MOS) producing for warrant officers and Additional Skill Identifier (ASI) producing for officers.

The six-week ASO Course (7K-F12) offers the most comprehensive training and is the most challenging. Two events are unique to this course. The first is an aviation accident prevention survey (AAPS) conducted at various locations nationwide. The AAPS consists of one week of on-site training to conduct surveys, write findings and recommendations, and prepare an out-brief for the participating unit. The survey is extremely beneficial for both the students and the unit. Students develop the skills and techniques to identify hazards in the workplace, and the unit receives a free look at their day-to-day operations and safety program. It is a positive experience for all concerned.

The second unique event for the ASO Course is the 9D5 Underwater Egress (Dunker) training. Classes are normally taken to Pensacola Naval Air Station (NAS), FL, for instruction. The swim tests are conducted in flight uniforms, boots, survival vests, and helmets. Successful candidates are then allowed to participate in the dunker qualification phase.

The experience of dunker training is not only for the benefit of the individual. In fact, the primary objective of dunker training is to provide each ASO with an experience base with which to use when advising his commander on the value and importance of overwater survival and underwater egress training. The training cannot be simulated. ASOs must experience first hand the lifesaving value and confidence building provided by the training. The ASO leaves the Army Safety Center not only better prepared for his own survival, but more capable of providing sound risk management advice to his commander.

How to apply

If you're interested in attending the ASO Course, submit a DA Form 4187 through your Personnel Administrative Center (PAC). Course information is contained in DA PAM 351-4, *U.S. Army Formal School Catalog*. You must be projected to go into an ASO position or currently serve in an ASO slot to attend the course. Course quotas are set by Department of the Army strength requirements and filled by PERSCOM, NGB, USARC, and IMSO. To attend the Phase II ASO Correspondence Course, you must first complete the Phase I ASO Correspondence Course IAW DA PAM 351-20, *Army Correspondence Course Program Catalog*.

For more information, contact CW4 "D" Smith, Director, Aviation Safety Officer Course, DSN 558-2376 (334-255-2376), smithd@safetycenter.army.mil.

FY03 ASO Training Schedule		
ASO Course # 7K-F12		
03-001	7 Oct - 15 Nov 02	
03-002	6 Jan - 14 Feb 03	
03-003	24 Feb - 4 Apr 03	
03-004	14 Apr - 23 May 03	
03-005	14 Jul - 22 Aug 03	
ASO Update Course #7K-F21		
03-001	2 - 6 Dec 02	
03-002	2 - 6 Jun 03	
03-003	9 - 13 Jun 03	
03-004	8 - 12 Sep 03	
ASO Course # 7K-F18		
03-01	15 – 27 Jun	WAATS / SC961
03-02	17 – 29 Aug	EAATS / SC960

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A model

■ **Class B:** During aggressive maneuvering to evade training surface-to-air radar, the pilot inadvertently allowed the main rotor blades (MRBs) to contact PNVS. As a result, two MRBs were damaged and a major portion of PNVS sheared off. Acft landed without further incident.

■ **Class C (Injury):** While positioning for hot refuel, a fuel handler sustained an injury when the right main landing gear tire of the aircraft contacted his right foot, subsequently resulting in a sprain and a chipped bone with anticipated lost time from duty.

CH-47

D model

■ **Class A (Damage):** Acft experienced brown-out conditions on touch-down to LZ and landed hard. Front landing gear collapsed and upon emergency shutdown, front rotor blades contacted the fuselage.

MH-47

E model

■ **Class A (Damage):** While conducting a training flight with the aircraft turning from base leg of the traffic pattern to final, the crew smelled a strange odor. The cabin began to fill with smoke and the crew declared an emergency. Landing was to the taxi-way and the attempts were made by the crew to extinguish the fire with handheld fire extinguishers. Ground firefighting equipment arrived three minutes after landing and extin-guished fire. Fire origi-nated in the rotor brake area.

■ **Class A:** While taxi-ing into a FARP, the main rotor blades of the chalk two aircraft struck the aft rotor blades of the chalk one aircraft that was stationary and refu-eling at the time.

MH-60

L model

■ **Class C:** During post flight following desert landing, crew noted damage to MRBs. Blades are suspected to have contacted ALQ-144.

■ **Class E:** During post flight following desert operations, crew noted damage to MRBs. Blades are suspected to have contacted ALQ.

OH-58

DR model

■ **Class C:** Acft expe-rienced engine torque reading of 132% (for 1 second) and landed hard following simulated engine failure at altitude. Minor damage to landing gear; engine replace-ment required.

■ **Class C (Flight):** Flight of two was con-ducting NVG operations vicinity enter/exit point of terrain flight train-ing area when chalk #2 noticed that they were in the wrong ravine. Chalk #2 began to scan the ridgelines when he detected power line poles. As he began to transmit this info to the lead aircraft, Chalk #1 struck three power lines. Acft landed without fur-ther incident. Damage includes a scratched windscreen and a voided MRB.

■ **Class C:** While the crew was conduct-ing a FADEC operation, an engine overspeed occurred, resulting in rotor RPM reach-ing 124% and turbine 126%.

TH-67

■ **Class C:** While per-forming a standard autorotation, the student pilot pulled initial pitch too high and the aircraft touched down with low rotor RPM. Afct sus-tained damage to the isolation mount, K-flex coupling, swashplate, and transmission cowl-ing.

UH-60

A model

■ **Class C:** Aircraft completed its landing to a stage field upon which its tail wheel strut failed.

■ **Class C:** Acft landed hard from a 10-ft hover. UNS antenna and searchlight punctured the belly of the acft, resulting in subsequent sheet metal damage; main landing gear WSPS damaged.

■ **Class C (Flight):** On takeoff, crew heard a loud bang in the #2 engine. Cockpit indica-tions were #2 engine out light, #2 engine low RPM, and low rotor RPM. Pilots performed roll-on landing and emergency shutdown. Engine is being sent to CCAD-AID for teardown.

■ **Class C:** Acft hover taxied to runway for hit-check and noticed fluctuating engine oil pressure in ENG #1. Acft returned to ramp. On ramp, engine oil pressure went to zero. Emergency shutdown performed. Post flight inspection revealed engine oil filler cap miss-ing. Engine removed and will be shipped to AVCRAD for overhaul.

Note: For more information on selected accident briefs, call DSN 558-9552 (334-255-9552). Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

COMING SOON TO A POST NEAR YOU!

Check below to see when the United States Army Safety Center Mobile Training Team will present the Risk Management Course at your facility.

LOCATION	DATES
2ND INFANTRY DIVISION – KOREA	16-20 DECEMBER
FORT KNOX, KY	6-10 JANUARY
FORT CARSON, CO	6-10 JANUARY
FORT HOOD, TX	6-10 JANUARY
FORT DRUM, NY	27-31 JANUARY
FORT DIX, NJ	23-28 FEBRUARY
SCHOFIELD BARRACKS, HAWAII	24-28 FEBRUARY
FORT BLISS, TX	10-14 MARCH
CAMP PARKS, CA	10-14 MARCH
FORT LEONARD WOOD, MO	24-28 MARCH
CAMP CASEY, KOREA	7-11 APRIL
FORT WAINWRIGHT, ALASKA	21-25 APRIL
FORT RICHARDSON, ALASAKA	28 APRIL – 2 MAY

If you don't see your facility represented here, call your Installation Safety Office and ask them to schedule a training visit at your installation.

For more information on the Risk Management Course or any of our other safety courses, please contact:

SFC Patricia Stoker
DSN 558-9854 (334-255-9854)
patricia.stoker@safetycenter.army.mil

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

DECEMBER 2002 ✦ VOL 30 ✦ NO 12

FY02 Aviation Safety Performance Review

Plus: 2002 Flightfax Index

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

Gearing Up Again—Safely

For many of us, the holidays are once again warm memories of celebrations with family and friends. For those of you deployed around the world, I trust you felt our gratitude for the tremendous sacrifices you and your families make every day for our country.

I'm confident that we all are refreshed, re-energized, and eager to kick off the New Year. But a word of caution is in order as operations at our training bases and in our theaters of operation get back into full swing. Environmental conditions—brownout and this season's snow and ice—can complicate even routine operations and missions. Last year, we had one Class A aviation accident with 16 injuries and three on-duty Class A ground accidents with two military fatalities and one civilian fatality during the month of January.

The aviation accident occurred during an NVG, multi-ship, terrain-flight approach to a known dusty landing strip. The CH-47D landed on its aft landing gear as a dust cloud enveloped the aircraft. As the forward landing gear made ground contact, the aircraft rolled into an irrigation ditch. As a result, the aircraft rolled right and the nose pitched down, causing the rotor systems to contact the ground. Fortunately there were no fatalities, but 16 personnel were injured and the aircraft was destroyed.

On the ground side, a tank commander was pinned and sustained fatal injuries when his armored combat vehicle overturned while en route back to a cantonment area. The second Army fatality occurred when a National Guard Bureau soldier driving his POV home from duty following annual training was struck by a POV driven by a civilian who had fallen asleep at the wheel. In the third on-duty ground accident, the driver of a 5-ton Army motor vehicle was making a U-turn and struck a POV. The civilian driver received fatal injuries.

As we gear back up to full speed, I ask that each of you watch the hazards. They are present in our theaters of operation, they are present on the highways in our POVs, and they are present during each of our training events. If your risk management skills got a little rusty during the break, get your mindset back on those five simple steps it takes to effectively manage risks in whatever situation you are operating.

Accidents and injuries are preventable if each of us makes a concerted effort to identify and control hazards in even our most routine tasks. Conditions are constantly changing, and we must always be mindful that as those conditions change, new hazards come up. Stay alert and stay focused. We can reduce those four Class A on-duty accidents and three fatalities to zero this January.

Train hard and play hard, but be safe!

James E. Simmons

FY02 Aviation Safety Performance Review

Aviation safety suffered a setback in FY02. Accident rates, total losses, and fatalities all were on the increase. In FY02, Army Aviation experienced a 16-percent increase in Class A-C accidents over FY01. The change was primarily due to the upsurge in Class A accidents. The number of Class A accidents almost tripled from FY01 and was almost double the 3-year average. These accidents resulted in 17 Army fatalities, an increase of 6 over FY01.

In this article, we discuss recent centralized accident investigations conducted by the U.S. Army Safety Center and emphasize problem areas that must be addressed if we are to reverse this upward trend.

Analysis of FY02 Class A aviation accidents reveals that there is a chain of events leading to an accident. The events often began with a breakdown in leadership, standards, or discipline. This, coupled with lack of experience and continuous deployments, contributed to Army Aviation's worst Class A accident rate since Desert Shield/Desert Storm. Some of us wearing wings are not executing fundamental tasks, those taught to us in flight school, to standard.

Flight profile

The typical Class A flight accident occurred at night or was a single-ship mission. Generally, it was experienced pilots having these accidents. An instructor pilot (IP) was part of the crew in 22 percent of the cases. The IPs involved had an average of 2,669 total hours with 792 in type. The average pilot in command (PC) had 1,421 total hours with 771 in type, and the average pilot (PI) had 997 total hours with 354 in type.

Airframes

The AH-64 experienced the greatest accident rate increase, with nine Class A accidents (see pie chart) and four fatalities versus no accidents or fatalities in FY01. The MH/CH-47 community experienced seven Class A accidents and eight fatalities versus zero in FY01. Over one-third (35 percent) of the FY02 Class A flight accidents occurred in AH-64 aircraft (6.99), closely followed by the CH-47D (6.78), MH-47 (5.91), and OH-58D (5.46).

Events

Collision with the ground accounted for 36 percent of all FY02 Class A flight accidents. The AH-64A accidents in Afghanistan and at Fort Carson both were the result of improper power management—the power required was greater than power available. Brownouts or whiteouts accounted for 24 percent of FY02 Class A flight accidents. The UH-60 accidents in Wyoming and at the National Training Center (NTC) are two examples of encountering brownout or whiteout conditions and subsequent failure to execute the appropriate aircrew training manual (ATM) procedure. Tree or wire strikes accounted for 16 percent of the Class A flight accidents. In addition, there were two accidents (8 percent) in Korea in which the crew unsuccessfully responded to inadvertent instrument meteorological conditions (IIMC).

Indicators of indiscipline

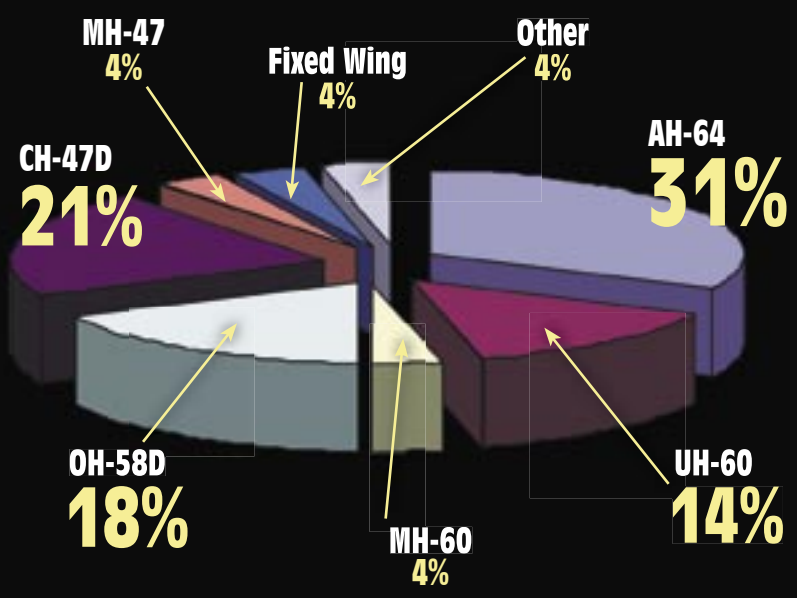
Human error caused the majority of the accidents. Systemic sources of this error can often be attributed to individual, crew, and leader indiscipline.

There are many examples of individual indiscipline in the planning, preparation, and execution phases of operations. Some examples of indiscipline during the planning and preparation

phases include IPs or PCs flying without the required performance planning, flying with incomplete or invalid weather briefings, and complacency in route planning. Additionally, failure to pre-flight and run-up using the appropriate checklist resulted in at least one, possibly two, OH-58D accidents due to the cyclic being locked out, killing two aviators and destroying two aircraft.

The following are examples of indiscipline during the execution phase: unauthorized deviations from the mission brief and failure to operate the aircraft in accordance with published standards; e.g., failure to execute a go-around when encountering whiteout or brownout conditions caused two UH-60 Class A accidents, destroying both aircraft. Failure to commit to IMC when continued VMC flight is no longer possible has resulted in one, possibly two, AH-64 accidents, killing two pilots and destroying both aircraft.

FY02 Class A Aviation Accidents
(flight, flight-related & aircraft-ground)



Crew indiscipline spans all phases of flight operations. In the planning and preparation phases, crews failed to perform table talk or to rehearse single-ship missions. In one class A accident, had the aircrew talked through the performance planning and compared it to the mission profile, they would have realized they were too heavy to accomplish their intended objectives. As a result, the aircraft was destroyed.

Crew indiscipline during execution has been demonstrated by crew members not holding each other accountable; e.g., pilots performing aggressive maneuvers not required for the mission profile and other crewmembers not challenging the pilot's actions. This form of indiscipline resulted in at least two destroyed aircraft.

Examples of undisciplined crew coordination include the improper transfer of controls of a flightworthy AH-64. The aircraft descended into the trees and crashed when each pilot assumed the other had the controls. A second example is a pilot failing to react to his crew chief's warning of aircraft drift. The UH-60 was destroyed when it struck a tree, the only obstacle in the landing zone.

Leaders must set and enforce standards. A breakdown in these aspects of leadership was evident in several FY02 accidents. In one specific accident a unit commander, who was also a PI, did not have an up-slip, nor did his crew fill out a risk management worksheet. In another single-ship accident, the unit commander was the mission briefer and he failed to conduct the required mission briefing. Instead, he simply initialed the flight log without ensuring the crew had conducted the required pre-mission planning. This commander was not aware of the flight route or intended landing zones (LZs). Had he required a back-brief, he could have identified his aircrew's lack of performance planning. Instead, the mission was flown with insufficient power, resulting in one destroyed aircraft.

Conclusion

Human error (pilot, crew, and leader) continues to be the number one cause of Army Aviation accidents. Indiscipline is a major factor in these accidents. Soldiers are dying and we are destroying expensive aircraft and equipment. Leaders, formal and informal, who understand and accept responsibility can help solve this Armywide problem. Effective leaders must ensure soldiers know the standards and enforce these standards, thereby improving aviation safety performance. If you are looking for a leader in your unit to make this happen, start by looking in the mirror. This will be your contribution to Army Aviation safety. ■

Editor's note: Statistics are current as of 5 December 2002.

—Operations and Training Directorates, U.S. Army Safety Center, DSN 558-1496 (334-255-1496)

Bird Strike Season

As summer left and the winter season began, so began the birds to make their way south, increasing the number of fowl in the air by thousands. As this photo shows from a recent strike in Wiesbaden, GE, the damage of one of those migratory Messerschmidts can be significant, to say nothing about if one comes through the windshield.

One of our own experienced a multiple bird strike during a night approach to their home airfield. Though damage resulted in costs of several thousand dollars, it could have been much worse. It could have been ingested into the engine (difficult, but not impossible), or lodged in the gear, or struck a flap, or any number of other scenarios.

Pilots have been seriously injured by birds of all sizes, and thousands of dollars in damages occur every year. I've hit three birds in my career without any damage: one in a helicopter, one in a single-engine airplane, and one in a twin-engine airplane.

In the first two, I had no warnings about "fowled" air hazards, but in the last one we did. Several other aircraft had taken off before me with no reports of strikes, so we tried our luck...without luck. When it hit, the sound made our hearts thump, stomachs quiver, and I'm not sure what other bodily functions may have gone awry, but suffice it to say that "fowl air" wasn't only outside! Fortunately, it had only bounced off the top of the cockpit windshield and after a maintenance tech cleared us, we continued the mission. ■

—CW5 R. Keith Lane, Brigade Safety Officer, HQ, 244th Avn Bde, Fort Sheridan, IL, 847-266-4423. CW5 Lane is the editor of the 244th Avn Bde Hawk Talk.

(Photo courtesy of CW4 Robert D. Petty, ASO, B Company, 1st MI BN, APO AE 09096.

WAR Stories

Risk management lessons learned

Freezing Rain

In 1986, I was flying for the U.S. Army in Montana. We had been in Helena for over 2 weeks doing Special Ops work. I was assigned the task of inserting a team at an Air Base to the north and then returning to Helena.

We checked the weather, and the flight would have clear skies and cold temperatures en route and scattered clouds with some light snow on the way home. It should be visual flight rules (VFR) all the way.

The weather en route was perfect; but on the way back to Helena, clouds closed in and snow started getting real bad. We had a UH-60 and all icing equipment was working. After trying to get to the nearest airport or landing site, we contacted Flight Service and filed an en route IFR flight plan home.

Now this is where the best laid plans fall apart. The weather checked out to be good: no icing and the snow level would be below our flight path—we looked at all the options. We called and received our IFR clearance and climbed to altitude. Clear at flight level and smooth air. Cold as all get-out, our crew in the back was freezing, but it looked like the flight home would be a safe one.

As you know, Murphy will strike at any time. About 25 miles short of Helena, clouds closed in, all anti-ice was on and working—rotor, pitot heat, tail rotor system. And then we ran smack into freezing rain! Where did this come from? No one had predicted this.

The aircraft started to collect ice. We tried climbing up. No help. Going lower in the mountains was out of the question. The weather was bad! No other route to go on, so we tried to get there as fast as possible.

Systems were working great, but visibility was limited through the windows. Power was starting to climb, so we knew the ice was building up on the aircraft.

To make a long story short, we made an IFR approach and landing. Tower told us to stay on the runway because we were throwing ice all over the place. I thought my heart would stop, and then my crew chief slapped me on the shoulder with a piece of ice that must have been 2 inches around and 1½ feet long. That came off the homing antenna!

I don't know what we could have done differently, except land when the snow was mentioned, but I don't think we could have explained that when another bird made it home before the unexplained freezing rain started. If it had been any other helicopter except the UH-60 with anti-icing systems, I would not be here to talk about it. Also, our maintenance officer (who we all thought was nuts for requiring the systems to work) made us check them all the time and then spent untold hours fixing them. We would have lost a ship and the crew if not for him. Needless to say, he earned my respect and I will always remember him for being the pain in the rear that saved us. ■

—Courtesy of HELIPROPS Newsletter and the author, James Szymanski (JSzymanski @bellhelicopter.textron.com)

Watching My Girls Grow Up

The story I am about to tell is much the same as any other that one would expect to see in a safety publication. The typical "it was just like any other day" line would apply to this story, except for one thing—this time, it involved me.

I am a company Aviation Safety Officer (ASO), and I address motorcycle safety in each month's safety meetings. This past summer I coordinated a Motorcycle Safety Foundation class, which was taught exclusively for our unit personnel. We were all taking the correct steps to ride our motorcycles safely. Throughout the course, the instructor mentioned the "other guy" as a hazard we would face. As it turns out, it was the other guy that found me one fateful night. I just didn't know it.

At work that day, the mission was an end-of-stage evaluation for two pilots completing their readiness level progression in the company. Just like any other day, we executed the flight debrief following the mission. We then sat around for several hours explaining to our two newest pilots what life would be like in their day-to-day duties. After that, just like any other day, I hopped on my motorcycle and headed home. As I neared my neighborhood, I slowed, signaled, and turned left...just like any other day. The events that followed would forever alter my life and the lives of those around me.

About 30 minutes after I left work, my wife received a phone call informing her that I had suffered a serious injury in an accident just six houses from home. When she arrived at the scene, my injuries were too grotesque for her to look at. When she asked me what happened, I simply did not know. To this day, I still have difficulty recalling what happened, although I am starting to remember bits and pieces. What I have learned of the nights' events, I hope others will learn from.

The car behind me had decided to cross the double-yellow line on this two-lane road in order to pass me just as I turned left. The right front of the other guy's car cut through my left rear shock and continued up the left side of my motorcycle, opening it up like a tin can. The inside of the engine was exposed, the gas tank caved in, the foot pegs were ripped off, and my left leg was nearly severed. On impact, I went up into the windshield and over the top of his car, while my motorcycle went under the right front tire. The driver continued on his merry way, uncaring as I lay bleeding to death in the opposite lane of traffic.

After being discovered by passers-by, I was taken to the military hospital on post and later flown to a university hospital approximately 200 miles away. That is where my left leg was amputated approximately 9 inches below the knee. As my wife was being driven to the university hospital, she received her second shocking phone call in a matter of just a few hours, informing her of the loss of my leg.

How could this happen? I had done everything right. I attended a Motorcycle Safety Foundation course, wore the proper personal protective equipment (PPE), and abided by all the laws. But the other

guy was out there that night and just happened to be behind me. I went from being an athletic 34-year-old to an amputee just trying to deal with reality.

The driver that struck my motorcycle that evening was apprehended a few miles down the road, driving home as if nothing had happened. Driving home with an imprint of my head on his windshield. He has been indicted on numerous charges and is awaiting trial. It was one of his many alcohol-related incidents and not his first DUI.

On impact, I went up into the windshield and over the top of his car, while my motorcycle went under the right front tire. The driver continued on his merry way, uncaring as I lay bleeding to death in the opposite lane of traffic.

Since the accident, I have had a lot of time to reflect and listen to what people around me have to say. A lot of what I hear is enlightening, but some is absolutely shocking. I hear a lot of discussion and controversy regarding the use of helmets and other protective gear. Please read the next sentence slowly and read it numerous times. *The reason I am here to write this article is because I was wearing ALL of the PPE required to be worn while riding a motorcycle.*

I have had several people tell me that if they were to lose a leg, they would rather just die. These same people have families. I promise you that the road to recovery has been and continues to be extremely difficult, especially for my family. But I guarantee you that they would rather deal with the road to recovery than the road to the cemetery. That is why I agreed to write this story.

Before, as an ASO, I would always discuss motorcycle and POV safety in meetings, but now I have an understanding that I hope the readers of this article will never reach. I am much more adamant about getting others to understand the importance of PPE. A traumatic event like this affects so many more people than just the victim. Believe me, I know. Had it not been for our friends and people we did not even know that well, this would have been so much more difficult. So, if you are reading this and thinking only about yourself, you are thinking WRONG!

Not too long ago, I saw the photos of my motorcycle and the other guy's car for the very first time. His windshield looked like someone had thrown a bowling ball at it. Unfortunately, the bowling ball was in the form of my head. Without a doubt, my helmet saved my life. Don't get me wrong, my scalp was sore for a while, but I did not suffer a major head injury. No skull fractures, no open wounds. I was just sore, a small price to pay considering what could have happened.

I also was wearing protective eyewear, a leather jacket, long pants, boots, leather gloves, and reflective material. As a result, I had no "road rash," no other broken

bones, and my hands were not even injured. I have had a few people tell me that in certain situations, any amount of safety equipment will not save you. That may be correct, but this is my answer to him or her: *You do not have the luxury of choosing how and when the other guy meets you in an accident*. So, if you don't look as cool because you have "helmet head" and your hair is messed up, bring a hat. If wearing the proper PPE improves my chances of surviving and being there for my family, then give it to me.

I sustained an amputated leg. As tragic as that sounds, that was pretty much the extent of it. The recovery has been trying at times, more so for my family and friends than me. To them, I apologize. I have learned that I am a work in progress and I accept that. This accident has definitely forced me to redefine the priorities in my life. Trust me, I would rather have the equipment that God gave me, but following the accident, so many other things in my life have gotten better. I was lucky—I was given a second chance.

I am up walking around on two legs again, thanks to some talented surgeons and an extremely talented prosthetist. I was able to go on vacation with my family for some much-needed "family healing" time. I returned to my duties as company ASO within a few months of losing my leg and, if I have my way, I will fly for the U.S. Army again. I am able to go to dinner or a movie with my wife and even take the trash out and cut the grass so she doesn't have to.

At the end of the day, I drive home on that very road and make the same turn I made that night. Each time, I see the blood stain that is still on the road from my injury. Each time I look at that stain, I simply smile. I smile because, just like any other day, I'm watching my girls grow up. ■

—POC: CW3 Dana E. Jones recently attended the ASO course here at Fort Rucker. You can contact him at dj.jones4@us.army.mil

Belleville 790 Combat Boot Approved

Effective 26 Nov 02, the U.S. Army Aviation Center waives the requirement in AR 95-1, *Flight Regulations*, paragraph 8-9c(1) Leather Boots, requiring the wear of leather boots when performing crew duties. This waiver specifically allows the wear of the Air Force Tan Combat Boot also known as the Belleville 790 series boot. No other non-leather boot is authorized for wear. The Belleville 790 series is the same construction as the Infantry Combat Boot with tan dye applied to the leather. This will provide Aviation warfighters a tan boot to be worn during flight operations with the tan aviation battle dress uniform in desert locations. ■

—POC: COL Ellis W. Golson, DSN 558-3203 (334-255-3203, GolsonE@rucker.army.mil.

Investigators' Forum

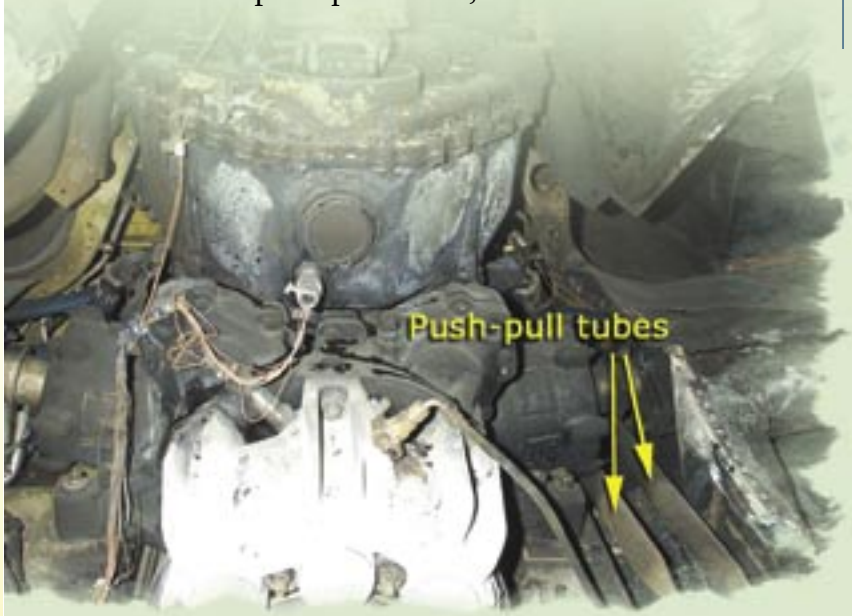
Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

Control of the Aircraft Was Never in Question

A recent in-flight fire on an MH-47E aircraft resulted in significant thermal damage to the rotor brake, synchronization shafts, combining transmission, and surrounding fuselage. The crew was able to land the aircraft safely without additional damage to the aircraft, and the fire was extinguished by the airfield fire department.

Several system safety improvements in the H-47 fleet performed as envisioned and the crew was able to maintain control of the aircraft as a result. Noteworthy of these improvements was the change several years ago to the push-pull tubes in the tunnel cover area.

A fire in the 1980s resulted in the crew losing control of the aircraft as the previous aluminum push-pull tubes failed from thermal damage. In the accompanying photo, the current push-pull tubes, which are made of stainless steel, exhibited only a layer of soot from the flames.



Although the temperature of the fire exceeded 1,200°F, the utility hydraulic lines, synchronization shafts, and push-pull tubes remained operational. The heat generated from the partial rotor brake engagement started a friction fire that scorched the combining transmission sump outer surface and caused the combining transmission oil to boil and overflow through the fill cap which in turn fed the fire.

The charred outer sump case exhibited a flaky layered texture. The inner sump case displayed a 2½-inch band of caked and discolored oil residue adjacent to the upper lip. The C-Box continued to run and did not fail. This fire also spread to the adjacent clam shell doors, aft cabin overhead paneling, the fuselage below the rotor brake assembly, the number one engine transmission to combining transmission drive shaft, and the combining transmission main body, including the cooling fan assembly.

The main point from all of this is the crew was able to maintain aircraft control during this in-flight emergency due to the system safety improvements. Units can help improve the reliability of our aircraft by continuing to submit QDRs on suspected or known part failures. This will allow our program management offices, aircraft manufacturers, and system safety engineers to correct system inadequacies, and therefore save people and equipment. ■

—Aviation Systems and Accident Investigation Division, DSN 558-9858 (334-255-9858)

DES Announces New AKO Information Portal Access

Have you logged on to your Army Knowledge Online (AKO) account lately? AKO is the Army's portal for soldiers and civilian employees worldwide. Along with all its other useful features, you can now access the Directorate of Evaluation and Standardization (DES). This information portal replaced the old DES website to enhance the capability of providing information to aviation units worldwide in a timely manner. When you "subscribe" to this portal, you will receive periodic E-mail notifications via AKO telling you what has changed. It will be much easier for you to keep up with current information from DES. Just follow the instructions below:

1. Log into Army Knowledge On-line (AKO) at (http://www.us.army.mil).

2. After your Home page opens on AKO, click on the green "Collaborate" tab.

3. Locate the box titled "Search for an Army Community Knowledge Center."

4. Type "DES" in the box. The box is located at the bottom of the page.

5. **Hit the "SEARCH" dialog box that is to the right of the text entry area. The following box will return the contents of your search.**

6. **Locate the listing for DES Information Portal and check the box to the left of the "Subscribe Now" listing. Then click on the Subscribe icon below the red GO icon.**
7. **You should see the following screen. This means that you are now subscribed to the DES Information Portal. Click Finish.**

8. **To access the DES Information Portal in the future, click on "Army Communities" on the left side of the page. Then click on "TRADOC/Aviation/DES Information Portal."**
9. **You can navigate through the DES Information Portal just like it was a directory on your hard drive.**
10. **Now that you have subscribed, you will receive a notification from AKO anytime a document is added or deleted to the DES Information Portal.**

—CW3 Shawn Hayes, UH-60 SP/IE, DES Information Portal Administrator, Directorate of Evaluation and Standardization, Ft. Rucker, AL 36362, DSN 558-1124 (334-255-1124), shawn.hayes@rucker.army.mil

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Avoiding Droop Stop Pounding in the Black Hawk – Nov
Black Hawk Rebuild – Feb
Investigators' Forum: Been There, Done That – Nov
The Use of the CEP in the UH-60 Black Hawk – Aug
UH-60 Safety Performance Review – Nov

VIDEOS
"Drive to Arrive" – Feb
"Every Drive Counts" – Jul

WAR STORIES
Don't Be Afraid to Say No – Jul
Freezing Rain – Dec
No Big Thing – Aug
Surviving a Crash...and Confronting the Cold – Sep
Timely Help From a Friend – Aug ■

Winterize Yourself and Your Aircraft

Control the risks — BE PREPARED!

- All aviation personnel should review Chapter 1 of FM 1-202, *Environmental Flight*, in preparation for Cold Weather Operations.
- Slips, trips, and falls increase exponentially in icy conditions. Don't rush. Walk slow and deliberately on slick surfaces.
- All personnel must dress appropriately for the conditions regardless of how little time they expect to remain in a cold environment. If you are delayed in conditions that you are not well prepared for, then there is the tendency to rush a task which leads to poor quality and potentially an injury or accident.
- Remove all snow, ice, and frost from aircraft, particularly potential projectiles thrown from rotating components. Damage to nearby equipment and aircraft, injury, or even death can occur.

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