# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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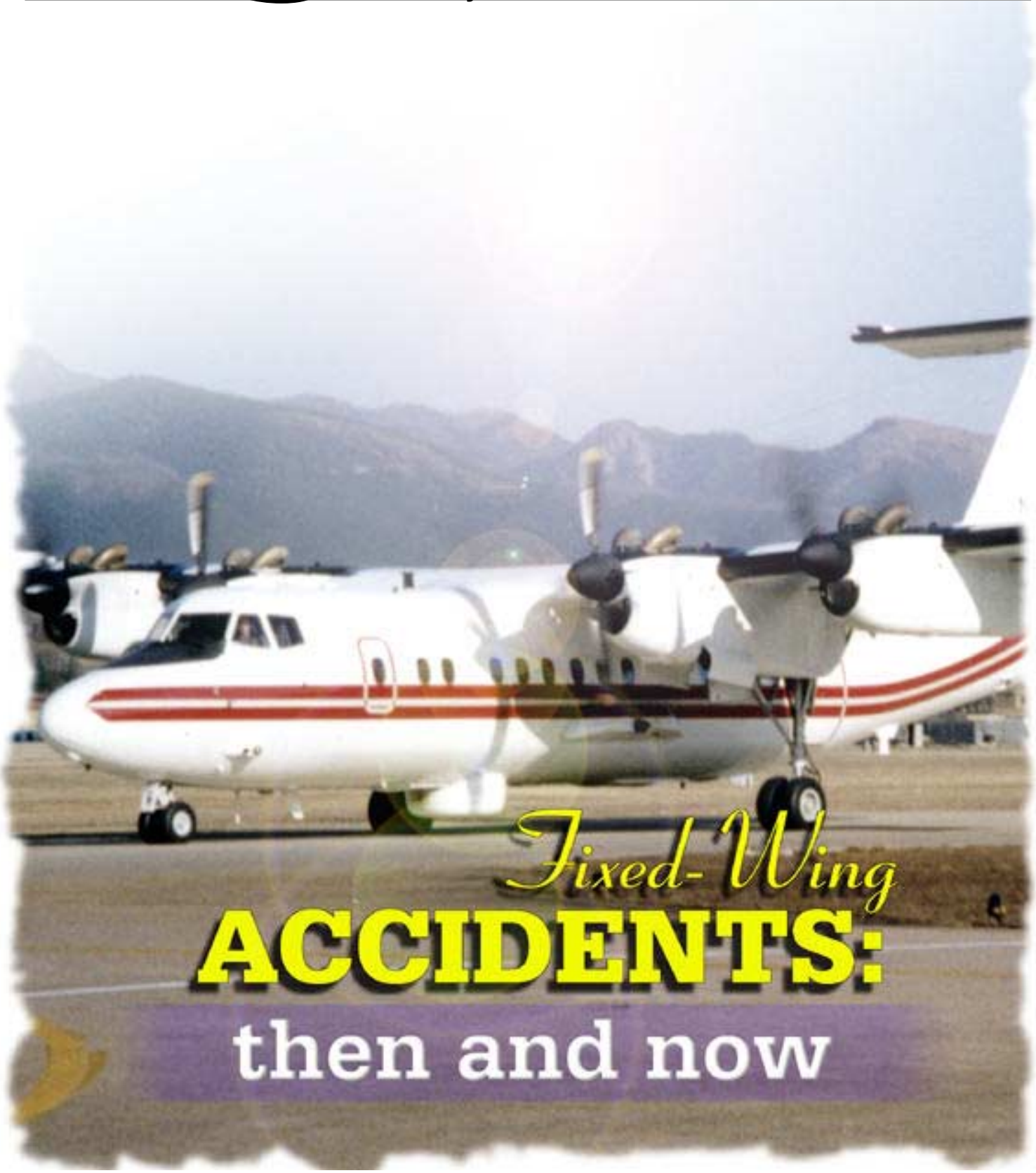

# Fixed-Wing ACCIDENTS: then and now

# FIXED-WING ACCIDENTS: then and now

In 1995, CW4 Al Rice analyzed Army fixed-wing Class A-C accidents that occurred from 1 January 1984 to 24 March 1994. For the selected time period, Mr. Rice analyzed data from the United States Army Safety Center (USASC) database and determined that—

■ 41 percent of the accidents were caused by human error.

■ 31 percent were caused by materiel failures or malfunctions.

■ 28 percent were caused by environmental factors.

To see if the trend was changing, I recently analyzed data for a subsequent 5-year period. I analyzed 59 Class A-C fixed-wing aircraft mishaps that occurred between March 1995 and March 1999 and found that—

■ 47.5 percent of the accidents were caused by environmental factors, (present in 28 of the 59 accidents analyzed).

■ Lightning strikes accounted for 21 of the 28 environmental-factor accidents. Lightning strikes appear to be prevalent in aircraft equipped with weather radar and storm scopes. However, some pilots may have a false sense of security or may not have received adequate training in using the equipment. Some lightning strikes may be completely unavoidable.

■ Other environmental factors contributing to accidents include bird strikes, deer strikes, and ice-related mishaps.

■ 39 percent of the accidents were a result of human error.

■ Analysis of the human error accidents from both studies revealed that there are still accidents due to poor landing and takeoff techniques. Poor landings and takeoffs resulted from a combination of environmental factors, fixation, pilot experience, effect of winds, improper power management, improper planning, and pilot overconfidence.

■ Other human errors involved hitting objects—such as fire extinguishers—while taxiing and not properly closing aircraft doors.

■ When comparing the two sets of data, I found nothing substantially different than Mr. Rice found. The types of human error and environmental factors accidents are basically the same as in 1995 which, by default, makes his corrective actions as appropriate today as they were a few years ago.

■ Effective aircrew coordination will assist in eliminating human error accidents. The proper use of basic aircrew coordination techniques—such as crewmembers monitoring each other, prioritization of tasks, and distribution of workload—will increase crew situational awareness and thus

reduce human error mishaps.

■ Thorough post-flight briefings are critical to ensuring that problems which occurred during the flight can be identified and briefed to the other aircrew members in the organization, thus reducing the possibility of similar situations arising during subsequent flights.

■ Proper use of the checklist will prevent mishaps.

■ Disciplined compliance with outlined procedures in standards such as Army regulations, Operator's Manuals, Aircrew Training Manuals, Training Circulars, Field Circulars and Approach Plates will also reduce mishaps. Deviations from standard procedures make aircrews more susceptible to mishap scenarios.

Fixed-wing aircraft continue to have the lowest Class A accident rates in the Army due to the efforts of the crewmembers and all the support personnel. Keep up the good work. Continue to maintain vigilance and the trend in human error mishaps will continue downward.

**—Gary D. Braman, Fixed-Wing/Cargo Aircraft and TUAV System Safety Manager, United States Army Safety Center, DSN 558-2676 commercial (334) 255-2676, e-mail: bramang@ safetycenter.army.mil.**

**CW4 Rice is currently the Aviation Safety Officer at ARCENT and portions of his research were used with his permission.**

# We need your Lessons Learned!

Safety Professionals…we need your help! As you identify lessons learned, please use one of the media avenues described below to get the information out to the field. It may be the difference between a life saved – and one lost. "Lessons learned" can keep people from "reinventing the wheel" or making mistakes that someone else has already made. Your input is vital to an effective Accident Prevention Program.

## What tools are available to help you get the word out?

■ **RMIS** – The Risk Management Information System is a powerful risk management and research tool aimed at helping meet Department of Defense and Army goals for accident prevention. It is a worldwide Internet-based risk management tool designed to help leaders and their staffs make informed decisions to do tough missions safely. The web site for RMIS is http://rmis.army.mil. Please send your Lessons Learned to Dwight Lindsey, RMIS Administrator Lindseyd@ safetycenter.army.mil.

■ **ASO/CP12 LISTSERVERs** – This is a quick way to get information out to the field. Send email to Dr. Brenda Miller MillerB@safetycenter.army.mil, CW3(P) Darrel Smith SmithD@safetycenter.army.mil, or Mr. Lee Helbig HelbigC@safetycenter.army.mil with the information you want disseminated. If you are a subscriber to these listservers, you can post the information directly.

■ ***COUNTERMEASURE*** – This publication is focused on "Ground" Accident Prevention – to include Army motor vehicles (track & wheeled), POV, munitions, fire protection, seasonal articles, recreation and athletics (all Army operations other than aviation). Countermeasure is published monthly with a circulation of 35,000 copies and is also posted to the Army Safety Center web site. Distributed down to unit level, its primary audience includes first-line leaders of soldiers and its secondary audience is commanders. Send your lessons learned or ground-related articles to Ms. Paula Allman, Managing Editor AllmanP@safetycenter.army.mil or countermeasure@safetycenter.army.mil.

■ ***FLIGHTFAX*** – This publication is designed for "Aviation" Accident Prevention. Flightfax is published monthly with a circulation of 18,000 copies and is also posted to the Safety Center web site. Distributed down to unit level, its primary audience is aviation safety officers and operational pilots, and its secondary audience is aviation commanders and maintenance personnel.

Send your lessons learned or articles to Ms. Judy Wilson, Managing Editor WilsonJ@ safetycenter.army.mil or

flightfax@safetycenter.army.mil.

■ **Center for Army Lessons Learned** – The Center for Army Lessons Learned [CALL] provides a forum for lessons learned. The CALL Publications are distributed in both paper and electronic copy. The intent is to share knowledge, support discussion and impart lessons and information in an expeditious manner. The CALL publication is not a doctrinal product and is not intended to serve as a program to guide the conduct of operations and training. The information and lessons are not staffed, but are the perceptions of those individuals involved in military exercises, activities and real-world events. If you have articles and lessons of interest to the Total Force, please contact the Managing Editor, Dr. Lon R. Seglie, Segliel@Leavenworth.army.mil. You can visit the CALL website at http://call.army.mil.

If possible, articles should be submitted in either Word Perfect or Word format. Graphs, slides and clip art should be submitted separately from the document in either ppt, pcx or wpg format.

**—Dr. Brenda Miller, Ch, Training and Education Division U.S. ARMY SAFETY CENTER, DSN 558-3553 or CML 334-255-3553 millerb@safetycenter.army.mil**

# "Did You See That Tower?"

How many times have you said this in your career in the cockpit? As an aviator with eleven years of experience I believe it is fair to assess that many of us have experienced a near-miss with an object that seemingly should have been lighted and annotated in our flight information publications but was not.

On several occasions I have flown past cell phone towers and wires that were either not lighted or not annotated in flight information publications. *They should have been, shouldn't they?* I decided to find out more about this, becoming the subject matter expert on how obstructions are reported through appropriate channels and ultimately make their way into flight information publications and tactical maps.

## Research

The federal government controls reporting, marking, and lighting of obstructions in the National Airspace System. Federal Aviation Regulation (FAR) 14 Code of Federal Regulation (CFR) Part 77 states that all obstructions more than 200′ above ground level (AGL) will be reported. Obstructions less than 200′ AGL do not have to be reported *unless*, according to Advisory Circular (AC) 70/7460-1K, dated 1 Mar 00, the *FAA recommends* marking and/or lighting such a structure because of its particular location. 14 CFR part 77 and AC 70/7460-1K basically state that obstructions within 20,000 feet of a runway, regardless of height, will be reported to the FAA. This allows an appropriate safety survey of its location and potential hazard to the National Airspace System (NAS) to be conducted.

The AP/1B Pg. 1-4, item (19) says, "Unpublished towers found by surveys 200 feet AGL and above are in this SOP." The Chart Update Manual (CHUM) is a living document that states, "all vertical obstructions 200 feet AGL and higher cannot be portrayed due to chart scale and feature density."

Okay, what all this means is that all obstructions that I have to deal with are required to be lighted, right? Wrong: AC 70/7460-1K says "pilots of aircraft traveling at 165 knots or less should be able to see obstruction lights in sufficient time to avoid the structure by at least 2,000 feet horizontally under all conditions of operations, provided the pilot is operating in accordance with Federal Aviation Regulation (FAR) part 91."

However, owners of obstructions may or may not be required to light the obstruction, based

on specific requirements in the AC. Painting of obstructions in either red and white checker pattern or aviation orange is expensive and is only *recommended* by the FAA. This requires increased vigilance on our part.

AC 70/7460-1K further states, "Construction or alteration of a structure that may affect the NAS is required under the provisions of 14 CFR part 77 to notify the FAA by completing the notice of proposed construction or alteration form (FAA Form 7460-1). This form may be downloaded from www.faa.gov/ats/ata/ata400." ACs may also be accessed and downloaded from this site. Lighting of obstructions above 200 feet AGL is not required, but is a normal operating practice. Obstructions within 20,000 feet of a runway and below 200 feet AGL may or may not be required to be lighted, based on a site survey conducted by the FAA.

## Light Failures

What happens when a light on a lighted obstacle fails? AC 70/7460-1K states, "Light failures on obstructions should be corrected as soon as possible. Any failure or malfunction that lasts more than thirty minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to the nearest Flight Service Station (FSS) so a notice to airman (NOTAM) can be issued. Toll free numbers for FSS's are listed in most telephone books or on the FAA's website." One of the problems we are dealing with is that ACs are not regulatory in nature, they merely describe an industry standard that is not a requirement unless directed by a governing body such as the FAA.

Obstructions that emit frequencies governed by the Federal Communications Commission (FCC) as stated in 47 CFR part 97, volume 5 part 80 to end, repeat what 14 CFR part 77 states. FCC forms, bulletins, and information can be obtained from the FCC's national call center at 1-888-call-FCC (1-888-225-5322).

## Army Requirements

What does the Army require of me as an aviator? Army Regulation (AR) 385-95 Pg. 12 E. (4) requires Army Aviators to immediately report hazards and unsafe conditions or acts to the proper authority. After initial verbal report, we should provide a DA Form 2696 (OHR) to document the condition and promote follow-up actions as appropriate.

The FAA has a similar program known as the Aviation Safety Reporting System (ASRS). AR 385-95 Pg. 10 C. (4) says, "the Operations Officer will ensure a detailed hazard location map covering the entire unit operational area is posted and current." Page 24, 3-3 A & H state that the SOP will address "terrain flight hazard avoidance and operations in a tactical environment." We often train in alert areas and MOA's that are beyond the boundaries of our "base operations hazard map." So, we must be aware of the manner in which hazards are promulgated in all of our areas of operation, and ensure that we include these areas in our terrain flight hazard avoidance operations in a tactical environment.

## Real hazards

Why is all of this so important to Army aviation operations? Power companies frequently put up distribution and transmission lines to homes, businesses, and other facilities that are not in the proximity of an airport. Depending on the terrain, distribution lines average 40-60′ AGL and transmission lines average 100-120′ AGL. These obstructions are not reported unless they are in proximity to an airport. And, these obstructions may not be lighted—even if they are above 200 feet. It is important to note that "our" Military Operations Area (MOA), Alert Area, or area of operation (AO) is not really "our" airspace—it is the FAA's. An individual or small company may or may not know whom to report construction projects to or if he/she is required to report an obstruction. This fact has aircrews relying on FAR part 91 (see and avoid). Remember, not all obstructions will be reported or lighted.

I am not even attempting to address such areas as errors in publications, or problems with

proper and timely dissemination of new hazards. My aim is to make sure that now you are armed with a better education and awareness of the hazards that lie in waiting in the NAS.

### Improve Your Program

How do I ensure my unit's terrain flight hazard avoidance program is the best it can be? My solution to this complex paradox of regulations and publications, that greatly relies on the human element, is to first set-up a working rapport with all cell phone, power, and construction companies in your local area and/or areas of operation. Second, give the information in this article to each of them (you will more than likely find yourself educating these companies, as I did) along with the name and number of your Post Airspace Safety Office. Third, work with your Post Airspace Safety Office frequently in an effort to develop the best, most proactive terrain flight hazards avoidance program possible.

AR 385-95 states that your SOP will address terrain flight hazard avoidance, and operations in a tactical environment; how well and completely you apply process system safety management into your SOP is up to you and your organization.

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OFF DUTY

# Flu season

## Find out how you can beat the flu at its own game this season.

It all starts with a shiver. Within what seems like a matter of minutes, however, it's obvious that the chill has nothing to do with dropping temperatures. Instead, you're bundled up even in your heated home, teeth chattering, head pounding, and feeling like you've just been run over by a herd of hyena-chased elephants.

Congratulations—you're among the one in 10 Americans who can expect to get the flu this winter.

There's good reason why you aren't alone in your misery. As viruses go, few are as omnipotent as those in the influenza family. From the moment they enter the body—via another victim's misdirected cough or sneeze, or by hitching a ride from a doorknob, telephone receiver, or other object onto a hand and then into the moist nasal membranes—the invading marauders launch their all-out assault.

The first step is to find host cells ripe for the takeover. Since the flu virus can't replicate on its own, it needs to use the body's cells to manufacture new virus particles. Several hours later, several hundred new virus particles emerge from each now-destroyed host cell, ready to seek new cells to invade. After a couple of days of such cellular invasions and replications, the virus particles will number in the billions.

While the body's own immune system will, in most cases, already have mounted its attack against the virus, you'll undoubtedly also be feeling the effects of the warfare taking place in your body. All that congestion in your heart and lungs? That's the dead cells and debris clogging your respiratory tract. The sore throat and tight chest? That's the viral attackers completely destroying parts of the protective cilia, or tiny hairs, lining the throat, windpipe and bronchi, consequently leaving the underlying membranes exposed and inflamed. And the throbbing headache, fever, and all-over soreness? That's just the effects of your immune system trying to oust the viral invader.

By the time you've felt your first shiver, however, some of these newly manufactured viruses have begun their exodus from your body and into other unsuspecting victims, ready to repeat the cycle. If you're like most sufferers, you'll feel the effects of the feud for only another five to seven days. However, there's a chance that other opportunistic invaders may take advantage of your worn-out immune system, leading to complications such as pneumonia or other bacterial infections. And while for most of us the flu is just a week or two of aches

and pains, for high-risk individuals (such as the elderly, newborns, or those with compromised immune systems or chronic medical conditions such as asthma or diabetes), a fight with the flu can turn out to be deadly.

## A SHOT IN THE ARM

Fortunately, there are ways to make your body an unappealing host to the flu virus. Your best defense is vaccination, which can lower your risk of infection by 70 percent to 90 percent and greatly reduce the severity if you do fall ill.

The trick to providing optimal immunity against the flu is in the timing. It takes 10 to 14 days for protection to start kicking in after you get the shot, so if you wait too long, you may be exposed before you're fully protected. On the other hand, the defense begins to wane after several months, so if you get vaccinated too early, the protection may begin to subside before the flu virus leaves your area.

Because the influenza bug tends to make its first appearance in mid-December, give or take a few weeks, peaking around the end of January and disappearing by March, the optimal time to get vaccinated is generally October through mid-November. Around this time of year, most military treatment facilities offer free flu shots on a walk-in basis (call your nearest facility to find out when the vaccine will be available), and many pharmacies and grocery stores also offer immunization typically at a cost of $20 or less.

Historically, the flu vaccine has been so effective at reducing the risk and severity of illness that the Centers for Disease Control and Prevention (CDC) has this year for the first time, lowered the age at which it recommends the vaccine, from 65 to 50 years. "A lot of people after age 50 begin to develop chronic conditions such as diabetes," says CDC spokesperson Kay Hoskins, "but don't normally get the flu shot. By lowering the recommended age, we hope that all those at risk {of complications} will get protected."

In addition to those over 50, the CDC also recommends vaccination for:

- Residents of nursing homes or chronic-care facilities;
- Those with chronic heart or lung disease, including asthma;
- Those with kidney or metabolic problems, such as diabetes;
- Anyone who has been treated for a blood disorder
- People whose immune systems are compromised, including those with HIV/AIDS or who are currently undergoing chemotherapy or radiation treatment;
- Children over six-months of age who are on long-term aspirin therapy;
- Women in the second or third trimester of pregnancy or those who are nursing;
- Doctors, nurses, other health care workers, family members, and anyone else who comes in close contact with high-risk individuals during the flu season; and
- Those traveling to foreign countries.

If the flu shot has such a great track record, why doesn't everybody get one? Availability, for one thing. Unlike vaccines for other diseases, such as measles and chicken pox, which provides decades-long or lifetime immunity, the flu vaccine must be given each year to provide protection against the constantly evolving strains.

The logistics of preparing enough vaccine each year for everyone, on the short notice required after the season's likely flu strains are identified, would be a nightmare. In addition, the vaccine potentially could be harmful for some, including women in their first trimester of pregnancy and people allergic to eggs or the preservative thimerosal (also found in most contact lens solutions).

And while some patients may develop a little soreness around the injection site, or even

develop a low-grade fever, fatigue, and muscle aches if they've never been exposed to the flu before, keep in mind that the vaccine can't give you influenza because it's made from an inactivated virus.

Of course, there are also some much more low-tech ways to protect yourself against the flu. One of the most effective is also one of the most time-tested: good old-fashioned hand washing. By regularly and diligently scrubbing with soap and warm water for at least 20 seconds, you can help keep the germs away. In addition, try to keep your hands away from your face, especially your nose and mouth, as much as possible to avoid giving the virus an easy entryway into your body. Don't forget that other factors, such as rest, moderate exercise, adequate water intake, and alcohol and tobacco abstention are important when it comes to keeping your immune system primed for fighting invaders.

Too late?

So what if you've opted out of getting the vaccine this year, or you were the one of the 10 percent to 30 percent who got the flu even after getting immunized? This flu season, there may be help for severe cases of influenza, as well as for those at high risk of complications. Two new prescription antiviral drugs, zanamivir (sold under the brand name Relenza) and oseltamivir (sold under the brand name Tamiflu), were approved last year, joining the older antivirals, amantadine and rimantadine, which often had side effects worse than the flu symptoms. By interfering with a protein on the surface of the flu virus, zanamivir and oseltamivir prevent the virus from leaving an infected cell and attacking others.

Yet even such treatments don't offer complete relief. In a clinical trial, adults with the flu who took zanamivir felt better on average only one day sooner than those taking a placebo. Another study by John J. Treanor and colleagues at the University of Rochester, NY, showed that patients who received oseltamivir within 36 hours after initial flu symptoms recovered 30 percent faster than placebo-treated patients (70 hours of feeling crummy compared with 103 hours). And the cost? Approximately $50 for a five-day supply. The trick is to start the medicine within a day or two of the symptoms' onset—assuming you can muster the strength to get out of bed and to the doctor's office.

But the use of these new drugs may not be limited to treating the flu in motion. New research is showing they may also help to keep the virus at bay—much like vaccination. In clinical trials, zanamivir was found to be 84 percent effective in preventing the flu when taken once daily for four weeks during the flu season. In another study, oseltamivir reduced the incidence of disease by 74 percent when taken once or twice daily for six weeks. The use of these antivirals as preventative measures against the flu has previously been reserved for high-risk patients who could not be vaccinated due to allergies or other reasons.

The practicality of all this use for the general public, however, leaves much to be desired. First of all, the expense can be prohibitive for many people, plus the drugs must be taken every day. Pending Food and Drug Administration (FDA) approval for their preventative use, they may be called upon in the face of an epidemic—for those who have been exposed to the flu but didn't get vaccinated, and for those who are unable to get vaccinated but are at high risk of developing complications.

Still, because of concerns about misuse of antiviral drugs, the FDA has issued a public health advisory to medical professionals encouraging judicious use of the drugs in influenza patients and reminding practitioners that vaccination should be considered the primary method of preventing and controlling the flu.

Before prescribing these antivirals, physicians must be certain that the patient truly does have the influenza virus and does not have any underlying chronic medical conditions or other significant bacterial infections. Additionally, physicians must use special caution when prescribing zanamivir to patients with asthma or chronic obstructive pulmonary disease, since there have been reports of respiratory problems following inhalation of the drug.

## LAST MINUTE REMEDIES

Even if you opt to let the flu run its course,

there are things you can do to reduce your discomfort if you can't get to a flight surgeon straightaway.

■ Stay in bed. Not only will the rest help your body fight off the bug, but it also will keep you from spreading the flu to others.

■ Drink plenty of fluids, especially water, juice, and non-caffeinated drinks, to help replace fluids lost through the fever process and to keep the mucus in the respiratory tract thin and easy to clear.

■ Use a steam vaporizer to help clear out your congestion and make it easier to breathe.

■ Take aspirin (except in children, who may be at risk of developing Reyes syndrome), acetaminophen (such as Tylenol), or other over-the-counter pain relievers to take the edge off the aches and pains.

■ Try over-the-counter, alcohol-free medication, depending upon your symptoms, such as decongestant to help you breathe easier and prevent secondary ear or sinus infections or cough medicine to make you more comfortable.

**Remember, if you self medicate, you must inform a flight surgeon before beginning any flight duties.**

During your recovery, pay close attention to signs that your bout with the flu may be developing into something more serious. Signs that you may have developed a secondary bacterial infection include a very high fever (104 degrees Fahrenheit or greater) or the spiking of a fever after you felt you were recovering, chest pain associated with breathing, or a productive cough with thick, yellowish-green mucus.

Also, be on the alert for the pain of ear or sinus infections. If you have any heart or lung problems or chronic diseases or are otherwise on the list of those high-risk individuals for whom the flu shot is recommended, consult your flight surgeon as soon as you suspect you have the flu. By taking such precautions, you can avoid being one of the 100,000 Americans who likely will end up in the hospital this winter due to complications of the flu—or one of the 20,000 for whom the virus will prove to be fatal.

*—reprinted from The Retired Officer. (The author is Karen Kopp DuTeil, with CMDR Gregory C. Utz, M.D., USN)*

## Is it a cold or the flu?

| Symptom | Flu | Cold |
|---|---|---|
| **Fever:** | **102-104 degrees** | **Rare** |
| **Headache:** | **Usual** | **rare** |
| **General aches/pain:** | **Usual, often severe** | **Slight** |
| **Fatigue/weakness:** | **Can last 2-3 weeks** | **Mild** |
| **Extreme exhaustion:** | **Early and usual** | **Never** |
| **Stuffy nose:** | **Sometimes** | **Usual** |
| **Sneezing:** | **Sometimes** | **Usual** |
| **Sore throat:** | **Sometimes** | **Usual** |
| **Chest discomfort, cough:** | **Common; can be severe** | **Mild to moderate Cough** |
| **Complications:** | **Bronchitis, pneumonia** | **Sinus Congestion or earache** |
| **Prevention:** | **Vaccination, antivirals** | **None** |
| **Treatment:** | **Antivirals** | **Rest, over-the-counter medicines** |

# Avoiding Ice Fright

An inadvertent encounter with icing conditions ranks right near the top of a pilot's worst fears. Even small ice accretions can decrease an airfoil's lift, increase drag, and cause dangerous drops in airspeed. That is why the cardinal rule of thumb is to take evasive action fast at the very first sign of airframe icing. Having ice-protection systems, or flying an airplane certified for flight in known icing conditions, can buy you some time to make your escape, but know this: Many airplanes with full complements of ice protection equipment and known icing certification have crashed after lingering too long in icing conditions,

## How it happens.

A pilot receives a weather briefing mentioning the chance of icing conditions, or even reported icing conditions, and launches anyway.

Or a VFR-only, or even instrument rated, pilot continues flying into deteriorating weather, eventually runs into instrument meteorological conditions, flies into clouds, and ices up.

Icing related accidents closely resemble one of the biggest killers in general aviation — continued VFR flight into instrument weather. The antidote to these accidents? Maintain better than VFR separation minima.

## Types of icing

There are two basic types of icing—clear and rime. Clear ice occurs most often in the 0 to –10 degrees Celsius temperature range. As the name implies, clear ice is a near coating over the airplane's leading edges. It's often found in cumulus clouds and unstable conditions. Rime ice usually lurks in stratoform clouds with temperatures between –10 and –20 degrees Celsius. It has a milky, pebbly appearance and usually shows up as a thin, white line on wing leading edges or other airframe protuberances, such as outside air temperature probes and antennas.

The icing process occurs when an airplane flies into clouds or precipitation composed of super-cooled water droplets. Super-cooled droplets are liquid but at freezing temperatures. They remain liquid until an airplane flies into them. Then they quickly freeze on impact with the leading edges. Rime ice is usually slower to build than clear ice.

## The worst of the worst.

High on the danger scale is freezing rain (FZRA). It is a fast-forming type of clear ice that occurs primarily in advance of winter warm fronts. It's caused by rain, snow, or ice crystals falling through a warmer layer of air at lower altitudes. Very large droplets associated with this phenomenon run far back on airfoil surfaces and can quickly disrupt lift.

But as bad as freezing rain is, freezing drizzle (FZDZ) is worse. It is characterized not just by large super-cooled droplets, but also by its extremely high liquid water content. When freezing drizzle strikes an airplane, ice formations can become large and strangely shaped. Ridges of ice may form along the entire wingspan, causing aerodynamic havoc.

Freezing drizzle was studied heavily after the 1994 crash of an ATR-72 in Indiana. The National Transportation Safety Board (NTSB) in its final report on the occurrence concluded that the aircraft experienced an uncommanded roll excursion and crashed during a rapid descent. The NTSB attributed the loss of control to a sudden and unexpected aileron hinge moment reversal that occurred after a ridge of ice accreted beyond the de-ice boots. Researchers determined that supercooled "drizzle drops" likely caused the ridges of ice to form aft of the de-ice boots. Freezing drizzle seems to occur most often in the Great Lakes and maritime regions, where the air in frontal systems can be loaded with huge amounts of liquid water. Results are pending from additional research, but the prevailing opinion these days is that freezing drizzle is predominantly a low-altitude phenomenon. The ATR's freezing drizzle encounters occurred between 10,000 and 8,000 feet MSL, when it descended in a holding pattern.

## Escape strategies—

Viable strategies for escaping icing conditions depend on the conditions at hand. A descent to altitudes with warmer temperatures may solve the problem. A climb to on-top conditions can also do the trick if your airplane has the power to climb high enough and you're certain of the nearby cloud-top altitudes. Climbing through clouds in icing conditions carries a risk: If you spend too much time at climb angles of attack, you

could cause ice to form on the undersides of the wings and aft of any boot or bleed-air-protected leading edge wing panels. This is a sure-fire way to kill lift quickly, which is why some manufacturers publish minimum airspeeds for use when climbing in icing conditions.

Often, a 180-degree turn is the best idea. Presumably, you began your flight in ice-free conditions. A return to the areas behind you, then, ought to take you away from danger. What if icing conditions have closed in all around you? A landing at the nearest airport—or a precautionary off-airport landing—is the best move.

The important thing is to have a preconceived idea in your mind as to what you'd do if you inadvertently encountered icing. If you can't come up with a satisfactory plan that has an extremely good chance of success, then the best strategy is not to fly at all.

## If you got'em, pop'em

Pilots who fly airplanes equipped with inflatable de-ice boots should inflate those boots as soon as ice forms on wing leading edges. The timeworn advice was to allow a certain amount of ice to form before inflating the boots. That theory was motivated by the belief that cycling the boots too often would cause ice to make a shell-like formation beyond boot-inflation limits. Ice bridging, it was called.

The latest research indicates that ice bridging is a myth. It's true that more ice will shed if more ice is allowed to build on booted surfaces. But experts now say there's no reason to believe that ice can continue to form and bridge over leading edges and leave boots to helplessly pulsate behind an ever-growing sheath of ice.

## A decision tree

Avoiding ice starts at the pre-flight planning stage.

**Pilots:** If you're not instrument-rated, fly only in VFR, ice-free conditions. Should the weather turn ugly, you must be proficient in the skills and procedures necessary to deal with ATC and perform climbing or descending turns solely by reference to instruments. Those with instruments ratings should be current and proficient in the basics of instrument flying should the need to shoot a tough instrument approach arise.

**The weather:** Flying in winter fronts is not a good idea in airplanes without certification for flight in known icing. Even with known ice certification, airplane performance can be crippled by a bout with severe icing.

During the pre-flight weather briefing, you're looking for above-freezing temperatures at or above any minimum en route altitudes (MEA). This way, should a descent be necessary, you'll lose any ice accretions on the way down. As for cloud tops, they should be low enough that your airplane can top them if a climb out of icing conditions is in order. Ideally, you should have scattered-to-broken cloud layers along your route of flight and plenty of holes to allow ice-free climbs and descents to your flight-planned altitudes—and to your destination airport. Extra caution is called for at night: Icing and other clouds obviously can't be seen as well.

**The airplane:** Turbine powered airplanes seldom have trouble climbing to on-top conditions—as long as the climb is initiated quickly enough. In the clear air above, any ice accumulation that you picked up down below will take some time to sublimate away (it could take hours) but at least you're not collecting any additional ice.

If you're in a piston-powered airplane with a comparatively low horsepower rating, your ability to climb out of ice is seriously compromised. So is your ability to overcome the drag caused by any ice you might pick up. These airplanes, though they may have heated pitot tubes and alternated engine air doors (tools that should be used on any airplane whenever flying in cloud or precipitation within the icing temperatures range) just aren't cut out for ice flying.

**Terrain:** Here the concern is flight over mountains and other high terrain. Icing is worse in the air currents over high terrain, and your ability to descend out of icing conditions is severely limited by high MEAs.

If any of the variables listed above raises any concern, your pre-flight decision tree has a shaky limb or two. You don't need to ground yourself every time clouds pop in a winter forecast, but you do need to look extra hard to determine if the trip is really critical or if any of the deciding factors raises any level of concern.

**—Reprinted courtesy of AOPA pilot, all rights reserved.** **Author: Thomas A. Horne, (301) 695-2359, Tom.Horne@aopa.org**

**http:/www.aopa.org/asf/publications/sa11.html-**
**http:/www.asy.faa.gov/safety_analysis/weather_study/**
**http:/www.ntsb.gov/**
**http:/www.crrel.usace.army.mil/**
**http:/icebox.grc.nasa.gov/**

# Final Exam on ICING

(More than one answer may apply.)

**1. The first day of winter is?**
**a. November 27**
**b. December 21**
**c. December 25**
**d. I don't care; how many days until summer?**

**2. The following is not a requirement for structural icing in flight:**
**a. flight through visible moisture**
**b. high speed**
**c. aircraft external surface temperature at or below freezing**
**d. ambient air temperature a degree or two above freezing**

**3. Match the following definitions with the type of icing**
**a. Rime**
**b. Mixed**
**c. Clear**
**d. Cloudy**
**1 Hard, Glossy, and Heavy**
**2 Brittle and Frost-like**
**3 Hard Rough Conglomerate**
**4 Not a Type of Icing**

**4. This is not a type of structural ice:**
**a. cloudy**
**b. clear**
**c. rime**
**d. mixed**

**5. Cloud factors affecting icing include:**
**a. droplet size**
**b. drop distribution**
**c. aerodynamic effects of the aircraft**
**d. all of the above**

**6. Icing is more hazardous in:**
**a. flatland areas**
**b. desert areas**
**c. ocean areas**
**d. mountainous areas**

**7. Icing can occur in which season?**
**a. winter**
**b. spring**
**c. summer**
**d. fall**
**e. all of the above**

**8. Frost should be removed from an aircraft before flight**
**a. sometimes**
**b. never**
**c. always**
**d. only at gross weight**

**9. Stall speed and icing are:**
**a. related**
**b. not related**
**c. somewhat related**
**d. none of the above**

**10. Approach speed when iced up should be:**
**a. adjusted as per the aircraft handbook**
**b. decreased**
**c. increased**
**d. none of the above**

**11. A Convective SIGMET implies severe icing.**
**❑ True**
**❑ False**

**12. SIGMETS are issued for severe icing.**
**❑ True**
**❑ False**

**13. AIRMETS are issued for moderate icing.**
**❑ True**
**❑ False**

**14. When icing conditions are encountered, what action(s) should be taken?**
**a. depart the area**
**b. climb to above freezing temperature**
**c. descend to above freezing temperature**
**d. any one of the above, depending upon circumstances**

**15. Match the following PIREP icing terms with their respective definitions.**
**a. Trace**
**b. Light**
**c. Moderate**
**d. Severe**
**15-1. Ice becomes perceptible. Rate of accumulation is slightly greater than the rate of sublimation. It is not hazardous even though deicing/anti-icing equipment is not used unless encountered for an extended period of time (over 1 hour).**
**15-2. The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate flight diversion is necessary.**
**15-3. The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or flight diversion is necessary.**
**15-4. The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.**

Quiz courtesy of Roy Gambino, 1st Warrant Officer Company, WOCC, Fort Rucker, DSN 558-1485 (334) 255-1485
Information sources: FAA's Aviation Weather (AC 00-6A) handbook and the FAA Airman's Information Manual (AIM). The answers include reference and location.

Answers:
1. b. December 21, 2. b. high speed. Weather, 92, 3. 3-1=c, 3-2=a, 3-3=b, and 3-4=d. Weather, 93, 4. a. cloudy. Weather, 92, 5. d. all of the above. Weather, 99, 6. d. mountainous areas. Weather, 102, 7. e. all of the above. Weather, 102,, 8. c. always. Weather, 103, 9. a. related. Weather, 92, 10. a and c, adjusted per the handbook, or if no, information is provided, increased. Weather, 104, 11. True. AIM, para. 7-5c5 Note, 12. True. AIM, Para. 7-5e, 13. True. AIM, Para. 7-5g, 14. d. Any one of the above. (Weather, 103/104, AIM, para.7-20b.), 15. 15-1=a, 15-2=d, 15-3=c, 15-4=b. (AIM, Para. 7-20b.)

# Message update

**MESSAGE DTG 161526Z Nov 00**
**AIG 12197**
**MACOMS**
**SAILE**
**DACS-SF**

**SUBJECT: ARMY ACCIDENT REPORTING AND RECORDS**

A. AR 385-40, Accident Reporting and Records, 1 November 1994
B. DODI 6055.7, Accident Investigation, Reporting, and Record Keeping, 3 October 2000

1. Reference A provides Army policy and procedures on Army accident classification, notification, investigation, reporting, record keeping, and implements related DOD requirements.

2. Reference B recently revised DOD accident investigation, reporting, and record keeping requirements. A revision of AR 385-40 will be coordinated and published IAW Army publications procedures. Until publication of the revised AR 385-40, requirements in Reference A remain applicable Armywide.

3. The following clarifies the AR 385-40 requirement that all training-related deaths be investigated.

a. Training-related deaths are deaths associated with a non-combat military exercise or training activity that is designed to develop a military member's physical ability or to maintain or increase individual/collective combat and/or peacekeeping skills, and, occurs during or within one hour after such training activity.

b. Training-related deaths occurring during or within one hour after any training activity will immediately be reported to USASC Operations DSN 558-2660/3410 or commercial 334-255-2660/3410 (para 3-2, AR 385-40).

c. If the training-related death is not selected by the Director of Army Safety for central accident investigation (para 1-4b, AR 385-40), a MACOM or installation level investigation will be conducted to determine cause of accident and identify controls that if applied would reduce the risk of further accidents or deaths.

d. Training-related deaths determined to result from natural causes will not be classified by USASC as Class A Army accidents (para 2-7i, AR 385-40). Training-related deaths determined to be Army accidents will be classified by USASC as Class A Army accidents.

**—Fran Weaver, Safety and Occupational Health Manager, Policy and Programs, USASC, DSN 558-1141, (334) 255-1141, email weaverf@safetycenter.army.mil.**

# How to get Flightfax

If you're reading this, you're probably okay. But if you have had problems getting Flightfax, get too many copies, not enough copies, etc., here's a suggestion. Contact Sharrel Forehand, publications distribution manager at the US Army Safety Center. Phone her at DSN 558-2062 or e-mail forehans@safetycenter.army.mil. She can help with Countermeasure distribution as well. And don't forget, you can always download Flightfax and Countermeasure from the Safety Center website: http://safety.army.mil

# ASO List Server 2000

**The Army Safety Officer e-mail list server is being transferred from the Pentagon to the Safety Center. The Safety Center will operate and maintain the server beginning January 2001.**

### TO SUBSCRIBE:

■ **Step 1: Address your request to listserver@safetycenter.army.mil**

■ **Step 2: Send your request containing your personal information, typed exactly this way Subscribe "ASOlistserver" Johnd@1/4cav.army.mil(CW3 John Doe, ASO, HHT, 1-4 Cav, 363-331-5555)**

**After you complete step 2, the computer will notify you by e-mail that you are added to the list. You will also receive the rules of engagement (ROE). At this point you may discard the e-mail address used in step 1; you won't use it again.**

**Step 3: Address all traffic for the listserver to: ASOlistserver@safetycenter.army.mil**

### IMPORTANT NOTES:

■ You must have a .mil or .gov address to subscribe.

■ The subscription address is not the address you will use for normal message traffic.

■ Maximum file capacity for the list is 4 megabytes.

*Warning: Violations of the ROE, posting inappropriate or sensitive information, will result in the termination of your subscription.*

—CW3 D. Smith, US Army Safety Center, DSN 558-3712, (334) 255-3712, smithd@safetycenter.army.mil

—Mr. Lee Helbig, USASC, DSN 558-9868 (334) 255-9868, helbigl@safetycenter.army.mil

# Logistics conference set for Feb 01

The 2001 Worldwide Aviation logistics conference and product support symposium is set for 20-23 February 2001 at Redstone Arsenal's Sparkman Center auditorium, Huntsville, Alabama. Lodging rooms have been set aside at the Huntsville Hilton, 800-455-8667. To facilitate badging and parking, Redstone Arsenal requests that prospective attendees register before 27 January with the Aviation and Missile Command at DSN 897-1476, (256) 313-1476, e-mail Patricia.Hopkins@redstone.army.mil

Contact Kimberley Daniel (256) 464-9191, Daniel_Kimberley@aepco.com for conference registration and other information. 31 Jan is the deadline to avoid late fees.

# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH1

### Class E

#### F series

■ While conducting armament systems operational check during engine run-up, the gun elevation stow light would not illuminate. Upon further inspection, the turret was found to be non-responsive to HSS or TSU commands.

## AH64

### Class C

#### A series

■ During a thru-flight inspection following an uneventful flight, the aircrew found the No.1 engine cowling open. Initial inspection revealed no apparent damage and the engine cowling was secured. After completion of the thru-flight inspection, the aircraft was flown an additional 0.7 hours. During the post-flight inspection, damage to the inside of the No.1 engine cowling was found. Maintenance and safety personnel were notified and the aircraft was secured.

### Class E

#### A series

■ While OGE at 80-120 feet AGL, attempting to land, aircraft experienced No.1 and No.2 engine/main rotor droop. While attempting to land at aircraft parking, the aircraft immediately began to descend downward and forward. In the effort to avoid hitting parking pad revetments and one parked UH-60, the pilot on the controls maneuvered the aircraft to an open area between two parking pads. As a result, the aircraft landed in the mud on a significant slope between an empty parking pad and one occupied by the UH-60. UHF antenna sustained superficial damage upon landing. Maintenance inspection revealed the No.2 engine alternator was out of specifications. Alternator was replaced. After exhaustive inspections and a comprehensive test flight no other malfunctions were found; the aircraft was released for flight.

■ During taxi, oil bypass utility hydraulic filter light illuminated. Aircraft was shutdown without further incident. Replaced utility filter button.

■ During engine shutdown, aft droop stop would not fully engage. Required high pressure water spray from fire engine to move droop stop into place.

#### D series

■ During aircraft run-up with just the APU in operation, the crew noticed a strong electrical burning odor in both crew stations. Earlier the aircrew had experienced trouble starting the APU. They decided to shutdown the APU and cancel the flight. Maintenance trouble shooting could not determine an APU or an electrical fault. Aircraft was released for flight.

■ During run-up, TADS FLIR video center 30% was blank in Night Vision System and sight select TADS in all fields of view. Replaced Night Sight assembly.

■ During run-up, TADS malfunctioned. Aircraft was shutdown without further incident. Mission aborted. Replaced night sight assembly.

## C12

### Class C

#### D series

■ While in cruise flight with the ice vanes extended, the PC placed the ice vane control switch in the retract position to retract the ice vanes. During retraction, the left ice vane fail segment light illuminated followed by illumination of the right ice vane fail segment light. The PC re-extended the ice vanes and attempted to retract them once again with the same results. The crew experienced difficulty with the manual operation of the ice vanes while carrying out the procedures in the -10 checklist for ice vane failure. Postflight inspection revealed damage to both vane actuators and one manual override assembly.

#### T series

■ Aircraft struck birds shortly after breaking out of clouds while on final approach for landing. Damage to right side leading edge of stabilator.

### Class E

#### N series

■ After completing a visual approach to airport on a routine training flight, the crew taxied to the airfield FBO for refuel. The ramp was full and the crew waited for ground assist personnel for parking assistance. Ground personnel arrived on a tug and signaled for the aircraft to follow to alternate refueling parking. While following ground crew personnel to parking the aircraft's left wing tip struck the side-view mirror of a parked fuel truck. The aircrew shutdown the aircraft immediately. Damage to the left wingtip pod and navigation light.

## CH47

### Class E

#### D series

■ On final approach to landing zone with an external training block, the forward r/h sling leg separated from the load. Upon arriving at the landing zone, the load was released normally. Aircraft was landed without further incident. Investigation found that the grab hook keeper bent and allowed the chain to release from the grab hook.

## OH58

### Class C

#### D series

■ Collective was reportedly not lowered in time after completing autorotation. Excessive coning and subsequent flapping of main rotor blades resulted in damage to 4 main rotor blades and 2 droop stops.

#### D(r) series

■ NP limits were exceeded during FADEC manual throttle operations.

### Class E

#### D (I)

■ After successful mass mounted sight run-up, MMS made uncommanded 180 degree turn and

slewed skyward. MMS would not respond to Line of Sight Inputs and failed to stow. Replaced Mast Mounted Sight System Processor.

### D (R)

■ During contour flight, aircraft's low oil quantity engine caution message displayed momentarily, so the crew began a turn back towards home station. Approximately one minute later, the low oil quantity engine message displayed steadily. The crew landed without incident. Maintenance inspection found no packing on the lower engine chip detector. It is suspected it was pinched/cut during installation and failed under pressure. Replaced packing, aircraft released for flight.

## UH60

## Class C

■ While performing hoist operations in the mountains, aircraft struck a tree and sustained damage to main rotor tip caps. Aircraft began to vibrate and was landed without further incident.

### K series

■ During a port-to-starboard approach, aircraft's tailwheel and left stabilator contacted shipboard components adjacent to flight deck of carrier.

### L series

■ Aircraft overshot intended landing area and struck a dirt berm during a terrain flight approach into a dusty, confined landing zone. Poor illumination due to overcast conditions created poor ground contrast during the approach. Aircraft landed on a downward slope and was unable to arrest forward motion prior to striking the berm. Aircraft was immediately brought to a hover to stop forward movement after contact with berm.

## Class C

### A series

■ Main rotor blades were flapping up and down excessively during engine start. Immediate shutdown was performed. Investigation revealed black main rotor blade inside anti-dash flap bracket was broken off and red main rotor blade anti-dash flap bracket was bent. Spindle damage also suspected.

## Class E

### A series

■ During flight, crew and passengers detected what appeared to be smell of burning plastic. Ten minutes later, the aircraft's HSI began to spin continously for three minutes. The anti-torque pedals made uncommanded movements right and left and the FPS caution light illuminated with the following capsule lights, RGYR, GYRO, and SAS 2. Crew returned to airfield without further incident. Maintenance personnel replaced the SAS/FPS computer and displacement gyroscope as fair wear and tear items. Aircraft released for flight.

**For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.**

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Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

February 2001 ♦ VOL 29 ♦ NO 2

http://safety.army.mil

## FIXED WING SPOTLIGHT

## Current and Future Issues

# Fixed Wing Evaluation Trends from DES

## General observations:

During recent DES assistance visits fixed wing units performed well. Whether a unit was battalion sized or a small state flight detachment, evaluation results were generally good. Units are completing most required training requirements while accomplishing ever-increasing mission demands. Personnel are well trained and strive for customer satisfaction. Although evaluation results have been positive, some systemic trends have been identified as noted below.

## Incomplete Evaluations

Normally a records review is the first area that is evaluated during a DES visit. Both the Individual Aircrew Training Folder (IATF) and the Individual Flight Records Folder (IFRF) are checked for accuracy and completeness. Inconsistencies are sometimes found for entries of required evaluations on the DA Form 7122-R. Specifically, the TC 1-218 ATM states that some maneuvers of the instrument evaluation must be flown in either IMC conditions or simulated IMC, and the unusual attitude recovery maneuver must be evaluated under simulated IMC conditions. Units should ensure that the APART evaluation requirements are met by completing the required maneuvers in the flight mode stated in the ATM.

## Evaluator Documentation

TC 1-210 requires documentation of all evaluations. Often the evaluator is not the one making the entry into the record. DES recommends that if the person making the entry is not the evaluator, a remark should be made on the back of DA Form 7122-R indicating the evaluator's name, rank and position.

## Continuation Training

Units generally have great training programs to progress newly assigned crewmembers to readiness level 1. Unfortunately, the flight schedule becomes so demanding that once a crewmember becomes mission ready, no time is set aside to make continuation training flights. Due to the nature of the fixed wing mission, instrument flight evaluations are normally exceptional check rides. Fixed wing aviators are well versed in the instrument flight mode. Conversely, stands evaluations tend to be weaker due to less training on ATM maneuvers. Commander's and Instructor pilots need to place more emphasis on the "upper air work maneuvers."

## Academic Training

TC 1-210 and unit SOPs

require academic training programs. Most units have exceptional academic training programs. Classes vary from VHS videotapes to computer programs to guest speakers. The shortfall for most units is the documentation process and procedures for make-up training. Units need to develop an accurate documentation procedure and a viable make-up procedure and place these in the unit SOP.

## No-Notice Program

Normally the no-notice program of the larger units is more aggressive than that of the smaller units. Smaller units with one instructor and just a few pilots find it harder to accomplish no-notice evaluations due to mission loads, training requirements, and aircraft downtime. Also, in the smaller units, the instructor flies with most of the unit's aviators on a regular

basis and may not see the need for an additional flight for a no-notice evaluation. This may lead to complacency. Units should develop a no-notice program that challenges the aviators to maintain proficiency throughout the year, not just during the APART period. A no-notice evaluation may be a written, oral or flight evaluation. Bringing in a SP/IP/IE from other units gives an outside perspective to the unit's training program. Units should ensure the no-notice evaluations are documented on the DA Form 7122-R.

*Crew Endurance.* Crew Endurance tracking has been a problem in some fixed wing units. AR 95-1 states that the Commander will design a program tailored to the unit mission and include it in the unit SOP. To ensure that crewmembers remain within crew endurance limits, a tracking system should be used. There are many ways of tracking crew endurance. Many units use a computer program to calculate duty time and flight time. Aircrew mission briefing officers are required to consider crew endurance during the mission planning (crew selection) process, and a computer program makes that easier.

All in all, positive trends continue, despite ever-increasing mission demands.

**—CW4 Kerry Lambert, Fixed Wing Branch, Directorate of Evaluation and Standardization, Ft. Rucker, AL, DSN: 558-2453, (334) 255-2453, lambertk@rucker.army.mil**

# OPARS Flight Planning Software

The Optimum Path Aircraft Routing System (OPARS) is a free Department of Defense preflight planning aid, which integrates forecast atmospheric conditions with the pilot's proposed flight profile to provide an optimized flight plan. It minimizes fuel consumption and time en route for each leg. Additional information is available in reference (a), which is available upon request. OPARS serves as a supplement to the DD-175 (Military Flight Plan) and DD-175-1 (Military Flight Weather Brief).

OPARS consists of a set of computer programs that select optimum fuel efficiency routes for aircraft. Within the context of OPARS, an optimum route is defined as the selected aircraft path and altitude that is constrained by aircraft performance parameters, weather conditions, flight regulations, and minimum total fuel consumption. OPARS comprises four sub-systems:

***Customer Interface:*** Provides an interface for the OPARS user to generate and submit OPARS requests and for the OPARS Duty Petty Officer, at Fleet Numerical, to monitor, control, and assist in flight plan development.

1. **Flight Planner:** Computes the optimum route and performance parameters for each aircraft in support of flight operations.

2. **Aeronautical Database:** Consists of aircraft performance characteristics, route structures, and boundary information required for the satisfactory performance of the OPARS.

3. **Environmental Database:** Consists of Flight Level wind and temperature fields (Flight Levels 1,000 through 45,000 feet). Temperature Fields are produced twice daily and are derived from the Fleet Numerical Naval Operational Global Atmospheric Prediction System (NOGAPS) forecast model. Flight Level wind and temperature fields based on climatology are also available.

The OPARS user is the individual interacting through a personal computer linked with the Fleet Numerical computer system (FLENUMMETOCCEN). The OPARS user builds a flight plan request on their computer with the aid of a graphical user interface and submits the flight plan request to the Fleet Numerical host computer for processing. Included within this request will be such information as aircraft type, number of flight legs, points of departure, times of departure/arrival, points of arrival, and other pertinent information as required.

After the flight plan request is submitted to and accepted by the system, the Flight Planner begins selecting an optimum route for the

aircraft to fly. During this building process the Flight Planner will call on different routes that could be used to fly from the point of departure to the point of arrival. These routes are flown while considering critical environmental data, flight restrictions and aircraft parameters. The route and flight altitude that provides the optimum fuel consumption is chosen. As the final step in the process, the information is formatted as a flight plan and is downloaded to the OPARS user's personal computer. Delivery to flight personnel completes the process.

## USER ACCESS TO OPARS

OPARS Flight Plan Requests are delivered to FLENUMMETOCCEN and completed OPARS Flight Plans are returned to the OPARS user by the following methods:

**a. Internet.** Connection to FLENUMMETOCCEN is made via the Internet using standard web browser software.

**b. NIPRNET.** FLENUMMETOCCEN host computers are accessed via NIPRNET the same way as described in the Internet. User is responsible for obtaining the proper NIPRNET account and configuring the appropriate items in the OPARS communication software.

**c. Dial-Up.** The OPARS Customer Interface contains the necessary software to provide a Commercial or DSN connection to FLENUMMETOCCEN.

**d. Telephone Requests.** Flight plans may be requested by telephone. Contact the OPARS Duty Petty Officer. The OPARS Duty Petty Officer takes the Flight Request information, runs the request and returns the completed flight plan via Fax or e-mail.

If your aircraft (either fixed or rotary wing) is not listed in the OPARS database, contact OPARS to get your aircraft's performance profile added.

## USER RESPONSIBILITY

It is the responsibility of the flight forecaster or OPARS user to review OPARS products to ensure their consistency/correctness with present and forecast synoptic conditions.

*OPARS Point of Contact: OPARS Duty Petty Officer Technical/software aspects*
*Commercial: 831-656-4453/4324, (831) 656-4471/4431*
*DSN: 878-4453 (312-878-4486)*
*DSN:878-4486 (312-878-4486)*
*E-mail:cdo@fnmoc.navy.mil/ or opars@fnmoc.navy.mil*

To get started, call the above numbers; or via the internet go to: http://fnmoc.navy.mil

**1.** Select Public Access.

**2.** Scroll down left side of page to "Contact Us" then go to: "Request Account".

**3.** You will be assigned an OPARS and Web account and password.

The Web account will allow you to download the OPARS Customer Interface software.

The OPARS account will then allow you to submit Flight Plan Requests to FLENUMMETOCCEN.

**—CW5 Dave Bean, Chief, Fixed Wing Branch, Directorate of Evaluation and Standards, Fort Rucker, AL DSN 558-2453, (334) 255-2453, beand@rucker.army.mil**

# Starching Aviation BDUs—NOT!

Some soldiers want a crisp look to their BDUs, so they starch them. That's permitted, according to DA Msg DAPE-HR-S 2017332 Nov 92, but remember that starch shortens the life of the fabric. (The message adds that commanders will not *require* starched BDUs.)

But when it comes to aviation BDUs or any NOMEX coveralls, DON'T STARCH! They are made to be fire-resistant and heat resistant, but if you starch them, the protection is defeated. Starch will burn and you're toast.

**—PS Magazine**

# How Fixed Wing Warrant Officers are Selected

Each summer, warrant officer division conducts a selection board for eligible warrant officers that are interested in applying for the fixed wing multi-engine qualification course. This is a highly sought after course. We average over 400 applicants for the 35 quotas that are normally allocated to warrant officer division.

Eligibility criteria may change slightly from year to year, but for the FY 2000 and FY 2001 board, all ranks and all MOSs were eligible to apply, and all ranks and all MOSs were selected, except for WO1s. The only eligibility requirement is that you must be in a PCS status during the fiscal year of the training. PCS status is defined as having a DEROS from an OCONUS location during that fiscal year, having a minimum of 24 months on station in a CONUS assignment during that fiscal year, or coming out of a degree completion program (DCP) during that fiscal year.

The board is conducted as closely as possible to the guidelines of any Title 10 promotion selection board, and consists of a minimum of four aviation warrant officers. Each applicant's file is reviewed and voted. The vote is a "blind vote", meaning that voting officers cannot see how the other voting officers rated the file. When the voting is complete, the scores are tallied, and the top 35 scores make the initial selection. The selection is based on past performance, as an indicator of future potential. Past performance is based mostly on Officer Evaluation Reports (OER); however, assignment history, civil schooling, and official DA photo are also reviewed.

## Shortfalls

If, during the initial call to one of the selectees, or at any time during the year, one of the selectees turns down the training, or cannot attend the training, the next eligible officer will be called. That is defined as the next officer on the list that has not already PCSed. The fixed wing qualification course, as all aircraft qualification courses, is funded for *TDY enroute only* under the new Military Training Specific Allotment (MTSA) funding guidelines. Again, warrant officer division only receives 35 quotas annually. The rest of the quotas are owned by the National Guard, U.S. Army Reserves, commissioned officer branch, Naval Test Pilot Program, and other agencies. These agencies own their quotas, and warrant officer division cannot fill them if THEY have a shortfall.

## Utilization.

Not all warrant officers that attend the fixed wing course will get an initial utilization tour, or continue to fly fixed wing for a career after an initial utilization tour. Every effort is made to utilize those selected, but shortages in some rotary wing MOSs will be filled by officers already qualified in those aircraft. All selectees are briefed that if they attend the training, they will incur a 3 year Active Duty Service Obligation, even if they are not utilized in a fixed wing aircraft. We have had no one decline the training based on this.

## AH-64 pilot utilization in fixed wing aircraft.

Warrant officer division is finally able to start releasing some of the AH-64 pilots that attended fixed wing training in FY 1999 and FY 2000. With the AH-64 pilot recall program having been in effect for over two years, and a slowdown in the number of warrant officers leaving active duty, the AH-64 community can now afford to allow some of those selected to have a fixed wing utilization assignment. Again, this will be on a case-by-case basis.

—CW4 James C. Reardon, 151A, 154C, 155E/F/G Career Manager, DSN 221-5284,(703) 325-5284, reardonj1@hoffman.army.mil

# CPSC Urges Seasonal Furnace Inspection to Prevent Carbon Monoxide Poisonings

The U.S. Consumer Product Safety Commission (CPSC) urges consumers to have a professional inspection of all fuel-burning appliances including furnaces, stoves, fireplaces, clothes dryers and space heaters to detect deadly carbon monoxide (CO) leaks.

These appliances burn fuels: typically gas, both natural and liquefied petroleum; kerosene; oil; coal; and wood. Under certain conditions, these appliances can produce deadly CO. However, with proper installation and maintenance, they are safe to use.

CO is a colorless, odorless gas produced by burning any fuel. The initial symptoms of CO poisoning are similar to flu, and include headache, fatigue, shortness of breath, nausea and dizziness. Exposure to high levels of CO can cause death.

"CO poisoning associated with using fuel-burning appliances kills more than 200 people each year and sends more than 10,000 to hospital emergency rooms for treatment," said CPSC Chairman Ann Brown.

CPSC recommends that the yearly professional inspection include checking chimneys, flues and vents for leakage and blockage by creosote and debris.

Leakage through cracks or holes could cause black stains on the outside of the chimney or flue. These stains can mean that pollutants are leaking into the house. In addition, have all vents to furnaces, water heaters, boilers and other fuel-burning appliances checked to make sure they are not loose or disconnected.

Make sure your appliances are inspected for adequate ventilation. A supply of fresh air is important to help carry pollutants up the chimney, stovepipe or flue, and is necessary for the complete combustion of any fuel. Never block ventilation air openings.

CPSC recommends that every home should have at least one CO alarm that meets the requirements of the most recent Underwriters Laboratories (UL) 2034 standard or International Approval Services 6-96 standard.

## Recall Program to Replace Vent Pipes

Consumers should also have the vent pipes on their heating systems inspected. In 1998, virtually the entire furnace and boiler industry together with the manufacturers of high-temperature plastic vent (HTPV) pipes joined with CPSC to announce a vent pipe recall program. The program's purpose is to replace, free of charge, an estimated 250,000 HTPV pipe systems attached to gas or propane furnaces or boilers in consumers' homes. The HTPV pipes could crack or separate at the joints and leak CO.

Consumers can check the vent pipes attached to their natural gas or propane furnaces or boilers to determine if they are part of this recall. They can be identified as follows: the vent pipes are plastic; the vent pipes are colored gray or black; and the vent pipes have the names "Plexvent(r)," "Plexvent(r)II" or "Ultravent(r)" stamped on the vent pipe or printed on stickers placed on pieces used to connect the vent pipes together.

Consumers should also check the location of these vent pipes. For furnaces, only HTPV systems that have vent pipes that go through the sidewalls of structures (horizontal systems) are subject to this program.

For boilers, all HTPV systems are subject to this program. Other plastic vent pipes, such as white PVC or CPVC, are not involved in this program.

After checking the vent pipes, consumers should call the recall hotline toll-free at (800) 758-3688, between 7 a.m. and 11 p.m. ET, seven days a week, to verify that their appliance venting systems

are subject to this program. Consumers with eligible systems will receive new, professionally installed venting systems free of charge. Additionally, consumers who already have replaced their HTPV pipe systems may be eligible for reimbursement for some or all of the replacement costs.

The U.S. Consumer Product Safety Commission protects the public from unreasonable risks of injury or death from 15,000 types of consumer products under the agency's jurisdiction. To report a dangerous product or a product-related injury, call CPSC's hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270, or visit CPSC's web site at http://www.cpsc.gov/talk.html. For information on CPSC's fax-on-demand service, call the above numbers or visit the web site at (http://cpsc.gov/about/who.html. To order a press release through fax-on-demand, call (301) 504-0051 from the handset of your fax machine and enter the release number. Consumers can obtain this release and recall information at CPSC's web site at **http://www.cpsc.gov.**

—Ken Giles, Consumer product Safety Commission, (301) 504-0580, Extension 1184, info@cpsc.gov



# U.S. Army Fixed Wing Maintenance Procedures

A proposal to transition from fixed wing maintenance test flights to functional check flights in line with best commercial safety and maintenance practices is currently being staffed and coordinated within AMCOM, DES, DCSLOG, DCSOPS, and the MACOMs. Accomplishing this transition will require updating current publications and outlining maintenance training programs for all Army fixed wing aircraft.

TM 1-1500-328-23, *Aeronautical Equipment Maintenance Management Policies and Procedures*, defines Army airworthiness standards and requirements for maintenance test flights for all standard Army aircraft. Thirty-seven percent of the Army's fixed wing fleet is composed of nonstandard aircraft.

The one standard Army fixed wing aircraft is the C-12 and includes over 15 different series: (C, D1, D2, F1, F2, F3, T1, T2, T3, R, R+, U, RC-12G, H, K, N, P, and Q). There are 13 types of non-standard fixed wing aircraft.

Fixed wing maintenance contracts are based upon best commercial practices in order to reduce direct costs and increase efficiencies of the fleet. The entire Army fixed wing fleet is maintained by civilian contractors to civil Federal Aviation Regulations (FAR) standards as defined in the contract's Statement of Work. The FARs provide for best commercial practices and other techniques to determine airworthiness, which causes a conflict between the contracts and current Army publications.

Recommended changes to TM 1-1500-328-23 will allow functional check flights to be accomplished in lieu of maintenance test flights in fixed wing aircraft. AR 95-1 will be changed to relieve the academic requirement found in paragraph 4-29b(2) to attend the Maintenance Manager (MM) portion of the Maintenance Test Pilot Course (MTPC).

FAR Part 91.407(b) requires an aircraft to be flown to determine airworthiness after having maintenance performed. FAR 91.407(c) does not require the aircraft to be flown if, prior to flight, ground tests, inspection, or both show conclusively that the maintenance performed has not appreciably affected the flight operation of the aircraft.

If you have any questions about this topic, contact the undersigned.

—CW4 Aycock, Fixed Wing Branch, Directorate of Evaluation and Standardization, Ft. Rucker, AL, DSN: 558-2453/1493, (334) 255-2453/1493, aycocke@rucker.army.mil

# "Just Because It's Installed Doesn't Mean It Works!"

Most of the Army's fixed wing aircraft are equipped with either a Flight Data Recorder (FDR) or a Cockpit Voice Recorder (CVR). Some aircraft carry both. But just because these recorders are installed on your aircraft doesn't mean they're working. A recent Class A accident demonstrated this.

The aircraft crashed in a very remote and inaccessible location. There were no survivors and no witnesses to the accident. Nevertheless, the accident investigators were hopeful of discovering what had happened because the aircraft had carried both a Flight Data Recorder and a Cockpit Voice Recorder. Both recorders were recovered and transported back to the Army Safety Center for analysis. Unfortunately, the recorders revealed no information about the accident. The FDR analysts discovered that in one of the recorders the magnetic tape had fallen off the spool, perhaps years earlier. The information stored on the tape, although recoverable, had been recorded long before and had nothing to do with the accident. The analysts discovered that the other recorder, however, was functional, but had again recorded nothing to do with the accident. The source of data for the recorder, a Signal Data Converter, had malfunctioned and had not sent any data to the recorder.

Some of the Army's FDR's and CVR's have a FDR/CVR Test/Pass/Fail Annunciator/Switch located in the cockpit. This switch permits the crew to test the functionality of the recorder. Many more aircraft, though, are not equipped with such a switch. It then becomes necessary for the unit to pull out their maintenance manuals and periodically inspect their recorders to ensure they work. If the unit does not have manuals for its recorders, they must be ordered. There are too many kinds of recorders on Army aircraft to include here. The box below lists the most common.

If you need to order manuals for your recorders, you can contact:

**L-3 Communications**
**Aviation Recorders Division**
**6000 Fruitville Road**
**Sarasota, FL 34232**
**(941) 371-0811 or (941) 371-5591 (FAX)**

The following table can help:

## Common Army Recorders

| Description | Loral P/N: | ATA No. |
|---|---|---|
| Fairchild Cockpit Voice Recorder, Model A100N/A23-70 | N/A | 23-70 |
| Fairchild Solid-State Cockpit Voice Recorder, Model A200S | 165E1233-00 | 23-70-03 |
| Fairchild Solid-State Flight Data Recorder, Model F1000 | 165E0503-00 | 31-30-02 |

If you have a recorder that is not listed here, you can contact the Army Safety Center for help in maintaining and ordering manuals for your recorders:

U.S. Army Safety Center
FDR Analysis Section
Ft. Rucker, AL 36362-5363
(334) 255-2259

—Joseph P. Creekmore, Jr. Chief, FDR Analysis Section, USASCM DSN 58-2259 (334) 255-2259. creekmoj@safetycenter.army.mil

# Fixed Wing Manual Updates

## Aircrew Training Manual (ATM), Training Circular 1-218, Utility Airplane C-12 Update

In June 2000, the Directorate of Evaluation and Standardization (DES) hosted a closed ATM conference to discuss TC 1-218 issues. Attendees representing DES were CW5 Dave Bean and CW4 Ed Aycock, the National Guard was represented by CW5 Ken Butler and CW4 Greg Hilewitz. The Aviation and Missile Command (AMCOM) was represented by Mr. Mike Kather and CW5 Barry Penny. The US Army Safety Center was represented by Mr. Gary Braman. Mr.J.P. Carrithers attended as author and also the Special electronic mission aircraft (SEMA) representative for the US Army Intelligence Command, Ft. Huachuca, AZ.

After discussing the National Guard and DES issues, it became apparent to all that the life cycle of the manual had reached the stage that the responsibility needed to be transferred from USAIC to DES. Additionally, the attendees recognized that needs for the SEMA Guardrail community were understandably different from those of the utility community. Mr. Carrithers remained the writer and SEMA training proponent for TC 1-219.

When the suspense for field input to the draft TC 1-218 ended, the input was evaluated and most of the comments were incorporated into the manual.

Common to both manuals was the decision to parallel crew coordination callouts and the revision of the maintenance chapter to reflect functional check pilots as much as possible.

Since then the revision has been centered on incorporating the guidance for training outlined in the new TC 1-200 Commander's Guide into Chapter 2, Training and Chapter 3, Evaluations. Some of the proposed changes to the ATMs are:

**1.** Transitioning from Vr/Vlof/Vyse to a V1/V2 terminology and maneuvering performance to include standardizing crew coordination procedures and call outs.

**2.** Transitioning from the Performance Planning Card (PPC) to the Takeoff and Landing Data (TOLD) Card.

**3.** Deletion of high risk in-flight maneuvers such as the Vmc and Full Stall maneuvers.

**4.** Rewriting of the take-off, slow flight,and stall maneuver standards and descriptions to insure an adequate margin of safety exists while training in the actual aircraft.

**5.** Establish the requirement that would mandate fixed wing aviator simulator minimums.

**6.** Transitioning from Maintenance Test Flight (MTF) and Maintenance Test Pilot (MTP) to Functional Check Flight (FCF) and Functional Check Pilot (FCP) qualifications and procedures.

The new TC 1-218 ATM will establish the standard format for future rewrites of all fixed-wing ATMs.

## Aircrew Training Manual (ATM), TC 1-219, Guardrail and Guardrail Common Sensor Airplane RC-12 Update:

In October 2000, the United States Army Intelligence Center and Fort Huachuca hosted a SEMA Standardization and Safety conference. The most pressing issue the attendees voiced concerned the new TC 1-219 publication date. Attendees were advised that the TC 1-219 was awaiting DES input on how TC 1-200 was going to be integrated into Chapters 2, Training and Chapter 3, Evaluations in TC 1-218. Once this was completed the same chapters in TC 1-219 could be completed and submitted to DOTDS for editing and publication. TC 1-219 is not tied to the revision of TM 1-1510-225-10 and should be published by the time of this *Flightfax* publication.

## C-12 Operator's Manual Update:

The C-12 fleet (G12C/D1, 2/T1, T2/ R and F3) Operator's Manuals are currently being rewritten. The two manuals being revised are the TM 1-1510-218-10 and the TM 1-1510-225-10. Each of the manuals will include several different series of C-12 aircraft and be approximately 1,500 pages in length. When completed, the manuals will be issued to the field on a compact disk (CD). The user will have the option of identifying which C-12 series he or she is operating and only the applicable areas of the manual for that aircraft will be viewed and available for printing. This aircraft series distinction will reduce the operator's manual to a usable size and format. Following are examples of how the proposed aircraft manual and chapter distinctions are drawn:

TM 1-1510-218-10 will include the C-12C, C-12D1, C-12D2, C-12T1 and the C-12T2 series aircraft.

Chapter 3 will include avionics common to all C-12 aircraft listed above. Chapter 3A will include C-12C and C-12D1 aircraft avionics. Chapter 3B will cover the C-12D2 aircraft avionics.

Chapter 3C will include both the C-12T1 and T2 aircraft avionics.

Chapter 7 will address both the performance data for the C-12C and D1 aircraft.

Chapter 7A will include both the performance data for the C-12D2, T1 and T2 aircraft.

### TM 1-1510-225-10 will include the C-12F3, C-12R, and C-12T3 aircraft.

Chapter 3 will include avionics common to the C-12F3, C-12R, and C-12T3. Chapter 3A will include the C-12R aircraft avionics.
Chapter 3B will cover the C-12T3 aircraft avionics.
Chapter 3C will address the C-12F3 aircraft avionics.

### Expected Release Dates:

Because of the depth of the proposed changes made to the two manuals, the TC 1-218 ATM and 225-10 will be released concurrently. DES Fixed Wing will provide to the field implementation guidance expected to require both academic and flight instruction addressing the changes made to both manuals. At the time of the writing of this article, the 218 ATM and the 225-10 were expected to be released in February or March of 2001. The release date for the 218-10 will be announced later.

**—CW5 Bean, Fixed Wing Branch Chief, Directorate of Evaluation and Standardization, Ft. Rucker, AL; DSN: 558-2453, (334) 255-2453/1752, beand@rucker.army.mil**

# AAAA Annual Convention set for April

"Aviation in the Army Transition — Strategy for 2001 and Beyond" is the theme of the Army Aviation Association of America's annual meeting. Planned for 4-7 April in Charlotte, NC, the event boasts GEN Eric K. Shinseki, Chief of Staff, US Army, as its invited keynote speaker.

An official housing registration form for the convention appears in the 31 December issue of *Army Aviation*. Opryland Travel, 800-677-9526, is available to assist with travel arrangements.

# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH64

### Class B

#### A series

■ During taxi for takeoff, aircraft experienced fire in the aft cargo compartment. Crew executed emergency shutdown. Firefighters extinguished fire.

### Class C

#### A series

■ During postflight inspection, damage was found to aircraft's main rotor blade. Bird strike is suspected.

#### D series

■ Aircraft was cleared for takeoff after refueling when No.1 engine experienced overtorque. No.2 engine was in the "fly" position but had not been started after refueling was completed.

### Class E

#### A series

■ During OGE, aircraft's oil hydraulic utility bypass light illuminated when gun was actioned. Aircraft proceeded to airfield without further incident. Maintenance replaced the utility bypass indicator.

■ Pilot Night Vision System went out of focus and could not get useable FLIR image through sensor. Replaced PNVS.

## CH47

### Class E

#### D series

■ During NVG mission, flight engineer noticed that the aircraft's No.2 flight control hydraulic temp was fluctuating. The mission was terminated and aircraft was returning to the departure point when the No.2 flight control hydraulic and No.2 AFCS caution lights illuminated. The emergency procedure was completed. Maintenance replaced pump.

## OH58

### Class C

#### D (r) series

■ NP reading reached 124 percent for 6 seconds while pilot was attempting a manual FADEC operation.

#### D (l) series

■ Aircraft drifted back into tree during aerial gunnery. Damage to all four tail rotor blades.

■ During a maintenance run-up, TGT rose rapidly, throttle was closed and the start was aborted. Engine monitor showed 144 degrees for 4 seconds. Maintenance personnel determined that the engine required replacement.

### Class E

#### C series

■ During runup, ENGINE OUT light illuminated. No other indication of engine failure was present. Replaced No.1 tachometer generator. Maintenance operational check OK.

## TH67

### Class B

■ During hover flight training, aircraft dipped nose low and to the left. Main rotor blades made ground contact. Aircraft came to rest on its right side. Main rotor blades were destroyed. Fuselage was damaged with loss of tailboom and tail rotor assembly. Two personnel were taken to hospital, treated and released.

## UC35

### Class E

#### A series

■ At FL390 the No.2 inverter fail light illuminated. Crew performed the appropriate checklist procedures for an inverter failure. The aircraft was landed without incident. Inverter was replaced, and aircraft was returned to service.

## UH1

### Class E

#### H series

■ Aircraft was in straight and level flight at 1,000 feet. The PC noticed the smell of hydraulic fluid and then observed the master and hydraulic caution lights come on. After proper notification, the crew performed a run-on landing to airfield where aircraft was shutdown without further incident. During maintenance inspections at airfield it was discovered that the hydraulic pump was not installed correctly causing the leather packing and rubber "O" rings to fail, resulting in total loss of hydraulic fluid.

## UH60

### Class C

#### A series

■ During takeoff, Chalk 3 of 4 observed a large bird descend through the tail rotor disc of Chalk 2. Entire mission was aborted. All aircraft landed safely without further incident. Damage to two tail rotor blades and a portion of the stabilator found on postflight inspection of the struck aircraft.

■ During postflight inspection, damage was found to trailing edge of stabilator, possible tail wheel damage. Aircraft had been practicing landings to a sod strip.

### Class E

#### A series

■ During cruise flight, generator became inoperable. Aircraft landed without further incident. Replaced generator control unit.

#### L series

■ During flight, aircraft's stabilator failed out of auto mode, would not reset. Later stabilator reset on its own. Aircraft landed without incident. When avionics checked, could not duplicate, test flown OK. Aircraft released for flight.

**For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.**

# The UC-35 and Army Fixed wing Aviation

With the Army's role in our national military strategy changing from a forward deployed force to a CONUS based, force projection army, fixed wing aviation has been challenged to provide the force with a fast and efficient medium range (500-1,800 nautical mile) transport.

This aircraft must provide the Army with an all-weather transport for commanders, their staffs, and critical equipment and parts. The Army's Modernization Plan and Fixed Wing Investment Strategy identified the need for an airframe capable of rapid worldwide self-deployment, while continuing to provide for cost-effective, intra-theater missions ranging from support-and-stability operations to wartime operations.

With the Army downsizing and operating under severe budget constraints, this airframe had to be capable of getting the decision makers and their staffs to the right place in the shortest possible amount of time with the greatest efficiency.

The C-12 Huron has been the workhorse of the fixed wing fleet since the 1970s. Originally intended to perform the Army's short range mission (up to 500 nautical miles), the C-12 is routinely tasked to undertake missions in excess of 1,000 miles. Although the C-12 has been a very reliable airframe it lacks the range, speed and efficiency to optimally perform the medium range mission.

A new aircraft was needed to fill the void. The gap between the operating capabilities of the C-12 and C-20 were bridged in 1995 when the Fixed Wing Product Management Office chose the Cessna UC-35 as an answer to the Army's challenges. Greater operating capabilities, along with low acquisition and maintenance costs, made the UC-35 an immediate hit with the fixed wing community. The US-35 has proven to be cheaper and more reliable than the C-12 when performing missions of more than 300 nautical miles. Twenty UC-35s have been fielded so far, with an approval to field a total of 67 to support the Army's medium range requirement.

Additionally, the immediate success and value of the UC-35 has prompted studies into the feasibility of replacing the C-12 with the UC-35, or another similar commercial aircraft, for the Army's short/medium range mission.

A key factor in the ability of the UC-35 and other Army fixed wing aircraft to fulfill their missions in the future will be their ability to conform to Global Air Traffic Management (GATM) procedures. The purpose of the GATM program is to preserve operational readiness and Department of Defense (DoD) access to global aviation routes into the 21st century by equipping military aircraft to meet the emerging requirements of the worldwide air navigation system. The International Civil Aviation Organization (ICAO), Federal Aviation Administration (FAA) and other civil aviation authorities plan to implement new air traffic management architecture to relieve the tremendous strain on the air

traffic control (ATC) system.

It is intended that the GATM group of technologies, also referred to as Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) in civil aviation, will ultimately provide the means to achieve dynamic routing and overall safer, more reliable training, and safe recovery of assets. Dynamic routing means that aircraft would no longer have to use prescribed tracks and airways, but would be free to select flight paths optimum for their missions. Although civil aviation authorities cannot mandate system capability for the military, commanders will have to deal with civil air traffic services, and may need to receive data feeds from FAA and other civil aviation authorities as a means of exchanging time critical flight information and of monitoring flight operations.

Failure to equip military

aircraft for civil compliance would have significant operational and organizational impact on ground commanders, forcing aircraft to fly non-optimum/longer routes and altitudes, resulting in increased flight times, increased fuel consumption and decreased payloads. Delays in delivery of combat troops and equipment, as well as delays in arrival of combat forces, may weaken a theater commander in chief's posture during the critical first days of an operation. Additionally, training and training support missions will be excluded from affected airspace resulting in critical training deficiencies.

To avoid these and other difficulties the Fixed Wing Program Manager plans to modernize aircraft to meet existing and emerging GATM requirements. The UC-35 is an example of the avionics-modernization effort. The A-models that are currently fielded are receiving an avionics upgrade that will bring the aircraft into compliance with near and mid-term GATM requirements. This upgrade is scheduled for completion by September 2000. The first UC-35Bs—scheduled for delivery in December 2000—will be GATM compliant when they are delivered to the Army.

**—Reprinted with permission of Army Aviation and the authors, Captain Matthew Jones and CW 5 Barry Penny, Fixed Wing project office, Redstone Arsenal, Alabama**

# Obstacle Avoidance During Army Fixed Wing Flight Operations

As air travelers, most of us assume a given level of safety when we purchase a ticket on a civil air carrier; a level of safety that includes properly maintained equipment and highly proficient flight crews that will be able to transport us safely and proficiently to our destination. We assume a level of safety exists that extends from normal to emergency operations helping the flight crew to negotiate emergencies resulting in successful outcomes.

One goal of Army fixed wing aviation operations is to maintain the same level of safety as our counterparts within the United States airline industry and we have been able to do that. To maintain that level of safety, DES and the MACOMs continuously review Army policy and procedures and civil regulatory changes to ensure that our aviators and equipment are able to operate at that high level.

Recently however, an issue was brought to light that concerns commanders and standardization officers: if an airplane experiences an engine failure on takeoff or departure, will the airplane have sufficient performance capabilities to remain clear of terrain and obstacles?

## The Issue

For flight operations, the Federal Aviation Administration (FAA) requires airlines and air carriers to maintain positive obstacle clearance for all departures, whether operating in instrument meteorological conditions (IMC) or visual meteorological conditions (VMC), by computing performance planning using one engine inoperative data. Positive obstacle clearance for US airlines and air carriers must be maintained for the entire duration of the flight: takeoff, en route, and approach.

When operating under instrument flight rules (IFR), Army aviators are required to comply with any published departure procedure (DP) in accordance with 14 CFR Part 91.129 and AR 95-1. Presently, no requirement exists for Army fixed wing aircraft to apply worse case (one engine inoperative) data to performance planning data for instrument departures. If an Army fixed wing aircraft experiences an engine failure either right at, or immediately after lift off, there are presently no assurances that the aircraft has sufficient climb performance to clear obstacles in the flight path. Assuming there is at least some one engine inoperative climb performance, this may not be much of a problem in VMC conditions, but is a critical requirement for IMC flight.

The concern that was highlighted above surfaces

when we make the startling realization that flight operations of U.S. Army fixed wing aircraft can only provide a comparable level of obstacle clearance safety as U.S. flag carriers when departure climb performance is based on one engine inoperative data.

## Background

The Army procures commercial, off-the-shelf aircraft directly from the manufacturer. When an aircraft manufacturer sells an aircraft to any customer, it is required to have a certified minimum level of performance. That level of performance is based upon a worse case scenario: one engine inoperative. Most Army fixed wing aircraft were manufactured and certified under 14 CFR Part 25 for transport category aircraft or Part 23 for normal, utility, and commuter category aircraft. Aircraft manufactured and certified under these portions of the FARs require initial one engine inoperative climbs of 2.0 to 2.4 percent or approximately 122 to 146 feet per nautical mile.
The FAA has developed instrument departure procedures in accordance with Department of Transportation (DOT) Terminal Instrument Procedures ensuring that obstacles along the departure path do not penetrate a 2.5% obstacle identification plane. To ensure obstacle clearance during the departure procedure, aircraft should climb on a standard, 200 feet per nautical mile, or 3.3% gradient. The FAA has determined that this climb gradient is used in "normal" conditions, however no procedure or explanation exists when aircrews encounter other than normal operations.

If an obstacle is found to penetrate the departure path obstacle identification 2.5% plane, the departure climb gradient will be increased through the issue of a departure procedure (DP) to ensure obstacle clearance. In this instance, higher weather minimums are also issued to give flight crews who cannot attain the required climb gradient an alternative see-and-avoid procedure for obstacles when departing under IFR.

As you can see anyone can purchase an aircraft and operate it in the national airspace structure utilizing "normal" procedures. However, the airworthiness flight performance required at certification may not ensure obstacle clearance during other than normal (read emergency) conditions. The Army fixed wing program manager (FWPMO) continues to procure commercial, off the shelf aircraft to avoid extensive research and development costs and reduce delays in fielding. Within the fixed wing community we are realizing the distinct difference between certification standards and the professional and ethical operational standards that must be addressed.

## Further considerations

Recently, the FAA has changed the identification of departure procedures from what we used to know as standard instrument departures (SID) to departure procedures (DP). These DPs have further been delineated as "named" or "obstacle." All DPs provide obstacle clearance and provide aircrews a method to depart the airport and transition to the en route structure. Besides providing obstacle clearance, DPs may also be present at busier airports to increase efficiency, reduce communications, and ultimately, departure delays.

In the FAA's Aeronautical Information Manual (AIM), a question is asked that needs follow up: Who is responsible for obstacle clearance during a departure? The AIM states that when a pilot follows the published procedure the DP provides obstacle protection. If a pilot chooses not to utilize a DP or to climb in VFR conditions then obstacle clearance cannot be assured. Also, if the aircraft maneuvers farther from the airport than the published visibility minimums within the DP then obstacle clearance is not guaranteed.

Aircrew responsibilities outlined in the AIM prior to departing under IFR conditions include determining whether a DP is available to use for obstacle clearance and transition to the en route structure. If a DP is available, does alternate weather exist that will assist the pilot in

seeing and avoiding obstacles or should the aircrew follow the DP? The AIM also states that the pilot must consider the effect of degraded climb performance and actions to take in the event of an engine loss during the takeoff or departure.

As mentioned earlier, the FAA requires all airlines and air carriers to have positive obstacle clearance during the duration of the flight from takeoff and departure, en route, and for the approach phase, as well. It seems that the FAA only recommends positive obstacle clearance for operations other than airline and air carriers.

## Current discussion

Within the Army fixed wing community, several MACOMs have addressed the requirements for positive obstacle clearance. The Operational Support Airlift Agency (OSAA) at Fort Belvoir was the first MACOM to implement minimum climb performance based on worse case information. The OSAA has requirements for minimum climb gradients in all of their aircraft using one engine inoperative performance data during all departures. If a DP has alternate minimum weather in lieu of a higher climb gradient, the OSAA requires their aircrews to adhere to the published weather minimums unless they can comply with the higher than standard climb gradient using one engine inoperative climb performance.

The FORSCOM Supplement to AR 95-1 also has minimum climb gradient requirements for fixed wing aircraft. For all takeoffs in FORSCOM fixed wing aircraft, the aircraft must have at least a 200-foot per nautical mile (3.3%) single engine climb gradient. This climb gradient meets the intent for standard climb gradients, but doesn't address the eventualities that may arise when an aircraft experiences an engine failure during takeoff or departure.

I think that you can see that some of our fixed wing operators within the Army are striving for that equivalent level of safety as our airline and air carrier brethren, but discussion continues on this issue. Discussion centers on the differences between Army and civil operations, between peacetime versus wartime operations, and we really need to protect our force but is this one way to do it. Prior to the OSAA implementation of their required climb gradient procedures in 1996; several of the Standardization Officers within the section conducted an informal survey of the Department of the Army Civilian (DAC) workforce. The survey centered on their knowledge and perception of safety levels of the airlines and, at that time, OSAA operations. These DAC staff members were shocked and dismayed when they found out that in the unlikely event that an aircraft they were passengers on experienced an engine failure on takeoff there was a high probability that the outcome would not be successful.

The last discussion issue concerns the ethical and moral requirement of the aircrew to inform the passengers when their aircraft is unable to perform at a safety level equivalent to the airlines. People who take the side of total disclosure see no problem in telling our passengers this information. They think it is a part of an unwritten contract that exists when someone participates in air travel in an Army aircraft as a passenger. They also think that just because the crew is willing to depart and accept the risk the passengers may not want to be a party to that risk assessment and acceptance.

The others side of the debate centers on the focus of military operations, mission accomplishment, and the low probability of this type of occurrence happening. Another point of the debate from this side becomes the use of information disclosure as a scare tactic. Supporters claim that the use of these "scare tactics" will generate an uneasiness and lack of confidence in our operations.

Resolution

Presently DES, in conjunction with input from the MACOMs, is trying to develop policy that governs Army fixed wing performance planning for all departures. While this policy is being developed, some of the issues we are covering include:

a. Requiring a minimum,

one engine inoperative, climb performance standard for all IFR departures.

b. Requiring that when higher than standard climb gradients are published that fixed wing performance planning must assure the required departure climb gradients can be accomplished with one engine inoperative.

c. Providing relief when alternate weather minimums are provided in lieu of higher than standard climb gradients. Aircrews may use the minimum standard climb gradient when the departure weather meets the published alternate weather minimums.

d. When a climb gradient is not specified, as in departing non-instrumented airfields and VFR climbs, the aircrew may revert to the one engine inoperative climb performance assured by compliance with takeoff weight charts in the appropriate Operator's Manual or Aircraft Flight Manual.

e. Providing some relief through a waiver process. Relief under certain situations defined by extraordinary and critical operational need and granted on a case-by-case basis by the first O-6, or higher, in the chain of command.

f. When conducting fixed wing flight operations granted under this waiver process, the pilot-in-command must brief the entire crew and all passengers that they are involved in a high-risk mission and inform them of the conditions that elevate the risk.

## SUMMARY

Providing safe customer support is the focus of all goals within the fixed wing community whether we are transporting commanders and staff or conducting intelligence gathering operations. Aviators must always be aware of the capabilities of the equipment they operate, the limitations of the mission (which might be imposed by the environment), and their own limitations as part of the aircrew. As we identify these risks and then implement operating procedures to mitigate them we continue to protect our assets and support safe operations within Army aviation.

**—CW5 Hilewitz is a 20-year Master Army Aviator currently assigned to the Operational Support Airlift Agency performing duties as the ARNG Liaison Officer to the Fixed Wing Branch, Directorate of Evaluation & Standardization.**

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## POV Fatalities

through 31 Dec

| FY01 | FY00 | 3-yr Avg |
|---|---|---|
| 22 | 21 | 28 |

U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

March 2001 ♦ VOL 29 ♦ NO 3

http://safety.army.mil


# Shipboard Landings can be a Wild Ride

# Shipboard Landings are a Wild Ride

The recent tragedy involving a Marine Corps CH-46, in which nine military personnel perished during a day VFR approach to a ship, is a vivid reminder that even seasoned pilots who operate from ships routinely can quickly find themselves at risk.

Whether you only land aboard a ship at sea once, or your mission essential task list details an over-water requirement, knowing the dangers of landing and recovering to pitching, rolling, moving ships may save your life. Here are some suggestions from JSHIP, the Department of Defense-chartered Joint Test and Evaluation Program designed to improve the interoperability of non-Navy helicopters on Navy ships.

■ Plan for unpredictable turbulence.

■ Know the approved wind envelope for your aircraft on the specific landing spot of the specific ship.

■ Review Navy procedures, voice calls and LSE (Landing Signal Enlisted) Hand Signals.

■ Turn off your AFCS.

■ If you expect to be hangared: (the hangar bay of the ship)

■ JP-5 required

■ Blades must be folded

## Plan For Turbulence

Because of wind flow anomalies over the flight deck and the close proximity of the ship's superstructure, expect turbulence at any time during takeoff or landing.

If you are operating on a multi-spot ship with other aircraft, expect interfering rotor-wash and as little as 15 feet between rotor disks.

## Use Only Approved Wind Envelopes

■ You are always safe to use the generic (but highly restrictive) wind envelope that is good for all aircraft on all ships.

■ If your aircraft has been tested and approved for expanded wind envelopes on a specific class of ship and a specific landing spot, then and only then can you be assured of safe launch/recovery ops.

Approved wind envelopes can only be found in the following Navy Pubs:

● CV NATOPS (Naval Aviation Training and Operating Procedures-Aircraft Carriers.)

● LHA/LHD/MCS NATOPS (Amphibious Assault Ships/Mine Countermeasure Support Ship, Naval Aviation Training and Operating Procedures.)

● Navy Pub 3-04.1, also known as the Air Capable Ships NATOPS, for single and dual spot ships.

● WARNING: FM 1-564, Shipboard Operations does have wind envelopes, but not all of them are accurate.

## Review Navy Procedures

■ Prior to your arrival, familiarize yourself with arrival, landing, refueling and shutdown procedures.

■ Check out **www.jship.jcs.mil** for an easy

to understand tutorial on shipboard procedures, electronic copies of the all-ship NATOPS manuals, and FM 1-564, and printable pilot knee board cards to have when you need them.

■ The LSE is your marshalling authority on the flight deck. Review the hand signals he will be using and remember to only proceed with engagement or disengagement of your rotors on his signal. This is necessary to ensure the ship is not maneuvering and the winds are within limits.

■ The LSE will want to gain your approval for all people who enter or exit your rotor

disk area.

■ Expect to have the Navy crew immediately chock and chain your aircraft upon landing on the LSE's signal, but don't expect them to know where your hard-points are—have your crew chief help them.

### Staying Aboard

■ If you expect to protect your aircraft from the elements, you will need to be prepared to stuff your helo in the hangar (deck). That means that you must fold your blades (yes really) and have less than ½ tank of gas if it is other than JP-5. The easiest solution is to plan your last one or two refuelings at Naval or Marine Corps Air Stations.

■ The restriction is due to keeping the flash point of the fuel in your tanks below 120 degrees in the hangar.

### Bottom Line

Shipboard helicopter operations present a whole new set of hazards and unfamiliar conditions that you must prepare for. Check out the website: www.jship.jcs.mil to review the latest on issues associated with your aircraft and the ships you expect to operate with.

**—CDR Bret Gary, JSHIP, Navy Deputy Director, Paxtuxent River, MD DSN 342-4936 (301)342-4936,GaryB@navair.navy.mil and Bob Giffin, System Safety Manager, CW4, USA Ret. US Army Safety Center, Ft Rucker, AL, DSN 558-3650 (334) 255-3650, giffinr@safetycenter.army.mil**

# Have we forgotten how to teach "What RIGHT looks like"?

***This is the first of a 5-part series on the risk management process. This article focuses on step 1 "Identify the hazard."***

The greatest legacy that leaders can leave their subordinates is the ability to know what RIGHT looks like. Experience can certainly be a powerful teacher, but it can also be the most costly in terms of lives and materiel when a mistake is made that clearly could have been prevented if the leader knew what RIGHT looked like. If the leader doesn't know RIGHT, he doesn't know WRONG. And if he doesn't recognize WRONG, he can't make it RIGHT. Then, he's doomed to needlessly repeat lessons we fail to learn, sometimes tragically. In the language of risk management: If the leader doesn't recognize the hazards (know what RIGHT looks like), then he won't assess the risks and develop appropriate controls (turn WRONG into RIGHT).

Recent accidents indicate that our soldiers do not have this leader tool in their backpacks, so the obvious question is: "Why not?"

First, what do I mean by "What does RIGHT look like?" I define it as being able to instinctively assess a situation as a right or wrong way to do a task; and if wrong, take the appropriate action to avoid an accident—a *sixth sense* perhaps, or that feeling of the hair rising on the back of your neck. Others might define it simply as common sense applied to a situation.

Whatever your definition, it is based on experience—yours or someone else's. For example, you wouldn't consider operating your privately owned vehicle (POV) without using your seatbelt. Someone taught you that. Likewise, you wouldn't allow anyone to ride in your vehicle without being belted in. Why? Because you know what RIGHT looks like.

Recent accident investigations clearly indicate that many of our soldiers are not exercising this absolutely essential leadership quality. Let me illustrate my argument.

**Remember a bad example is still a lesson learned. . . but you have taught what WRONG looks like.**

An eager ground cavalry platoon leader took his M3A3 Bradley platoon to the field to conduct much needed training. When the platoon reached a rain-swollen creek that was clearly impassable by fording, a squad leader elected to cross anyway. The result was a swamped vehicle and a drowned soldier.

This training experience cost a soldier his life. Specifically, this accident had failures of what RIGHT looks like throughout the chain of command. The leaders responsible for training this platoon leader and his platoon sergeant were nowhere to be found.

This is just the latest example in a very disturbing trend. Young leaders don't seem to recognize what RIGHT looks like, nor do they identify the hazard and appreciate the associated risk. How do we as leaders correct this trend? What is the mechanism in your unit that allows junior leaders the latitude to learn valuable lessons while still maintaining that necessary oversight to prevent accidents? Without an effective mentoring process, how will the future leaders of our Army build their foundation? In other words, how do you train a leader to know what RIGHT looks like?

Leadership remains an art, not a science. This simple statement means that the answer is not a checklist. The essence of mentoring from every level is that it builds competence and confidence in our leaders. Equally as clear is that mentoring does not occur if leaders are not present when their soldiers are training.

Remember, too, that the bad example is still a lesson learned. For example, who is to blame when the chain of command allows soldiers to use a propane heater in a location that the manufacturer clearly warns that it should not be used? The initial answer is clear, yet the deeper question is how did this chain of command not recognize this as WRONG and make it RIGHT?

This is the essence of knowing what RIGHT looks like. When you walk by a bad practice or overlook a standard not being met, you have taught the Army's young leaders a lesson. But you have taught what WRONG looks like; you have established a new, lower standard of acceptable performance; you have set young leaders up to repeat history's mistakes.

I have found nothing more rewarding in my military career than being in command of soldiers. Our soldiers need our very best effort as well as the opportunity to learn. Leaders must create the proper environment and then coach, teach, and mentor leaders at every level. Our Army needs it now more than ever. Pass on your talent and experience. Teach our soldiers to recognize what's WRONG so they ***know what RIGHT looks like.***

**POC: COL Michael N. Riley, USASC Director of Operations, DSN 558-2461 (334-255-2461), rileym@safetycenter.army.mil**

# Attention Chinook crewmembers!

## Incorrectly installed CH-47D droop stop Alert!

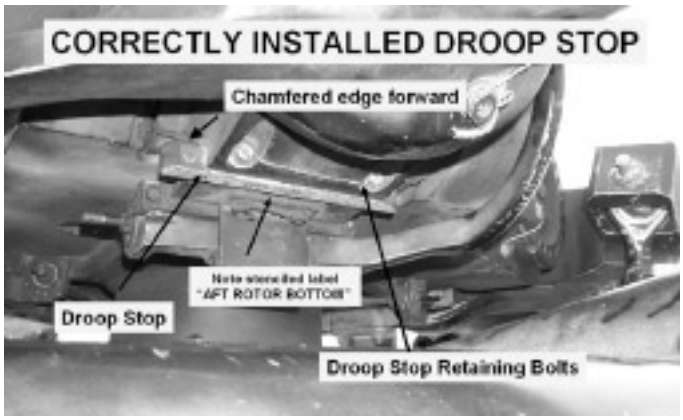
A recent accident investigation into a CH-47D droop stop failure revealed that incorrect length bolts may have caused the aft droop stop to fail, resulting in significant damage to the aircraft from blade strikes.

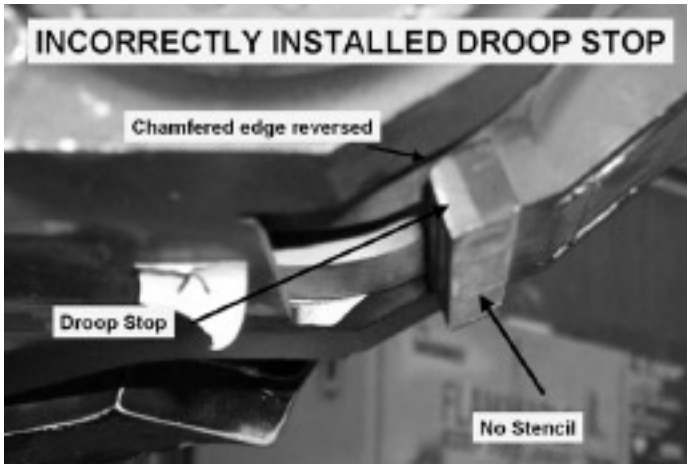
A subsequent Aviation Safety Action Message (ASAM), CH-47-01-ASAM-05 was issued directing units to inspect forward and aft droop stop bolts for correct length.

A few weeks later, another droop stop failure accident occurred. The subsequent accident investigation determined that the original ASAM may have inadvertently caused units to incorrectly reinstall the forward and aft droop stops after inspecting them for correct bolt length. This accident investigation determined that Task 5-48, Replace Fixed Droop Stop, in TM 55-1520-240-23-4, does not adequately describe the correct installation of the forward and aft droop stops. The drawings contained in the maintenance manual do not show the detail of the droop stop's chamfered and beveled edges, and the correct positioning of the droop stop.

**The droop stop can be installed incorrectly. Incorrect installation will lead to stress on the retaining bolts and subsequent failure of the droop stop.**

As a result of this investigation, the Aviation and Missile Command (AMCOM) issued Safety of Flight Message CH-47-01-02 for inspection of all droop stops for proper installation. This message includes detailed inspection descriptions. A copy of this message with detailed technical drawings can be accessed at http://safety.army.mil under the CH-47D Safety of Flight link. (See photos for correct and incorrect examples.)




The CH-47D droop stops are seldom removed or installed at unit level. Most installations occur at depot level when the rotor head is overhauled. The forward droop stop (P/N 114R2063-7) and the aft droop stop (P/N 114R2087-3) should be stenciled on the bottom: AFT ROTOR BOTTOM or FWD ROTOR BOTTOM. **These parts are not interchangeable.**

The investigation also revealed that these stencils can be painted over with black paint during depot overhaul of the rotor heads. Without the stenciling and detailed installation instructions in the maintenance manuals, units may incorrectly reinstall droop stops, and an accident can occur. Additional investigation revealed that there are many of these parts in the supply system that are not correctly labeled-this, too, can lead to incorrect installation. Product Quality Deficiency Reports (SF368) should be initiated IAW DA PAM 738-751 if any of these unlabeled parts are discovered in the supply system.

**—Major Mike Cumbie, Chief, Scout/Attack Branch, USASC, DSN 558-3754, (334) 255-3754, cumbier@safetycenter.army.mil**

# Didn't USAARL research that?

## *AVIATION RESEARCH AT FORT RUCKER HELPS THE AVIATION COMMUNITY*

The U.S. Army Aeromedical Research Laboratory (USAARL) has 38 years of research experience in aviation medicine. It is one of seven laboratories under the U.S. Army Medical Research and Materiel Command, located at Fort Detrick, Maryland. The mission of the laboratory since its establishment in 1962 has been to support Army aviation and airborne activities.

This mission has since expanded to include medical research programs in acoustics and vision, and health hazard assessments of rotary-wing aircraft, tactical ground vehicles, selected weapons systems, and airborne operations.

Housed in an approximately 167,000 square-foot building complex, USAARL draws upon the skill, education, experience, and dedication of 90 military and civilian scientists, engineers, flight surgeons, technicians, and support personnel. Major capital resources include a full-motion, fully instrumented, climate controlled NUH-60FS research flight simulator, a man-rated 3-axis ride simulator capable of replicating the ride of any rotary-wing aircraft or ground tactical vehicle, an anechoic acoustic chamber, and dedicated aircraft assets consisting of a JUH-1H (Huey) and a JUH-60A (Black Hawk).

USAARL's current areas of research include:

- Aircrew endurance and sustainment, development of aviation life support equipment and crashworthiness design standards.
- Coping strategies for shiftlag and jetlag.
- Acceleration injury assessment using a crash manikin.
- The communications earplug.
- The UH-60 cockpit airbag system.
- Spatial disorientation.
- The effects of head-supported weights on Army warfighters.
- Refractive error correction methodologies and military implications.
- Visual performance with electro-optical displays.

USAARL supports cooperative efforts with both commercial and other Department of Defense (DOD) agencies. A customer-funded program allows DOD customers to access USAARL's expertise and research resources for specific needs. Through Cooperative Research and Development Agreements (CRDAs), commercial organizations and universities can exchange data, equipment, and/or services for the purpose of conducting joint research investigations, maintaining scientific state-of-the-art awareness, and expediting technology transfer. USAARL currently is entered into 14 CRDAs with various companies and universities.

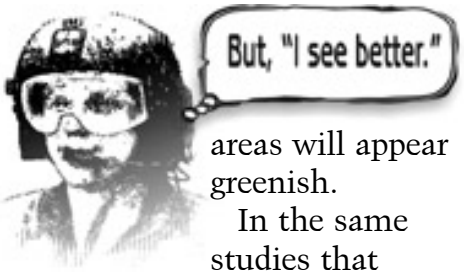
Today, the limited funds for research must be oriented to ensure relevant direction with the results transferred to both the military and civilian communities. USAARL scientists in 1999 produced 15 open-literature articles published in scientific journals and professional magazines, published 27 technical (laboratory) reports, and made 32 presentations at professional conferences and meetings.

Over its 38 years of research for the soldier, USAARL has published 1,189 reports supporting the Army mission, the majority of which are available through the Defense Technical Information Center. An annotated bibliography of all laboratory reports is published annually and is available for distribution.

**—Linda M. Burt, Writer/Editor, USAARL, DSN 558-6906 (334) 255-6906; Linda.burt@se.amedd.army.mil**
**Visit our website: http://www.USAARL.army.mil**

# Yellow visors...More harm than good!

***Do you have a yellow-tinted visor on your helmet or in your flight bag? Does your buddy? Many aviators do. That may be a problem.***




## The Question

Every 3 to 4 years the question, "Is the Army ever going to issue yellow-tinted visors?" seems to rise like a phoenix. The Army's answer to this question has been, and still is, "No." But, there is still a persistent perception among aviators that visual performance can be improved by wearing yellow-tinted (blue-blocking) visors, especially in haze and snow environments. The idea that yellow-tinted filters, glasses, etc., can be used to improve visual performance can be traced back as far as 1912. Today, one only has to browse through hunting and gun magazines to find more than one advertisement for "yellow, high-contrast" shooter's glasses.

In combat, where even the smallest edge can make the difference between life and death, soldiers, sailors, and aviators are all looking for that one improvement which will make the difference. In response, the Army, Navy, and Air Force, over the years, have conducted numerous studies to investigate the possible benefits of using these "vision enhancers."

## Just The Facts, Please

From 1912 to 1999, over 200 papers have been published on performing various tasks while viewing through yellow or blue-blocking filters. The overwhelming majority of these papers conclude that the use of these filters does not improve performance of the selected tasks and can actually degrade performance.

For example, color information is very important to aviators. Colored lights are used at airports to provide information. Blue lights outline taxiways. Taxiway turnoff and centerline lights are green. When viewing through yellow visors, pure blue light is not transmitted and therefore disappears. Broadband blue lights appear greenish. White and yellow lights appear yellow. Accurate color discrimination through yellow filters is also problematic in other aviation areas, e.g., smoke grenade signaling and aviation sectional charts. Smoke grenades come in such colors as red, green, yellow and violet. When viewed through yellow visors, yellow smoke will appear white, and the violet smoke will look orange. Aviation maps color code information such as areas with dense populations and urban structures (yellow), water (blue), restricted areas (blue), and controlled air spaces (blue and magenta). When these maps are viewed through yellow visors, population and urban structures will blend away, and water and restricted areas will appear greenish.

In the same studies that failed to find performance improvement when viewing through yellow filters, the study participants reported that the scene was brighter, and their vision was improved. But believing that you can see better does not mean that your visual performance is better. Yellow visors, by blocking the blue parts of the scene, give the appearance of reduced haze. But this is a false improvement because the blue light carries information that is lost when viewing through the yellow visor.

## The Bottom Line

For the overwhelming number of flight scenarios and tasks, the use of yellow visors will not improve visual performance. For many tasks, visual performance, and therefore mission effectiveness, will be compromised. Undoubtedly, there are unique or narrowly defined situations where the yellow visor may provide an edge. However, it must be generally concluded that unilateral use of yellow visors will do more harm than good.

**—Clarence E. Rash, research physicist, USAARL, DSN 558-6814, (334) 255-6814, Clarence.rash@se.amedd.army.mil; Sharon D. Manning, Aviation Branch Safety Office, Fort Rucker, AL, DSN 558-3000, (334) 255-3000**

# Safety professionals must make a difference!

In fiscal year 2000, the Army enjoyed one of its best years ever in terms of safety performance. In aviation, both the number of fatalities and the Class A and B flight accident rates were reduced to all-time lows. In ground accident prevention, FY00 was the second-lowest year ever in terms of the number of ground and privately owned vehicle fatalities.

Each and every one of you can take credit for these safety successes. All of us rolling up our sleeves and working together made a difference. It was an extraordinary effort of—

■ Leadership involvement in safety programs.

■ Safety professionals-civilians and military-helping commanders make informed risk decisions.

■ NCOs enforcing standards and making on-the-spot corrections.

■ Individual soldiers exhibiting the self-discipline to follow standards while resisting the temptation to take shortcuts sometimes perceived necessary due to the OPTEMPO.

We all can be, and rightfully should be, proud of the Army's FY00 safety performance. However, early trends in FY01 indicate that we are not following success with success. We have already surpassed the total number of Class A aviation accidents from FY00 and we are less than half way through the fiscal year. Leader intervention is necessary to stop this trend and to get us back on track.

## Individually and collectively, we will have to seek even better ways of making a difference in our Army

At this year's Fall Army Safety Conference, members of two distinguished panels provided what I believe are some critical insights into how each of us can make a difference in the safety performance of our organizations and units. Three highly respected members of our civilian safety professional corps-Ms. Connie DeWitte, Chief of the U.S. Army Corps of Engineers Safety and Occupational Health program; Mr. John Frost, Chief of the Aviation and Missile Command Safety Office; and Mr. Fred Fanning, Safety Director of the U. S. Army Maneuver Support Center, Fort Leonard Wood—shared with us some sage advice on being relevant to their commander's needs and things they wish they had known before being placed in their first safety positions.

Their views from the safety manager perspective were complemented by recommendations from three field commanders—COL Bernard Champoux, Commander, 2d Bde, 10th Mountain Division; COL Nolen Bivens, Commander, Basic Combat Training Brigade, Fort Benning; and LTC Jeffrey Cairns, Deputy Commander, 1st Special Warfare Training Group, Fort Bragg—on what they, as commanders, are looking for from their unit safety managers.

Personally, I believe that listening to the voices of experience and applying the panels' proven recommendations can help each safety professional better support his or her commander in establishing and executing viable, risk-management-based safety programs. I urge each safety professional, civilian and military, to carefully consider the comments from both panels and incorporate their lessons learned and recommendations into your proactive goals for making a difference in the Army's continuing campaign to reduce accidental losses of both human and materiel resources.

## Things I Wish I Had Known Before My First Job–A Safety Manager's Perspective

We have all learned lessons the hard way. We have all wished that we had been told some things before we were assigned to our first safety position. Following are some of the lessons that Ms. DeWitte, Mr. Frost, and Mr. Fanning have learned from a cumulative total of 70 years of experience in the safety field:

■ Pick battles that are big enough to be important, but

small enough to win.

■ Remember that no one's view is complete. Each person sees some of the truth. Listen carefully to everyone's position before forming your own. You can learn from them all.

■ Obtain command support. Command support makes all the difference in the world to your success. It is great when you have it, and it is frustrating when you don't. It is also very fleeting. You must be relevant to the commander's needs.

■ It's the little things that make a big difference in a safety and health program.

■ Widespread impact can only come through effective leveraging through others.

■ Think outside the box - if for no other reason than to keep life interesting.

■ Interdependence results in a stronger safety and health program than independence.

■ Without deadlines, goals are just dreams. Or put more directly, if it weren't for the last minute, nothing would ever get done.

■ Integration is the lifeblood of an effective safety program.

■ Attitude often breaks or makes a situation.

■ Make fun and laughter core values of your safety office. Take your work seriously, but not yourself.

■ Bad safety news does not get better with age.

■ Surround yourself with great people.

■ Don't just tell me that I can't do my job because it is unsafe. Rather, tell me how to do my job safely.

■ Take the initiative, be a Safety Professional, not a practitioner.

## How Unit Safety Managers Can Make a Difference–A Commander's Perspective

The following insights into how safety professionals can better serve their commanders were outlined by COL Champoux , COL Bivens, and LTC Cairns:

■ Find what is knowable and what is unknown.

■ Waiting for the question to be asked is the path to irrelevancy.

■ Safety analysis must inform the decision maker about risks and returns of each decision.

■ Decision implementation is based on planning. Planning results from organizational learning. And safety analysis must speed up the organization's learning.

■ There is no cold start. Risk is a cumulative thing.

■ Nobody has all the answers. Collaborate. Function as a team.

■ Be ready to serve - be trained for the position. Understand the organization's mission.

■ Understand the military decision-making process and how to integrate risk management into it.

■ Be visible and proactive in the organization. Get out from behind the desk and out into the organization to see first hand what the mission is all about and what risks are present.

■ Provide continuity, cohesiveness, and commitment.

■ Understand the benefits of professional coordination up, down, and across the organization.

■ Become the commander's right-hand source for all safety issues and risk-management decisions.

■ Be the professional safety watchdog in the organization-the honest broker.

■ Be an integral part of the staff. Plug into the S3 section; attend quarterly training briefs. Be an advisor to the command team.

■ Be part of the solution. Be a risk management analyst. Create an atmosphere of managing risks—not of telling others what to think, but how to think in terms of hazards and controls. Anchor to standards, and offer the commander informed risk-management options.

■ Be a subject matter expert from both a safety and task perspective. In addition to understanding and ensuring that the OSHA and environmental standards are met, devote time to understanding the mission and the potential hazards and risks associated with each METL task.

■ Go beyond a simple knowledge of risk management; acquire the wisdom to apply the process.

■ Think in terms of where is the next accident going to happen and how you can help the commander reduce the risks.

■ Be physically fit and willing to go to the field with the troops if necessary.

■ Plug into the Army's Risk Management Information System (**http://safety.army.mil**). There is an incredible amount of resources and information available at this site for safety personnel to use.

Each commander reminded us that safety is not a mission unto itself; it is an integral part of every mission. A leader's credibility is built on trust. And safe operations form a foundation of trust within each command.

### SUMMARY

GEN Shinseki, the Army's Chief of Staff, is adamant that he is the Safety Officer for The Army. He is equally adamant that each commander with a flag outside his or her unit or organization is the Safety Officer for that unit or organization. At the third quarter safety in-progress review, GEN Shinseki stated that "our business is a dangerous business, and command involvement is the key to our success. When I talk safety and why we are having problems, I talk to commanders." His words reinforce to those of us who have accepted command responsibility that it is up to each of us to protect and ensure the safety of the human lives entrusted to our care.

Commanders across the Army are busy people, and they need your help. The success of the safety program depends, in large part, on you-the safety professional-understanding your commander's needs and assisting him or her in making sound risk decisions. If you are relevant to your commander's goals, he or she will find time to engage your counsel. You *can* make a difference in your organization's safety performance, which will ultimately enhance the combat readiness of our Army.

**—BG Gene M. LaCoste, Director of Army Safety, DSN 558-2029, Commercial 334-255-2029**

## President's message 2001

*SUBJ:* ***PRESIDENT'S MESSAGE TO THE ARMED FORCES OF THE UNITED STATES***

To the armed forces of the United States and the men and women whose work supports them:
Your service in the cause of freedom is both noble and extraordinary.
Because of you, America is strong and the flame of freedom burns brighter than at any time in history.
Your country can never repay you for the sacrifices and hardships you endure. But we are grateful for the liberties we enjoy every day because of your service. As your commander-in-chief, I will always support you and your families, so that this great nation continues to have the greatest armed forces in the history of the world.

THANK YOU.

SIGNED,

GEORGE W. BUSH

## In memoriam

This issue is dedicated to the memory of Sally Yohn, who died February 2, 2001 after a courageous struggle with cancer. Sally was editor of *Flightfax* for several years, beginning in 1996. She was also a contributor to *Army Aviator*, *Army Aviation Digest, Soldier Magazine*, and other publications; and a member of the Order of Saint Michael.

# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH1

### Class E

■ During aerial gunnery, pilot heard a loud report from the engine. Aircraft yawed left, and torque increased from 58 PSI to 71 PSI. Nr decreased to 93%. Aircraft was landed without further incident. Maintenance was notified. Governor and fuel control were replaced, aircraft was placed back in service.

■ At cruise, TGT fluctuated +/- 4% N1, +/- 3% N2. Aircraft yawed slightly left and right. The aircraft was landed without further incident. Maintenance personnel replaced the fuel control.

## AH64

### Class A

#### A series

■ Aircraft experienced fire in the aft cargo compartment during taxi for take-off. Emergency shutdown executed by crew. Fire extinguished by firefighters. (reclassified from Class B per unit ECOD)

### Class B

#### A series

■ During terrain flight, aircraft's main rotor blades contacted tree. Damage occurred to all four main rotor blades, three presumed damaged beyond repair. Aircraft was landed without further incident.

### Class C

■ Aircraft contacted wires during NOE flight and the forward wire strike protective system cut all three wires in the set. Aircraft landed without further incident. Damage to the lower IFF antenna and IDF antenna mount and two main rotor blades, in addition to damage to wires.

### Class E

#### A series

■ In flight, on down wind, aircraft's No.1 engine segment light illuminated with no corresponding lights in the pilot's station. Aircraft landed without further incident. Fault panel was replaced.

#### D series

■ During run-up, TADS was discovered to be inoperable. Aircraft was shutdown without further incident. TADS control panel assembly was replaced.

## CH47

### Class E

#### D series

■ In cruise flight, aircraft entered uncommanded pitch-down. Pilot corrected and noticed that VGI had tumbled. Pilot switched to VGI Emergency. Aircraft then entered uncommanded pitch-up. Co-pilot disengaged AFCS. Uncommanded inputs ceased. When co-pilot re-engaged the AFCS systems individually, aircraft continued uncommanded inputs. Crew returned home station with AFCS disengaged. Maintenance replaced AFCS switches assembly.

■ During deceleration for approach to land, crew noticed that aft longitudinal cyclic trim (LCT) activator had not retracted. Crew performed go-around and performed emergency procedures. Crew switched to Manual LCT and retracted the aft LCT for 30 seconds, LCT was still extended. Crew landed without further problems.

## OH58

### Class B

#### D-R series

■ During SEF at altitude, the aircraft impacted the runway, landed hard, became airborne again and came to rest in the sod adjacent to the runway.

### Class C

#### D(I) series

■ Aircraft contacted commo wire at 5 feet above ground level and subsequently landed hard. Aircraft sustained a collapsed left skid, came to rest on Hellfire rack. Damage noted to tail boom and stinger.

### Class C

#### C series

■ Aircraft landed hard and tail low during performance of standard auto. Damage occurred to K-Flex driveshaft, isolation mount, aft cross tube and tail boom.

#### D(I) series

■ Aircraft experienced excessive engine torque reading during hovering autorotation maneuver.

#### D(r) Series

■ Suspected "hot start" during engine run-up following engine flush.

## TH67

### Class D

#### A series

■ Spike knock revealed damage to K-Flex driveshaft, isolation mount, and striker plate.

## UH1

### Class E

#### H series

■ During straight and level flight, Master Caution and HYD Oil Pressure segment light illuminated. There was corresponding feedback in the controls and a cavitating sound from the hydraulic pump. Emergency landing was immediately initiated. The tail rotor hydraulic servo pressure elbow had cracked and the hydraulic sight gauge was empty. The hydraulic fluid had been expelled from the cracked elbow.

## UH60

### Class C

#### L series

During flight no.1 engine experienced a "High side failure" and NP went to 120%. Aircraft was landed with no further incident. Apparent indication is that the DECU failed.

**For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.**

# NEW System Safety Managers

Over the past months, the United States Army Safety Center (USASC) has added three new aircraft system safety managers to its staff: a Fixed-Wing/Cargo Aircraft and Tactical Unmanned Aerial Vehicle (TUAV) System Safety Manager, a Utility Aircraft System Safety Manager, and a Scout/Attack Aircraft and Flight Data Recorder System Safety Manager.

They are basically responsible for ensuring that an aircraft is safe throughout its life cycle—cradle-to-grave system safety. System safety is nothing more than risk management.

System safety managers identify hazards by reviewing Abbreviated Aircraft Accident Reports (AAAR - the old PRAM) daily, reviewing Class A-D accident reports, searching the USASC database, contacting units in the field by telephone and e-mail and attending various user's and safety conferences.

Upon identifying a potential or real hazard, contact is made with the appropriate Project/Program Manager (PM) and a course of action is recommended. Obviously, the farther along in the life cycle of the aircraft a hazard is identified, the harder it is to design out that hazard. The selected course of action will normally result in accepting some residual risk, thus requiring additional training or education based on time and resources available and the nature of the hazard.

With military aviation experience (officer and warrant officer), these three new aviation system safety managers can also answer your questions concerning and provide information about aviation operations, safety program management, and accident investigation. Your phone calls or e-mail messages requesting assistance are welcomed.

For all your questions or issues concerning—

■ Fixed-wing/cargo aircraft and TUAVs, contact Mr. Gary Braman, DSN 558-2676, (334) 255-2676 or e-mail bramang@safetycenter.army.mil

■ Utility aircraft, contact Mr. Bob Giffin DSN 558-3650, (334) 255-3650 or e-mail giffinr@safetycenter.army.mil

■ Scout/attack aircraft and flight data recorders, contact Mr. Joseph Creekmore at DSN 558-2259, (334) 255-2259 or e-mail creekmorej@safetycenter.army.mil

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through 31 Jan

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| FY01 | 30 |
| FY00 | 39 |
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U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

April 2001 ♦ VOL 29 ♦ NO 4

http://safety.army.mil

# What Do You Mean, They Went Inadvertent IMC?

As the unit Safety Officer, that was my response when I heard that one of our crews had "punched in." Of all the times for it to happen, it occurred during a deployment to Bosnia, over mountainous terrain, and at night while wearing Night Vision Goggles. If that wasn't bad enough, the flight was a MEDEVAC mission with a patient on board and the two pilots combined, had about 800 total flight hours. (The PC did have some additional civilian flight experience and is considered one of the more squared-away pilots-in-command in the company.)

I used to consider inadvertent IMC (IIMC) as a "self-induced emergency caused by pilot error." For the most part I still think that's true. But, I guess there are times when you just cannot see the clouds. Or, if you're wearing NVGs, by the time you realize that you're in a cloud, it's too late to continue Visual Meteorological Conditions.

I never gave IIMC much thought until that day. We're not supposed to do it, we have procedures in place in case we do it, and nobody ever does it. So why worry about it? I've been in Army aviation for more than 11 years and had never been in a unit when a crew had gone IIMC.

This perfect track record had lulled me into a false sense of security. It allowed me to think that it couldn't happen, or wouldn't happen. Not on my watch anyway.

## "IF THE WEATHER IS BAD, DON'T FLY"

Why should it happen? We train our crews to avoid it at all costs. We tell them over and over, don't attempt to fly VMC in IMC conditions. It's dangerous. We've all seen the Safety Center posters showing the catastrophic results. If weather is bad, don't fly. If weather gets bad, turn around and go back, or land where you are and wait it out. Or, if you are trained, equipped, prepared, and proficient for IMC/IFR flight, request an IFR clearance from ATC and continue the mission IMC/IFR. (That last option may not always be available in Bosnia, or on other deployments, based on local NAVAIDS and instrument approaches.)

## SCUD RUNNING

Have we all been lulled into a false sense of security? We've all heard the old pilot joke: "If it's too bad to go IFR, we'll go VFR."

To avoid going IFR, many of us have gone scud running. A Federal Aviation Administration publication defined scud running as *"pushing the capabilities of the pilot and the aircraft to the limits by trying to maintain visual contact with the terrain while trying to avoid physical contact with it."*

I've had several encounters with deteriorating weather while flying VFR. There have been many times when I simply turned around and went home. On a few occasions, I radioed ATC and received an IFR clearance so that I could continue the mission IMC. But, I've never gone IMC

inadvertently. I've turned down countless missions (including MEDEVAC missions) because of poor weather. Somehow it's easier to refuse a mission while standing in the flight operations office, than refusing to continue to fly a mission while in the air. We all want to succeed in our mission, especially if that mission is to save a life.

There are times when a patient's only hope of survival may be via a flight on an Army helicopter. Air ambulance units, like the one I'm in now, are frequently called upon to fly in poor weather and at a moment's notice. All too often, DUSTOFF crews will fly a MEDEVAC mission in weather that they wouldn't even consider flying in on a training flight. (Been there, done that.)

The desire to succeed can easily turn into a perceived pressure to complete a mission, particularly in the case of a MEDEVAC mission. That pressure is almost always self-induced and is felt by pilots and even non-rated crewmembers. Commanders will always support crews that turn down missions for safety reasons.

According to an NTSB study, unplanned entry into IMC is the single most common factor in fatal emergency medical service helicopter crashes. Because most of the IIMC accidents result in pilot fatalities, accident investigators are able to learn little about the events that lead to the accidents. In cases where pilots lived to tell their story, it's like the Safety Center has been telling us all along, the pilots tried to fly VMC in IMC conditions. They also felt pressure to accomplish the mission, in spite of deteriorating weather conditions.

Fortunately for those of us in Army aviation, there are established procedures in place that prepare us in the event that we do go IIMC. We brief IIMC procedures with the crew prior to every flight. The Aircrew Training Manual (ATM) clearly states, step-by-step what to do after encountering IIMC. Local standard operating procedures (SOP) also provide guidance in case we accidentally punch in.

On this night when our crew went inadvertent, they did everything by the book, just like they were taught. The PC briefed IIMC procedures to the crew prior to the mission. The pilots obtained a valid weather briefing and had even updated it just prior to takeoff. The PC had the only available instrument approach procedure open and strapped to his kneeboard and approach control frequencies were set in the radios. (The weather forecast called for better than VFR conditions, but proved to be incorrect.)

About five minutes after take-off, the pilots watched as the ground lights started to fade, flicker, and then disappear. They controlled the aircraft just like the ATM tells them to and began the local IIMC recovery procedures. The initial feelings following going IIMC included fear, anxiety, and nervousness; the first 30 seconds were the worst. Once they knew that the aircraft was under control and they transitioned from NVGs to instruments, they felt much better. Thankfully, this crew was prepared for the worst when it happened. With the assistance of ATC, the aircraft broke out on final of an ILS approach and landed safely.

## NOW I KNOW

Now I know that sometimes aircrews really do go inadvertent IMC. Now I know that pilots can't always see the clouds as they approach them. Now I know that the IIMC procedures in the ATM work. Now I know that the IIMC procedures in the SOP work. And now, you know, too.

**—MICHAEL K. PHILLIPS Aviation Safety Officer 57th Medical Company (AA) / FME DSN 314-762-0258 / 0166 , e-mail AASAFETYOFFICER@e-mail-tc3.sigcmd.army.mil**

References: FAA. *Aeronautical Decision Making for Helicopter Pilots.* Report no. DOT/FAA/PM-86-45, February 1987.

Harris, Jowl S. *Every Helicopter Pilot Must be Prepared for Inadvertent Entry into Instrument Meteorological Conditions.* Helicopter Safety. Flight Safety Foundation, March-April 1996.

# Truth or Consequences

**This is the second of a 5-part series on the risk management process. This article focuses on Step 2 "Assess the hazards."**

In the past 18 months, I have had the unfortunate task of investigating accidents that resulted in the deaths of 14 soldiers. Without exception, these soldiers were performing their duties in an outstanding manner; giving their all; working hard to carry out their missions for their units, the Army, and the nation. They made the ultimate sacrifice in the service of their country.

I will never forget what these soldiers have done. I will also never forget that during many of these investigations, I was told that others knew of the dangers these soldiers and their comrades faced while performing their duties. That's right...in many cases, someone had already identified that something wasn't right. They had identified the potential hazards.

Unfortunately, they did not determine the likelihood that an accident would occur because of these hazards. They ignored the critical Step 2 of the risk management process.

Last month, we discussed the first step in the Army's 5-step risk management process—Identify hazards—in an article titled "Have We Forgotten How to Teach What Right Looks Like?" Now, we'll look at Step 2: Assess the hazards. We'll discuss the importance of truthfully assessing risks associated with those hazards we identified. And, we'll also discuss gambling with the consequences of performing tasks and executing missions with hazards inadequately assessed.

Field Manual 100-14, *Risk Management,* states that step two takes place after you have identified a hazard. To assess the hazard, first determine the probability of a hazardous event occurring, and then address the potential severity resulting from this hazardous event. In other words, once you know that something doesn't look right, make an assessment of how likely it is that this hazard will cause harm to you, your unit, your equipment, or your mission. Then determine that ***IF*** this hazardous event occurs, how ***MUCH*** harm will it cause?

Conducting an effective assessment requires broad understanding of the task/mission at hand. The person making the assessment uses his knowledge of applicable regulations, procedures, and SOPs. He also uses his experience in performing this or similar tasks. In fact, experience can sometimes be a valuable tool for leaders to use. Let me give an example.

During a deployment to a desert training area, a support platoon was driving many miles during both daylight and darkness in support of their tank battalion. During these movements, the dust from the vehicles could be seen for miles. The platoon sergeant, who had deployed to the desert numerous times throughout his career, informed his platoon leader of the problems associated with driving in the desert. The platoon leader did not think it was a major problem, so he did not take it into consideration while completing his daily risk assessment.

One day at the evening convoy briefing, the platoon leader instructed the drivers to maintain only 50 meters distance between vehicles during that night's movement to avoid separation among the vehicles. When asked by several of the drivers about this requirement, the platoon

leader stated that it was unlikely that following so close would cause any problems, and that the drivers would just need to stay alert during the mission. As you've probably already guessed, this platoon leader failed to properly gauge the impact of his decision. At one point during the night move, the platoon leader stopped his vehicle abruptly. The 5-ton truck that was following him had to brake hard to avoid a collision. The next two vehicles were also able to avoid a collision. However, the last three vehicles in the convoy were not as fortunate. The collision resulted in two injured drivers and three heavily damaged vehicles. All because the platoon leader failed to properly assess the hazards his unit faced. Regrettably, he did not appreciate the experience of the platoon sergeant; he did not recognize that the hair stood up on the back of his men's necks when he described the plan of operation; he did not appreciate the courage it took for his platoon sergeant and his unit to raise concerns for their personal safety and the success of their mission.

No, the platoon leader didn't have the personal experience to adequately assess the hazard. But he had plenty of clues and opportunities to get to the truth about the risks and consider the consequences. One of the Army's great strengths is learning from the successes and failures of each other, and growing stronger on that foundation.

The next time you see something that just doesn't look right, take a moment and ask yourself how this might impact you, or the soldier next to you, or your unit, or the family of four who might be driving down the road as your convoy approaches.

Safety is not a sometimes thing, and your actions don't just affect you. Exercise the courage to tell the truth about risks, and to face the potential consequences. That way, you and your unit can avoid those consequences.

This information gives you as an individual, your unit, and the Army an advantage: Armed with knowledge that the hazards in your task or mission are identified (Step 1); and the hazards are assessed (Step 2); now, controls can be developed and selected (Step 3). Stay tuned for more on Step 3 next month.

—LTC Andrew Atcher, Ground Systems and Accident Investigation Division, DSN 558-9525 (334-255-9525), atcherd@safetycenter.army.mil

## Spatial disorientation HUD/ODA survey

The unpredictability of spatial disorientation combined with the stress of night operations makes it necessary to determine what experiences aviators have had concerning disorientation while using head-up displays (HUDs). A short survey was developed to gather information from Army aviators who use or have used the aviator night vision imaging system/heads up display (ANVIS/HUD) and/or similar counterparts such as the optical display assembly (ODA). If you have used the HUD or ODA, please consider completing the survey that can be found at the following web address: **www.usaarl.army.mil/hudsurvey/anvishudoda.htm.** Information provided will be used by the U.S. Army Aeromedical Research Laboratory to assess potential problems in this area and, if necessary, to design and test countermeasures. Thank you for your assistance with this project!

—US Army Aeromedical Research Laboratory

# How's Your Harness?

The mission was a simple one. Complete night vision goggle (NVG) hoist qualification for a flight medic and pilot to complete NVG readiness level progression. The crew consisted of an instructor pilot (IP), pilot (PI), crew chief standardization instructor (SI), and medic (MO). The location where the training was to be conducted had been picked out the day before and used the previous night by the same IP.

At approximately 4500′ in elevation, the layout of the location was a challenging one. Approximately 50′ in width (north to south) and 100′ in length (east to west) with a 9 degree slope up to the south side and surrounded by pine trees. One hundred feet south and two hundred feet east of the target area, an "L" shaped cliff rose to a height of 300′.

The IP was seated in the right cockpit seat, PI in the left, MO at the right crew station, and SI on the left. The aircraft was configured for medevac operations (high performance hoist and carousel installed with the hoist on the right side). The wind was from the east at about fifteen knots and the moon was at almost ninety- percent illumination.

NVG hoist qualification required both the PI and MO to complete four lifts with a 200# weight; one from 50′, two from 100′ (one with a simulated emergency procedure), and one from 200′. Due to a lack of available personnel, no ground assistant was available to switch the jungle penetrator for the weight, so the decision was made to simply use the weight. On the initial recon for the flight, the SI had dropped some chem sticks for the medic to use as a target while lowering the weight.

While the PI hovered into the wind, the MO proceeded to move from his seat into position by the hoist and secure himself to the floor of the aircraft using his safety vest assembly (monkey harness) while the SI moved into the right crew seat to monitor the MO. The 50′ and 100′ lifts were uneventful. The medic had no difficulty hitting his target or controlling the weight and the pilot was able to maintain sufficient ground references to minimize his drift.

Problems began when the pilot completed a small traffic pattern and returned to a 200-foot hover over the target area. Although he was hovering into the prevailing wind, a combination of turbulence near the top of the cliff and lack of visual cues made holding a steady hover difficult for him. This unsteady hover in turn caused the weight to begin oscillating under the aircraft as it was being lowered. The medic attempted to arrest the movement of the weight, but underestimated its momentum and was pulled from the aircraft. At this point a calm SI stated, "He just fell out." The calm manner of the standardization instructor helped eliminate the initial sense of panic felt by the instructor pilot. "He's OK. He's hanging by his harness. I'm going to try and pull him in."

The SI then repositioned his harness into a position that would allow him to reach the medic. While he was doing that, the IP was clearing the right side of the aircraft and instructing the pilot to descend vertically. Attempts to pull the medic into the aircraft were unsuccessful and it became apparent that a landing would be required.

The pilot continued to descend vertically toward the landing area, with the IP and SI clearing the aircraft, then asked, "Are we landing?" He had been concentrating so hard on his hover work that he was unaware that the medic was hanging beneath the aircraft by his harness. He had only been responding mechanically to the instructor pilots directions to begin a slow vertical descent.

During the descent, the IP suggested using the hoist control panel, located in the cockpit, to reel in cable as the aircraft descended. (The hoist control pendant had egressed the aircraft with the medic.) However, the cable had already become tangled in some trees and reeling it in was not feasible. The option of cutting the cable to ensure it remained clear of the aircraft

during landing was ruled out because 1) it could easily injure the medic by whipping past him and 2) he had been holding on to the hoist cable to keep from spinning.

The final decision was to continue a slow descent while ensuring the hoist cable remained clear of the aircraft. The SI kept the pilot informed of the cable status while the aircraft was landing. The aircraft touched down with a grateful medic and no difficulties from the cable.

It is worth noting that the medic's intercom cord remained connected throughout the incident and he was able to communicate his well being (or lack thereof) to the rest of the crew. He had properly worn his harness (other than the length) and suffered only minor chafing on his upper thighs. The medic stated during the after-action review that had the leg straps not been properly secured, he was certain that they would have pulled across a sensitive portion of his lower anatomy. He had also properly worn the neck cord for his NVGs, which hung nicely until the aircraft had landed and he could reattach them to his helmet. The SI was able to free the hoist cable and reel it in.

The medic finished his training that night then had one heck of a story to share when he returned to the airfield.

Among the many learning points, a few come readily to mind. The most obvious lesson being the length of the harness. While performing as intended, its designed use shouldn't have been necessary. This is a pertinent teaching point for any unit trainer involved in hoist work. Also, it seems that crew coordination was initially inadequate due to the pilot not understanding the severity of the situation. Although this merits discussion, it is apparent the crew quickly pulled together to avert a life threatening situation. It is now obvious that harness length and procedures for dealing with an emergency of this nature are topics that must be included in crew briefings prior to engaging in hoist work. It is also just as important for the hoist operators to verbally confirm the pilot on the controls has adequate visual references to maintain a steady hover before beginning to reel hoist cable out.

A situation that could have easily been tragic ended without injury to personnel or damage to equipment. A tense few moments were transformed into a learning tool that will hopefully prevent future injury or save a life. This experience is a testament to our equipment and professionalism.

—Submitted By: CW3 Brandon Erdmann
ASO 1022nd Med Co DSN: 943-5986
brandon.erdmann@wy.ngb.army.mil

## Speaking of harnesses...

**In a recent accident investigated by the Safety Center, the crew chief was injured when he fell out of the aircraft during the accident sequence. His Safety Restraint Assembly was not properly adjusted in accordance with Aircrew Integrated System Advisory Message AIS 97-08. In the same accident, another crewmember was not using a complete Safety Restraint Assembly, just the strap. The strap was secured to his Aircrew Survival Armor Recovery Vest (SARVIP), in contravention to the warning in the operator's manual, TM 1-1680-359-10. The warning states "THE SARVIP VEST IS NOT DESIGNED TO BE USED IN LIEU OF THE GUNNER/HOIST OPERATOR RESTRAINT HARNESS."**

## When you're not flying...

The Army's Medical Department Center and School has developed an innovative website to help runners learn everything there is to know about running shoes, and the appendages that go into them. Check out: **http://cs.amedd.army.mil/aegis/**

—COL Valerie Rice, Director, Operation Aegis, Fort Sam Houston, TX , DSN-471-0118 (210) 221-0118, Valerie.Rice@@CEN.AMEDD.ARMY.MIL, and CPT Allyson Pritchard,

**The Army Aviation Broken Wing Award recognizes aircrewmembers who demonstrate a high degree of professional skill while recovering an aircraft from an inflight failure or malfunction requiring an emergency landing. Requirements for the award are in AR 672-74, Army Accident Prevention Awards.**

## CW3 Allen Raye and CW3 Peter Schuesler

CW3 Schuesler and CW3 Raye were awarded the Broken Wing award for their actions during an MH-60L engine failure emergency. They were on an aircraft accident recovery mission in a remote and rugged, heavily vegetated mountainous environment. This mission required that soldiers rappel from the helicopter high above the crash site, while their equipment was lowered to them via the aircraft's external hoist. Combined conditions placed the aircraft in a mode where single engine flight was not possible at slow airspeed or at a hover.

Aircraft mission weight was kept at a minimum. Aircraft gross weight was critical because Out-of-Ground Effect (OGE) power was essential to conduct the mission. Based on steep slope and terrain, the aircraft needed to operate at an OGE stationary hover.

Just prior to the incident, CW Schuessler maneuvered the aircraft away from the infiltration site and transferred the controls to CW3 Raye. CW3 Raye was maneuvering the aircraft in a slow left turn and decelerating below 30 KIAS on final approach when the low rotor RPM alarm sounded.

CW3 Raye lowered the collective to regain rotor RPM. At the same time, the aircraft began to settle downward toward the nearly vertical slope of the mountain side less than 20 feet away. As the Low Rotor RPM continued to sound, CW3 Schuessler took command of the flight controls and executed a descending right turn; the proximity of the terrain and altitude offered no room for error.

CW3 Schuessler maneuvered the aircraft down the mountainside less than 10 feet above rocks and vegetation, gaining the needed single engine airspeed to keep the aircraft aloft and flying.

The only safe and suitable landing area was fifteen miles away. CW3 Schuessler continued to fly the aircraft while CW3 Raye confirmed the engine failure. En route to the landing area with the aircraft stabilized, the controls were transferred again to CW3 Raye. He completed a roll-on landing without further incident.

The actions of CW3 Scheussler and CW3 Raye not only prevented the loss of a valuable helicopter but also more importantly saved the lives of all four US Army soldiers on board.

## CW2 Robert J. Ladd and CW3 Kelvin Holt

CW2 Ladd and CW3 Kelvin Holt were awarded the Broken Wing award for actions in an AH-64A performing an aerial reconnaissance mission in Bosnia. The aircraft was in cruise flight with the pilot on the controls when the aircraft began experiencing strong vibrations. The aircraft was over steep, heavily wooded hills with possible anti-personnel mines in the landing area.

Shortly after the vibrations began, the aircraft began to fishtail about five feet, left to right. CW2 Ladd was on the controls. The PC, CW3 Holt, briefly took the controls and determined that the severity of the vibrations required a return to base. CW3 Holt then turned the aircraft. The vibrations became worse because part of the trailing edge of the blade separated completely. CW2 Ladd announced that he was getting back on the controls to help land the aircraft. Both pilots used proper aircrew coordination techniques throughout the emergency.

CW3 Holt began an approach to the only landing area available, steep terrain possibly

infested with anti-personnel mines. CW3 Ladd announced that he was applying the brakes, and remained on them so that CW3 Holt would not have to let go of the controls as he set the brakes. The steepness of the slope made the usable touchdown area about 25 feet wide by 60 feet long.

As the aircraft was landed, it began to settle to the left side. The settling to the left became more pronounced when the rotor system began to slow down after engine shutdown. CW2 Ladd got out of the aircraft after the rotor system stopped and sat on the right winglet to try to prevent the aircraft from rolling over while CW3 Holt was still inside the aircraft. Throughout the incident, both pilots used appropriate and proper aircrew coordination techniques.

Congratulations to these recipients, whose skill, judgment and technique resulted in the Broken Wing awards.

**—Mr. Richard Lovely, USASC, DSN 558-2781, (334) 255-2781, lovelyr@safetycenter.army.mil**

# Safety Guardian award

**The United States Army Safety Guardian award is presented for extraordinary individual action in an emergency situation.**

## CW3 Timothy J. Burke/ SSG Sidney Hudgens

CW3 Burke and SSG Hudgens received the Guardian award for their performance during an incident involving a CH-47D helicopter. This aircraft was flying as trail aircraft in a six-ship NVG formation flight, operating under zero illumination. The aircraft was transporting 25 combat–loaded Rangers.

CW3 Burke was on the controls when unusual noises and vibrations were heard from the vicinity of the number 2 engine. After scanning the engine instruments, CW3 Burke notified the crew of engine failure and asked the crew chief to check the number 2 engine for fire.

The crew chief then announced that the engine was on fire and CW3 Burke immediately began a descent for a landing in an open field. As CW3 Burke put the aircraft in a descent for a roll-on landing, the flight engineer noticed that the field was covered with sheets of plastic. CW3 Burke aborted that landing, and began an approach to an adjacent area, a soccer field in the middle of a well-lit town.

At about one-quarter of a mile from the target landing area, the flight engineer spotted wires slightly above the aircraft and in the path to the landing area. CW3 Burke, using a combination of available power and aft cyclic, got the aircraft to climb over the wires. After clearing the wires and re-establishing his approach, CW3 Burke safely landed the aircraft in brownout conditions. As soon as the aircraft stopped, CW3 Burke and his co-pilot executed an immediate shutdown of the remaining engine.

SSG Hudgins was serving as Flight Engineer during this incident. After verifying the status of the fire, SSG Hudgins was busy ensuring that the 25 passengers were secured and in a crash position for landing. Looking out once again at the first intended landing area, he noticed that the selected area was a rice paddy with sheets of plastic covering it, and notified the PIC who aborted that landing. While continuing to prepare passengers for landing, he noticed that wires were directly in front of the aircraft and about the same altitude. He immediately announced "Wires! Climb, climb, climb." The PIC initiated a climb and missed the wires by approximately 40 feet. SSG Hudgins and his crew chief successfully evacuated all 25 passengers while under NVGs and in brownout conditions.

CW3 Burke demonstrated skill and performed actions which prevented serious damage and possibly complete destruction of the aircraft, as well as serious injuries of loss of life for the passengers and crew. SSG Hudgins demonstrated a preeminent degree of skill and situational awareness, preventing serious damage and possibly serious or fatal injuries for passengers and crew.

# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH64

### Class C

**A series**

■ Reported uncommanded arrest of No.1 engine during MTF. Power-on landing was executed with reported over-temp and over-torque of the No.2 engine.

### Class B

**A series**

■ Main rotor blades contacted tree during terrain flight, resulting in damage to three blades.

### Class E

**A series**

■ Crew smelled electrical smoke in the cockpit and suspected electrical fire. Flight terminated on airfield. Maintenance crew also smelled smoke as they approached aircraft, but found no evidence of fire. Maintenance crews could not pinpoint the source of the fumes.

■ While in contour flight, cockpit began filling with smoke and burning odor was detected. Aircrew made a precautionary landing and aircraft was shutdown without further incident. Maintenance replaced turbine on ENCU and aircraft was returned to service.

## CH47

### Class C

**D series**

■ During power up for flight, APU power turbine separated from the No.1 housing. Some sheet metal damage sustained to aircraft.

### Class E

**D series**

■ During hover, No.1 engine failed. Aircraft landed without further incident. Replaced engine.

■ Aircraft was flown for 2.0 hrs, shutdown and refueled. Aircraft sat idle for 1.5 hrs. On start attempt for second flight, No. 2 engine failed to accelerate to 50% N1 and start was aborted. Three attempts were made to start the No. 2 engine to include max acceleration of the No.1 and only momentarily holding the start switch to start. The No. 1 engine was shutdown and the No. 2 engine was started first. The No. 2 engine accelerated smoothly to 50% and started. With the No. 2 engine running No. 1 engine failed to accelerate to 50%. Unsuccessful attempts were made to start No. 1 engine in the same manner. Engine replaced to correct hang start.

## OH58

### Class A

**D-I series**

■ Aircraft encountered brownout conditions while attempting to terminate a terrain approach. While descending, the aircraft drifted forward and right and contacted the ground. Aircraft destroyed.

### Class C

**D-I series**

■ Aircraft contacted commo wire at 5 feet AGL and landed hard, damaging the landing gear, tail boom and stinger.

### Class D

**D-I series**

■ While conducting Mass mounted sight checks during run-up, MMS would not change field of views in the Thermal Imaging Sensor and would sometimes change on its own with no input from the pilot. Aircraft shutdown and released to maintenance. Replaced thermal imaging system TIS.

## AH6

### Class C

**J series**

■ During flight, aircraft experienced a series of loud reports, illumination of engine-re-ignition warning light, and power loss/settling. Aircraft landed hard. Postflight inspection revealed damage to tail stinger and tail rotor blades.

## RC12

### Class E

**K series**

■ During cruise flight at FL 320, 130 kias, the No.1 engine oil temperature indicated 135 degrees. Power was reduced from 48% to 25% torque and aircraft descended to FL 280. Oil temperature returned to normal range within 4 minutes. Aircraft landed without further incident.

## TH67

### Class E

**A series**

■ During flight, aircraft's main and standby generators failed. Aircraft landed without further incident. Replaced starter generator.

## UH60

### Class A

**L series**

■ During sling load operations of an M998 HMMWV, aircraft came to rest on top of the M998 with major damage to aircraft and M998. Five aircrew members were admitted to hospital with back and neck injuries. Aircraft destroyed.

### Class C

**A series**

■ During flight, with the cabin doors open for over water flight, the Jungle Penetrator was not secured. Damage was done to the aft cabin wall and to the hoist assembly, due to the JP swinging in the slipstream.

**L series**

■ Postflight inspection revealed stabilator damage. Accident Aircraft had been Chalk 2 of an air assault training mission.

### Class D

**A series**

■ During training operations, main rotor tip cap struck tree branch.

### Class E

**A series**

■ While conducting ATM training, both No.1 & No.2 NP and RPMR rolled back simultaneously to 93%. PC took controls and lowered the collective while actuating the inc/dec switch. Aircraft would not respond. PC reduced the collective to full down in preparation for an autorotational approach to airfield. NP & RPMR returned to 100%. The flight was terminated with a roll on landing. During ground taxi the RPMR and NP again dropped to 96% and then returned to 100%.

### *Correction*

In the February accident briefs, the mishaps appearing under OH-58 should have been under the UH-60 category. Thanks to all the sharp-eyed readers who told us about it.

**For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.**

# QUAD A 2000 Awards

The Army Aviation Association of America presented its annual awards during the Aviation Leaders Training Conference 2001. Nominations for each category can come from commanders, individual members or each of the 65 chapters of AAAA.

For outstanding individual contribution, the *Army Aviation Trainer of the Year* award went to **CW3 Robert B. Rainier**, B Company, 1st Battalion, 160th Aviation Regiment.

The *Aviation Medicine Award* went to Fort Rucker's **LTC Walter J. Lawrence**, US Army Aeromedical Center. The award recognized Lawrence as the flight surgeon or medical physician assistant that best exemplified the medical contribution to Aviation during 2000.

The *Aviation Fixed Wing Unit* award was presented to the fixed wing unit that has achieved the highest level of excellence in flying, safety, logistics, operation and support.

The 204th Military Intelligence Battalion walked away with those honors. Accepting the award was **Lt. Col. Charles R. Mehle II**, commander, and **Command Sgt. Maj. Charles R. Holloway**, battalion command sergeant major.

The *Air/Sea Rescue* award for the unit whose crew performed a rescue, saving a life or easing the suffering of an individual or individuals, was presented to the 571st Medical Company (Air Ambulance). The commander, **Maj. Joseph G. Eckert**, and the company's first sergeant, **1st Sgt. Michael Brennan**, accepted the award.

The members of the 3rd Battalion, 58th Regiment from Camp Bondsteel, received the *Air Traffic Control Facility* award. Their facility earned the highest ranking as the facility which has greatly contributed to safe and efficient air traffic control. **Lt. Col. Eric M. Nelson**, commander, and the unit's command sergeant major, **Command Sgt. Maj. Charles A. Momon**, accepted the award.

For the tactical air control unit which has achieved significant objectives in accomplishing the tactical mission, the *Air Traffic Control Company* award went to C Company, 3rd Battalion, 58th Regiment. **Capt. Bryan K. Phillips**, commander, and the company's first sergeant, **1st Sgt. Joseph L. Hawbecker**, accepted the award.

The *Air Traffic Controller* award went to **Staff Sgt. Scott E. Nutter**, D Company, 1st Battalion, 58th Regiment at Hunter Army Airfield, Ga. The award is presented to the air traffic controller who has demonstrated superior performance through selfless service.

For commendable contribution to the management of air traffic control through the development of new air traffic control procedures, **Sgt. 1st Class Bobby Griffin** was given the *Air Traffic Control Manager* award. Griffin is with E Company, 1st Battalion, 58th Regiment at Fort Drum, N.Y.

Two students were also honored. **Katherine A. Oleksiak** and **Hartleigh Caine** were named Outstanding ROTC Cadet of the Year and Outstanding USMA Cadet of the Year, respectively.

# A FLYER'S CODE OF CONDUCT

You may have seen the expression "a good pilot is always learning" on one of your favorite aviation periodicals. This statement holds true not only for the lieutenant or warrant officer recently out of flight school, but also for the seasoned veteran with thousands of hours in a variety of environments. A pilot's continuing education is not limited to maneuvers and missions, it is also critical that crewmembers continue to learn how to perform these tasks in the safest possible manner.

The key elements in safe mission completion have not changed since the horse was the primary maneuver vehicle. **Avoid** unsafe situations, **Recognize** events or actions that lead to accidents, and **Recover** properly when unplanned events take place. As our knowledge and technology improves, we find new and better ways to deal with known hazards in the aviation environment. The latest new way becomes the 'hot' topic for a period of time until the next hot issue arrives or the statistics swing in a new direction. To turn this phenomenon to our advantage, we must allow these lessons to build on previous ones and not simply push them aside.

An additional complication is the numerous sources that safety and standardization guidance comes from. There are literally hundreds of AR's, FM's, TM's, TC's, SOP's, and policy letters that contain valuable information to the aviator. Indeed, even this publication has invaluable information in every issue. Let us try to keep it simple and focus on those items that have been present in almost every accident over the last several years. Unfortunately, the most common causal factor in recent accidents continues to be the actions of the pilot. More importantly, this means that it is within our power to change these faults.

The following is a list of essential elements to safe mission completion that can serve as a pilot's personal safety checklist:

**1. I am adequately rested, in proper health, and not influenced by some inappropriate medication or recreational substance.**

The nature of military personnel is to get the job done. It is difficult for most of if we feel like we are letting our comrades down or someone else is picking up your 'Slack'. Although standards are set forth in AR 40-8, SOP's and policy letters, the issue of appropriate rest and health is, for the most part, a personal one in that you cannot necessarily see when someone is ill or only had two hours of sleep. It falls to the integrity and moral courage of the individual to say,"I really should not be flying today".

**2. I have quelled any desire to exceed standards or my briefing for the 'thrill of it'.** I impress people with my professionalism, not with how far I can push the limit.

It is remarkable how many accidents take place in front of an audience. Our need to show off for the crowd or to impress the new guy has resulted in many incidents of crewmembers exceeding not only the limitations set forth for the aircraft, but their personal limitations as well, often with tragic results. Ask yourself "would I try this with my SIP on board?"

**3. I have analyzed and adjusted for all of the risks involved, and will continue to minimize or eliminate hazards I encounter.** The risk management process is an extremely valuable tool that encompasses continuous assessment of the situation and a series of decisions and actions that allow for the lowest amount of necessary risk exposure. It may not be the path of least resistance but it should be the path of fewest unnecessary hazards. You are the risk manager, all day, every day.

**4. I know exactly how this aircraft will perform in this set of conditions, and that it will remain within safe operating parameters throughout the entire flight.**

One of the more recent accident trends is improper power management. It is imperative that you remain aware of changing conditions and the performance parameters of your airframe for every flight. A maneuver that went well back home in cool weather may be completely outside of available power margins in the summer or at NTC.

Be a diligent planner and focus on key elements such as: Out of Ground Effect Power, Single Engine Capability, or Tail Rotor Effectiveness.

Limiting factors should be discussed during the mission brief.

**5. I am confident that this crew mix is appropriate, and that we use the elements of crew coordination in every flight task from beginning to end. I respect the opinions of my crew.**

We maximize our effectiveness as a flight team when we utilize crew coordination.

Keep in mind that it begins with assigning crews that ensure a balance of experience and ability. Be warned that it is easy to become complacent when you continuously operate in a familiar environment. This includes the people you fly with. It is also critical that you maintain a climate in the aircraft in which other crewmembers feel they can voice their opinions. If you make it difficult for them to have input, you will not get any when you need it.

**6. I recognize that when minor problems begin to accumulate, I will modify or terminate before a chain of events overwhelms me.**

Almost every accident since the beginning of flight has a traceable series of actions, decisions, and circumstances that led to the final incident. Situational awareness is a term that most are familiar with and it includes not only what is happening right now, but also the progress of the flight thus far and the correct anticipation of what is to come. Recognize that conditions are leading you into a situation beyond your capabilities. Never be afraid to make the decision to stop.

**7. I will always strive for mission accomplishment, unless it unnecessarily endangers others or myself.**

As Army Aviators, it is our job to get the mission accomplished whenever possible.

You may find yourself in situations where you want to say "sorry we can't do this mission". Be flexible enough to tell the supported unit that you could do the mission if a few changes were made. Remember that it is our job to DO the mission in the safest manner possible. We may also have to weigh the importance of the task as a factor in your risk assessment. Sometimes that may indeed mean we cannot do the particular mission, many times it is a matter of making the appropriate modifications to ensure we can do so safely. This should be accomplished as early as possible in the planning process.

I acknowledge that checklists and briefings are important elements of every flight and are not merely for use in ideal circumstances.

Keep in mind that these tools are written for a reason and no matter how proficient you become, the checklist keeps the flight going the way it is supposed to and helps you catch mistakes. Briefings are the check and balance and serve as the template for the conduct of your mission. There is no acceptable reason for not following this guidance.

**8. I will resist any false sense of urgency that may affect my decision-making.**

As we strive to make training progressively more realistic, it is very easy to get caught up in the moment and feel a sense of pressure to get the mission done at all costs. It is imperative that at all levels we keep in perspective that it is, in fact, only training. As General Wickham said " Nothing we do in peacetime warrants the unnecessary risk of life". This also includes get-home-itis.

**9. I am focused on the task at hand, and not distracted by other things that may be happening in my life.**

Avoiding distractions is fundamental to situational awareness, and discussions of topics unrelated to your flight have no place in the cockpit. By the same token, you must be able to concentrate on your flight, and you may have to separate your private life from your flying to do so. If you cannot do this, take yourself off of the flight schedule until you can.

**10. I accept the responsibility that has been entrusted to me.**

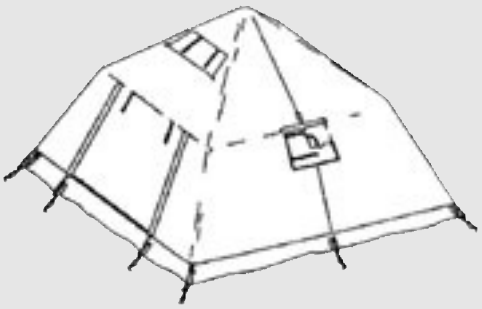
This occupation, by its very nature, carries with it an enormous amount of accountability. You are a member of a society of professionals. The safety of everyone you work with is quite literally in your hands.

Do not take this lightly.

These steps are fundamental and by no means complete. It is simply a reminder that when we preflight we begin with ourselves. Remember what a wise aviator once said, "experience is something you get just after you needed it".

**CW3 Scott Chandler**
**IP/ASO**
**B Co 1-223rd Avn Regt**

# Soldier crew tent warning



The Army recently lost two soldiers as a result of carbon monoxide poisoning. While on a field training exercise, two soldiers returned to their Soldier Crew Tent and started a commercial off-the-shelf (COTS) heater to warm up. The soldiers then closed the tent while the heater was on. Because the tent was essentially air tight, a lethal environment was created not only by the carbon monoxide from the heater but also from oxygen depletion from combustion and the soldiers' own breathing.

A factor in this accident was the use of an unvented commercial off-the-shelf heater. Warnings specified in ground precautionary messages indicate that the use of unflued or unvented heaters is inherently dangerous because they vent exhaust containing carbon monoxide into living spaces. Similar warnings as well as risk mitigation steps to include following manufacturers instructions, leaving tent doors and roof flaps open to allow air circulation, and using carbon monoxide detectors appear in safety of use messages as well as on the heater itself. Despite these warnings, the chain of command failed to inform or train subordinates of the dangers involved when using unvented heaters.

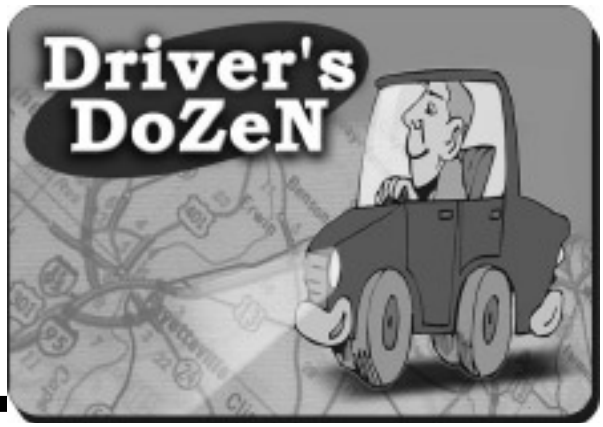
The Soldier Crew Tent also poses a hazard in that its fabric does not breathe. As noted in the operator's manual, all windows and flaps must be open to provide adequate ventilation. If windows and flaps are closed, it is possible to use all oxygen contained in the tent, especially during sleeping hours, resulting in death. The tent in combination with an unvented heater creates a high-risk hazard of possible suffocation and carbon monoxide poisoning. These dangers must be carefully risk managed with control measures that ensure the safe use of the tent during sleeping periods.

Another contributing factor in this accident was the implied approval by the chain of command of unvented propane heater use. Soldiers continually observed their use in the field so they assumed it was a normal procedure. Both the chain of command and the users became complacent in its use and these actions subsequently led to the accident. Supervisors at all levels must use risk management to identify potential hazards and establish controls to ensure the safety of subordinates. Leaders *must* enforce standards and continually be aware of possible hazards. In this case, the chain of command tacitly allowed the risk to exist and failed to follow their established procedures. Enforce the standards — don't let this silent killer get to you or your subordinates.

**Gene M. LaCoste**
**Brigadier General, GS**
**Director of Army Safety**

# Get the New Video—

**A young soldier encounters Sergeant Safety during inprocessing to his first duty station. The Sergeant takes the young soldier around the installation, choosing 12 areas of traffic safety on which to focus. In the process, the soldier begins to understand that traffic safety is more than just rules.**




## Attention Commanders and First Sergeants!

The Safety Center has a new video tool ready for you to use as part of your POV traffic safety program. It's a remarkably brief (15 minutes), lively and entertaining show in which SGT Safety targets 12 traffic safety points and shows the consequences of bad driving decisions. Every soldier, family member, and new civilian employee should see it. Driver's Dozen is available now.

■ Go to our website: http://safety.army.mil

■ Clilck on MEDIA-VIDEOS-POV VIDEOS-Driver's Dozen

A Facilitator's guide is available for download, as well as ordering instructions.

## DRIVER'S DOZEN

**1. Seatbelts**—*Cut your chance of being killed or seriously injured.*

**2. Airbags**—*Allow 10 inches between steering wheel and driver, in case it inflates.*

**3. Child safety**—*Use the correct child safety seat; 12 years and under—"Back is where it's at."*

**4. Motorcycle safety**—*It won't be pretty to see what's left after the G-forces perform experiments on your body. Wear the following protective equipment—*

■ *DOT-approved helmet*

■ *Eye protection*

■ *Long-sleeved shirt or jacket*

■ *Long trousers*

■ *Brightly colored top during day*

■ *Reflective during night*

■ *Full-fingered gloves*

■ *Sturdy footwear (leather boots or over-the-ankle shoes)*

**5. Bicycle safety:**

■ *Use marked paths when possible.*

■ *See and be seen; wear proper clothes and reflectors.*

■ *"Go with the flow" when riding on the street (in the same direction as vehicle traffic), and use hand signals when turning.*

■ *Wear a helmet.*

**6. Pedestrian safety—**

■ *Use marked paths when possible.*

■ *See and be seen; wear proper clothes and reflectors.*

■ *"Go with the flow" when skating on the street (in the same direction as vehicle traffic), and use hand signals when turning.*

■ *Wear protective equipment—helmet, wrist guards, and knee/elbow pads.*

■ *Make sure your equipment fits and is properly adjusted.*

■ *Especially watch for children walking to and from school, loading and unloading school buses, and playing in housing areas.*

**7. Headphone use**—*The ONLY place you can listen to tunes is on a track.*

**8. Vehicle inspections—** *Download checklist from* ***http://safety.army.mil****. List includes—*

■ *Safety belts*

■ *Lights*

■ *Window tint*

■ *Exhaust system*

■ *Brake systems*

■ *Wipers*

■ *Horns*

■ *Suspension*

■ *Steering systems*

■ *Wheel assemblies*

■ *Tires*

**9. No laser or radar detectors are allowed on post.**

**10. Alcohol**—*No open containers in passenger compartment.*

**11. Post-specific rules**—*Ask your first-line supervisor.*

**12. Driver's training**—*4 hours of training for age 26 and under.*

**—POC: James "Al" Brown, USASC Traffic Safety Manager, DSN 558-3421, brownj@safetycenter.army.mil**

# Most Recent Safety Messages Issued by AMCOM

| Date | Message Number | Subject | Suppl Info (pdf file) |
|---|---|---|---|
| 172100Z Jan 01 | UH-1-01-ASAM-02 | Inspect Fuel Quantity Transmitters | None |
| 172110Z Jan 01 | OH-58-01-01 | Replacement of Compressor Scroll | None |
| 181630Z Jan 01 | UH-1-01-03 | Inspect Mast Assembly | None |
| 251830Z Jan 01 | AH-64-01-ASAM-05 | Hydraulic Fluid Sampling | None |
| 252130Z Jan 01 | UH-1-01-04 | Inspect Mast Assembly | None |
| 121443Z Feb 01 | CH-47-01-02 | Inspect Droop Stops | Diagrams |
| 030504Z Feb 01 | CH-47-01-ASAM-07 | Inspect Untested FSP Bolts | None |
| 161845Z Feb 01 | CH-47-01-03 | Incorrectly Installed Droop Stops | Diagrams |

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## POV Fatalities

through 28 Feb

| FY01 | FY00 | 3-yr Avg |
|---|---|---|
| 37 | 44 | 49 |

U.S. ARMY SAFETY CENTER


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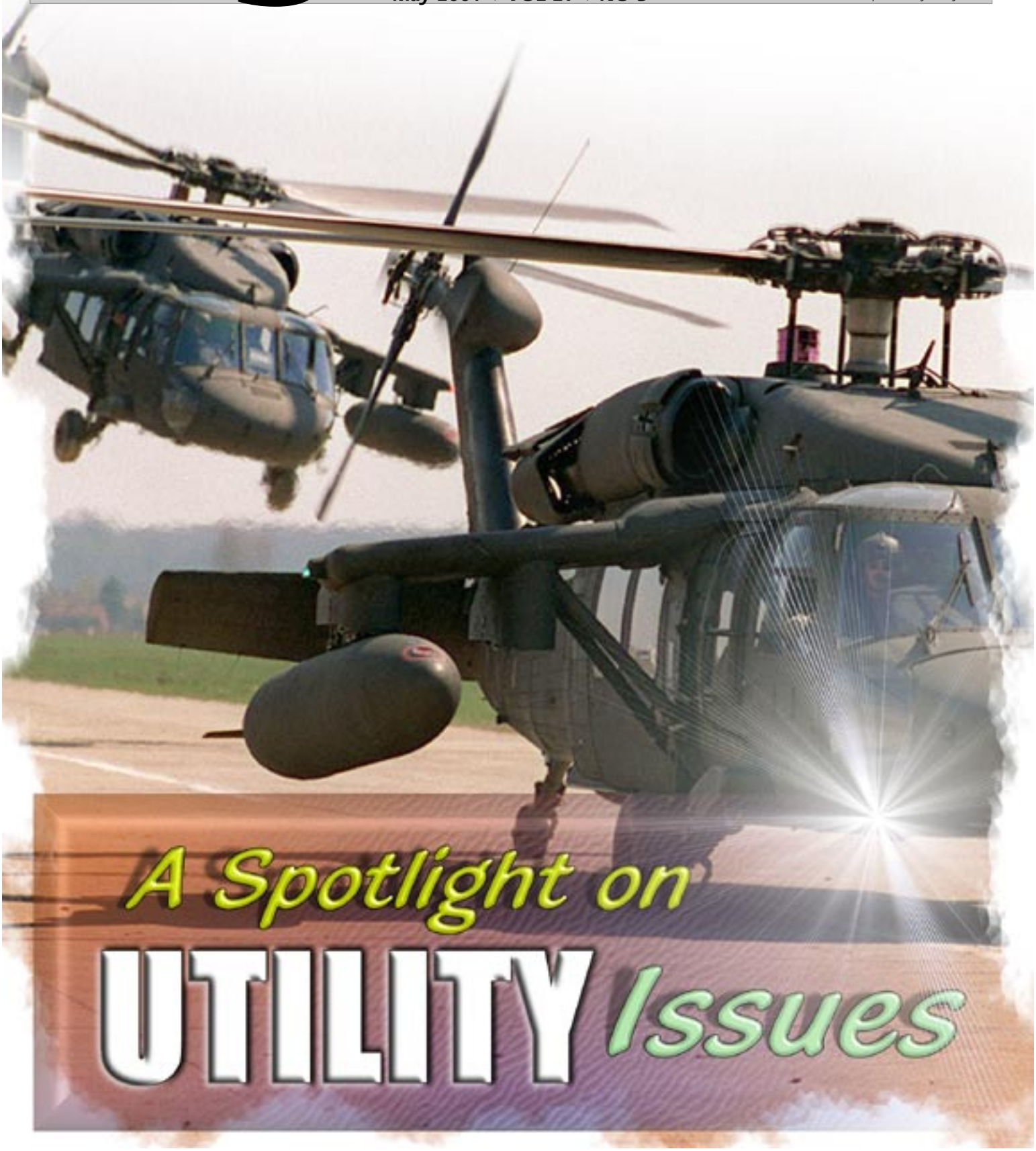
Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

May 2001 ♦ VOL 29 ♦ NO 5

http://safety.army.mil



# About this issue:

In accident after accident the investigators of the Army Safety Center see the same mistakes over and over again: aircrews and other soldiers either not knowing or not adhering to established standards. There are shortcomings and recommendations in 90 percent of the accident investigations that cite regulations, Aircrew Training Manuals, Technical Manuals, and SOPs not being adhered to. This issue of *FLIGHTFAX* is intended to address these issues but in a somewhat different way.

In a cooperative effort with the U.S. Army Aviation Center Directorate of Evaluation and Standardization (DES), this Utility Helicopter Update is intended not only to review accidents from the Safety Center database and to continue the discussion of the five-step risk management process, but also to take advantage of the trends seen by DES as they travel the world evaluating unit training programs. In this issue you will find some of these trends and some inventive ways for unit leaders and standardization officers to approach them. You will also find new approaches to training, points of contact in the utility helicopter arena, and snapshots of resources available to help units in the field.

Many thanks to the members of the Utility Branch of DES for their input to this issue. Look for similar issues for other aircraft in the future.

**—LTC W.R. McInnis, Director of Operations US Army Safety Center**

# MESSAGE FROM THE UH-60 BRANCH of DES

We would like to congratulate those men and women in the Black Hawk units worldwide, who day after day perform their duties selflessly and professionally. As we crisscross the world conducting unit Aircrew Training Program (ATP) evaluations, we have encountered some truly outstanding units and individuals in both the active duty and reserve component. Because of our wide exposure to such a variety of Black Hawk units, we have been able to identify some trends that seem to be common throughout the Black Hawk community. Some of these trends develop because of a misunderstanding of written guidance, poorly written or omitted guidance or sometimes just an oversight by the unit's commander and/or standardization personnel.

In this issue of *Flightfax*, we address some of the more prevalent trends and offer solutions and standardized clarification for corrections. Additionally we would like to expose you to some new approaches to training, and some sources of information to aid in implementing your ATP. Please keep up the good work and positive attitude toward standardization. Serving the Best.

**—CW5 Rodney L. Sangsland, Chief, Utility Division, Directorate of Evaluation and Standardization, Fort Rucker AL. DSN 558-2442, (334) 255-2442, sangslandr@rucker.army.mil**

# UH-60 POWER MANAGEMENT AND PERFORMANCE PLANNING

Power management has been a hot topic in the safety and standardization arena during the last few years. This is primarily because power management failures have directly contributed to the cause of several recent UH-60 accidents. All factors must be considered when properly managing power (as we read in the *Flightfax* issue of September 99) and none should be regarded as less important than any other. However, during the analysis of these failures, one factor—the lack of performance planning knowledge—has consistently been present.

## THE PROBLEM

We have found many reasons for the failure to fully understand performance planning. Based on worldwide DES unit evaluations; we offer the following reasons:

**Minimal task iteration requirements:** In the TC 1-212, the description section of the TASK 1004, *Prepare a performance planning card,* may tend to imply that regular use of the DA Form 5701-R, UH-60/AH-64 Performance Planning Card is not necessary.

**Inadequate performance planning information:** When properly filled out, the PPC does not provide the pilot with all the performance planning data required for flight. For example, the actual gross weight of the aircraft and the minimum single-engine airspeeds for the departure and arrival conditions are missing.

**No dynamic update in flight:** As the performance requirements change during the mission, there is no established method to perform quick and accurate power management updates in flight.

**Exceeding angle of bank limitations:** Black Hawk pilots often disregard, or are not aware of, the aircraft bank limits based on ambient conditions and/or torque available.

**Power available assumption:** Black Hawk pilots often disregard narrow power margins, incorrectly assuming there will always be sufficient power available.

**Failure to perform a timely jettison:** There is nothing more sad than a UH-60 crashing with low rotor RPM and full external fuel tanks.

**Command emphasis:** Many unit commanders and standardization personnel do not require proper pilot correlation of the PPC to their actual mission (a pencil drill).

## THE SOLUTION

DES, in conjunction with the Aviation Training Brigade (ATB) and Directorate of Training, Doctrine and Simulation (DOTDS) has developed a revised PPC that addresses all these problems. This PPC will be included in the publication of the new UH-60 Aircrew Training Manual (TC 1-237). Due to the urgency of improving power management, DES has requested that an interim change to the current TC 1-212 be implemented which includes the revised UH-60 PPC.

Until the interim change is published, the Utility Division of DES recommends the following power management guidance be implemented now at the unit level:

*1. Increase individual PPC task iterations across the board and ensure follow-up. Additionally, require pilots to complete the entire PPC when planned takeoff gross weight is within 3000, pounds of maximum allowable gross weight for: a) OGE hover for departure and/or arrival conditions, b) planned cruise conditions.*

*2. Ensure pilots verify the aircraft takeoff gross weight through accurate weight and balance calculations, or hover check and update the aircraft gross weight in flight as fuel is expended. Pilots cannot know their performance requirements for proper power management unless they can determine at any given time the actual aircraft weight.*

*Ensure pilots determine minimum single-engine airspeeds for takeoff and landing with and without external stores/loads.*

*3. Ensure pilots reference Fig 5-9 of the UH-60 operator's manual to determine recommended maximum aircraft bank angles for their planned cruise conditions. Additionally, ensure pilots correlate the relationship between the increased torque requirements and the selected angle of bank as the aircraft rolls into and maintains a coordinated turn.*

*4. Ensure pilots know how to update their PPC in flight as conditions change during the mission. The tabular data in the back of the UH-60 checklist is the preferred method to easily and accurately update the aircraft performance and power requirements in flight. Ensure your pilots have a thorough understanding of tabular data usage.*

*5. Ensure that pilots know how to adjust their takeoff and landing techniques when power margins are narrow (high aircraft gross weight and/or high density altitude). Takeoffs should be accelerated through ETL prior to climb out and landings performed with a constant approach angle, low rate of descent and slow airspeeds slightly above transverse flow. Pilots must* ***always*** *consider the effects of the wind and plan their takeoffs and landings accordingly regardless of aircraft weight.*

*6. Ensure the pilots are trained to know how, and have the confidence to, jettison external stores/loads when conditions require.*

*7. Unit commanders and instructor pilots must ensure that their pilots not only correctly fill out the DA Form 5701-R, but also accurately apply the data to every aspect of the flight. Ensure correlation of the PPC during readiness level (RL) progression, no notice evaluations, and APART evaluations.*

AMCOM has authorized the use of an electronic PPC for the UH-60L, which is Windows 95, 98 and NT compatible. The program and airworthiness release (AWR) may be downloaded from the Aeromed website. The URL is included on page 16 of this *Flightfax*.

PPC is clearly a key factor in properly managing power. I cannot overemphasize the importance of proper performance planning.

**—CW5 Rodney L. Sangsland, Chief, Utility Division, Directorate of Evaluation and Standardization, Fort Rucker AL. DSN 558-2442, (334) 255-2442, sangslandr@rucker.army.mil**

**Standardization issues**

# SPATIAL DISORIENTATION SCENARIOS

Spatial disorientation (SD) remains an significant cause of accidents in military flying. Field Manual No 3-04.301, *Aeromedical Training for Flight Personnel*, states that, "SD contributes more to aircraft accidents than any other physiological problem in flight." Regardless of their flight time or experience, all aircrew members are subject to SD. In 1997, the U.S. Army Aeromedical Research Laboratory (USAARL) developed spatial disorientation awareness scenarios for visual flight simulators. The scenarios re-created the conditions and events under which actual SD accidents occurred. Although the scenarios are performed to provide a greater awareness of spatial disorientation, the opportunity to impart other lessons is available. These include the maintenance of Visual Flight Rules (VFR) or Instrument Flight Rules (IFR), the difference between VFR and Visual Meteorological Conditions (VMC), the difference between IFR and Instrument Meteorological Conditions (IMC), aircrew coordination, decision making, problem solving, judgment, and overall situational awareness. The scenarios are available as USAARL Report 98-17. Contact USAARL for copies: Bldg. 6901, Fort Rucker, AL 36351, DSN 558-6936, http://www.usaarl.army.mil.

## Standardization Issues

# TRAINING SUPPORT PACKETS (TSP)

Ensure that in qualifications requiring a TSP, that the current TSP is used. Below is a list of current TSPs available from DOTDS, USAAVNC that are required by the UH-60 ATP:

- ✓ TSP-Air Volcano
- ✓ TSP-ERFS with AFMS
- ✓ TSP-Aircrew Coordination Training qualification
- ✓ TSP-AN/ASN 128B Sustainment
- ✓ TSP-UH-60 NCM Familiarization
- ✓ TSP-EH-60A Aircraft and Mission Qualification

To request a TSP, call CW4 Mark Duerst, ATM Branch, Directorate of Training, Doctrine and Simulation, DSN 558-9660/9661, (334) 255-9660/9661 or log on to FTP://155.147.190.23

## Emergency procedures

# ECU/DECU Lockout Procedures for the UH-60

The DES Utility Division has noticed a trend among UH-60 aviators involving task no.1062, Perform Electronic Control Unit (ECU)/Digital Electronic Control Unit (DECU) Lockout Procedures. A common practice while performing this task is to retard the Engine Power Control Lever (PCL) to the 6 o'clock position immediately after placing the engine in lockout. However, placing the PCL at the 6 o'clock position removes torque being supplied to the main rotor by the malfunctioning engine and could cause the Rotor RPM (RPM R) to droop further. This technique could lead to some disastrous consequences if the power from the engine in lockout is required to maintain flight.

### Definitions

First, let's review what the ECU/DECU provides to the Hydro Mechanical Unit (HMU). When everything is operating normally, the ECU/DECU provides an electrical input to the HMU to accomplish three tasks. 1) Control Turbine Gas Temperature (TGT) not to exceed the limiter value. 2) Maintain the Np reference, usually at 100%. 3) Match the other engine torque, if it is higher than its own torque. When an engine is placed in lockout, these functions of the ECU/DECU are removed from that engine and engine power is set directly by the PCL. This power is set based on a fixed collective position. Increasing or decreasing the collective will increase or decrease engine power on the lockout engine because the HMU load demand inputs are still functioning. The normal engine will still try to load share with the lockout engine, so once the power to maintain RPM R is set, the lockout engine torque can be set 10% below the normal engine to reduce pilot workload of constantly adjusting the PCL due to collective changes.

Now, let's look at the definitions of ECU/DECU lockout and some situations where retarding the PCL too far during lockout would not be the right choice. Keep in mind that this article is referring to using ECU/DECU lockout *only* for the reasons described in chapter 9 of the UH-60 operators manual, i.e., DECREASING % RPM R due to a malfunctioning ECU/DECU or % RPM INCREASING/DECREASING (OSCILLATION). The following information is not designed as an emergency procedure for decreasing RPM

R when there is insufficient dual engine power. Accurate performance planning and dinamic updates must be used to prevent entering this condition. If you don't have the power, you don't do the maneuver!

The UH-60 operators manual defines lockout as "manual control of engine RPM while bypassing ECU, or DECU functions. Bypass of the engine control will be required when % RPM 1 or 2 decreases below normal demand speed."

Remember, one of the ECU/DECU's primary functions is to maintain RPM R at a constant 100%, or whatever reference is set. RPM R equals survivability in the UH-60. Again, without the ECU/DECU providing this function, we, the pilots, now become the controller's function of RPM R

The underlined procedure in the UH-60 operators manual for performing lockout reads "*ENG POWER CONT lever – Pull down and advance full forward while maintaining downward pressure, then adjust to set % RPM R as required*."

Nowhere in this description does it say to retard the PCL to the 6 o'clock position. It **does** say to adjust to set RPM R as required. The proper response may be to hold the PCL forward of the fly detent until RPM R recovers, then adjust as necessary. This may mean allowing the RPM 1 or 2 and RPM R to transient into the 101-107 range before retarding. This decision will be based on how critical the situation is.

The technique of retarding the PCL to the 6 o'clock position may be a byproduct of the CAUTION associated with ECU/DECU lockout, which states that engine response is much faster and TGT limiting system is inoperative. DES is not advocating that crewmembers ignore their limitations, but in certain situations it is better to risk a possible engine "overtemp" and get the aircraft and crew down safely. Maintaining RPM R is the key to making sure this happens. In these situations, the engine owes you nothing more than to get the crew and the aircraft down safely.

The TC 1-212 reference for ECU/DECU procedures is found on page 6-55. The procedure says to "Immediately retard the engine power control lever to some intermediate position between IDLE and FLY to manually control the engine." Based on the urgency of the situation, following this procedure could cause the RPM R to further decrease if the PCL is retarded too far.

## Situations

**Situation #1:** During level flight at 500' AGL the crew notices a decrease in RPM R due to a malfunctioning ECU/DECU. If the dual engine torque reading is above ½ the maximum torque available, lowering the collective will probably bring the RPM R back into the continuous operating limits. The crew now has time to determine when and if the engine will need to be placed into lockout. The urgency of the situation is not at a critical stage, and time is available to perform lockout. If the aircraft is within the single-engine airspeed flight envelope, placing the ECU/DECU in lockout and immediately retarding the PCL should have no adverse affect on the aircraft. Limitations will not be exceeded and a suitable area to land as soon as practicable can be found. This is a situation where the training of retarding the PCL immediately to the 6 o'clock position will not become a factor.

**Situation #2:** In a heavily loaded aircraft during the landing approach into a small LZ, the crew notices a decrease in RPM R due to a malfunctioning ECU/DECU. The collective cannot be lowered enough in this case to return RPM R into the continuous range. The crewmember identifies the proper PCL and places it into lockout, holding the PCL forward until engagement of lockout is confirmed by an increase in power (torque, TGT, Np), keeping it forward of the fly detent until RPM R returns within limits. The PCL can then be smoothly retarded until torques are approximately matched. Then adust PCL at least 10% below the other engine torque. The initial rearward movement of the PCL should be accomplished quickly enough to avoid exceeding transient limits, yet maintain RPM R at or near 100%.

As an UH-60 aviator, how well do you really know your

aircraft systems? As a trainer in the UH-60, how are you teaching your aviators to perform maneuvers? Confidence and proficiency in lockout operations comes with practice. This procedure should be trained and practiced in the simulator throughout the entire flight spectrum from approach to Vh. Training in the UH-60 must be realistic, and the guidelines of the ATM and manual are the standards we will follow. DES is not advocating going outside the training guidelines, disregarding standards or exceeding limitations. Solid knowledge of systems, situational awareness and prioritizing actions play a very important part in surviving a critical situation. Would you rather replace an engine or a flight crew?

**—CW3 Steven W. Woodfint, SP, UH-60 branch, Directorate of Evaluation and Standardization, Fort Rucker AL, DSB 558-1748, (334) 255-1748, woodfints@rucker.army.mil**

## Emergency Procedure Issues

# UH-60 EMERGENCY PROCEDURE TRAINING: A NEW PHILOSOPHY

Over the lifetime of the Black Hawk, the method by which crewmembers were trained to perform certain emergency procedures has failed to properly prepare the crew to perform in critical situations. According to the results of worldwide evaluations and accident investigations, aircrew members have not performed according to their oral knowledge in critical situations. These same crew failures of the past haunt the Black Hawk community today, despite the introduction of aircrew coordination training and changes to emergency procedures.

Our new training philosophy seeks to fundamentally change the way emergency procedures are trained and evaluated. With the current UH-60 Operator's Manual we can incorporate the crew coordination elements into emergency procedure training. The intent is to improve how emergency procedures are trained and evaluated now, while the procedures evolve over time. This brings us to our first tenet:

### Rote Memorization is for the table.

A pilot should not be required to recite all underlined steps of an emergency procedure while in flight and at a set of controls. This disrupts crew coordination and the proper performance of the procedure. It is imperative that we train and evaluate these actions separately. Rote memorization is required in an academic setting while application (performance and proper crew coordination) is required in the aircraft. When performing emergency procedures in the aircraft, each pilot should announce his actions and perform them as required by his duty position. This point brings up the next tenet:

### Each procedure has two parts.

The pilot on the controls (P*) performs the first part and The pilot not on the controls (P) performs the second part.

Each underlined step of the emergency procedure

designates which pilot must perform the step depending on which pilot is on the controls. Pilots must show proficiency in each role. Training that incorporates both of these roles will enhance aircrew coordination. A standardized crew can then use the immediate action steps as a call-out checklist as each pilot performs the steps required by his duty position. An example of a well-coordinated crew proficient in the performance of a particular emergency would be similar to this:

P*: "I have a pedal drive; I am opposing the drive."
P: "Trim switch is off."
P*: "The pedal is still driving."
P: "Boost switch is off."
P*: "The pedal is still driving."
P: " Boost switch is on; I'm inside with the checklist."

The immediate action steps in current checklists are not scripted for easy announcement of actions. However, using scripts similar to this will allow the trainee to perform in each role while announcing his actions in the proper sequence. A proficient pilot will be able to understand and perform the emergency procedures using proper crew coordination. We also must consider those emergencies where the steps are not in order. For instance, during an engine fire, would the pilot on the controls wait for the last step to start his approach for landing? We hope not, but that is what we have seen during evaluations. It is the responsibility of standards personnel to develop the scenarios necessary for proper practice.

### THE MOST IMPORTANT CONSIDERATION IS AIRCRAFT CONTROL.

The pilot on the flight controls will fly the aircraft.

This is emphasized as one of the most fundamental aspects of the crew briefing, as it should be. This new philosophy requires that pilots perform specific actions in the event of an emergency while they are on the controls, rather than just verbalizing these actions. The instructor must teach in detail what specific actions must be performed. This sounds simple, but during evaluations many inexperienced pilots cannot state how they would fly the aircraft, specifically, what they would do with the flight controls. For example, let's start training pilots in one simple maneuver: establish single-engine airspeed. The pilot in command should select an emergency single-engine airspeed based on power available and brief that emergency single-engine airspeed to the crew. Don't always assume this will be a deceleration. Use normal flight attitudes (no extreme maneuvers to establish this airspeed). No matter what the emergency, establishing a single-engine airspeed will give the crew the best chance for a successful recovery.

The next step is establishing an approach to a suitable landing area. Look for a place to land. It falls to the pilot on the controls to find the best spot to land, but the rest of the crew can assist him. The emphasis here is to be prepared to make the approach with a normal rate of descent to the ground. The pilot on the controls only has a few things to do: control the rotor, control the aircraft, establish single-engine airspeed, and set up for approach and landing. These actions should be briefed prior to each flight and should be initiated and completed whenever an emergency is detected. The instructor pilot should allow simulated emergencies to continue to a successful landing whenever possible.

### SOME EMERGENCIES ARE MORE CRITICAL THAN OTHERS.

We are not saying that some emergencies are more important; we are saying that there are some emergencies that are more time-critical when it comes to performing the immediate action steps. Most emergencies can be dealt with in a deliberate manner, but some emergencies require true immediate actions. We strongly recommend that the initial immediate action of these particular emergencies be briefed prior to each flight. We have purposely kept this list to a minimum, and suggest that if others are added, they be scrutinized carefully to ensure that they are truly critical emergencies. They are:

- SINGLE-ENGINE FAILURE
- DUAL-ENGINE FAILURE
- DECREASING % RPM R

■ LOSS OF TAIL ROTOR THRUST

■ ENGINE FIRE IN FLIGHT

■ UNCOMMANDED NOSE DOWN PITCH ATTITUDE CHANGE

**MOST REAL EMERGENCIES HAPPEN OUTSIDE THE TRAFFIC PATTERN.**

This is really where an IP begins to earn his money. The IP must train emergency procedures in realistic tactical settings. There are no regulatory restrictions to this. When local SOPs restrict this type of training, commanders should revise them. We must develop scenarios that replicate the real emergency as closely as aircraft limits and safety allow. It is not necessary to announce, "simulated" prior to the pilot reacting to the emergency. The pilot on the controls must learn to recognize that something has changed in the performance of the aircraft, and relay this information to the pilot not on the controls. This does not mean taking chances or putting the aircraft in unrecoverable situations. However, this does mean that the IP be proficient enough to allow for safe training in realistic situations.

Once adopted, units will find that this training philosophy will foster smooth, efficient and safe emergency procedures performance in the cockpit.

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# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH64

### Class C

#### A series

■ During hover taxi while aircraft was repositioning for take off, gun barrel made contact with the ground. Aircraft was kept at a hover and maintenance personnel removed barrel assembly. Aircraft landed without further incident. Damage to gun barrel and carriage assembly.

### Class E

#### A series

■ During Post Phase Test Flight, Test Pilot was performing power check on the No.1 engine. The No.2 power lever was at idle, while aircraft was cruising at 130KIAS at 4500 MSL. BUCS Fail Light illuminated. Pilot returned the No 2 power lever to fly and landed as soon as possible. Aircraft was landed with no damage, all systems were brought back on line. Maintenance personnel could not duplicate; aircraft was released for flight.

■ During RL progression, the master caution light illuminated with corresponding illumination of the VIB GRBX segment light. When segment light did not extinguish after 10 seconds, crew landed as soon as possible to an open field in the training area and maintenance was notified. The signal data processor had failed. Maintenance replaced the SDP. No damage to the aircraft was found. Aircraft was released for flight.

## CH47

### Class B

#### D series

■ Rear rotor blade contacted the fuselage on engine shutdown. Damage to fuselage.

### Class C

#### D series

■ During post phase maintenance test flight, copilot's jettisonable door departed the aircraft over water and was not recovered. Aircraft was landed without further incident.

## OH58

### Class A

#### D-I series

■ During overwater flight, aircraft crew experienced severe vibration and the decision was made to ditch into the sea. Observer reported seeing a piece of the aircraft separate prior to the ditching. Two crewmembers sustained hypothermia injuries. Aircraft lost at sea.

■ During acceptance flight while conducting an autorotational RPM check, aircraft landed hard and off the runway. Damage to airframe, skids, 4 main rotor blades, tail rotor assembly with tailboom separation. Aircraft destroyed.

### Class C

#### C series

■ During IERW basic combat skills training, while demonstrating a low-level auto, the instructor pilot (IP) felt a vibration in the aircraft as the short landing slide stopped. The IP repositioned the aircraft to the grass next to the landing lane and exited the aircraft to ensure there was no damage. The IP discovered damage to the tailboom and shut down the aircraft. The post-flight inspection confirmed that the K-FLEX drive shaft had made contact with the isolation mount cover.

#### DR series

■ Aircraft made a turn into a tailwind condition and began to spin. Engine and mast experienced overtorque while arresting spin condition, Engine 135 percent, Mast 128 percent.

■ Aircraft landed hard during autorotation maneuver. Engine experienced power droop during application of collective during recovery. Damage occurred to aircraft's landing gear.

### Class E

#### C series

■ While hovering to parking, engine oil bypass segment and master caution lights illuminated with all other instruments indicating normal. Aircraft was landed and shutdown without

further incident. Postflight inspection revealed oil on left side of engine. Maintenance inspection revealed upper scupper packing had failed. Maintenance replaced packing and aircraft was released for flight.

### DI series

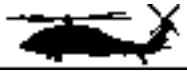
■ Aircraft took off from airfield and pilot noticed stiffness in controls. Aircrew remained in the traffic pattern and discovered binding/resistance in left rear quadrant of cyclic. Aircraft landed at airfield and taxied to parking. Aircraft was shutdown without further incident. Maintenance notified. Hydraulic servo was replaced. Aircraft was released for flight.

## TH67

### Class B

■ During hover, aircraft made contact with the ground. Tail boom separated, damage to main rotor blades, right skid, loss of windshield.

## UH60



### Class A

### L series

■ While conducting a night, NVG terrain flight multi-ship air assault, a flight of four aircraft were executing a right-hand turn to final from a staggered right formation, when two aircraft collided in mid-air. Six fatalities. Two aircraft destroyed.

### Class C

### A series

■ While entering landing zone, Chalk 3 of 3 encountered whiteout conditions. All four main rotor blades struck a tree. Replacement of rotor blades required.

### Class D

### A series

■ After a Night Vision Goggle training flight, which included terrain flight decelerations and landings to a sod area on the airfield, damage was found to the trailing edge of the stabilator during the post flight inspection. During one of the training iterations, the instructor pilot had recovered the aircraft from excessive pitch attitude and rate of descent. There was no indication of any malfunction with the stabilator, and training was continued.

### Class E

### A series

■ During engine start, crew noticed smoke/exhaust in the cabin area. Engine was shutdown and smoke/exhaust ceased. Inspection of engine compartment revealed V-band clamp loose allowing improper direction of exhaust gases. Improper torque was apparently applied to V-band clamp nut. Additionally, the nylon engine cowling stop block had melted from heat. V-Band clamp nut and stop block were replaced. Aircraft released for flight.

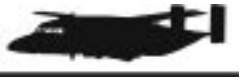
## C12

### Class E

### P series

■ On climb out when aircraft began pressurizing, pilot's airspeed indicator began decreasing erroneously. Pilot switched to alternate pitot static source and returned to base without further incident. Maintenance inspected aircraft and found pilot's static system drain was not properly seated. Aircraft was given a MOC and released for flight.

## C23



### Class E

■ During takeoff right engine failed. Aircraft returned to field and landed without further incident.

**For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.**

# Do Your Crew Chiefs Know?

In the UH-60 community, crew chiefs have always played a critical role. Bad pilots view them as little more than passengers. Good pilots have always recognized their importance and encouraged all members of their crew to actively participate in the flight.

While assigned to the 82nd and during a 1992 JRTC rotation, I was amazed to learn how valuable another aircraft's crew chief could be to me.

The mission was to be a "typical" ten-ship assault of Airborne Infantry troops into the box, nothing any one of us had not done before. AH-64s, OH-58Ds and Cs, UH-60s from the CAV and a flight of ten UH-60s from my unit would all be in and around the box at the same time. The challenges of multiple aircraft attempting synchronized movement were many. Recognizing the dangers, the routes and AOs were de-conflicted by time, terrain or altitude.

Flying co-pilot in the lead Black Hawk was exciting. At the FSB, I was pumped to see all those Black Hawks armed with 60s, ready to go. It had become normal practice for our unit to fly with external tanks installed, as on this mission.

The take off was routine and the route easily identifiable at the beginning of the 30-minute flight to the PZ. Thankfully, the radios were quiet. So far, things were going by the book.

The box was getting closer. The crew chiefs armed the 60s and prepared to look for threats. Even though the area was to be somewhat safe, the nature of JRTC Low Intensity Conflicts made every flight in the box full of threats. The crew chiefs did their best to maintain airspace surveillance, but remember, the M-60's range is primarily forward and down. This, we later learned, made the crew chiefs tend to channel their attention that way. To complicate matters, crew chiefs have almost no visibility directly out the sides, and viewing to the rear is challenging to say the least.

As we entered the box, we came to about 80 feet AHO. The terrain relief was minimal, making navigation more difficult than it had been. Sitting in the right seat, I scanned as well as I could in all directions, knowing that the PIC was busy managing timing and navigation. We had studied the route well, and knew that on entering the box our route went between several areas full of aircraft. As usual, commanders were getting antsy as we got farther into the mission, and the time for pick-up got closer. The radios exploded. As the lead aircraft, we did not have the luxury to turn any radios off and needed to plainly hear any call that came for us. Communication among our crew dropped off a bit. The only quiet net was our flight internal net. Have-Quick, VHF and one FM were blaring.

Suddenly, we heard over flight internal net, a frantic voice calling "CLIMB! CLIMB! CLIMB!" I sat up a little straighter, but assumed, just like the rest of our crew, that an aircraft behind us was about to strike a tree. "CLIMB! CLIMB! CLIMB!" This time I recognized the voice; it was the PIC of Chalk Four. Again, I looked around a little more, but saw no danger.

On flight internal, we now heard a very calm, but forceful call starting with our call sign.
"_____ ONE ONE, CLIMB NOW!"

That's all I needed! I pulled the collective up sharply and felt the PIC assisting. We shot from 80 feet AHO to about 300. As we began climbing I heard the PIC yell. All of this took place in a matter of seconds.

Once we leveled out, I looked around. The only thing I could see was an OH-58D below us to the right, heading off to our two o'clock. Strangely, I had not noticed him earlier. The AMC told us to descend and slow down so the flight could reform.

That's the first indication we had that the flight had split up. The rest of the flight had seen the 58 approaching our aircraft, almost perpendicular to our flight path from the left, from about our eight. Expecting the worst as it got closer, other crews had departed the flight so as not to join the impending mid-air. When one PIC had tried to warn us, we interpreted his frantic call as HIS emergency. When we climbed, the 58 continued on its way to our right front, towards our two.

My PIC seemed shaken as we landed at PZ and asked the AMC for a delay. He told me he needed a second to collect himself. He was the one who had yelled out at the same time he saw the 58. He later told me if he had stuck his leg out the door, he could have kicked the ball off the mast!

The life saving radio call had come from chalk three. Realizing that the call was not being correctly received, the crew chief on the left side off that aircraft made the all-important radio call that saved 6 lives and two aircraft.

At the completion of the mission, we could not determine if anyone was where he was not supposed to be. We believed ourselves to be at the right place at the right time along the route. We could not find a 58 crew who could say they had been around or saw the assault flight. The only thing we knew for sure, as the other nine crews confirmed, was that the crew chief of chalk three had saved the day. He knew his equipment. He knew radio procedures. He quickly sized up the situation and took action. If not an actual hero, he sure was mine.

UH-60 Pilots, ask yourself how you view your crew. **All** of your crew. Let them know that you understand the essential function they perform. If they are not encouraged to participate and keep a level of situational awareness as high as yours, you may not reap the benefits that two aircraft and crews did in the box.

**—CW3 James C. Boyd, 160th SOAR (A), Ft. Campbell, KY Company ASO**
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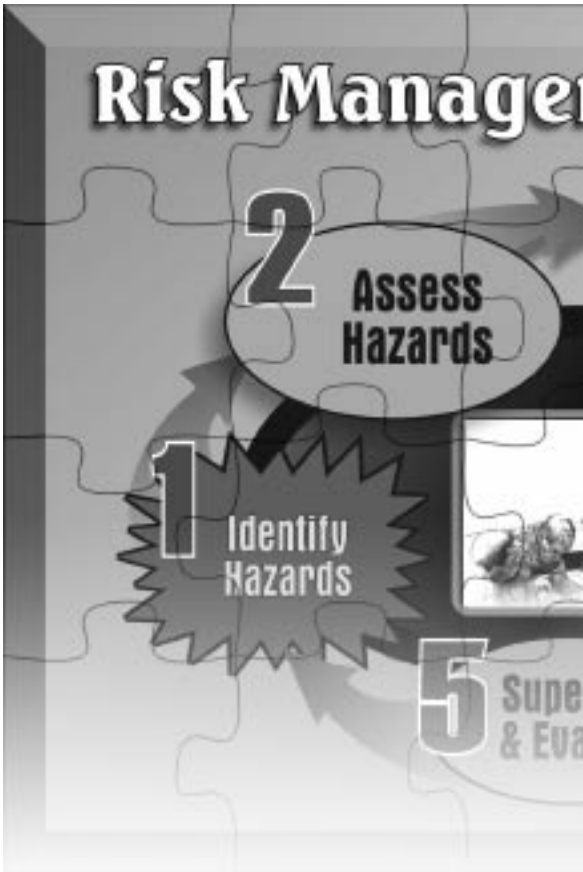
# Looking Beyond Identifying and Assessing Hazards

**This article, the third in a series on the risk management process, focuses on Step 3: "Developing controls and making risk decisions."**




When Safety Center personnel conduct accident investigations, they look for the root causes of the accident. One that often stands out is that leaders are not fully applying the 5-step risk management process. The commanders and NCOs of accident units can usually show that they penciled a worksheet. They identified likely hazards. They assigned at least a personal impression of the degree of risk. Then the process broke down. The leaders didn't really carry out Step 3, developing controls and making risk decisions at the appropriate level. Thus, there was no countermeasure to execute, nothing to follow-up.

Too often, risk-reduction controls are never developed, and when they are, they are not adequate or are not implemented. Without that central risk-management step, the first two steps are almost useless and the last two are not properly targeted!

Actually, there are two related phases to this step. Leaders must obviously develop hazard controls before they can make any decisions about them, so I'm concentrating on that aspect in this article. Next month, we'll discuss the second part of Step 3 "*Making risk decisions*."

Control development hasn't changed since people started thinking about safety in an organized method—most controls can fit into three methods.

■ **Engineering.**

Leaders can engineer-out some hazards. Engineering is the most positive and proactive way to control hazards. When the soldiers' equipment, environment, or tasks are permanently changed to remove the hazard, troops can operate more freely without losses.

Ideally engineering begins before the drawing board—when the acquisition folks first design requirements and materiel solutions. In the real world, engineering continues long after equipment is fielded.

Engineering doesn't end when good equipment gets in the soldier's hands. The state of maintenance and facility upkeep is constantly monitored through the command inspection and work order effort. The Armywide equivalent is the Modification Work Order (MWO). Even MWOs ultimately rely on user-unit leaders to make sure their equipment gets the right priority and doesn't fall through the cracks.

Reengineering a mission doesn't mean abandoning it. Reengineering means finding and maximizing every available advantage—time, equipment, illumination, rest, troop talent, support—all the METT-T factors and more.

■ **Training.**

Soldiers can be trained to safely operate around hazards. When hazards can be physically eliminated, they should be. But, much of the time, the Army operates in situations where engineered controls aren't feasible. This means that when the environment can't be fixed, or the fix is slow in coming, commanders fall back on training.

Soldiers who trigger human-error accidents sometimes don't know how to perform the operation safely.

Those soldiers are candidates for more training. If a soldier knows his job, but he chooses to take shortcuts, that's a different problem and requires a different solution (see Enforcement below).

Training is best used to teach soldiers how to operate around risk that can't be further reduced without compromising the mission. Instead, unit commanders sometimes are forced to use training to compensate for hazards inherited from a flawed system or facility. For example, training to improve driving behavior is a good control for the high-risk traffic environment. It's a bad control for a lousy vehicle suspension or defective tires and brakes.

■ **Enforcement.** Leaders must enforce safe standards of unit performance and individual discipline. Just as there are missions and environments that are not safe for any soldier, we get accident reports on soldiers who would not be safe in any environment, no matter how well-engineered. Erratic behavior can make any mission a high-risk mission. The most extreme cases are rare, but all units will experience human-error accidents if soldiers are not given effective standards and held to them. If standards aren't enforced, there are no standards.

The standards themselves must be appropriate to the operation. They must be current, they must be suitable, and they must be understood. Standards are not risk controls when they are out-of-date, or when they call for unavailable resources (such as equipment and the time to use it). Standards are not controls when they're in a book back at the head-shed. Army regulations, technical manuals, and SOPs become *real* standards when leaders communicate them to their soldiers in a way that consistently produces the desired performance. And that's not always easy, and it's never a one-shot effort.

We've looked at soldiers who don't know or don't understand the standard for safe performance—they are uninformed. Sometimes they don't trust the standard—they are unconvinced. Sometimes they know and understand the rules, but choose another course of action—those soldiers are undisciplined. Effective leaders make soldiers internalize the rules for safe behavior, and act to the standard. They consistently acknowledge and reward soldiers who are doing the right thing the right way, not those who gamble for short-term results by "making it up as they go along."

Internalized discipline, which becomes habitual self-discipline, is essential for on-duty performance to standard. It's even more important off-duty, away from a controlled situation and leadership oversight. Most Army fatalities are caused by off-duty accidents, primarily in POVs. It's the attitudes learned in the unit that protect young soldiers out on the highways.

The unit commander can't re-engineer the car or the highway, however he can have some influence on the timing and conditions of his soldier's trip. Constantly building self-discipline is the way commanders and NCOs reach into the cab of the soldier's pickup.

In planning real-world missions, risk managers will mix and match these control methods. However, none of the methods will have any impact on fatal accidents unless the risk management cycle is completed. The developed controls must be executed and monitored. Somebody has to do it!

**—POC: MAJ Brian Sperling, Chief, Operations Research and Statistical Analysis Division, DSN 558-1496 (334-255-1496), sperlinb@safetycenter.army.mil**

# NCM vs. NRCM?

Currently the acronyms NCM and NRCM are being used incorrectly—some clarification is needed. AR 95-1, AR 600-106, TC 1-212, TC 1-211 and TC 1-210 all recognize NCM as the official acronym for Non-Rated crewmember. TC 1-210 is the only publication that addresses NRCM. NRCM is an acronym that also represents Non-rated crewmembers. In future publications (TC 1-200, the new commander's guide and TC 1-237, the new UH-60 ATM) the NCM acronym will be the only authorized acronym for Non-rated crewmembers.

## INDIVIDUAL AIRCREW TRAINING FOLDERS (IATF)

IATFs inspected during recent visits reveal that many mandatory entries per TC 1-210, paragraph 3-18 (pages 3-40 through 3-42) are not being documented. Entries such as evaluations, Aircrew Coordination Training (ACT) qualification, start of RL progression, and significant training events are not being properly annotated on DA Form 7122. Completion of ACT academics and ACT academics/evaluation flights must be annotated on DA Form 7122 per TC 1-210, paragraph 1-9b(2). All evaluations will be annotated on DA Form 7122 (i.e. Commander's evaluation, annual NBC evaluation, Aerial gunnery, No-notice evaluations, etc.). The start and completion date of aircraft or NVG qualification must be annotated. The start date should correspond with the date the individual was designated RL 3. Other entries include all significant training. Examples of significant training include, but are not limited to: local area orientation, Non Rated Crew Member Flight Instructor (FI)/Non Rated Crew Member Standardization Flight Instructor (SI) training, M60D training, and any qualification academics (i.e. ERFS, ACT, or NVG). Local area orientation is required per TC 1-210, paragraph 3-5, prior to the NCM progressing to RL 1. FIs and SIs will be trained

per AR 95-1; paragraph 4-33 and all significant training will be documented on DA Form 7122.

In reference to DA Form 7120-1/-2, Task 2079 (Perform terrain flight mission planning) does not apply to NCMs. An error in TC 1-212, figure 5-3, incorrectly states that Task 2079 applies to NCMs. *Task 2079 is not required for NCMs.*

## TRAINING

We are finding that training for NCMs is not beening annotated IAW TC 1-210 or conducted IAW TC 1-212. All training required per AR 95-1, TC 1-210 and TC 1-212 must be annotated in the IATF. Inspections have discovered that units were unaware of the requirement for NCMs to undergo mandatory qualification academics per TC 1-212, paragraph 2-1b and figure 2-1. They must also complete written exams per paragraph 2-1b and Figure 2-1. During initial flight qualification, NCMs must receive at least one hour of night unaided flight prior to progressing to RL 2 day/night. During NVG progression the NCM must have a start date of NVG qualification/RL training. This date is needed to determine the start of the 90 days required for RL progression. The NVG academics as outlined in the USAAVNC NVG ETP, must also be annotated on the 7122 upon completion.

These dates will allow for FIs and SIs to follow and track NVG progression and ensure that the 60-day sliding window is not exceeded per TC 1-210, paragraph 4-4a. NCMs must complete one hour of NVG training in a static aircraft. This training is to include emergency engine shutdown, egress (i.e. evacuation of a pilot), NVG failure, and aircraft switch locations. This hour may be applied towards the 5.5 NVG flight hour minimum for NVG qualification in the aircraft and must be annotated on DA Form 7122.

## EVALUATIONS

NCM evaluations had not been conducted IAW TC 1-212, chapter 8. FIs and SIs must ensure they perform all evaluations using chapter 8 and following the four phases in order. When conducting evaluations, FIs and SIs must ensure they evaluate to the standard, *and not conduct training*. This seems like a simple task, but too often FIs and SIs turn the evaluation into training. Then they annotate the results as if an evaluation had been completed. An example: during an NCMs standardization evaluation, the NCM failed to perform TASK 1065, Perform emergency egress, to standard. The NCM failed to turn off the fuel boost pumps during emergency engine shutdown. The FI or SI decided not to give the NCM a "U" for that task and trained the individual instead. This brings up two problems. First, the FI or SI did not enforce and/or grade to the established standards in the ATM. Second, by giving the NCM credit for a task not performed to standard, the FI or SI consequently has lowered the standard. The next time that NCM is evaluated he/she may feel that there is no need to maintain individual proficiency. The soldier may be tempted to say, "The last time I had an APART evaluation Joe SI showed me how to do the task…so he will probably show me this time too…so I do not need to prepare or study".

The standards need to be enforced IAW the ATM. FIs and SIs need to set and enforce the standards. This is non-negotiable.

The commander's evaluation, as per TC 1-210, paragraph 2-4, is used to determine the initial readiness level of crewmembers. The evaluation consists of a records review and possibly a Performance Flight Evaluation. The shortcoming we have noticed is that the commander's evaluation is not being annotated on DA Form 7122 or is not properly conducted. The record(s) review includes the IATF and the IFRF. During the review the commander or his representive must investigate for the NCM's last day/night flight, NVD flight, ACT qualification date, ACFT qualification date, current/local DA Form 4186, RFO or placement on flight status, and any other special mission qualifications (i.e. EFRS qualification, SPIES qualification, rescue hoist qualification, etc.). On completion of the commander's evaluation, the results of the records review should be annotated in the Remarks section of DA form 7122.

## NON-CREWMEMBERS

Non-crewmembers as defined in AR 600-106, will not be integrated into the ATP, except those authorized to perform non-rated crew member duties. They do not need IATFs or APARTS. RL progression does not apply to non-crewmembers. The commander, however, may utilize non-crewmembers to perform NCM duties if they meet the following requirements:

- Must be MOS qualified to perform duties as mentioned above. For example, platoon sergeants and technical inspectors are both 67Ts.
- May perform NCM duties only when the assigned NCM is on an authorized absence (leave, TDY, etc.)
- Must be fully integrated into the ATP to include IATFs, APARTS, RL progression and all training and evaluations that normally apply to NCMs (i.e. ACT Qualification, NBC evaluations, etc.).

Shops personnel (avionics or engine technicians) are not authorized to be integrated into the ATP. Non-crewmembers will receive a passenger briefing from a crewmember prior to each flight to ensure they are aware of ALSE, emergency egress, emergency procedures and any other pertinent information required for that flight.

**—SFC Robert L. Cashin, SI, UH-60 Branch, Directorate of Evaluation and Standardization (DES), DSN: 558-1442, (334) 255-1442,CashinR@rucker.army.mil**

# Useful Utility Websites

➲ **Directorate of Evaluation and Standardization (DES)**
http://www-rucker.army.mil/des/des.htm

➲ **AMCOM Aviation Safety Messages**
http://www.redstone.army.mil/sof

➲ **Directorate of Training, Operations and Simulation (DOTDS)**
http://155.147.98.10/dotds/dotds.htm

➲ **Electronic Technical Manuals Online**
http://www.logsa.army.mil/etms/online.htm

➲ **Utility Helicopter Project Manager's Office**
http://www.uhpo.redstone.army.mil

➲ **United States Army Aeronautical Services Agency (USAASA)**
http://www.usaasa.belvoir.army.mil

➲ **UH-60L Electronic Performance Planning Card**
http://www.aeromech.redstone.army.mil

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## POV Fatalities

through 28 Feb

| FY01 | FY00 |
|---|---|
| 40 | 56 |


U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

June 2001 ♦ VOL 29 ♦ NO 6

http://safety.army.mil

# Over water missions– Ready or Not?

# Over water incident could have been a lot worse...

**"Army units are routinely being tasked to conduct over water missions for which they are not properly trained or equipped," notes Brigadier General Gene LaCoste, Director of Army Safety. Many units do not possess appropriate protective clothing, or flotation devices, and few are appropriately trained.**

**A recent accident illustrates the point. During over water flight, an OH-58D aircraft was forced to ditch. While the crew was fortunate in having search and rescue craft in the immediate area, and spent very little time in the water, they still suffered hypothermia injuries.**

**In this Flightfax, we will look at various aspects of this issue, and try to provide you with some starting points if you are tasked for an overwater mission.**

# Risk Management Can Work.

## How we got into the over water business

We have all heard it. "The train is moving fast," "Our plate is full," and all the creative comments in that vein. More and more, our training calendar pushes the training pace and sets the tone for the company level and below. Many times the line pilots wonder if staff members even look at the tasking before passing it along. Doesn't the Army know how much detail and planning has to go into aviation operations? Why don't they apply to their level what they want us to do at the line?

Well, they do. We just don't see it all the time. Here is a good example of how risk management can work and why it is so important to be involved in the planning process.

### THE MISSION

During the first week of holiday block leave and already on a half-day schedule, the unit received initial warning that it would be required to support the Joint Shipboard Helicopter Integration Process (JSHIP) mission with two OH-58D aircraft and crews and armament soldiers. This was not a standard tasking, but one that would involve many unfamiliar aspects of planning and execution. The purpose of the test was to evaluate non-naval helicopter units operating from a Carrier class ship in order to identify any compatibility, procedural or training issues associated with the shipboard operations. A significant portion of this test was to evaluate Army ordnance handling and to develop procedures, methods and controls to safely embark, load, fire, download and disembark Navy ships with this ordnance.

The majority of the unit and most of the key staff officers had already departed on leave or were in the process of departing for the holidays. The unit was not flying or training during block leave. The limited staff remaining requested relief from

the tasking but began an immediate mission analysis in the event relief was not granted. This initial analysis was accomplished because the training requirements for the mission would begin the week the unit was to return from block leave.

## THE ANALYSIS

The staff analysis revealed the unit had not trained or conducted over water operations since deploying to Haiti in 1994. Over water operations was not a METL task of the unit. Only five aviators in the battalion had experience with over water missions and not all were available for the mission. The unit did not have sufficient ALSE equipment for over water operations. The initial analysis, including a risk assessment, put the mission in the extremely high-risk category. By SOP, extremely high-risk missions required division commander approval in order to execute. The major hazard identified during the mission analysis was crewmember fatality from drowning or exposure.

**Over water operations was not a METL task of the unit. Only five aviators in the battalion had experience with over water missions and not all were available for the mission.**

## THE CONTROLS

The following control measures were planned to mitigate the risk down to a medium risk mission. The special staff, specifically the Safety Officer and Standardization Officer, was involved early in the planning process, adding to the success of developing a comprehensive set of control measures. All of these control measures were briefed through the entire chain of command including the commanding general.

■ Increase the tasking to at least a platoon level mission. Desired a company level training event.

■ All crewmembers would wear a Life Preserver Unit (LPU).

■ All participants would pass a Navy standard swim test and Army drown proofing.

■ All crewmembers would complete HEEDs and Dunker Qualification. It was desired that all ground support personnel attend this training.

■ All crewmembers would wear 'Constant Wear' anti-exposure suits.

■ SAR aircraft will be in the air, not on standby, during operations. Aircraft would only operate multi-ship.

■ No night or NVG training would be conducted over water.

■ Aircraft would operate only under VFR (1000/3) conditions and above 300 feet Above Water Level (ABL).

■ Aircraft door armament side panels would be removed.

■ All crewmembers would complete "deck landing" qualifications under day, night and NVG conditions.

■ All participants would receive academic and hands on ALSE training.

■ Capitalize on battalion and brigade over water experienced aviators. Desired an over water experienced crewmember on each aircraft.

■ Communications between the company and battalion commander would be maintained throughout the duration of the mission.

■ Seek strategic airlift to gain more training time and to train on METL tasks of deploy and redeploy.

## ANATOMY OF AN ACCIDENT

Each accident is a sequence of other events that lead to the eventual accident. Eliminate any of those events, and the incident will not happen or the result will be less severe. Here is the summary of what happened.

A flight of three OH-58D(I) aircraft with a trailing SH-60 SAR aircraft departed at 0930 en route to land on an aircraft carrier located approximately 70 NM offshore.

At approximately 1008, while at 93 knots, 300 feet above water level approximately 58 NM from the departure point and 15 NM from the carrier, the crew in chalk three heard a loud report from the rear of the aircraft. This report was immediately followed by a very noticeable high frequency vibration, and a 10-15 degree right and left yaw of the aircraft nose. The PI, a maintenance officer and maintenance examiner joined the PC, the company safety officer, on the controls and began assessing aircraft controllability as well as

airworthiness.

The PC made an emergency call on UHF to the ship, which was received and acknowledged by both the tower and SAR aircraft. The PI attempted to contact the flight on the FM radio; this call was not received by either of the two remaining aircraft. The PC adjusted the airspeed in an attempt to regain control of the aircraft. Approximately 12-15 seconds later, the crew heard an even louder report from the rear of the aircraft followed immediately by a 90–120 right yaw, a nose pitch down, and a left roll. This placed the aircraft in a near out of control situation. The PC unsuccessfully attempted to fly into the turn in an attempt to regain control of the aircraft. He immediately decreased the throttle and lowered the collective, entering an autorotative flight profile. The crew regained control of the aircraft and began preparing for impact.

The PC passed the flight controls to the more experienced PI during the autorotation and immediately began PI duties. The PI decelerated at about 100 feet and allowed the tail of the aircraft to make contact with the water. As the tail contacted the water, the PI pulled the remaining collective and reduced the throttle to the idle position. The aircraft settled into the 69 degree Fahrenheit water with minimum forward momentum and settled upright without any collateral damage. The aircraft settled to the left rear, the main rotor blades contacted the water and the aircraft began to sink.

Both crewmembers exited through the right door into the water and waited to be extracted.

At 1013 the SAR aircraft began extraction of the crewmembers and recovered them to the aircraft carrier at 1035. The crewmembers were immediately rushed to awaiting emergency medical personnel who diagnosed them with mild hypothermia. The reason for loss of the aircraft remains under investigation.

## THE REST OF THE STORY

The crew's survival was a direct result of their training and solid risk management by the chain of command. A review of the 14 control measures planned revealed that, for this mission, 10 were fully implemented, one control measure was not implemented, and three control measures were partially implemented. The only injuries directly resulted from the partial implementation of one of these critical control measures.

■ All crewmembers would wear 'Constant Wear' anti-exposure suits. Partially implemented. The water temperature was above 60 degrees Fahrenheit. The crew of the accident aircraft felt they were within regulatory and command guidance not to wear the suits.

The other partially implemented controls were:

■ Increase the tasking to at least a platoon level mission. Desired a company level training event. **Partially Implemented.** The Battalion desired a minimum of 6 aircraft to deploy as a company task force augmented by AVUM and armament soldiers. 4 aircraft were approved for the mission due to storage requirements on board the aircraft carrier. Due to maintenance, one of the scheduled 4 aircraft did not deploy on this mission.

■ All crewmembers would qualify "deck landing" under day, night and NVG conditions. **Partially Implemented.** 4 of the 8 qualified day only.

■ The only identified control that was not implemented was:

■ Seek strategic airlift to gain more training time and train on deploy and re-deploy METL tasks. **Not Implemented.** U.S. Air Force aircraft were unavailable to execute the mission.

**The crew's survival was a direct result of their training and solid risk management by the chain of command.**

This is a success story of how staff integration in the risk management process pays off. From concept until the AAR, complete staff integration was key to the planning process. Decisions regarding controls were brought to the Commander. The Commander took the data and made educated decisions. He accepted the residual risk after applying good risk management. The bottom line—two crewmembers are alive today because of risk management, a process that really does work.

**—Lt.Col Scott Larese, Commander, 1st Battalion (ATK), 10th Aviation Fort Drum, NY 13602, DSN 341-3806 (315) 772-3806, scott.larese@drum.army.mil**

# So you've got an overwater mission?

*Here are some hints to get you started, from someone who has been down this watery road before.*

## 1. TRAIN, REHEARSE, TRAIN SOME MORE

Over water and shipboard training should not be conducted on a whim or for "adventure" type training. The unit should have this type of training identified in their unit METL and their unit individual and collective training programs should focus on this type of training. When tasked for missions of this type, the unit must assess their training and resources to ensure quality training can be conducted and the training is not rushed.

Develop unit-training criteria to determine who is over water qualified. What is the minimum NVG mission training time an individual needs before he or she is "qualified"? What weather minimums will the unit use for training and actual missions? What is the minimum mission essential equipment list required? What phraseology will you use? What are over water crew coordination measures that are different from normal missions? What altitude restrictions will you use to train and conduct operational missions? Develop any new crew endurance factors for over water flight.

Dunker and HEEDS classes are great training, but this is a sterile, classroom environment compared to an actual emergency. Most units with good over water training programs will actually train in open water. Get in all your ALSE gear and actually get extracted on a hoist or ladder. Doing it under rotor wash or in the surf is much different from the pool. Does your SOP cover how to do this? What signals will you use? Have you practiced it at night also?

Develop mission abort criteria and stick to it; i.e., mission critical malfunctioning equipment, loss of navigation equipment or vectoring capability, or loss of visible horizon in more than 2 quadrants, minimum fuel state, winds or sea state.

Know the effects of Electromagnetic Interference and expect it. Know what the ship emits and what frequency. Know how this can affect your aircraft and have a plan to report it. Every aircraft can be affected differently (even if it has been EMI tested).

Know how to conduct an air-to-air link up at a point in space over water. Learn to use the air-to-air TACAN mode if equipped. When using an Attitude Heading Reference system or Doppler, remember that accuracy of the system can be degraded after prolonged flight over water.

## 2. EMERGENCIES HAPPEN

Always brief a divert or emergency plan when conducting long flights over water. Know the distance and

bearing to this location at all times. Keep in mind if your objective is a ship, it may have moved due to unforeseen circumstances.

Discuss emergency procedures before training over water. Know the difference and consequences of landing as soon as possible and landing as soon as practical. This can mean the difference between successfully recovering the aircraft and ditching the aircraft for what might have been a minor problem. The fuel you conserve—see hint Number 3—can be vital.

Avoid flying single ship if possible. Your wingman may be your only hope of rescue or rescue coordination. Have a plan for backup SAR of self-extraction within your flight.

## 3. FUEL IS LIFE

Always know your exact time until splash. Know your exact fuel state in hours and minutes and keep any ship or controlling aircraft informed. Checking the fuel every 30 minutes is not enough. If a vectoring or controlling agency asks you to hold or "drop anchor." throttle back on the power to conserve fuel. Holding at 60 knots burns less fuel than holding at 100 knots. You're not going anywhere since they ask you to hold, so why burn a lot of gas? Any fuel you save can buy you time in an emergency; time to think about the emergency and develop a plan or time to get to another location.

## 4. OH SAY CAN YOU SEE?

Review vestibular and ocular illusions. You may encounter illusions you may not have seen in a while. Light and depth perception illusions are very likely over the ocean.

Have a plan for inadvertent IMC and multiship IMC breakup. What altitude will you use? Practice an Emergency Low Visibility Approach (ELVA) to a ship before you have to use it in an actual emergency.

Develop and rehearse a lost commo scenario. What do you do if you have lost commo and lost NAV?

Learn how to recognize small commercial or recreational boat radars on your radar-warning receiver.

## 5.THE NAVY IS DIFFERENT

Smaller ships such as FFGs and DDGs do not have tugs like larger flat top ships. Hangars and decks are often small and restricted movement areas. Set up an area in your hangar or on your ramp that replicates the dimensions and markings of the ship hangar. Practice spotting the aircraft within these dimensions and conduct blade folding, chalking, tie down, etc. Make everyone practice dressed in their float coats and cranials. Once you do it in the daytime, practice it at night also. Every member of the handling team or blade unfolding team must know their exact position and duties and who is directing them.

Learn the capabilities and limitations of Navy ships and aircraft. Know how far their radars and communications can reach, how low and how high? How are they affected by atmospheric conditions? What is their steaming speed in an emergency? What sort of surveillance and electronic capabilities do they have? How can this help you in an emergency or from a tactical aspect?

The Navy operates under strict IFF procedures and even ships use transponders. Review all the procedures and know how to use all your aircraft IFF equipment. Make sure it is operational.

## 6. WATER IS DIFFERENT FROM LAND

Learn how to acquire and read nautical charts. They can identify things such as general water depths, lights and buoys, oil drilling rigs, surface obstructions, etc.

Use caution when using FLIR and pilotage FLIR systems. The performance of these systems can be degraded over water and they can be affected by EMI.

## 7. ALSE

Know where everything is located in your survival vest and how to use it. Make sure all your important signaling devices are tied to your vest. If you carry a military angle head flashlight clipped to your vest, remember that it can easily be mistaken for your HEEDS bottle in a dark, underwater cockpit.

Remember that your helmet is connected to the ICS cord, NVG power supply, your HUD or PNVS HDU and these items may impede your ditching or underwater egress.

Use caution when wearing body armor. Lightweight, body conforming police type body armor may be a better option if you have a requirement for over water contingency missions.

Make sure your aircraft are equipped with water activated underwater pinging beacons if your unit has a continuing over water mission.

Immersion suits may or may not be required. AR 95-1 states that when water temperatures are below 60 degrees Fahrenheit, commanders must develop a program regarding wear of immersion suits. Experience suggests that water temperatures above 60 degrees Fahrenheit can still be dangerous and units must address them. Get your flight surgeon involved. Also, you must understand that there are several different types of suits available and proper fitting is paramount in their effectiveness.

## 8. MAINTENANCE

Pay close attention to maintenance procedures in the ship hangar, especially power on electrical checks. Develop standard procedures for disconnecting batteries, pulling igniter circuit breakers, etc. Aircraft engines can, and have been, accidentally started with blades folded in ships hangars. When conducting post flight engine flushes and run ups, always insure blade-folding locks are secure before engaging engines and rotors.

## CONCLUSION

This is just a laundry list to get you thinking about things connected with taking on an over water mission. Be sure to get your command involved at the highest levels possible, to ensure you get the support needed to successfully conduct over water missions.

This is not an all inclusive list. Units tasked with over water missions should conduct a complete risk assessment and develop appropriate control measures before embarking on any over water training program.

**—Major Mike Cumbie, Chief, Scout/Attack Branch, USASC, DSN 558-3754. (334) 255-3784 umbier@safetycenter.army.mil**

# AN/PRC-112 Survival Radio upgrade process

The AN/PRC-112 Survival Radio has three identified issues which may contribute to a degradation of the radio's operational readiness for the soldier in the field.

**1.** The large VOL/OFF knob can accidentally be turned on when the radio is handled. If turned on, it will lead to a dead battery.

**2.** Water has been reported to leak into the radio's case, rendering the radio inoperable.

**3.** Chance frequency hopping due to the design of the radio's transponder may yield less reliable communications.

There is an upgrade program for the AN/PRC-112 currently underway which addresses each of these issues:

**1.** The current VOL/OFF knob is replaced with a smaller knob that is more difficult to accidentally turn on.

**2.** A new, better gasket that stops the water intrusion is installed.

**3.** A more efficient transponder is installed that corrects chance frequency hopping.

Upgrades are already in progress. It is important to identify if your radio has been upgraded or not. If radio's NSN is 5820-01-458-6018, then radio has been upgraded. If radio's NSN is 5820-01-279-5450 *and* a Tobyhanna Army Depot (TYAD) sticker has been added, then the radio has been upgraded. If the NSN is 5820-01-279-5450 and there is *no* TYAD sticker, then the radio needs to be upgraded. Contact CECOM at DSN 992-1191 or (732) 532-1191 or e-mail them at: **bruce.jetter@mail1.monmouth.army.mil** for instructions on how to begin the process.

**—David Venezia, Safety Engineer, CECOM, DSN 992-0084 X 6439 (732) 532-0084 x 6439, david.venezia@mail.monmouth.army.mil**

# ALSE over water issues

**From time to time, *Flightfax* hears from the field. A lot of what we are hearing lately has to do with ALSE, and specifically, the lack of Aviation Life Support Equipment (ALSE) needed to safely support mission performance, specifically over water missions.**

**Some of the questions raised include:**

***Where are we going to get all the necessary equipment and tools?***

***Who is going to inspect that equipment?***

***Who is going to maintain that equipment?***

**We went to the source—the Project Manager's office for Aircrew Integrated Systems, for some answers. Here is the response.**

# Response from the PM

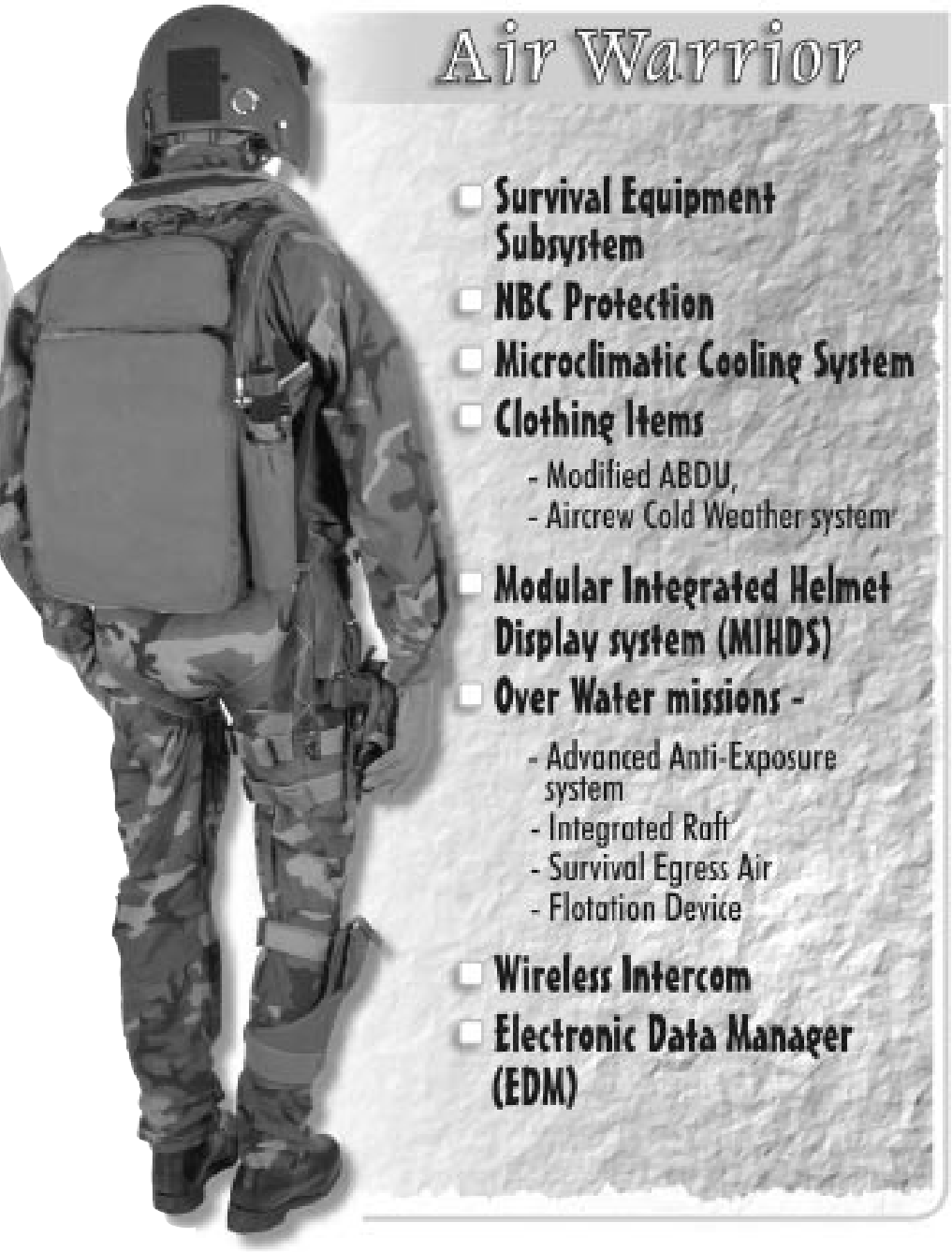
The Product Manager's Office, Aircrew Integrated System (ACIS), does not dispute the fact that Aviation Life Support Equipment (ALSE) is not where it should be for today's aviation warfighter. However, while the ALSE System may appear on the surface to have significant problems we feel that the team approach already underway will make ALSE better. We in PM ACIS work hard with the ALSE user in the field, the other Army and DOD developers of ALSE equipment and the Director of Combat Developments (DCD) at Fort Rucker, AL, to ensure the best ALSE support is provided for the resources allocated.

To answer the mail, PM ACIS is developing the Air Warrior ensemble that provides for the long-term solution to many ALSE problems. This ensemble will provide the aircrew and aviation commanders a highly flexible, modular and state-of-the-art system that will provide each aviation warfighter the ability to perform over water, high altitude, climatic (hot & cold), and night missions in a clean or a Nuclear, Chemical and Biologically (NBC) contaminated environments where the threat levels are changing rapidly.

Over-water missions seem to be particularly troublesome at this time, but they won't be very soon. The Air Warrior system will provide each aircrew member with a low-profile (read: one that won't knock your HDU off) floatation collar; a removable, improved and much thinner raft that can integrate with all Army rotary-wing aircraft seats; and an air breathing device equipped with a hose for ease of use and comfort. These pieces can support either unit training or combat missions in an over water scenario.

In the interim, PM Soldier is in the process of fielding a replacement for HEEDS (Sea Mark II) and that system will be integrated with the AW ensemble. The command will have on-hand (or at the depot) all the items necessary to rapidly support the mission in the field, no matter where the unit is or what type of missions the unit is originally designated to have. Air Warrior will provide unprecedented flexibility to every unit. The Air Warrior program is in the testing phase of Engineering and Manufacturing Development (EMD) stage of the acquisition life-cycle model, with production to begin in 2003. This effort by no means is the silver bullet fix for ALSE, but the fielding of Air Warrior will be conducted from and is funded for the total package fielding (TPF) approach. This

approach will ensure Air Warrior comes with training, manuals, and a support package and that the technician at the battalion level can maintain this equipment.
The training approach ensures that the TRADOC schools will be updated before the equipment is fielded and that the ALSE technicians already in the field will receive an exportable training package that contains Computer Based Training for sustainment of the legacy ALSE equipment as well as Air Warrior. We currently have a contract with a local vendor who is developing this Computer Based Training for legacy ALSE equipment right now and will soon begin work on the Air Warrior equipment.




The Air Warrior manual will be a compilation of new and legacy systems so the ALSE technicians will have a one-stop manual for ALSE used by Army aircrews, regardless of the original service or manufacturer.
Finally, an extensive MOS skill and inspection criteria scrub has already been undertaken to ensure that the unit ALSE technician's workload will not be increased by the Air Warrior equipment. No additional tasks will be required of the ALSE technicians because this system will be integrated and standard inspection criteria will be established. This is an issue we know is dear to all the hearts of *Flightfax* readers.
With the large increase in capability (especially in NBC environments) that the Air Warrior system provides, there is some increase in maintenance, but not at battalion level. The largest maintenance burden stems from the Microclimate Cooling Unit (MCU) that will be maintained by trained 52Cs at AVIM or division level.
In conclusion regardless of how the state of ALSE equipment appears in some units, we can tell you this office, PM ACIS, and other Army and sister-service material developers, are working hard and have had success ensuring ALSE is improved for the user now through initiatives like the Soldier Enhancement Program and the ALSE IPT, and will be improved in the near future through the Air Warrior program.

**—John Jolly, PM-ACIS, Redstone Arsenal, AL 35898,DSN 897-4262, (256) 313-4262 John.Jolly@peoavn.redstone.army.mil**

# Accident Scene Preservation

**"CW2 Smith, the XO just called and said for you to start recovering aircraft 12345 that had the bird strike and landed in the field just off the reservation. The old man will be appointing an investigation board tomorrow to take a look at the aircraft once you get it back to the hangar."**

What is wrong with the above fictitious scenario? Odds are that right now, somewhere in the Army a unit is facing a similar event, such as a bird strike, tree strike, or minor mechanical failure that would require an accident investigation board to be convened.

If you don't know what is wrong with the battalion XO or Commander directing the recovery of an aircraft (or for that matter an Army vehicle) then read AR 385-40: *Accident Reporting and Records* . Physical evidence at the accident site—such as ground markings, damage, position of the aircraft, and equipment settings — can provide vital clues to determining the cause of the accident. A board investigates all Class A and B accidents and Class C aircraft accidents. Generally speaking, only the appointed Board president can release an aircraft/vehicle for recovery from an accident scene. This includes performing minor maintenance actions on the aircraft or vehicle without the express permission of the Board president.

Most Army accidents (both aviation and ground) are Class C-F and will be investigated by a local Installation Accident Investigation (IAI) board or individual designated by the commander. The Army Safety Center will be involved with Class A and selected Class B accidents under what is called a Centralized Accident Investigation (CAI) and will provide the President of the Board and the Board Recorder. Whether the investigation will be conducted locally or by the Army Safety Center, units must comply with the accident scene preservation procedures listed in AR 385-40 and DA PAM 385-40 (paragraph 2-2). As soon as the safety of any victims or personnel involved is ensured, the accident site should be secured by roping off the area and placing guards around the scene. This safeguards the site from bystanders and the curious. This includes military and civilian personnel who have no business at the scene.

Photographs of the scene, either still or video, will help the board in cases where the scene must be cleared before the board arrives. A sketch or diagram is also helpful. Every effort should be made to portray things as graphically and accurately as possible.

AR 385-40 paragraph 4-5(a) states: " *When the situation permits preservation of the accident scene, only those actions necessary for rescue or recovery of victims and the initial on-site investigation by MP/CID will be allowed. Whenever possible, photographs of the location of victims should be made before the victims are moved.*

*Access will be restricted to those commanders and personnel directly involved in investigating the accident. Before the arrival of the accident investigation board at the accident site, MP/CID personnel should remove only those items of evidence which would be destroyed by time or*

*the elements…"* Paragraph 4-5(b) lists specific actions to be taken if the situation does not permit preservation of the accident scene. The crux of this paragraph is to thoroughly document the scene and all actions taken in the recovery of victims so as to facilitate the accident Board's investigation.

Some examples of situations that may not permit preservation of an accident scene include an aircraft landing on a busy roadway or vehicle blocking a roadway. Another example would be an aircraft or vehicle resting in a dry creek bed with thunderstorms and, /or flash flooding imminent.

There are also bad examples of situations that should have permitted accident scene preservation, but a unit chose not to preserve it. For instance: "There was a long weekend coming up and we didn't want to inconvenience the unit with pulling guard duty in the field," or "There was a thunderstorm (snowstorm) forecast and we didn't want to leave the aircraft (vehicle) out in the weather" or "We didn't know that the Safety Center was coming to do the accident investigation."

Regardless of who conducts the investigation, unit safety officers and the chain of command must know how to preserve the accident scene and provide general guidance to local authorities. Installation regulations, local SOPs and pre-accident plans should provide the specific details needed to accomplish the reporting of accidents as well as actions needed to secure the accident scene. Access to the accident scene must be restricted to those commanders and personnel directly involved in investigating the accident to minimize contaminating the wreckage for analysis.

Speaking of pre-accident plans, does your unit's plan cover chain of custody issues? Would the crew involved in the fictitious bird strike example be required to submit to biochemical testing at a local medical treatment facility? How would you transport them?

IAW AR 385-40, crewmembers/personnel will undergo biochemical testing for Class A-C aviation accidents and whenever deemed appropriate by the commander in all other accidents.

Remember to coordinate with your installation safety office and other local agencies to ensure your pre-accident plan reflects the requirements guidelines of AR 385-40 and DA Pam 385-40 and local policies, regulations and guidelines. Securing the accident scene begins with timely and accurate accident reporting and concludes with the accident Board releasing the accident aircraft/vehicle back to the unit and concluding the investigation. Make sure you do it right… the first time.

**—Major David Schoolcraft, Chief, Fixed Wing/ Cargo Branch, USASC. DSN 558-9858. (334) 255-9858 Schoolcd@safetycenter.army.mil**

# Aviation Safety Officer Course

## Training for Life

The United States 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 Refresher 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 nation wide. The AAPS consists of one week 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 NAS 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. This requires three successful egresses from a submerged airframe mock-up (9D5 device). The third egress is accomplished while wearing blacked out goggles. The 9D5 device first simulates a rapid descent, much like a ditching maneuver in an aircraft. Once contact with the water is made, the device begins to submerge and then rolls either left or right. Only when full submersion is accomplished and the device comes to a complete rest are participants allowed to conduct egress procedures. Most students describe the training as an "eye opening" experience. This description is meaningful in a number of ways.

Sometimes, ASO candidates question the need for Dunker training when they initially sign up for the course. At that point in time they do not understand the relationship between risk management and tempting the hand of fate by seeing how long they can hold their breath. Ironically, end of course critiques always stress the need to keep Dunker qualification as an integral part of safety officer training. A recent accident discussed in this issue firmly establishes the logic behind that perspective.

The successful outcome of this event can be directly attributed to risk management and training, and in fact one of the members of that crew was first Dunker qualified in the ASO course.

This is a success story not only for the unit and crew members, but also for the concept of risk management. The process works when implemented correctly.

So, back to the question of why we conduct Dunker training in the ASO Course. The experience of Dunker training is not only for the benefit of the individual. The insight provided by this training into the hazards associated with over-water operations cannot be duplicated. The ASO leaves the Army Safety Center better prepared for their own survival and better capable of providing solid risk management advice to their commanders. The ASO Course is a proactive approach to safety.

**—CW4 Don Wright, US Army Safety center,**
**DSN 558-2376, (334) 255-2376 wrightd@safetycenter.army.mil**

## Unresolved issues

After an accident occurs in which materiel factors are suspected, many questions are typically left unanswered. One of the ways questions are answered is by sending components suspected of materiel failure for teardown analysis.

When submitting category 1 Product Quality Deficiency Reports (PQDR) for equipment or components suspected of defects that are believed to have contributed to an accident, be sure to enter code 8 in Block 22 of the PDQR, and in addition, state that the equipment is an ACCIDENT EXHIBIT. That alerts those providing equipment disposition instructions that a teardown analysis is required. This ensures that appropriate equipment disposition instructions are provided for teardown analysis of the equipment to determine the source of failure. Let's do our part to see that the materiel failure causes are identified and corrective actions initiated to prevent future accidents.

—Ray Kennamore, US Army Safety Center, DSN 558-3493 (334) 255-3493, kennamor@safetycenter.army.mil

# Risk Management Integration: Key to Sustained Accident Prevention Success

The Army achieved steady gains in safety from the late 1980s through the mid-1990s by implementing the five-step risk-management process as its principal risk-reduction tool. From 1996 through mid-year 2001, there have been several short-term up and down trends, but basically accident rates in most categories have leveled out. To achieve and sustain additional gains in safety, we must close the gap that still exists in the full integration of risk management into Army culture.

The Army's current safety performance news is both good and bad. Total Class A accidents are about 12 percent below the three-year average, but fatalities are up about 9 percent. On a very positive note, privately owned vehicle (POV) accidents—notoriously the number one killer of soldiers—are 28 percent below the three-year average, with fatalities also dropping 26 percent (57 in FY 00 to 42 at mid-year FY 01). However, total Army fatalities have increased from 79 at mid-year FY 00 to 87 in FY 01. Aviation was a huge safety success story last fiscal year (in fact, our best year ever), but we have had eight Class A aviation flight accidents already compared to four for the same time period last year, which is almost 15 percent above the three-year average. The real tragedy is that these 8 accidents resulted in 11 Army fatalities and 18 Air Force fatalities, compared to 2 Army fatalities for the previous year. Personal injury accidents (for example, gunshot wounds, carbon monoxide poisonings, and drownings) have also increased and resulted in 19 fatalities, compared to 12 in FY 00.

Analysis of both aviation and ground data shows that accidents are occurring because of indiscipline. This is demonstrated in three major areas—a lack of leader involvement and therefore, the ability to effectively manage risks, failure to maintain rigorous training standards, and failure to maintain and enforce discipline. All three areas are well within our ability as an Army and as individuals to affect.

Armywide initiatives to further embed risk management into all missions include the following:

■ Identifying opportunities to integrate risk management into the Army through Army Transformation and aligning

the Army Safety Strategic Plan with the Transformation Campaign Plan.

■ Continuing aggressive efforts to institutionalize risk management into all aspects of doctrine, training, leader development, materiel development, organizations, and soldier systems.

■ Partnering with industry organizations recognized for their world-class safety programs.

■ Ensuring that soldiers from initial entry through division commanders receive initial and sustainment risk management training.

■ Initiating a Department of the Army Inspector General (DAIG) review of risk management integration in units across the Army.

Safety Center initiatives to help leaders become more proficient in making risk decisions include the following:

■ Enhancing the Safety Center's Web-based Risk Management Information System to provide commanders with near real-time access to hazards, risks, and controls information and as a medium for sharing lessons learned.

■ Increasing the number of Safety Center NCO professional development mobile training teams to teach risk management to NCOs and junior officers. To date, some 1,900 Active, Reserve, and National Guard soldiers have received risk-management training through this program.

■ Fielding assistance visit teams from the Safety Center to help commanders assess their safety programs and help them see where they need to focus resources to best control unit hazards.

■ Enhancing cradle-to-grave system safety initiatives in our weapon systems.

■ Supporting the DAIG in reviewing risk management integration in units across the Army.

■ Assisting the Army Aviation Center in integrating risk management into simulation-based aviation training exercises, Army Training and Evaluation Program mission training plans, and the captain's career course.

Individual initiatives that each of us can undertake to ensure that risks are managed effectively in our units and organizations include the following:

■ Emphasizing to soldiers the importance of executing each mission to the risk management standard--an informed decision at the appropriate level.

■ Providing constant reminders to soldiers that a risk assessment is not an end state; it is only the first two steps of risk management. Controls must be developed and put in place, and hazards must be identified and assessed and reassessed as missions and conditions change.

■ Making sure that you and your key personnel are at the right places at the right times to make risk decisions.

■ Mentoring junior leaders, teaching them what right looks like, and helping them gain the experience and wisdom to effectively manage risks.

■ Demanding that training be executed to standards; no compromises, no shortcuts accepted.

■ Enforcing discipline and setting the example.

■ Ensuring personnel in your unit are risk-management trained and practice sound risk management techniques.

All of the above risk management integration initiatives, and others that are ongoing but not listed here, are crucial to improving safety performance. But ultimately, safety is a commander's program and leadership involvement is paramount. Pushing accident rates down and, more importantly, sustaining a long-term downward trend requires aggressive actions to firmly embed risk management into all Army operations as well as developing a risk-based investment strategy.

Changing the culture of an organization may be an evolutionary process, but we can completely integrate risk management into ours if we persistently execute one mission at a time--every mission, every level--to the risk management standard. Success in making risk management a part of the Army's culture will enhance combat readiness by ensuring that soldiers are not injured or killed in preventable accidents.

**—Ms. Jane D. Wise, Public Affairs Officer**
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# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH64

Class C

### A series

■ During traffic pattern work, No.2 engine failed and No.1 engine and main rotor system experienced a momentary droop. Aircraft entered autorotation for landing. When No.1 engine took up the load, the main rotor system experienced overspeed. Aircraft was then landed without further incident. Damage to one main rotor blade confirmed. Possible damage to drive train.

### Class E

### A series

■ Pilot's Night Vision System failed during day system training flight. Aircraft landed and shut down without further incident. Replaced PNVS.

■ While on short final, oil bypass utility hydraulic caution/warning light illuminated, followed by oil low utility hydraulic light. Aircraft was shut down without further incident. Replaced switch.

■ During run-up, just prior to taxi, HARS system started fluctuating, heading (HSI) plus or minus 60 degrees, altitude/horizon line plus or minus 30 degrees. This resulted in DASE uncommanded inputs and eventually DASE channels disengaging. Aircraft was shut down without further incident. Replaced HARS.

### D series

■ During runup checks, utility hydraulics PSI indicated 6,000 PSI. Exceedance file indicated Utility Hyd 3,300 PSI and Utility Hyd 3,400 PSI. Aircraft was shutdown without further incident. Replaced manifold pressure transducer.

## C12

### Class A

### Series K

■ While on final approach for landing during an instrument training mission, aircraft departed from the approach flight path in a left turn with a rapid rate of descent and was lost from approach radar. Aircraft was found crashed in a remote area. Two fatalities. Aircraft destroyed.

### Class E

### T series

■ During takeoff, the No. 2 engine ITT indicated 800 degrees Celsius. Torque dropped to 1950 FT PDS. Aircraft returned to home station for landing without further incident. Maintenance determined that pre-formed packing (o-ring) in groove base of housing flange on low pressure bleed valve failed and caused blockage of valve. Maintenance personnel replaced pre-formed packing.

## C23

### Class A

■ While flying in the vicinity of severe thunderstorms, aircraft control was lost and aircraft broke up in flight. Aircraft destroyed. Twenty-one fatalities.

### Class E

### B series

■ No. 2 right engine N1 dropped to 89 percent on rotation. Torque dropped to 100 lbs. No other indications. Aircraft yawed to right. Fluid was seen streaming from No.2 engine nacelle. Engine shut down and aircraft landed normally on single engine.

## CH47

### Class D

### D series

■ The pilot started to make turn to downwind leg of the traffic pattern when the aircraft flew through a flock of birds. A bird struck and broke the center windscreen. The aircraft was returned to the airfield and shutdown. No further aircraft damage was noted during postflight. Center windscreen replaced.

### Class E

### D series

■ During aircraft run-up, a hydraulic leak was noted in the vicinity of the ramp area. Aircraft was shut down and explored further for cause of the leak. Maintenance replaced hydraulic line. Maintenance checked and found OK.

## OH58

### Class C

### D-R

■ After entering brownout conditions, aircraft made a hard landing. Main rotor blades flexed down and made contact with the FM homing antenna. All four main rotor blades and FM homing antenna were damaged.

### D(I)

■ During landing, mast torque went to 128 percent for 4 seconds duration.

### D-R

### Class E

■ While conducting hover checks, the crew noticed binding in the cyclic aft quadrant. The aircraft was landed and checked for obstructions around the cyclic controls. No obstructions were found. When a second flight control check was performed, the binding was still present. Maintenance inspection revealed three pitch change links improperly installed.

■ During NVG training flight, aircraft experienced an Engine Chips Freewheel Caution warning light. Attempts to clear the chip detector were unsuccessful. The PC declared a precautionary landing, and the aircraft was landed in a field without further incident. Post flight revealed that the chip detector had fallen on the engine deck and grounded itself.

## UH1

### Class C

### H series

■ The No.1 FM antenna separated in flight and struck the tail rotor assembly. Aircraft was landed without further incident. Post flight inspection revealed damage to the tail rotor assembly, 42 and 90 degree G/boxes and No.1 FM antenna.

## UH60

### Class B

**A series**

■ Chalk 3 of 3 encountered a white-out condition while entering landing zone and struck a tree with all four main rotor blades. All four blades require replacement.

### Class C

**A series**

■ Following training check ride, flight inspection revealed damage to the intermediate gearbox cover associated with main rotor blade contact. Replacement of all four main rotor (blade) spindles required as a contingency due to lack of evidence of damage to any one of the 4 blades to corroborate contact. Suspect damage occurred during abrupt (possible hard) landing iteration.

■ While performing an MOC to assume stand by duty, the crew performed a HIT check on the #1 engine, the crew heard a low aerodynamic hum, followed by a shudder in the aircraft, a loud pop, and the aircraft lurched. The PC preformed an emergency engine shut down. The #1 engine Np reached 130 percent (for 1 to 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.

### Class E

**A series**

■ During cruise flight, crew noticed the smell of burning electrical components. SAS2 and RGYR capsule lights illuminated on AFCS panel. The system was reset and all visible connections/cables checked with no visible sign of electrical failure or fire. After reset, the smell of burning and the failure lights returned. The aircraft was landed with no further incident. Maintenance replaced the digital computer.

■ After departure, crew detected fumes in the cockpit and cabin. PIC aborted the mission, returned to home base and shutdown the aircraft. Maintenance discovered a hole burnt in the power circuit card of the comparator signal data converter (SDC) underneath the pilot's seat. Maintenance personnel concluded that water got into the comparator SDC while the aircraft was being washed, causing the electrical connections to short. Maintenance replaced the comparator, performed a MOC and released the aircraft for flight.

## MH6

### Class A

**J series**

■ While at an out-of-ground hover, the main rotor system came in contact with an obstacle. The aircraft crashed and was destroyed. The pilot received serious back injuries, and the IP and the passenger received minor injuries.

**Shipboard Ops: AFCS On or Off?** In reference to the March 2001 issue article, **"Shipboard Landings are a Wild Ride"**, we apologize for any miscommunication on our part in reference to the sentence "Turn off AFCS". When conducting shipboard operations please consult the appropriate operators manual, TM's, FM's, NATOPS, etc, for the correct operation of the AFCS when operating on and off ships. Ships do pitch and roll, we recommend caution. **—Commander Bret Gary, USN, JSHIP Navy Deputy Director, DSN 342-4936**

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## POV Fatalities

through 30 April

| FY01 | FY00 |
|---|---|
| 47 | 56 |


U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

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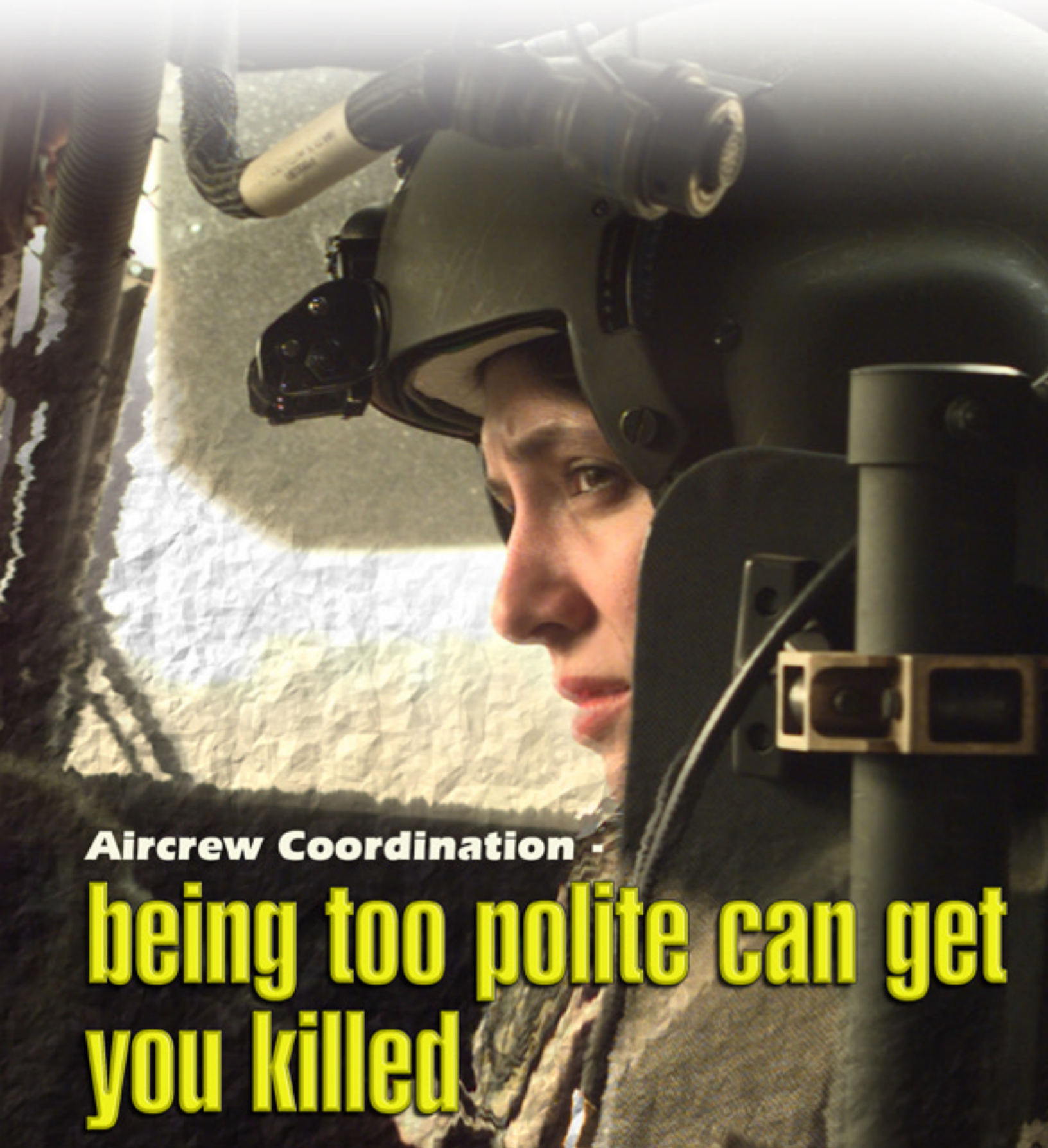


## Aircrew Coordination - being too polite can get you killed

# Crew Coordination: Just Do it

Aircrew Coordination: we all talk about it; it's part of what we do every time we fly. It's as basic as a three way positive transfer of controls in the traffic pattern or as complicated as clearing the aircraft into a confined area, under goggles with zero moon illumination, or dealing with inadvertent IMC. 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. Unfortunately, these lapses often occur during relatively routine situations.

## NOT A TIME TO BE EXCESSIVELY POLITE

One of the shortcomings in crew coordination that often shows up in investigations is commonly referred to as "excessive professional courtesy." This can be simply defined as an aircrew member, in most cases an inexperienced one, not communicating when he/she perceives a hazard because the other pilot "must know what he's doing". This reluctance to say anything to the more experienced aviator may be caused by a lack of personal confidence, overconfidence in the other aviator's ability, uncertainty that there truly is a hazard, or even fear that there may be reprisals from the more experienced aviator.

Two examples from recent accident investigations demonstrate this crew coordination breakdown. Fortunately in both cases, all the crewmembers were available for interview by the accident board. In the first case, a UH-60 was conducting training under night vision goggles in an extremely dusty environment. The PI, who had been flying for most of the period, was a 600-hour aviator. The IP had over 8,000 hours of flight time and was highly respected for his abilities. On the takeoff that resulted in the accident, the IP was on the controls. As the aircraft took off into the dust cloud the PI and both crew chiefs sensed that the aircraft was in a left turn. None of them said anything over the intercom. They all became concerned when they didn't break out of the dust and then the aircraft contacted the ground, rolled over, and was destroyed. The board found that the aircraft had indeed been in a left turn from immediately after takeoff. This left turn had changed a stiff right crosswind into a tailwind. Once the aircraft was in the tailwind condition, it couldn't clear the dust cloud because the power application was not sufficient to establish a climb.

In the second case a helicopter was hovering close to an obstacle on a nearly perfect day. The crew had conducted the maneuver numerous times before and was confident in their ability to do it again. The more experienced IP was on the controls and closest to the obstacles. The PI was seated in the aircraft away from the obstacle, but thought the aircraft was lower and closer to the obstacle than in previous iterations. He didn't say anything to the IP because he was sure the IP would maintain sufficient clearance. As the aircraft hovered and unloaded troops, the rotor system contacted the obstacle. The aircraft began to vibrate severely and was eventually destroyed in the accident.

In both of these cases, crewmembers knew that the operation was not going precisely as planned. They either sensed or saw that the pilot on the controls was doing something that was not expected. In both cases the deviation from the plan was small and not expected to cause any problems. AND IN BOTH CASES A QUICK COMMENT OVER THE INTERCOM COULD HAVE PREVENTED THE ACCIDENT!!!!!!!!

So as a crewmember, what do you do? First and foremost, everyone in the crew must understand his or her responsibilities as far as crew coordination is concerned. Experienced aviators must ensure their fellow crewmembers understand the responsibility to speak up if they think that something's not quite right. The experienced members of the crew need to mentor less experienced members in the knowledge that while we all make individual mistakes on occasion, and only as an integrated, working crew can missions best be accomplished safely.

Lastly, for the "new guys", know your responsibilities. Every aircraft's aircrew training manual has standards for crew coordination. Know them and meet them. Talk to the Instructor Pilots, Unit Trainers, and Pilots in Command that you fly with. You will find that if you are familiar with the standards and demonstrate that you want to do things the right way, they will not only welcome it, but you may be able to mentor the old guys a little.

**—LTC W.R. McInnis, Director of Operations, USASC, DSN 558-2461 (334) 255-2461, mcinnis@safetycenter.army.mil**

# ACT Revisited

**The current Army Aircrew Coordination Training (ACT) program does not adequately support the dramatic changes in Army aviation mission complexity, operations tempo, declining experience levels, and modernized systems**.

This is the initial finding of the group tasked with enhancing the Army's Aircrew Coordination Training program. The purpose of this effort is to improve the crew and team coordination effectiveness of Army aircrews and aviation leaders. This program can provide a tool for leaders at all levels.

The enhanced ACT program will build on the original exportable training package, revitalizing it from a one-time training event and enhancing it to a dynamic, relevant program that is continuously updated and improved.

The plan provides a proactive, multi-phased course of continuous improvement to maximize Army aviation modernization investments and complement leadership training initiatives. The current ACT Enhancement program, with its focus on upgrading and sustaining ACT, constitutes Phase One.

### Phase One: Upgrade and Sustain the Current ACT Program

Major actions in this phase include:

■ Establish an interim Aircrew Coordination Working Group (ACWG) to guide the ACTE applied research effort.

■ Review current programs.

■ Include information and discussion on ACT policy and program enhancement initiatives in aviation leader conferences.

■ Recommend adding ACT as a permanent item of interest for Senior Readiness Oversight Council.

■ Develop a behaviorally-anchored ACT performance evaluation system.

■ Develop core-training modules.

■ Pre-test courses of instruction.

■ Demonstrate and validate courseware.

■ Field test and refine courseware with both active and reserve units.

■ Develop an evaluation-based feedback system to evaluate, manage, and maintain overall program effectiveness.

### Phase Two: Refresh and Maintain the Upgraded Sustainment Program

Phase Two completes the applied research effort and will further advance the upgraded program by establishing a permanent ACT working group consisting of Interim ACWG plus Major Command, Army National Guard, and Army Reserve representatives, designating an ACT program manager and instructional model manager, and developing a separate ACT policy or preparing an ACT specific supplement to TC 1-200. Additional Phase Two major actions will include:

■ Tailor training scenarios for specific aircraft and missions.

■ Integrate ACT into Readiness Level training, APART evaluations, and Flight School XXI.

■ Provide an accident investigation tool and training materials for accident investigations and field use.

■ Include ACT in distance learning developments.

■ Develop a web site for ACT related data and anonymous reporting.

### Phase Three: Develop and Deploy Advanced Applications

Phase Three incorporates the prototype training products into normal flying operations and deploys advanced ACT applications. This final phase will include the development of training packages for non-rated crewmembers and implementation of the accident investigation tool. Additional Phase Three tasks will include:

■ Develop advanced ACT scenarios for AVCATT or reconfigurable simulator, e.g., multiple aircraft team operations and UAV interactions.

■ Develop a web-based repository for ACT training resources, applications examples, and lessons learned.

■ Establish an ACT Operations and Maintenance recurring funding plan.

■ Establish a formal team training and evaluation research and development program.

### A Forum for Input

The Army's ACT program effectiveness has greatly declined since 1995. It needs revitalizing.

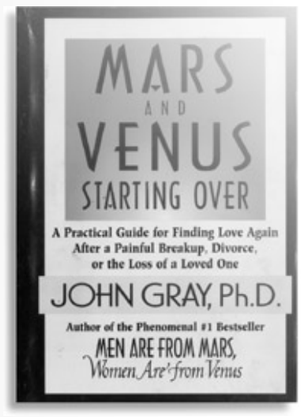
We now have the opportunity to: 1) integrate ACT into all aspects of aviation operations, 2) reinforce ACT in the Flight School XXI initiatives to include aviation leadership training and junior officer professional development, 3) incorporate ACT into all aspects of mission training, 4) recognize ACT as a key component in Army aviation's risk management and decision making process and controls, and 5) capitalize on advances in distance learning and web-based instructional technologies. The Army Research Institute and USAAVNC believe that the current revitalization plan will accomplish these goals, but they would like input from you to keep them on course. You can provide your feedback by visiting the ACT Enhancement website at http://teams.drc.com and clicking on Flightfax Feedback. Expect to see periodic progress reports and feedback articles in future issues of Flightfax.

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

**Eight elements of crew coordination**

1. Communicate positively—sender directs and receiver acknowledges
2. Direct assistance
3. Offer assistance
4. Announce actions
5. Acknowledge actions—repeat critical parts
6. Be explicit
7. Provide aircraft control and obstacle advisory
8. Coordinate action sequence and timing – Request tail clear, receive clear acknowledgement and turn tail

# Researching Mars and Venus Communicating in the Cockpit




Research in the social sciences has found that men and women communicate differently and for different reasons, a concept popularized by John Gray's "Men Are From Mars, Women Are From Venus." Much of the communication in aviation is procedural and well structured, but unclear or ineffective communication remains a frequent contributor to mishaps. Because females presently comprise about 7 percent of all Army aviators, we are investigating whether gender-related differences might impact crew coordination. Please consider completing a short survey that can be found at the following web address: **http://act.drc.com/** *Flightfax*. Information provided will be used by the U.S. Army Research Institute to assist in the current development of an enhanced aircrew coordination training program. Thank you for your assistance.

# A simple failure to communicate

During an aerial gunnery exercise at a multipurpose range complex in Korea, the pilot was having trouble finding the targets. For three attempts his difficulties continued. On the fourth attempt, the pilot informed the instructor pilot that he had it, meaning that he had the targets in sight. On looking back on the incident with 20-20 hindsight, it is possible that those words may have had more than one interpretation.

All went well for the first couple of seconds. Then the aircraft started drifting to the right, nose pointing down. The pilot, who had many years of flying experience, became aware of the possibility that the instructor pilot was no longer flying the aircraft. He must have assumed the pilot was flying. The pilot recovered the aircraft and continued flying downrange.

The above scenario actually happened. The outcome could have been disastrous, but for the experience of the pilot who was not intimidated by the instructor pilot. A positive hand-off of the controls is needed, whatever the level of the pilots' experience.

A less-experienced pilot, intimidated by the instructor pilot, may not have realized that the aircraft was not being flown. The instructor pilot, thinking that the pilot was on the controls, may not have realized that there was no one actually on the controls until it was too late to make a successful recovery. The result could have been the loss of an aircraft, and possibly injury or death to the crew.

All through flight school, advanced training, and in units, positive hand off of the flight controls is stressed. Yet even when experienced pilots are flying together, it can be assumed that the "other one" has the controls. This is a good lesson on why positive hand off of the controls is stressed, and why it should always be followed.

**—Michael T. Minson, 22 ASG Safety Office, Camp Daray, Italy. DSN 634-7045, michael.minson@setaf.army.mil**

## Coming Next Month in Flightfax

Next month's issue of *Flightfax* is a quantum leap forward in our history. Since 1972, we've been the official safety publication for Army aviation, bringing you stories and facts to help keep aviators out of harm's way.

Every month, we land in mailboxes and day rooms at Army installations around the globe. Over 15,000 copies are distributed and read by soldiers in the field (we've even heard tales that we are standard reading material in latrines). We hear from readers who access our publication on the safety center website at http://safety.army.mil, as well as those who read the traditional paper version.

We hope that you've found *Flightfax* to be a helpful and readable tool for the past 28-plus years. Now we come to the end of our black and white era. In August 2001, we'll be coming to you in vivid full-color. We hope this makes *Flightfax* livelier, more readable, and more interesting for you. But the bottom line, as always, is to send you the lessons learned about the principles of risk management, and to keep Army aviation's soldiers alive.



### Safety Alert Notification

# UH-60 Main Rotor Blade Expandable Pin

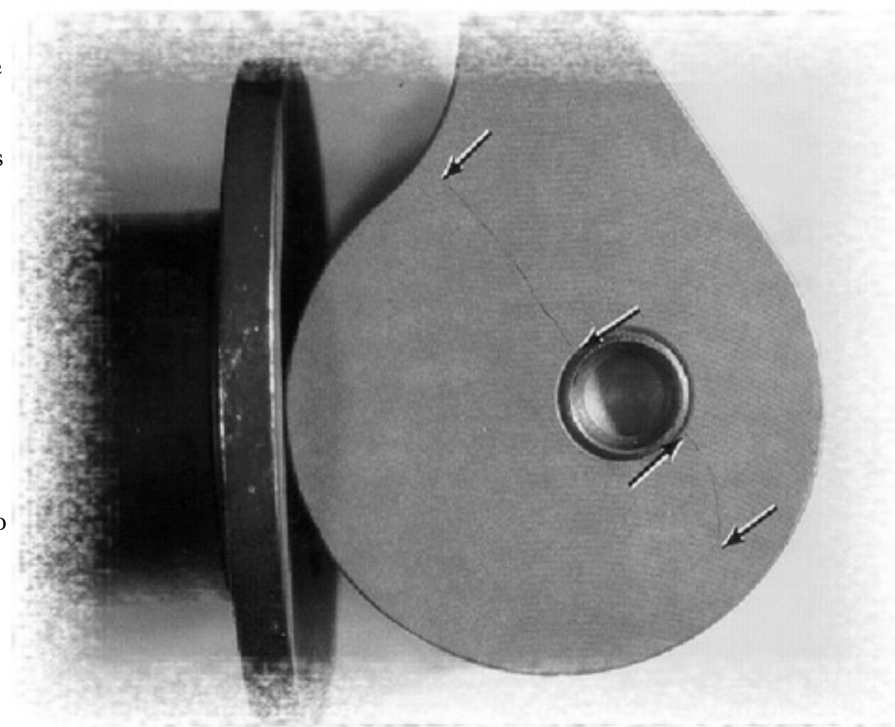
A Category One Quality Deficiency Report has identified a serious problem with UH-60 main rotor blade expandable pins manufactured by APEX with serial numbers 0001-3800. This problem led the leadership of the Army to issue Safety of Flight (SOF) Message UH-60-01-09 that requires removal of all pins produced by APEX Corporation with the aforementioned serial numbers and a one-time inspection of all other main rotor blade expandable pins.

**Summary of the Problem:** A main rotor blade expandable pin was discovered with a crack in the cam handle that, if left uncorrected, could have resulted in a catastrophic failure and the loss of a main rotor blade. The material investigation indicated that the cracking was due to stress and corrosion. Pins currently in the inventory from APEX with serial numbers 0001-3800 are susceptible to this failure prior to normal wear out times because of a manufacturing defect. In order to control the risks these cracks present, the Army leadership has determined that the specified APEX pins are not safe for flight and must be removed. Additionally, all other main rotor blade expandable pins will undergo a one-time inspection with 10 power magnification for cracks and corrosion.

It is going to take a cooperative effort to ensure that we have safe aircraft to fly. Leaders must make sure that the SOF message is disseminated to all personnel and that all main rotor blade expandable pins produced by APEX are removed. This will require a visual inspection of each aircraft to ensure all APEX pins are properly identified and removed. Additionally, leaders will have to ensure that appropriately trained and experienced personnel, technical inspectors, conduct the one time inspection of the remainder of the pins.

The Army leadership is developing a plan to provide replacement pins to the field at the earliest possible date. Until the replacement APEX pins become available, only pins manufactured by Avibank and Shur-lok Corporation are authorized for flight, and only after the appropriate one time inspection.

**Gene M. LaCoste**
**Brigadier General, GS**
**Director of Army Safety**



### Laser FAQs: A Three part series begins

# Part I, Lasers and aviation on the modern battlefield

The U.S. Army fields a number of laser systems. They primarily are used as range finders or designators. The first systems were fielded in the early 1970s. Yet, even today, lasers are a source of much misunderstanding. This article, the first of a three-part series which looks at lasers, laser protection and laser injuries as they apply to the aviator in the cockpit, attempts to address this confusion.

***Q: How does laser light differ from "normal" light?***

**A:** While "light" is "light," light produced by a laser has three unusual properties. The first is that laser light (energy) is emitted on a very narrow band of wavelengths. A second property is that laser energy can travel greater distances with very little spreading out (divergence). Laser beams have been bounced off the moon. The third property is called coherence, which means the light waves from a laser are in phase with one another.

***Q: How are lasers named or classified?***

**A:** A given laser can be classified in several ways. One way is by the region of the electromagnetic spectrum in which the laser energy is emitted; e.g., visible, infrared (IR), or x-ray. This is defined by the laser's wavelength (measured in nanometers [nm]). Another way is by whether the laser produces a continuous beam or a series of pulses. Or, lasers can be named according to the optical medium used within the laser to produce the light; e.g., gas, solid-state, dye, etc. The most common military laser in aviation is the Nd:YAG laser (operating at 1064 nanometers in the infrared) used in rangefinders such as on the Apache.

***Q: How far away from a laser do I have to be to be totally safe?***

**A:** The distance from a laser beyond which the maximum permissible exposure (MPE) is not exceeded is known as the "Nominal Ocular Hazard Distance (NOHD)". For military lasers, this distance can be up to 10 kilometers for the unaided eye and up to 100 kilometers if viewed through unprotected optics.

***Q: How do lasers vary in power?***

**A:** Laser power is measured in units called "watts." Lasers, such as those used in science classrooms, are measured in thousandths of a watt or "milliwatts." Industrial lasers can range in the thousands of watts or "kilowatts." Pulsed lasers can deliver power in the "megawatts per pulse" range. Lasers can be classified by their power output (Class 1,2,3,or 4). The lowest power lasers, Class 1, are those that, under normal conditions, cannot cause damage even when viewed directly. Class 4 lasers are high power lasers capable of causing fires, damage to the skin, and damage to the eye, potentially even from reflections.

***Q: What is a visible laser?***

**A:** Any laser operating at a wavelength between 380-730 nm can be seen by the human eye. You can expect to encounter a variety of "colors" from common laser pointers ranging from blue (480 nm) to green (532 nm) to red (670 nm).

***Q: Are there lasers I can't see?***

**A:** Yes, military laser rangefinders/ designators operate at longer wavelengths and are not visible. Such lasers emit at wavelengths greater than 780 nm and are referred to as infrared lasers. Even though you can't see infrared lasers, the eye can still focus this energy on the retina creating the potential for injury.

***Q: Can a laser change its wavelength?***

**A:** Currently, all lasers you might encounter are single or "fixed wavelength" lasers. However, "tunable or agile" lasers exist in the laboratory. These lasers have the ability to change the wavelength at which they produce energy.

***Q: What type of laser is used on the AH-64 and OH-58D?***

**A:** The rangefinder/ designator on the AH-64 and OH-58D is a Neodynium:YAG pulsed laser. It is a solid-state laser using an yttrium-aluminum-garnet (YAG) crystal as the lasing medium. It produces non-visible laser energy pulses in the infrared at approximately 1064 nm. Pulsed lasers put out energy in a single pulse or in a train of pulses. The important characteristics of pulsed lasers are their pulse frequency rates (PFR) and their energy or power per pulse. The most common pulsed laser is called a Q-switched laser. Its pulses are typically 20 billionth of a second long but can deliver a million watts or more of power per pulse.

***Q: Are lasers a threat to me?***

**A:** Yes, although lasers have been around for a long time, today they are cheaper, smaller, more easily obtained, and produce more energy than in the past. The number of reported laser incidents to date is small, but the potential for such incidents is growing significantly. Of greatest concern to the aviator is the impact of laser exposure to the eye, the results of which could include dazzle, flash blindness, and retinal damage. And, yes, they are a threat not only from direct viewing such as might occur during force on force training, but also from reflections during firing range exercises. Rangefinders are also a hazard to maintenance personnel.

***Q: Does my aircraft windshield stop laser energy?***

**A:** In general, no. The typical aircraft windshield is highly transmissive to both visible and near-infrared lasers. It will stop ultraviolet and far-infrared lasers, but these are the least likely to be encountered.

***Q: Is there such a thing as an "eye safe" laser?***

**A:** The claim of being "eye safe" means that you supposedly are able to view the laser directly without incurring damage to the eye. This phrase is often misused. A wise philosophy is never to intentionally look directly into any laser device.

***Q: Should I worry about the laser pointers being sold in department stores?***

**A:** Yes and no. Laser pointers are inexpensive ($5 to $500) and readily available. They produce laser energy in a variety of colors (wavelengths), mostly green and red. These devices are very low power and unlikely to be a source of damage to the aviator. However, they are capable of producing dazzle (a temporary loss of vision that will return immediately when the light source is removed) or flash-blindness (again, a temporary loss of vision, but this loss can persist for several minutes even after the laser source is no longer present). These effects are similar to being "blinded" by a bright light or flashbulb. It is obvious that even the temporary loss of vision in the aviation environment could have catastrophic results. USACHPPM has developed an excellent web-based presentation on laser pointers available from their site at **http://chppm-www.apgea.army.mil\laser\laser.html**. Safety officers can request it in various computer media formats.

***Q: Where can I get more information on lasers?***

**A:** Questions about lasers can be answered by contacting USACHPPM, Laser/Optical Radiation Program, DSN 584-3932 or COM (410) 671-3932.

***Q: What is the Army doing about laser protection issues?***

**A:** Due to the continuing change in the laser threat, providing protection has been a game of trying to catch up. Next month, Part II of this laser series will look at the issues of laser protection and what is available.

—Clarence E. Rash, research physicist, USAARL, DSN 558-6814, (334) 255-6814, Clarence.rash@se.amedd.army.mil; Jim Hauser, product engineer, PM-AES, DSN 897-4267, (256) 313-4267, jim.hauser@peoavn.redstone.army.mil

NCO Corner

# NEW AVIATION TOOL SYSTEM (NATS)

## Positive safety results show the value of Army's New Aviation Tool System (NATS)

It took a bit of time and "doing" to gain program approval and then to accomplish design, testing, and reconfiguration and, finally, fielding of NATS. But now the Army is beginning to reap the positive results envisioned several years ago for the new tool system.

NATS is a tool system designed to bring about a new level of tool control and accountability. It supports AR 385-95, *Army Accident Prevention*, which requires commanders to establish foreign object damage (FOD) prevention programs that, in turn, require unit personnel to "ensure all tools, hardware and other equipment are properly accounted for at the end of each maintenance operation." NATS and this regulation, working together, will substantially reduce FOD and increase safety in Army aviation.

Since Army aviation began, there has been a not-so-well-appreciated discipline required of aviation maintenance personnel. That discipline is tool control. Because of the potential negative impact of improper tool control upon the safety of the aviator and his/her equipment, as well as the responsible aviation mechanic, there has been significant interest in finding "a better way." Ultimately, this concern led to outright insistence upon what has evolved into NATS. Approval of NATS for Army aviation provided an opportunity to satisfy an additional long-standing request from mechanics—higher quality tools.

Recently, the Aviation Ground Support Equipment (AGSE) office at Huntsville, Alabama received an e-mail from an OH-58 maintenance test pilot who had been about to test fly an aircraft after the crew chief had made an adjustment to the pitch change links which connect the flight controls to the rotor head. He inspected the adjustments and then looked around the area for tools and other debris. He did not notice anything out of the ordinary.

As he walked by the mechanic's toolbox, he observed that an open-end wrench was missing from its slot. He humorously inquired if the mechanic had "Lost his tools already." The mechanic replied that he had them all before he started the repair. Fortunately, the test pilot got back on the aircraft and found the missing wrench stuck in the aircraft rotor system swashplate. How unfortunate it might have been if the pre-NATS toolboxes (the ones without the NATS instant inventory feature) had still been in service. Possibly the test pilot would have started the aircraft and done severe damage to both the aircraft and, he says, "my ego."

Even though the tool control features that are designed into the NATS tools have proven effective, the mechanic must follow a disciplined tool control process. He must ensure that all toolboxes have been returned to the toolbox at the end of each aircraft maintenance task. Field Manual 1-500, *Army Aviation Maintenance*, requires this process.

—AMCOM AGSE office
John Lewis (256)430-1610 X 118



# Accident briefs

Information based on *preliminary* reports of aircraft accidents

## AH6

### Class C

**C series**

■ During aircraft familiarization training, right skid became hooked under a perforated steel place expansion joint. Part of the skid was torn off. Damage to the right skid, front right landing gear and surrounding sheet metal where the strut enters the lower fuselage.

## AH64

### Class E

**A series**

■ During take-off from airfield, aircraft's stabilator auto mode failed with audio, and would not reset to auto mode, and IP manually controlled stabilator. After aircraft turned downwind, manual control could not be maintained. During approach, IP reset stabilator and auto mode was restored. Aircraft was landed and shut down without further incident. Maintenance replaced stabilator transducer.

**D series**

■ During confined area operations utilizing the night vision system, aircraft's aft deck fire audio, caution warning and up-front display (Deck Fire) illuminated. Aircraft was landed and shut down without further incident. No visible signs of fire were present to crew. Replaced aft deck fire overheat detector.

## OH58

### Class C

**C series**

■ Damage to aircraft was discovered during a 10 percent QDA inspection. Damage consisted of several small holes and a large gouge to aircraft's underbelly between forward and aft landing gear cross tubes near the fuel drain.

**D-R series**

■ During nap-of-the-earth, night vision goggle flight, wire strike protection system contacted the ground.

## CH47

### Class D

**D series**

■ Aircraft was run up and take off initiated for training mission with AFCS deactivated. Upon touchdown, aircraft landed on a fire extinguisher, damaging the aircraft's ramp, operating cylinder and strut.

## RC7

### Class E

**B series**

■ During normal taxi after normal landing, pilot flying felt abnormal brake action. Pilot not flying verified HYD #1 reservoir quantity read zero. Crew terminated flight and returned to parking with no further incident. Hydraulic line nut was found to be loose.

■ Number 4 Engine oil segment light and master caution light illuminated during flight. Oil pressure was confirmed below 75 PSI. Engine was shut down with precautionary engine shut-down check-list. Flight continued to home station on three engines with no further incident. Maintenance replaced oil seal.

## UH1

### Class E

**H series**

■ While in flight, crew smelled a faint odor of burning wire. PI shot an approach into an approved LZ and came to a stationary 3-5 ft hover. Crew chief opened cargo door and noticed smoke coming from engine compartment. Aircraft was set down and starter-generator was found smoking. No open flame was observed. Flight was terminated. Maintenance replaced the starter generator.

## TH67

### Class C

■ After engine start, during throttle roll-up, aircraft engine N2 overspeed to 114 percent occurred.

## UH60

### Class C

**A series**

■ Post-evaluation flight inspection revealed damage to the intermediate gearbox cover, two main rotor tip caps, and tail rotor drive shaft. Damage is suspected to have occurred during a high-speed landing demonstration.

■ A parked aircraft, chocked and tied down with mooring chains, sustained damage to the lower right forward section of its tailboom from the rotor wash of another aircraft hovering in close vicinity. Aircraft reportedly rotated about the left landing gear.

**L series**

■ During live rescue hoist training, the soldier in the basket began to spin at a high rate as the basket got closer to the aircraft. Upon reaching the door the soldier in the basket stuck out his foot to arrest the spin and contacted the crew chief in the upper thigh. The contact resulted in a severe bruise to the crew chief. The crew chief was placed on 10 days bed rest with resultant loss of work days.

### Class E

**L series**

■ The stabilator auto mode failed after takeoff. After pilot attempted slewing the stabilator to flat pitch, auto control did not reset and sequentially failed to reset a second time. The pilot terminated the flight at a satellite airfield. The flight ended without further incident. Maintenance replaced the stabilator actuator.

## UC35

### Class C

**A series**

■ Aircraft encountered weather with hail in flight. Postflight inspection revealed hail damage to radome and rubber de-icer boots.

**For more information on selected accident briefs, call DSN 558-9855 (334-255-9855). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.**

# 2001 Aviation Life Support Equipment User's Conference

The 2001 ALSE (Aviation Life Support Equipment) user's conference will be held at the Rocket Auditorium, Redstone Arsenal, AL on 17-18-19 July. Commanders, ALSE officers and technicians, unit Safety officers and other interested personnel are invited to attend. There will be no conference fee charged this year. A block of one hundred rooms is reserved at the Huntsville Hilton (256-533-1500 or 800-445-8667). Mention you are attending the conference in order to get the per diem rate.

If you are interested in making a presentation or would like a particular topic covered during the conference, notify the Program Manager Aircrew Integrated System (PM ACIS) point of contact before 15 Jun 01. A copy of the briefings/presentations should also be forwarded to the PM ACIS point of contact. Those planning to attend should notify PM ACIS by 15 Jun 01.

The dress for the conference attendees is BDU/ABDU or class B uniform. The last day of the conference civilian attire is acceptable.

The PM ACIS points of contact are: Melanie Barksdale,(256)313-4269, melanie.barksdale@peoavn .redstone.army.mil; or John Jolly, (256)313-4262, john.jolly@peoavn .redstone.army.mil

## Correction for July issue

In the April 2001 issue of Flightfax, in the "Speaking of harnesses" story, we incorrectly identified the Advisory Message. The correct numbers are AIS 97-09, which relates to the leg straps of the Safety Vest with proper adjusters, spring loaded lockbar installed.

Thanks to SSG Gary L. House of Fort Rucker for pointing out the correct information.

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## POV Fatalities

through 31 May

| FY01 | FY00 |
|---|---|
| 60 | 75 |


U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

AUGUST 2001 ✦ VOL 29 ✦ NO 8

## Weather supplies hazards – You apply controls

# 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*

## A final note on change

Sometimes change is subtle, sometimes bold. The Army has seen a lot of it, with a lot more to come. It doesn't take a keen eye to spot the bold change in the look of *Flightfax*. I hope you'll tell us if you like it—and if you don't. More importantly, I hope you'll notice the more subtle changes in content and sections we've added, such as this one. The redesign is intended to provide you—aviators and commanders—with more relevant aviation hazards, risk, and controls information in a timely manner and provide you with insights on some of the 5-meter targets where your limited time and resources can impact most.

One thing has not changed. Accidents are still a major threat to soldiers. As we entered the fourth quarter of this fiscal year, our fatality rate was about 9 percent above where we were last year at the same time. While we are not achieving the overall 20 percent reduction in total military fatalities goal established for this fiscal year, command involvement is succeeding in reducing our privately owned vehicle (POV) accidents, notoriously the number one killer of soldiers. Currently, we are on target with nearly a 20 percent reduction in POV fatalities. There are still a lot of the 101 days of summer left, so we must keep the emphasis on POV accident prevention so that our success does not slip away. Of particular concern is the fact that fatalities from motorcycle accidents are on the rise. We must ensure that soldiers who choose to ride motorcycles receive the Motorcycle Safety Foundation Course at no cost to the individual soldier.

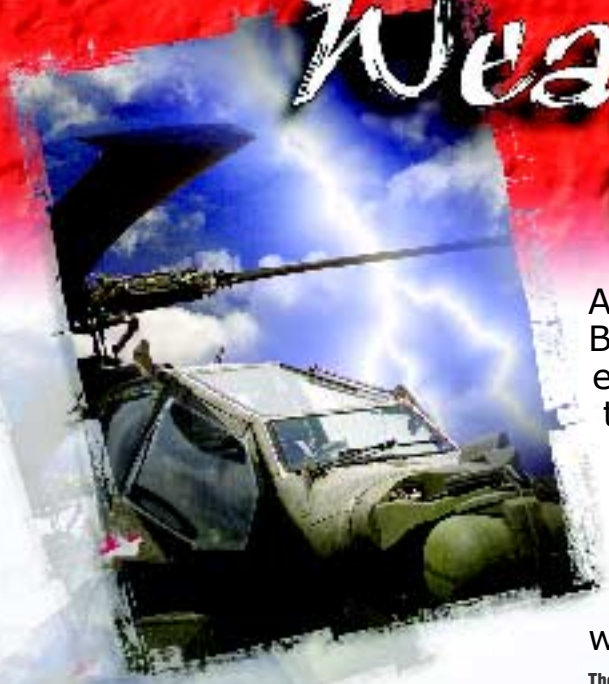
Aviation fatality rates are also up. Last year, aviation accidents and fatalities were at an unprecedented low. This year, we've lost some hard-earned ground in our aviation accident prevention efforts. Indiscipline—knowing the standard and electing to ignore it—is a factor in 25 percent of our aviation accidents. Weight and balance issues, weather decisions, and over water operations are critical areas of concern. Leaders should carefully assess these hazards and ensure informed decisions are made at the appropriate level. Of greatest concern are the effects of cumulative risk. Seemingly low-risk individual hazards, when left uncontrolled, can collectively raise risk to an unacceptable level.

A final note on change. As I write the first From the Director of Army Safety commentary for this inaugural color issue of Flightfax, I realize it is also my last. I'm passing the responsibilities of the Director of Army Safety to Brigadier General James E. Simmons. BG Simmons will now spearhead the Army's continuing efforts to affect a cultural change where risk management is not just another safety requirement but is fully integrated into all Army operations. I personally thank each of you for the great work you're doing in embracing risk management as a sound investment in readiness. An informed risk decision at the appropriate level is the standard we must meet. Soldiers' lives are at stake. ★

**BG(P) Gene M. LaCoste.**

**(General LaCoste became the assistant Deputy Chief of Staff for Personel on 9 July 2001.)**

# Weather can do strange things to your aircraft



And it's out of your control...or is it? Because the Safety Center has heard of several weather-related accidents recently, we thought it was time to look at different aspects of weather and your aircraft.

In this special premiere color issue of Flightfax, we look at several weather-related subjects, and explore what you can do to manage the risk associated with some weather hazards.

**The editor**

## Thunderstorms—Stages and Types

Pilots who fly IFR are very aware of the hazards associated with thunderstorms. They include squall lines, tornadoes, hail, ice, rain, low ceilings and visibility, lightning, and turbulence. But one issue that requires further discussion is the development of thunderstorms and the up- and downdrafts and windshear associated with this development.

Thunderstorms develop in three stages and are basically of two types: air mass and steady state. They are different in that the life cycle of an air mass thunderstorm may last from 20 minutes to 1.5 hours while the life cycle of a steady state thunderstorm may last several hours.

Regardless of the type of thunderstorm, they all start as a cumulus cloud. During its life cycle, a thunderstorm cell progresses through three stages: (1) the cumulus, (2) the mature, and (3) the dissipating. In the cumulus stage, the updrafts vary in strength and extend from very near the surface to the cloud top. The cloud growth rate may exceed 3,000 feet per minute.

The most dangerous of the stages is the mature stage. The hazards associated with thunderstorms reach their maximum intensity in this stage. Downdrafts may exceed 2,500 feet per minute with updrafts exceeding 6,000 feet per minute. Updrafts and downdrafts close together create strong vertical shear and a very turbulent environment. Downdrafts characterize the dissipating stage of the thunderstorm.

**—POC: Gary D. Braman,Fixed-Wing Aircraft System Safety Manager, U.S. Army Safety Center, *bramang@safetycenter.army.mil*, DSN 558-2676, CML 334-255-2676**

# Flying and thunderstorms—Do's & Don'ts

## Do . . .

■ Avoid by at least 20 miles any severe thunderstorm, or one giving an intense radar echo.

■ Circumnavigate an entire area having 60 percent thunderstorm coverage.

■ Remember that vivid and frequent lightning indicates probability of severe thunderstorms.

■ Regard any thunderstorm with tops of 35,000 feet or higher as extremely hazardous.

■ Ensure that cells are a minimum of 40 nautical miles apart when you must fly between cells.

■ Circumnavigate cells upwind of the cell.

■ Know your airborne weather radar—its capabilities, limitations and in-flight trouble-shooting procedures. Carry the operator's manual with you when you fly.

■ Know that some approach control radars can only paint an area of weather and are not able to provide you thunderstorm Video Integrated Processor (VIP) levels as on your forecaster's weather radar. Ask the controller if he has ASR-9 radar. If so, the controller can give you the cell's VIP level.

■ Be aware that what you see on the forecaster's weather radar screen will not be the same on your airborne weather radar. Green on his screen will be yellow on yours. Yellow on his will be red on yours. Red on his may be magenta on yours; or it may be black, a shadow.

■ Update your weather after takeoff for any changes. When advised by ATC of weather advisories, check with approach control, pilot to metro service (PMSV) or flight service.

■ Know which VOR stations along your route of flight have HIWAS (Hazardous In-flight Weather Advisory) capability.

■ Remember that your airborne weather radar is meant for thunderstorm avoidance—NOT thunderstorm penetration.

## Don't . . .

■ Don't land or takeoff in the face of an approaching thunderstorm. A sudden wind shift or low-level turbulence could cause loss of control.

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

■ Don't fly without airborne weather radar into a cloud mass with scattered embedded thunderstorms.

■ Don't trust visual appearance to be a reliable indicator of turbulence inside a thunderstorm.

■ Don't attempt to clear the top of a known or suspected severe thunderstorm. To do that safely, the top must be cleared by 1,000 feet for every ten knots of wind speed at the cloud top. This will exceed the capability of your aircraft.

■ Don't preflight plan a route of flight between echoes.

■ Don't ever fly into an area depicted as a shadow on your airborne weather radar.

# Why were we there?

Our mission was to conduct an aerial gunnery to maintain currency as part of the continuous operations program. Our company had recently changed commanders, and everyone was unsure of the new boss and what his reaction would be to any type of failure.

It was mid-winter in Korea. The day got off to a slow start. Weather was questionable, at best, and no one really wanted to be there. When the weather was reported to be "legal" for the entire day, the commander continued to push the training. No one said anything, we just fell in line to accomplish the mission. The brief was an hour late, and the tension grew. It was hard not to notice the increasing agitation of the commander.

As the time approached for the run-up, the lead aircraft broke, decreasing the range time and pushing back the timeline even further. As we approached the range, the afternoon gave way to night and snow began to fall. The weather was getting worse and we had not finished our training for the day.

The forecast was for scattered snow showers throughout the night. Ceilings, temperatures and visibility were all decreasing, but still within the legal minima. We began to upload for the return flight home.

As we took off out of the valley, the snow began to intensify, and visibility decreased dramatically. We continued on our way, suffering from a severe case of *get-home-itis*. The flight seemed to slow to a hover at times, due to decreasing visibility and the lowering ceilings, causing visual illusions.

Options were decreasing rapidly for us. The lead aircraft disappeared into a cloud, and I lost him completely. The instinct born of every instrument meteorological conditions (IMC) briefing I had heard over the years told me I should be turning away from him and avoid going into that cloudbank.

I was flying in the left seat, chalk 2 of a staggered left formation. I turned to the left, expecting chalk 3 to turn to the right for the inadvertent IMC break-up, but were we inadvertent IMC yet? As I turned to avoid the cloudbank, a ridgeline came into view, growing in size like a morphing power ranger. I was increasing the bank angle to complete a 180 degree turn when the left side crew began screaming "Chalk 3, nine o'clock closing fast!" I scanned immediately to my left to see Chalk 3 closing through my upper green house window. Instead of turning away from me, he had tried to maintain the formation. When the turn was complete I had become Chalk 2 in a flight of two, with trail now leading. He had just passed over the top of my rotor system!

The only choice now was to take a deep breath, relax and continue to our home station. Everyone seemed to be waiting to breathe until we got back. After what seemed like an eternity, we disembarked onto solid ground.

During a lengthy and detailed debrief, we realized that several crewmembers felt the weather wasn't good enough for this flight. Some felt that they could not speak their mind, no matter how uneasy they felt about the mission. There seemed to be more concern about the timeline than standing back and looking at events. Everyone agreed that it would only have taken one person the stand up and ask "Why are we doing this under these conditions?" Never let it be said that you cannot be that one to ask *What are we doing here?*

—CW2 Dillon, ASOC-04

**During a lengthy and detailed debrief, we realized that several crewmembers felt the weather wasn't good enough for this flight.**

# The Hurricane that cried Wolf

Although it was a beautiful day in North Carolina, we knew a hurricane was making its way towards the East coast. None of us at Fort Bragg expected what would happen next.

Soon after our morning physical training, the alert roster was activated instructing us to report to the flightline with a small overnight bag of civilian clothes. Upon arriving, we were briefed that a hurricane emergency operations center was activated and tracking Hurricane Bertha as it approached North Carolina. The plan was to evacuate all the flyable aircraft to Fort Knox as soon as possible.

It is a large operation to move two brigades worth of aircraft from Fort Bragg to Fort Knox. Fortunately, there is a plan for just this type of evacuation. Some of the items in the plan include flight routes, fuel stops with contract fuel, overnight arrangements at hotels en route and billeting arrangements at Fort Knox.

Even with the amount of pre-planning done at Corps level, the unit still had much to accomplish. For example, we needed to carefully check all the aircraft logbooks to make sure a service or inspection would not come due during the flight. The crew chiefs and maintenance sections performed the herculean task of getting every possible aircraft ready for evacuation, and they did a superior job. Aircrews made sure they had the proper sectionals for the cross-country flight and kneeboards were prepared with all the necessary frequencies for the flight. Air mission briefs were conducted for all the flights and the evacuation began.

## Safe from the storm

All the aircraft made it to Fort Knox without incident. Hurricane Bertha changed course to the North and Fort Bragg and the Fayetteville area only received some rain and mild thunderstorms. At this point, most of us felt that we had burned up lots of flying hours on a cross-country flight that was unnecessary.

A few weeks later, we got word that Hurricane Fran was now headed for North Carolina. When we were alerted for possible evacuation, we all thought, "Here we go again." This time however, we were told to dense pack all the aircraft into the hangars. Aircraft were placed as close together as they would be on a C-5 Galaxy. A squadron of OH-58D aircraft that normally used an entire hangar were squeezed into a little over a quarter of the hangar. We put as many UH-60s as we could into the remaining space.

## This one hit

Hurricane Fran did not turn north and spare us as Bertha had. It stormed through North Carolina leaving a path of destruction. Homes were destroyed and power went out across much of the area. I couldn't help but think of the millions of dollars worth of aircraft packed into hangars at the airfield.

Fortunately, when the storm cleared, there was only one hangar that had minor damage to the roof. None of the aircraft inside were damaged. While many of us thought (with 20-20 hindsight) that we should have evacuated the aircraft for Hurricane Fran and not for Bertha, the bottom line for both cases is that we did not lose any aircraft. In both cases the leadership evaluated the risk associated with the courses of action and made an informed decision at the appropriate level.

## Take it seriously

The lesson learned from both of these scenarios is to take a hurricane warning seriously. You cannot predict exactly where a hurricane will go when it makes landfall, just as you cannot predict the order to evacuate or not. Know your unit's evacuation plan and prepare in advance for all contingencies.

—Major Dave Hudak, USASC, DSN 558-2075 (334) 255-2075, hudakd@safetycenter.army.mil

# Tailplane Icing

Ice can accumulate extremely fast on the exposed surfaces of an aircraft. Some experts tell us that four to five minutes is all that is needed to build up ice on the surfaces of an aircraft and cause adverse flight characteristics.

In the last few years, I have heard of at least 16 airplane accidents resulting in 139 fatalities, attributed to ice contaminated tailplane stall (ICTS). This icing phenomenon causes a sudden downward force on the aircraft's elevator, which in turn causes a nose down attitude. Unchecked, it could quickly exceed 30 to 40 degrees. In one case, a pull force of 400 lbs was required to counteract this downward force.

The horizontal stabilizer (HS) and the attached elevator are sometimes referred to as the Tailplane. The elevator attached to the horizontal stabilizer of an aircraft controls the movement around the lateral axis (pitch) of the airplane. The pilot's ability to control his/her airplane about this axis is very important. In designing an airplane a great deal of effort is spent in making it stable around all three axis. But longitudinal stability, or stability about the pitch axis, is considered to be the most affected by variables introduced by the pilot, such as airplane loading. Three forces govern the pitch balance of the aircraft. The weight acts through the aircraft center of gravity (CG); the wing's upward lift acts through the wing center of lift and is aft of the CG. Note that these two forces generate a nose-down pitching moment. The horizontal tailplane creates a downward lift to counteract this nose-down pitch. The elevator allows the pilot to control the pitch.

## NASA research

The FAA requested the NASA Glenn Research Center at Lewis Field, Cleveland, Ohio to study this ICTS phenomenon. Because the HS of most turboprop aircraft is engineered with a sharper leading edge than that of the main aircraft wing, the HS is a more efficient ice collector and collects a higher percentage of ice than the wings when flying in icing conditions. Therefore, if the crew observes ice on the other parts of the aircraft such as the wings, they should then presume there is a significant amount of ice buildup located on the unobserved HS leading edge.

## Pop those boots

Currently, Army in-flight de-ice procedures for most aircraft installed with de-ice boots is to wait for the activation of the de-ice boots until a minimum 0.5 inch buildup of ice on the wing has accumulated. The reason for the 0.5 inch buildup is that anything less might not break off, but balloon out and then freeze to create a hollow air pocket between the ice and leading edge. This is referred to as 'ice bridging'. After formation of this pocket any subsequent activation of the de-ice boots would not have any effect on breaking up the ice. However with 0.5 inches of ice on the wing leading edge your HS could have twice that much ice buildup and you can't see it.

In the January 2001 *Flightfax* article by Thomas A. Horne, 'Avoiding Ice Fright' it was shown that 'ice bridging' is a myth. Mr. Horne points out that new research indicates, "*…that it's true more ice will shed if more ice is allowed to build on booted surfaces. But experts now say there is no reason to believe that ice can continue to form and bridge over leading edges and leave boots to helplessly pulsate behind an ever-growing sheath of ice*". With this in mind, aviators should pop their boots when any sizeable ice buildup is noticed on the boots. This would help prevent ice buildup on the 'out of sight, out of mind' horizontal stabilizer.

HS tailplane induced stalls are rarely a problem in cruise flight. Research indicates that during cruise flight in icing conditions, ice will collect on the HS, but result in very minor flight control changes. In this cruise flight profile, the HS is not anywhere near its performance limit. However, when the aircraft changes configuration for approach and extends flaps, the HS is pushed closer to its performance limits.

Flying in icing conditions can cause a buildup of ice along the leading edge of the HS creating a distorted leading edge and causing the airflow to separate under the HS and reattach itself further back on the airfoil than desired, causing a loss of lift. Along with an ice buildup on the HS aft of the de-ice rubber boots, this can cause the airflow to reattach itself aft of the hinge for the elevator. When this happens it causes a low-pressure area where the elevator will be forced down (again some tests show this force could be in excess of 400 lbs.), causing the nose of the aircraft to dramatically pitch down. Unfortunately, when this happens the corrective actions are almost exactly the opposite of what the pilot is trained to do during a wing stall condition. When the nose pitches down the yoke must be forced aft, the flaps must immediately be reset to the last position (landing flaps to approach flaps or approach flaps to flaps up) and power is either reduced or used very judiciously, but not maximum power. During a wing stall recovery the aviator is trained to push the nose forward, and add maximum power, further aggravating the Tailplane Stall.

## Wing stall or tail stall?

Much confusion exists with the recovery procedures between a wing stall and a tail stall. Recovery procedures between the two are almost completely opposite.

To correctly diagnose which problem is present, situational awareness is critical. Wing stalls tend to occur at slower airspeeds and with flaps up. Tails stalls tend to occur during or shortly after flap extension, and at higher airspeeds.

If the situation progresses, a tail stall will always result in a nose-down pitch. With an ice-contaminated wing stall, the aircraft usually rolls initially, but could also pitch nose down.

The diagnosing of symptoms of tailplane icing are dependent on pilot experience, current workload in the cockpit and good crew resource management. This will determine the aircrew's ability to diagnose the suspected problem and proceed with the right course of action.

However, flying with the autopilot on in icing conditions can mask the aircraft hints telling the pilot that a problem is about to happen. The autopilot takes the pilot out of the loop of detecting flutters, lightness in the controls or lightness in the forward direction of the yoke, adverse movements in the yoke, pilot difficulty in trimming the aircraft, or pitch excursions similar to pilot induced oscillation. These are all telling signs of an impending loss of control on the horizontal stabilizer.

So remember, when in the terminal area and icing conditions exist, it is best to hand fly your aircraft, and pop the boots when you notice an appreciable ice accumulation on your wings.

**—Bradford F. Kopp, USAREUR Fixed Wing Standardization Officer, V CORPS Aviation Safety and Standardization Detachment (CASSD), CH-47 SFTS Facility, Unit 29716, Box 354, APO AE 09028 DSN: 382-5389, Civil: 49-621-779-5389**
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# Brownout conditions

The conditions that night were conditions an aviator can expect in any desert—low contrast terrain, and loose, blowing dust and sand. Any or all of these can eliminate any visual ground reference during certain maneuvers.

The mission for the UH-60L standardization instructor pilot (SIP) was to conduct night NVG (night vision goggle) training prior to the unit entering "the box" at the training center. The illumination for the scheduled period of training was zero. The winds had decreased significantly since the end of the day.

The plan for the evening was to conduct an NVG approach and takeoff simply to get a feel for the terrain and conditions. Next, pick up and fly a 500-gallon blivet over somewhat contrasting terrain. Finally, pick up and fly a TOW HMMWV in conditions to simulate those in "the box."

Neither the SIP nor the Instructor Pilot (PI) had attempted such a slingload under those conditions in recent memory. The SIP decided he would try it first. After three aborted attempts, the SIP successfully picked up the HMMWV on the fourth try, and turned the aircraft toward a dry lake bed, away from the originally intended flight path and also away from the only terrain in the immediate area offering any semblance of contrast or definition in the immediate area.

The SIP became focused on the pick up, and did not ask for, or receive, any crew coordination assistance from the rest of the crew. He was flying the aircraft and scanning the instruments when he became spatially disoriented in low illumination, low terrain contrast brownout conditions.

Because none of the other crewmembers had visual contact with the ground, there was virtually no crew dialogue. Overconfidence in his own ability led the SIP to not require the PI to make instrument callouts, namely power and radar altimeter readings. Approximately 500 feet from the pick up zone, the external load and then the aircraft impacted the ground and were destroyed. All five crewmembers sustained significant injuries.

Limited visibility operations, whether they're in dust, sand or snow, are some of the most challenging environments an Army aviator can face. The primary duty of the pilot in command is the safe operation of the aircraft while performing the mission. Flight technique is important while flying in these challenging conditions. However, crew coordination briefs, rehearsals, and application, coupled with the correct flight techniques, are critical to both mission accomplishment and aircrew safety.

—Major Erich Erker, Chief, Utility Branch, USASC, DSN 558-9853 (334) 255-9853, erkere@safetycenter.army.mil

# Scratching your head for a proper fitting helmet?

The U.S. Army Aeromedical Research Laboratory (USAARL) offers a specialized fitting service for aircrew members who cannot achieve a comfortable, safe fit with their flight helmet. Over the years, we have assisted individuals experiencing persistent hot spots from unusual head characteristics including cranial ridges, protuberances, asymmetrical skull shapes, scars resulting from birth anomalies or burns or trauma, and even major facial reconstruction due to cancers. Just in the past 5 years, over 160 crewmembers have been seen in our Laboratory located at Fort Rucker, Alabama, and over twice that number have been accommodated through telephonic consult with unit ALSE personnel or flight surgeons.

The Laboratory's Problem Fit Team has many tools at its disposal to help achieve optimal fit, including contracting for special long or wide helmet shells, modifying suspension, retention, visor, or chinstrap assemblies, relocating earcup assemblies, and in some cases, custom molding earcups. In the past few years, custom thermo plastic liner (TPL)™ trimming has been performed most frequently. The Oregon Aero Zeta Liner™ is an evolving alternative to the TPL™ that is currently being tested. Over the past 5 years, USAARL has successfully modified the TPL for 66 individuals, and installed the Zeta Liner as an alternative for over 70 individuals. Our experience indicates the TPL accommodates better than the Zeta Liner for individuals with pronounced cranial ridges, individual protuberances (bumps), or scarring.

The Zeta liner appears superior on individuals who are pushing the limits (large/small or long/wide heads) in a given helmet shell size. Also, we have used the Zeta Liner in conjunction with experimental protective mask wear, and it may hold promise as a solution to those painful but necessary protective mask buckles. Although the comfort liner (e.g., TPL and Zeta Liner) is not designed to provide impact protection, USAARL engineers must verify that any new helmet component is safe. While that testing is being completed, the Zeta Liner is considered an experimental modification.

If you have a helmet fit or hot spot problem, first meet with your unit ALSE person and attempt to solve the problems locally, by using well-established procedures for helmet fitting. If you still have difficulty, see your unit flight surgeon, who can arrange for a USAARL consultation.

Aircrew and unit ALSE personnel should remember that USAARL is the only agency authorized to modify flight helmets beyond that which is designated in the appropriate manuals, as determined by helmet developers at the U.S. Army Natick Research Development and Engineering Center for the SPH-4 and 4B, and the Program Manager—Aircrew Integrated Systems, AMCOM for the HGU-56/P.

—Point of contact is Mr. Joseph R Licina, USAARL, Fort Rucker, AL, DSN 558-6893 or (334) 255-6893.

# Aviation circuit breakers

## The deliberately weak link in the electrical chain

Circuit breakers! They stare at you from panels at your knees, overhead, behind you, or perhaps on your console between you and your crewmembers. Occasionally they trip. Just what does it mean when they pop? Just what do these humble, yet hardworking, devices do? And, just as importantly, what don't they do?

Circuit breakers probably don't get the attention they deserve. However, neglect of critical components in aviation, even small ones like circuit breakers, can have tragic consequences.

## What they do

Aircraft circuit breakers are designed to interrupt the flow of electrical current when specific conditions of time and current are reached. Those conditions generate heat, and circuit breakers are designed to trip (open the circuit) before this heat damages the wiring or the connectors. If the designed overload conditions are not exceeded, the circuit breaker will not trip.

The very tolerances that must be built into a circuit breaker to prevent nuisance tripping mean that some glitches may not trip the breaker. Short, violent bursts of arc tracking will not necessarily trip breakers, which are comparatively slow-arcing devices. If your aircraft had aromatic polyamide wire, there are very good reasons not to be in a rush to reset any trapped circuit breakers—the results could be catastrophic.

## Protecting the wiring, not the equipment

Circuit breakers are not intended to protect the electrical equipment, which may have its own built in protection system. They are intended to protect wiring and connectors. Aging, vibration, excessive bending, improper installation, heat, moisture, friction, windblast, and chemicals can damage the insulation on the wire and any connectors. This could also create a fire hazard, possibly in an area where it is impossible to use fire extinguishers, which can threaten the safety of a flight.

With any in-flight fire, an immediate landing becomes a very high priority. Because such an option may not always be readily available, adequate circuit protection and a good knowledge of what it can and cannot do is essential.

## It's not a switch

On some aircraft, the circuit breakers are mounted along the bottom of the instrument panel. Having them within sight and reach can be a blessing and a curse; they can be seen and reset if necessary. But it is tempting to use them as a switch—a purpose for which they were never intended—and to reset them when they should not be reset. The construction of a circuit breaker was not designed for it to be used as a switch; that causes premature wear and the risk of failure.

When a circuit breaker fails, it will take down a system that may be needed for the safe operation of the aircraft, or it will leave a circuit online that should be de-energized. Both alternatives are unattractive, and both may inflict catastrophic consequences.

## Think twice before resetting

When a circuit breaker trips in flight, it is telling you that something is wrong, and that there has been a serious electrical event. This danger signal should be treated with extreme seriousness. Some old hands might say they have heard it's okay to allow one reset. This is not prudent unless specifically called for in the operator's manual. Crews should not reset any tripped breaker unless it is essential to flight, and only after consulting the aircraft's Technical Manual.

Circuit breakers can be your friend, if you understand and respect their limitations.

—Adapted from the Aviation Safety Newsletter

# TRAINING & RISK MANAGEMENT

# Communication Is Key!

In previous articles, we discussed the first three steps of the risk management process: identifying hazards, assessing risk, and developing controls and making risk decisions. At this point, the controls have already been identified, selected, and used to re-assess the hazards to derive their residual risk. This article will address Step 4 of the risk management process—implementing the control(s).

Have you thought about how difficult it would be to tell a family member that a soldier in your unit died because an identified control simply was not implemented?

While leaders are good at identifying hazards, they often fail to implement controls needed to eliminate the hazards or decrease their risks. Once the commander or leader has selected controls, they must be effectively implemented or the entire risk management process breaks down.

### Communication is key to implementation——

Ensure controls are communicated and understood down to the lowest level. This can be accomplished by integrating them into standing operating procedures (SOPs), written and verbal orders, demonstrations, rehearsals, battle drills, during mission or safety briefings, and back-briefs.

During orders production, the staff implements accident risk controls by coordinating across the staff and integrating them into the appropriate paragraphs and graphics of the operation order (OPORD). The controls selected, regardless of whether they already existed or are newly developed, should minimize the chance of accidents, and maximize the chance of mission accomplishment.

It is important to coordinate with adjacent units to ensure they understand the hazards identified and the controls to be implemented, especially if they will encounter the same hazards or play a role in implementing the controls.

### Where the rubber meets the road—

The most important aspect of implementing controls is clearly communicating how the controls will be put into effect, who will implement them, how they will fit into the overall operation, and how the commander expects them to be enforced.

Staff sergeants and sergeants are leaders/first-line supervisors and as such, are key to implementing the controls specified in the operations order. For example, a control for convoy operations in adverse conditions is implemented that specifies maximum speeds and spacing between vehicles in the convoy. It is the squad or section leader's responsibility to make sure his soldiers are briefed on the controls, that they understand them, and they comply with them in order to minimize the risk of an accident. The Army has entrusted its leaders with the responsibility to effectively train soldiers on their battle tasks and make sure those tasks are performed to standard. Implementing controls and making sure they are performed to standard is no different.

By applying *all* of the risk management steps, we can reduce the risk that we face daily —during mission performance and at home. It is one thing to identify the controls; it is another to take action. Don't just think about it—communicate! Your life and your soldiers' lives may depend on it.

—POC: Dr. Brenda Miller, Ch, Training and Education Division, DSN 558-3553 (334-255-3553), millerb@safetycenter.army.mil

# ACCIDENT BRIEFS

*Information based on preleminary reports of aircraft accidents*

## AH-64

### Class B
**A Series**

■ During flight, aircraft's main rotor system struck a tree, the crew landed the aircraft without further incident. Three main rotor blades were destroyed. The remaining blade sustained repairable damage.

### Class E
**A series**

■ While hovering in ground effect (IGE), aircraft descended onto a rock causing damage to the VHF antenna. Crew found damage during post flight. Maintenance performed repair.

**D series**

■ While conducting day training flight, ECS DGR FWD advisory and ECS Fwd Fail caution were observed on the UFD. Crew aborted mission and landed the aircraft to the airfield without further damage. Maintenance inspection revealed that the No.1 ECS condenser failed due to No.1 ECS compressor low suction. The ECS No.1 was charged with R134A and the aircraft was released for flight.

## CH-47

### Class E
**D series**

■ During engine run-up, crew noticed a 5% fluctuation on the rotor RPM and a torque split of 20-30%. A maintenance officer was called out and an attempt was made to troubleshoot the No. 1 and No. 2 engine beep trim switch. During the first two tests, there was no response on the No. 1 and No. 2 engine beep trim increase. On the third attempt, the No. 1 engine began to high-side. Pilot pulled No. 1 engine condition lever to stop without damage. N2 actuator replaced.

■ Aircraft experienced a bird strike while flying as Chalk three in a formation of three aircraft. The bird struck the plexiglass windshield (chin-bubble) breaking it and creating a hole roughly the size of a grapefruit. The aircraft crew sustained no injury, and the aircraft was flown to base and landed without further incident. The chin bubble was replaced and aircraft was returned to service.

## C-12

### Class C
**D series**

■ Aircraft sustained a blown tire and prop damage while conducting a high speed braking MOC prior to a training mission. Accident is under investigation.

## OH-58

### Class A
**C series**

■ While maneuvering downwind to a tactical assembly area, aircraft encountered an uncontrolled spin and crashed. Crew exited the aircraft without assistance and sustained no injuries. A small post crash fire self-extinguished. Aircraft destroyed.

### Class C
**D-R series**

■ During nap-of-the-earth, night vision goggle flight, aircraft's wire strike protection system (WSPS) contacted the ground. Subsequent inspection of aircraft revealed damage to the undercarriage and flight controls, as well as to the WSPS.

## TH-67

### Class E
**A series**

■ During hover, aircraft's air conditioner was inoperative. Aircraft landed without further incident. Maintenance replaced compressor.

## UH-1

### Class B
**H series**

■ During a Night Vision Goggle terrain flight takeoff, at approximately 100 feet above ground level (AGL), the aircraft experienced an engine under speed condition that did not respond in the emergency governor mode. During emergency autorotation, the aircraft encountered a brownout condition at approximately 20 feet AGL. The aircraft impacted the ground in a level attiude, collapsing the landing gear, coming to rest on its side.

### Class E
**V series**

■ During IFR flight at 5,000 ft MSL, the engine chip light illuminated and stayed on steady. Crew diverted to nearest suitable airport which was about 35 miles away. Approach and landing was completed safely. Aircraft was shutdown with no incident when clear of runways. Further maintenance checks and ground runs confirmed metal in the oil so the engine was changed.

**H series**

While aircraft was on the ground with engine running, grinding was noticed in forward right and left cyclic quadrant. Aircraft was shut down without further incident. Replaced left and right servo cylinder and lower push/pull tube bell cranks. Maintenance test flown OK.

## UH-60

### Class C
**A series**

Aircraft struck wires during flight. Wire strike protection system channeled and negotiated the wires. Crew executed precautionary landing without further incident. Postflight inspection revealed damage to windshield, FAT gauges, pitot static tubes and all main rotor blade tip caps.

**L series**

Following takeoff, crew noticed unusual noise from the aircraft's rotor system. Aircraft was landed. Three rotor caps were identified as damaged. Tree strike suspected during previous landing to an unimproved site.

### Class E
**A series**

During NOE flight no. 2 engine failed to low side then recovered briefly then failed to low side again with abnormal vibrations. Crew made a precautionary landing without further incident. Maintenance recovery team replaced the no. 2 engine alternator and recovered aircraft to home base without further incident. PQDR submitted.

# NEWS & notes

## Airport data available for hand-held computers

The DESC AIR Card contractor, AVCARD, announced that they developed and have deployed a system that allows their on-line data base to be accessed by persons using Personal Digital Assistants (PDA). This means that pilots and aircrews can link their "Palm Pilots" to the AVCARD web site and download Fixed Base Operators (FBO) names, phone/FAX numbers, hours of operation, services provided, etc., at 6000 world-wide airports. This breakthrough allows aircrews to access into-plane and local purchase airport data when away from their internet-connected PCs. Access to this technology is at www.avcard.com.

## Bee solution

Having problems with bees buzzing around your aircraft? The pesky creatures seem to have a special liking for Black Hawks. The rotor head apparently resembles an inviting tree crotch with lots of nooks and crannies around the gear box and unit joints that attract swarmers looking for a new hive. Here's one solution a unit used to ward off the critters.

One installation used 10 to 20 percent dishwashing soap in water to knock them down, because of the concern about unknown operational and corrosive effects of pesticides and solvents. The crew chief can do this, since you don't need a certified bug guy to apply soapy water. With good aim, good head pressure, a good spread on the nozzle and stream, and a healthy sense of adventure, even killer bees are no problem. The wetting agent unhooks their hamuli so they can't fly, and shuts down their spiracles, which deprives them of respiratory oxygen. They are immobilized within seconds.

Tip: The green kinds of dishwashing liquid worked best. Some of pink and yellow varieties have flowery scents that attract more critters.

—LTC Terry Carpenter, USAF, Armed Forces Pest Management Board, Washington D.C, DSN 295-8317 (301) 295-8317, carpentl@acq.osd.mil

## EXTRA! EXTRA! Read all about it

Writing your Flightfax article

Thinking about writing an article? Here are some helpful hints.

- Write about your own experiences, in your own words. Remember, ideally the story should sound like you are talking to a buddy.
- Future Flightfax topics will cover areas such as refueling, night vision goggles, spatial disorientation, simulators, FOD, flight data recorders… the list is as long as aviation problems can make it.
- A WORD document, e-mailed to **Flightfax@safetycenter.army.mil**, is the most efficient way for your story to get to us.
- Don't try to help us by putting it in column format. We just have to re-do it.
- Most *Flightfax* stories run about three double-spaced pages of text. If your story is longer or shorter than that, send it anyway. We can fix grammar and spelling. We'll try to keep it in your own unique "voice of experience."
- If you need help, e-mail or call the editor; if you have photos, send them, too. We are always looking for excellent photos. We need high resolution photos, preferably electronic, but a 35mm slide or a negative will do.
- Have fun with it.

Judy Wilson, Flightfax editor
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# Even when it's "Clear, Blue & Twenty-Two"

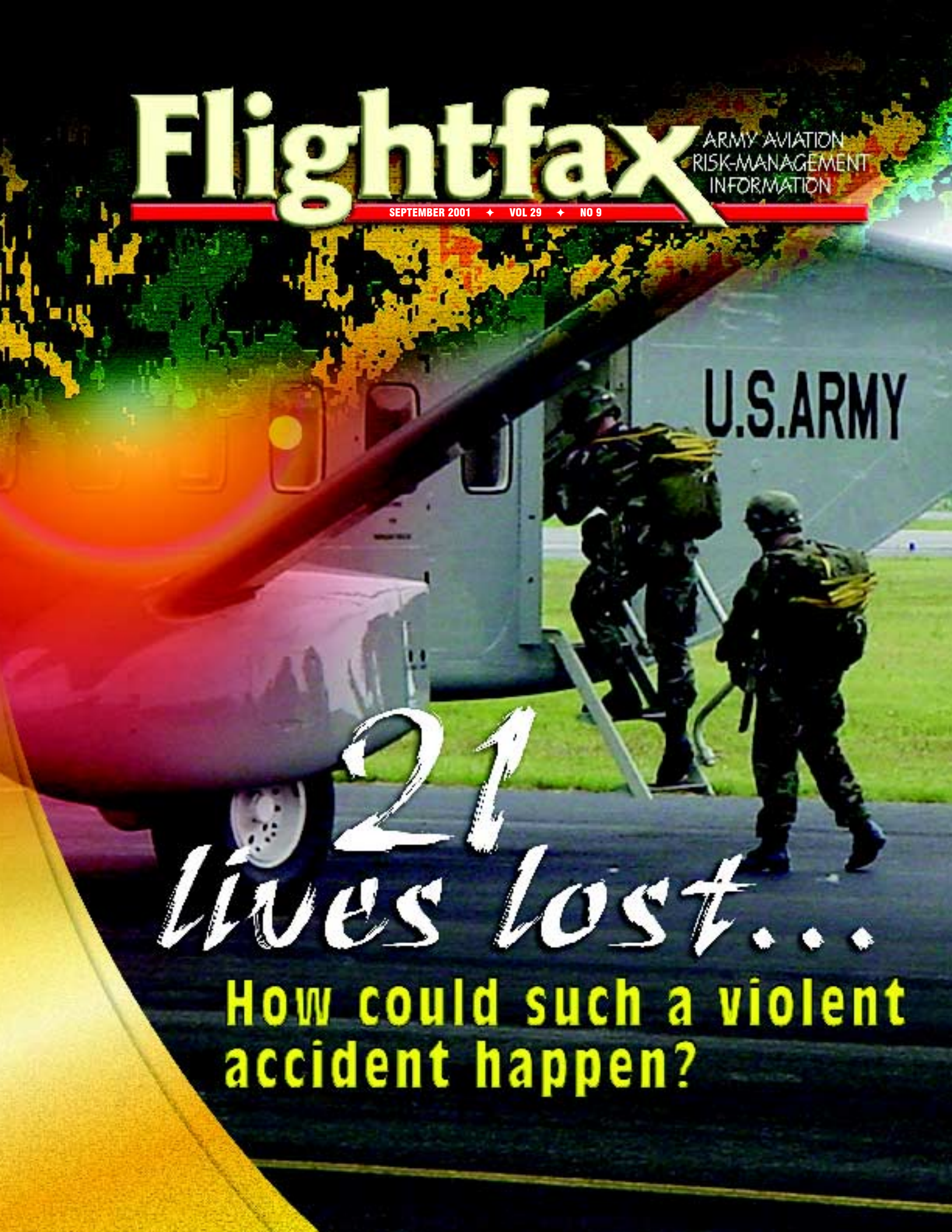
*An environmental accident can happen to you*

# Beware of Brownout

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

SEPTEMBER 2001 ✦ VOL 29 ✦ NO 9




## 21 lives lost...

## How could such a violent accident happen?

# Flightfax

ARMY AVIATION RISK MANAGEMENT INFORMATION

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James E. Simmons
Brigadier General, US Army
Commanding

DASAF's CORNER

*from the Director of Army Safety*

# Leaders out front save lives

I'm Jim Simmons. For the past 27 years, I have sat where you are—in the field executing tough missions. Now I'm the new Director of Army Safety.

I can sum up my safety philosophy fairly simply. **Units that participate in tough, well-disciplined training with technically and tactically competent leaders present have significantly fewer accidents.**

Safety is discipline. It is doing things right—every time! It's competent leaders being at the right place, at the right time, to make sound decisions. And it's leaders who enforce discipline and standards. Flapping canvas, not wearing Kevlars and chin straps, inattention to uniforms—these are small items that clearly indicate indiscipline in the unit. Fail to do these right, and pre-combat checks, pre-combat inspections, preflights, and checklists are next.

Leaders must be technically qualified to lead their unit. Pilot-in-command status is one measure of your technical qualifications. One method of demonstrating your technical proficiency is to put your checkride score up for others to emulate. The first guy going up for the DES evaluation should be the commander. It isn't enough to be technically proficient; you must also be tactically proficient. Your tactical competence must be reflected in two areas: your complete understanding of the unit's mission essential tasks list (METL) and how to do each of them correctly and proficiently; and of the battle space in which you will operate. Understand whom you are working with and how your support affects them. Dropping infantry soldiers 1500 meters from the landing zone and having them close the distance is unacceptable.

Commanders and leaders must be on the front lines in the aircraft accident prevention battle. We have to be actively involved before the aircraft breaks friction with the ground, and our most state-of-the-art safety weapon is risk management. It's up to each of us to set the standard in our units. I will tell you that normally, generally, almost always, no one accomplishes the risk management standard (that is, an informed decision at the appropriate level) while sitting behind a desk doing e-mail. As leaders, our presence must be on the front lines. While there are lots of folks to help us in integrating safety and risk management into our operations, leaders guide the boat. At the same time, we must also be skilled in using the talents and assets in our organizations. If you cannot physically be present, make sure the Command Sergeant Major, S3, XO, or another principal staff member is out there to observe the training.

My message to you is, don't stop training. Tough, realistic, disciplined training lessens casualties in combat. Effectively applying the 5-step risk management process, and ensuring risk decisions are being made by leaders at the appropriate level, will help us do the right training and do it safely. ★

# Flying in bad weather is high risk

Early one Saturday morning, I sat on my front porch having coffee as a large storm system approached from the west. It stretched from the Gulf of Mexico northeast in a line across the southeastern states, almost to the east coast. It had been three days in coming, but now it looked as though it would finally get here bringing needed rain. The winds began picking up—an indication that the storm would be here soon. As I watched it approach I wondered if anyone would dare to fly that day. A couple of hours later, my wife called for me to watch a news clip on CNN: an Army airplane had crashed, killing all on board.

Not long afterward, the Army Safety Center notified me that I would be deploying with an accident investigation team. I readied my deployment kit and was picked up by the board president. We arrived at the Safety Center where we were briefed on the latest details of the accident. Quickly completing last minute logistics coordination, we departed for the accident site.

## Looking for answers

We arrived on scene after dark but walked the crash site, looking at the devastation and wondering how such a violent accident could happen. An aircraft was destroyed and burned; 21 fellow servicemen were dead. Needless to say, it was a sobering experience standing there viewing the wreckage, and feeling the weight of the responsibility for finding the answers to everybody's questions: What happened and why?

For the next two weeks, the board sifted through wreckage; took pictures and measurements to document the site; reviewed numerous documents; interviewed anyone and everyone who heard, saw, or knew anything about this accident; and ensured we had accounted for all aircraft pieces and parts. This required an air search for major components of the aircraft. The left wing (outboard of the engine), both rudders, a wing strut, and several smaller pieces were found in a line downwind of the wreckage and as far away as two and quarter miles. As the investigation proceeded,

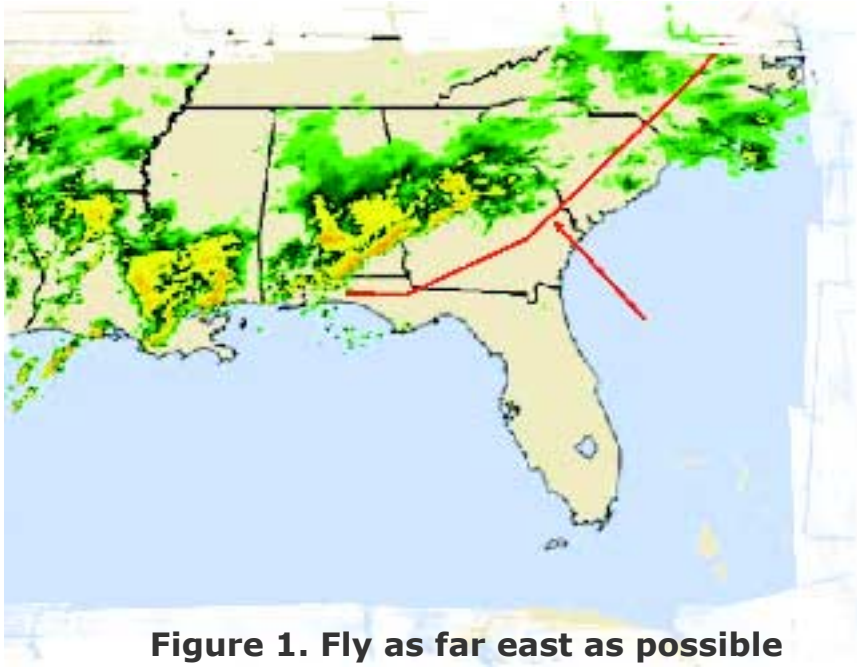

**Figure 1. Fly as far east as possible**

the picture of what happened became clearer.

### The flight

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

The flight crew arrived at base operations approximately 1 hour before the scheduled takeoff time on the day of the mission. About 40 minutes before takeoff, the crew received a weather briefing. The forecaster identified an area of thunderstorms along the crew's filed route of flight, with 16 to 45 percent coverage, and maximum tops at 50,000 feet. He told the crew to fly as far east as possible before turning north to avoid the weather (See Figure 1). There were no questions of the forecaster by the crew.

The flight crew filed an instrument flight rules (IFR) flight plan (which was printed at their home unit). The crew was to take off and fly a northeasterly route along a series of VOR airways to their destination. They requested a cruising altitude of 9,000 feet MSL and estimated their time en route as 3+00 hours, with 5+00 hours of fuel onboard. A passenger manifest listing 18 AFNG passengers to the flight plan was attached. The flight engineer loaded the aircraft with passengers and baggage as the flight crew readied the aircraft. He had computed the weight and balance for the flight prior to departing home station.

The crew departed the training site, and a few minutes later, air traffic control (ATC) had the aircraft under positive radar control at 9,000 feet. ATC then advised their traffic of Convective SIGMET 11E (See Figure 2). The advisory stated that there was a line of severe thunderstorms moving from 280 degrees at 30 knots with tops at 40,000 feet. Hail to 1 inch and wind gusts

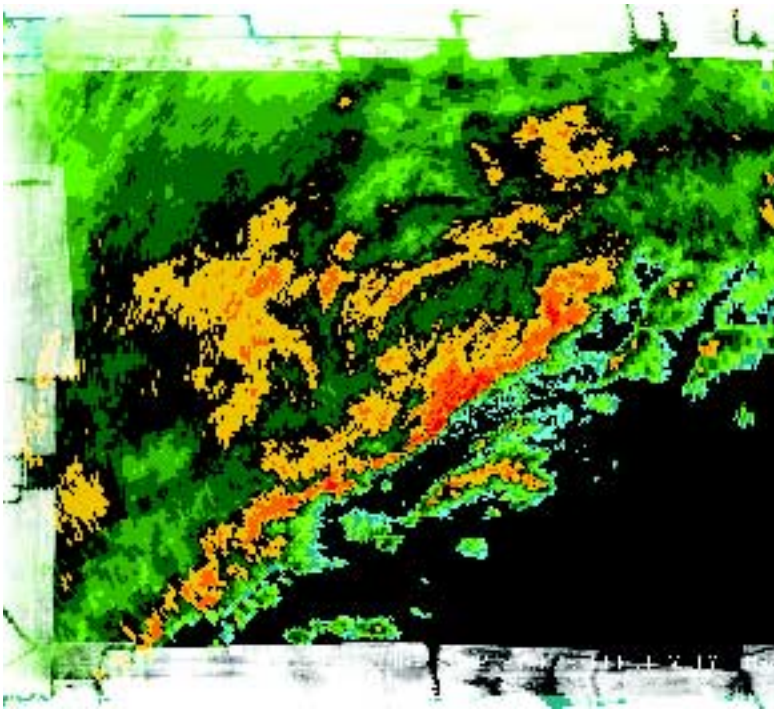

**Figure 2. Severe thunderstorm advisory**

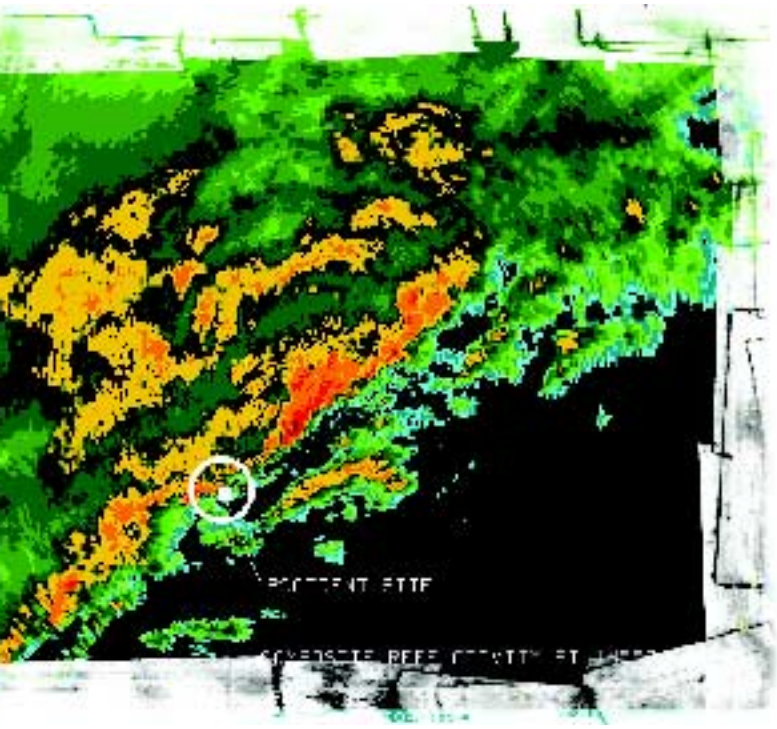

**Figure 3. Aircraft broke apart before impact**

to 60 knots were also possible. A convective SIGMET implies severe to extreme turbulence, severe icing, and the potential for microbursts and windshear. Traffic was further instructed by ATC to contact flight service or monitor HIWAS (Hazardous Weather In-flight Advisory Service) for the details of the advisory. The C-23 crew did not contact any flight service station for more information on Convective SIGMET 11E. (It is not known if the crew monitored HIWAS on any VOR in their vicinity.)

The crew continued to stay on their filed route of flight, avoiding buildups with small flight deviations. One approach control assisted them in avoiding some heavy thunderstorms (level 3 and 4 and some level 5s). Additionally, there was another aircraft approximately 15 minutes behind them that was receiving vectors of 090, 100, and 110 degrees to avoid buildups from ATC. The other aircraft was only equipped with a Stormscope, but the C-23 was equipped with a weather radar and a Stormscope and informed ATC of this fact (See figure 3).

The crew of the Sherpa never deviated to the east farther than a heading of 063 degrees. They maintained their northeasterly heading throughout the entire flight, with only short deviations for weather as each air traffic facility advised them of the line of severe weather. Approximately 45 minutes after takeoff, the crew checked in with their last ATC facility. The crew was given the current altimeter setting, which they read back. ATC received a good transponder code from the aircraft showing them at their assigned altitude. Soon thereafter, their altitude began to drop for no apparent reason. Ten minutes after checking in with this controller, the C-23 disappeared from the radar screen. The air traffic controller heard no Mayday call, nor did he receive a 7700 emergency transponder code. The controller made numerous attempts to contact the crew, but received no replies.

## Lessons re-learned

The crew had encountered extreme turbulence and upper level wind shear in the vicinity of a severe and violently developing level 4 to 5 thunderstorm. The crew lost control of the aircraft, the aircraft experienced loads beyond its design limits, and it broke apart in-flight before impacting the ground.

It's easy to learn from mistakes, but tragically that usually means somebody had to pay the price for our re-education. I hope as you read the account of this flight that you were able to see what can happen when you don't stay on the ground, land early and take cover, or stay well clear of severe weather.

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

**—Gary D. Braman, Fixed-Wing Aircraft System Safety Manager, U.S. Army Safety Center, bramang@safetycenter.army.mil, DSN 558-2676,CML 334-255-2676**

# Investigator's Forum

## Computer-assisted disasters

Computers, digital instruments, glass cockpits, and mission planning stations are tools that have taken Army aviation from the analog to the digital age. Each can assist aviators to plan and execute missions more efficiently and effectively. While many of us older guys were hesitant about them at first, we all have come to rely heavily on these systems.

They have a down side—what I call "computer-assisted disaster". I know of three accidents investigated by the Safety Center in which the flight crew either relied too heavily on digital aids or improperly entered data into the machine. In short, "Garbage in, Garbage Out." Unfortunately, in these cases, the garbage out was critical information that contributed to damaged and destroyed aircraft and lost lives.

### The accidents

A fixed-wing aircrew was flying in rugged terrain, at night, on what had become a routine mission. The crew was navigating using waypoints put into the computer by a mission specialist. Approximately one hour into the flight, the aircraft flew directly into the side of a mountain, killing all on board. Documents found in the wreckage indicate that the mission specialist apparently entered the grid coordinates incorrectly, and the flight crew failed to recognize the error prior to the flight. The aircraft was several miles off the planned course but directly between the improperly entered waypoints at the time of the accident.

### Weight was off

A rotary-wing flight crew was conducting gunnery when they experienced a bleed off of main rotor RPM and crashed into trees. The investigation revealed that the computer-assisted weight and balance form used by the crew did not list all the equipment installed on the aircraft. This led them to believe that the aircraft was lighter than it was. The root cause of the accident was insufficient power available for the maneuver. The flight crew did not realize they would have insufficient power because they did not know the actual weight of the aircraft. Fortunately, both crewmembers walked away from the accident.

Another rotary-wing aircrew suffered an extremely hard landing because they put their faith in a computer that told them they had sufficient power to conduct an OGE hover. Unfortunately, the takeoff weight put into the computer was off by over 1000 pounds.

### G.I.G.O.

Each of these accidents was in some way affected by the "Garbage In, Garbage Out" phenomenon; the "Fat Finger" exercise of putting flight data into a computer. However, the critical mistake was made when the pilot-in-command (PC) did not confirm all the numbers, after they were transformed from pencil and paper to the 1s and 0s of the digital world.

How do we avoid these "computer-assisted disasters"? The most obvious way is to ensure the numbers are right when they go in the first time. Take your time. More importantly, PCs have to ensure that the numbers are correct by checking them, either by comparing them to other logbook entries or to the good old hand held map. If the PC inputs the data, the copilot needs to check them. Let's not let labor-saving devices become aircraft destroying ones.

—LTC W.R. McInnis, Aviation Systems and Accident Investigation Division, DSN 558-2450, CML 334-255-2450, mcinnisw@safetycenter.army.mil

# BROKEN WING AWARD

The Army Aviation Broken Wing Award recognizes aircrewmembers who demonstrate a high degree of professional skill while recovering an aircraft from an inflight failure or malfunction requiring an emergency landing. Requirements for the award are in AR 672-74, Army Accident Prevention Awards.

**CW2 Aaron L. Fisher,**
**Pilot in Command (PC)**
**CW3 Roy A Hollins co-pilot (PI)**

While ferrying a flight of three OH-58D (I) aircraft over water to a carrier, the crew, CW3 Hollins (PI) and CW2 Fisher (PC) in chock three heard a mild report from the rear of the aircraft. This noise was followed by a very noticeable vibration and a 10-15 degree right and left yaw on either side of the course line.

CW3 Hollins, a maintenance officer and maintenance examiner, got on the controls and began assessing the aircraft's controllability as well as its airworthiness. CW2 Fisher confirmed the transfer of controls and immediately declared an emergency to the tower. CW3 Hollins immediately assessed the vibration he felt in the airframe and pedals as a high frequency vibration. While adjusting the airspeed, he applied pressure to the anti-torque pedals to see if they would respond to his inputs. The pedals would not move and appeared to be stuck.

Immediately after the emergency was declared, a very loud report was heard by the crew. This was followed by a 90-120 degree yaw, a nose pitch down, and a right roll. The aircraft was now in an out-of-control situation.

CW2 Fisher made a mayday call to the tower. CW3 Hollins determined that his only course of action was to place the aircraft in an autorotational profile by reducing the collective and adjusting the throttle to try to regain control of the aircraft.

After the collective was reduced, the aircraft stopped its right yaw. CW3 Hollins applied the cyclic in the direction of the turn and was able to regain control of the aircraft, which was 180 degrees from the original heading. CW3 Hollins entered a deceleration at about 100 feet and allowed the tail of the aircraft to make contact with the water.

As the aircraft's tail contacted the water, CW3 Hollins pulled the remaining collective and reduced the throttle to the idle position. The aircraft settled into the water without any forward momentum and settled upright without any collateral damage. CW2 Fisher jettisoned the right crew door. As the aircraft settled, the crew exited through the right pilot's door. The crew suffered minor bruises and mild hypothermia.

The entire crew

demonstrated outstanding airmanship throughout the emergency, executing the prescribed emergency procedure to standard. CW3 Hollins and CW2 Fisher communicated effectively and utilized effective cockpit resource management, which played an important role in the successful outcome of this potentially disastrous situation. The decision of the PC to relinquish the controls to the more experienced aviator allowed CW3 Hollins to continue the procedure. The crew's technical knowledge, situational awareness, and outstanding airmanship prevented the possibility of this becoming a fatal accident. (Editor's note: This over water incident was featured in the June 2001 issue of *Flightfax*.)

### CW2 Christopher T. Rowley

During a zero illumination night flight using Night Vision Goggles (NVG), CW2 Rowley was in the left seat of the OH-58D (I), operating the mast mounted sight. The pilot was flying from the right seat maneuvering into the observation point, which was located behind a ridge line with an extremely steep, tree-covered slope. The aircraft was loaded with approximately 315 pounds of fuel, 168 rounds of .50 caliber ammunition, and three multipurpose submunition (MPSM) 2.75" rockets.

As the aircraft decelerated, the LOW HYD PRESS and SCAS DISENG caution messages illuminated on the multi-function display, and associated audio alarms sounded. CW2 Rowley, sitting in the left seat, took the controls and immediately attempted to regain forward airspeed and altitude. He felt pronounced control feedback, but regained aircraft control in time to clear the ridgeline that was in the front of the aircraft. Realizing that the aircraft had suffered a complete hydraulics failure, CW2 Rowley declared an emergency to the tower, and directed the pilot to safe the weapons system and assist him with the appropriate emergency procedure. When hydraulic power was not restored by pulling the HYD SYS circuit breaker, CW2 Rowley realized that it was necessary to fly to an area that would permit a run-on landing. CW2 Rowley opted for an airfield because it afforded crash rescue facilities, but decided on an alternate facility which precluded flying through more mountainous terrain. The crew contacted a sister aircraft for flight following, and advised them of their emergency and intentions.

CW2 Rowley approached the airfield at approximately 400 feet above ground level (AGL) and 60 KIAs. The crew completed a high reconnaissance of the area to ensure there were no obstacles on the runway. CW2 Rowley then opted to attempt the run-on landing to avoid the most extreme terrain conditions and the highly lit areas that would interfere with the NVGs. As the aircraft cleared a set of trees and crossed the runway threshold, CW2 Rowley executed a smooth touchdown with airspeed slightly above ETL. Once the aircraft came to a complete stop, he notified his sister ship and the tower that the aircraft was down and safe, and he performed normal shutdown procedures.

CW2 Rowley's actions were extraordinary. A complete hydraulics failure at low airspeed in the OH-58D is difficult, if not nearly impossible, to control. The situation on this night was greatly exacerbated by the fact that the crew was flying NVGs on a zero illumination night; this was the first time either crew member had flown a gunnery at this range; the co-pilot was at readiness level 2; the terrain was extremely mountainous and full of wire obstacles, and the aircraft was fully armed. CW2 Rowley displayed incredible flying skill, executing exacting crew coordination with his co-pilot, and flawlessly executed the emergency procedure from the onset of the emergency, to the touchdown and shutdown of the aircraft. CW2 Rowley's competency, good judgement, and skill saved the lives of two crewmembers and a multi-million dollar aircraft.

# Laser FAQs: The second of a three-part series

## Part II – Laser Protection

Last time, in Part I of our laser series, we answered questions concerning the nature of lasers on the modern battlefield. This month, in Part II, we address questions about laser protection. The challenge of providing protection against an ever-changing laser threat, while not compromising performance, is a difficult one.

**Q: What is my greatest concern from exposure to lasers?**

**A:** For the aviator, the greatest concern is potential injury to the eye. While the skin does absorb laser energy, much more energy is required for skin damage than for eye damage.

**Q: Why is the eye at such great risk?**

**A:** The eye is designed specifically to focus light onto the retina of the eye. For continuous wave lasers, the eye will focus a higher concentration of energy on a very small area. In addition, laser energy can be absorbed by the various parts of the eye, causing thermal damage. Pulsed lasers can cause damage by a shock-wave effect, similar to that caused by a bullet.

**Q: What parts of the eye can be affected?**

**A:** Ultraviolet and far-infrared laser energy can damage the cornea. Visible and near-infrared lasers will be focused on and damage the retina.

**Q: What are my chances of being seriously injured by lasers?**

**A:** To date, only a handful of laser injuries have been documented, and most of these have been self-inflicted. Whether damage will occur, and to what extent, depends on many factors. These include the laser's wavelength and power, exposure duration, distance from laser source, pulse repetition frequency (for pulsed lasers), and the nature of the exposure (direct beam or reflection).

**Q: Do my sunglasses or standard flight visors provide any protection against lasers?**

**A:** Your sunglasses and standard clear/tinted visors provide virtually no "real" protection against military lasers, no more than a sheet of paper would provide protection from bullets. However, they will afford you some protection against dazzle and flash blindness.

**Q: What form of laser protection is available to the aviator?**

**A:** Both 2-notch (NSN 8415-01-394-8026) and 3-notch (NSN 8415-01-394-8024) laser visors have been fielded for the HGU-56P flight helmet. The 2-notch is "light green" in color; the 3-notch is "bronze or brownish." The notches cover the military laser wavelengths considered to present the greatest threat. The 2-notch protection can be worn either day or night, but the 3-notch protection is too dark to be worn safely at night. For the Apache aviator, a 2-notch visor (NSN 1270-01-327-3107) is available. Spectacles (made with pale green KG-3 or KG-5 glass) protecting against the AH-64's own laser are available.

**Q: What is meant by a "2-notch or 3-notch" laser visor?**

**A:** A "notch" refers to a section of the spectrum for which your visor offers protection. Therefore, a "2-notch" visor provides protection against two different lasers, a "3-notch" against three different lasers. However, you need to know *which* laser wavelengths your visor protects against. The 2-notch visor protects against Ruby (visible red) and Neodymium YAG (infrared) lasers. The 3- notch protects against these two and one additional wavelength that has a military application.

**Q: How is the protection level of a visor rated?**

**A:** Any laser protective device is rated by: a) the wavelengths it protects against and b) the amount of protection for each of those wavelengths. The amount of protection is called the "optical density" or "OD." An OD value of 1 means 1/10th of the incoming laser energy gets through; OD=2 means 1/100th gets through; OD=3 means 1/1000th, etc. OD values of greater than 3 are usually required to provide adequate protection.

**Q: How does laser protection work?**

**A:** Current laser protection methods are generally of two types: absorption and reflection. Absorption is achieved by mixing a dye with the standard visor during molding. The dye absorbs the laser energy that strikes the visor. Reflective coatings are typically "sandwiched" between two layers of polycarbonate and reflect the laser energy.

**Q: Does the protection level of my laser visor hold up over time?**

**A:** No, most dyes used in absorption visors are affected by sunlight exposure. Current guidance is that absorptive visors should be replaced after 600 hours of sun exposure. To maximize the life of laser visors, wear them only when a laser hazard/threat is anticipated. Reflective coatings are not known to degrade over time or with exposure to sunlight.

**Q: Is there a performance price for wearing laser protection?**

**A:** Yes, any time you have to look through one more layer between you and the outside world, your visual performance will be degraded, even if ever so slightly. In addition, since the protective device may be designed to block certain visible wavelengths, it may affect your ability to view cockpit displays and warning lights.

**Q: Do scratches on my laser visors affect my laser protection?**

**A:** Minor scratches will diffract and defocus the intensity of the laser, which actually increases the laser protection. Large scratches which might allow a laser to penetrate, will be objectionable from a pilot's visual perspective and are easily identified.

**Q: Can my mechanic/technician use my laser visor for protection while he is performing maintenance on the rangefinder/designator?**

**A:** No. Your visor was designed to provide you adequate protection at operational combat ranges. A technician working on the system is working at point blank range. His OD requirements are much greater than yours.

**Q: Does looking through optics give me protection against lasers?**

**A:** No, direct-view optical systems do not provide protection...unless they specifically have a laser filter installed, and, even then, they protect only against those laser wavelengths for which the filter was designed.

**Q: Do my NVGs offer laser protection?**

**A:** Yes. When you are looking in the direction of the laser, the energy *does not* pass through the goggles. But, the goggles will bloom. And, of course, if you are looking under or around the goggles, you are at risk.

**Q: What can and should I do if I am exposed to a laser?**

**A:** Next month, in the third and final part of this laser series, questions regarding laser injuries will be answered.

**Q: Who can I contact for more information on laser visors?**

**A:** HGU-56/P wearers can contact PM-AES (see below). Apache aviators can contact Mr. Larry Best, Aircraft Armament Group Leader, DSN 793-2329.

**—Jim Hauser, product engineer, PM-AES, DSN 897-4267, (256) 313-4267, jim.hauser@peoavn.redstone.army.mil; Clarence E. Rash, physicist, USAARL, DSN 558-6814, (334) 255-6814, Clarence.rash@se.amedd.army.mil**

NCO CORNER

# Aviation life support message RECAP

AIS 01-01 rescinds AIS 99-01 summary of ACIS messages about ALSE. This is a list of messages transmitted by PM-ACIS (SFAE-AV-LSE) from 1 February 1996 through 31 December 2000. This annual update of messages assists units in checking to see if they have received all ALSE Messages. The 2000 PM-ACIS recap:

✔ AIS 96-01 dtg 080026z Feb 96 (superseded): by AIS 96-12: Summary of AIS 1995 messages

✔ AIS 96-02 dtg 041636z Mar 96 (superseded): by AIS 96-12: Summary of all messages published by the product manager

✔ AIS 96-03 dtg 072220z Mar 96 (current): Overview of the SPH-4/SPH-4B Flyer's helmet

✔ AIS 96-04 dtg 041641z Mar 96 (expired) by AIS 97-02: Repeat of HQDA-AV message dtg 081254z Aug 95

✔ AIS 96-05 dtg 041647z Mar 96 (superseded): by **www.http://134.78.40.107** : Questions about the AN/PRC 90, AN/PRC90-2

✔ AIS 96-06 dtg 041659z Mar 96 (expired) by the Army FEDLOG: Medical components used in the SRU-21/P vest

✔ AIS 96-07 dtg 041711z Mar 96 (superseded): by AIS 97-03: $CO_2$ cartridge

✔ AIS 96-08 dtg 041239z Apr 96 (current): Aviator and aircrew laser eye Protection

✔ AIS-96-09 dtg 041715z Apr 96 (current): info on the SRU-21/P component list

✔ AIS 96-10 dtg 051938z Mar 96 (current): survival rations NSN 8970-00-082-5665

✔ AIS 96-11 dtg 041244z Apr 96 (superseded): by AIS 96-15: signal kit foliage penetrant

✔ AIS 96-12 dtg 062313z Apr 96 (superseded): by AIS 98-01: summary of messages published

✔ AIS 96-13 dtg 291849z Jul 96 (superseded) by AIS 97-08: Manual Reverse Osmosis demineralizer (MROD-06)

✔ AIS 96-14 dtg 591855z Jul 96 (superseded) by AIS 97-03: helicopter oxygen system

✔ AIS 96-15 dtg 301900z Jul 96 (current): signal kit, personnel distress

✔ AIS 96-16 dtg 301906z Jul 96 (superseded) by AIS 97-07: aviation life support school

✔ AIS 96-17 dtg 011656z Aug 96 (current): repeat of Joint Services Sere Agency (JSSA)

✔ AIS 96-18 dtg 051531z Aug 96 (current): mustang survival, mac 10 anti-exposure suit

✔ AIS 96-19 dtg 142203z Aug 96 (current): disassembly/ reconfiguration authorization

✔ AIS 96-20 dtg 232000z Sep 96 (current): life raft and container assembly

✔ AIS 96-21 dtg 232215z Sep 96 (superseded) by AIS 97-08: manual Reverse osmosis (water purifier MROD-06)

✔ AIS 96-22 dtg 262032z Sep 96 (superseded) by AIS 97-02: delay of this HQDA message

✔ AIS 97-01 dtg 051858z Feb 97 (superseded) by AIS 98-01: summary of 1996 AIS messages

✔ AIS 97-02 dtg 052025z Feb 97 (current): repeat of avn wpn sys,DALO-SMV message ensure that there is one fully operational survival radio is on board the aircraft

✔ AIS 97-03 dtg 052029z Feb 97 (current): Compressed gas cylinder overhaul/inspection

✔ AIS 97-04 dtg 052031z Feb 97 (superseded) by AIS 01-02: use and inspection of harness, safety restraint

✔ AIS 97-05 dtg 052034z Feb 97 (current): BA-1574/u battery used in the SDU-5/E light

✔ AIS 97-06 dtg 052054z Feb 97 (current): survival kit multi-climate for OH-58D aircraft

✔ AIS 97-07 dtg 052103z Feb 97 (superseded): by www.http://134.78.40.107 Aviation life support equipment course

✔ AIS 97-08 dtg 052104z Feb 97 (current): manual reverse osmosis

✔ AIS 97-09 dtg 031939z Jun 97 (current): leg straps on restraint harness

✔ AIS 97-10 dtg 032017z Jun 97 (current): HGU-56/P ear cup assembly

✔ AIS 97-11 dtg 221812z Sep 97 (superseded): by AIS 99-06 SARVIP modification strap kit and instruction

✔ AIS 98-01 dtg 102011z Mar 98 (superseded): by AIS 99-01 summary of 1997 ACIS messages

✔ AIS 98-02 dtg 151356z May 98 (superseded): by AIS 98-05 turn in of SPH-4/4B helmets

✔ AIS 98-03 dtg 151531z May 98 (current): optional removal of HGU-56/P nape strap pad foam insert

✔ AIS 98-04 dtg 111621z Aug 98 (current): matches, non safety, wood (NSN 9920-01-154-7199)

✔ AIS 98-05 dtg 111632z Aug 98 (current): revision of turn in of SPH-4/4B helmets

✔ AIS 99-01 dtg 201938z Apr 99 (superseded): by AIS 01-01 summary of 1999 ACIS messages

✔ AIS 99-02 dtg 281951z Apr 99 (current): revision of compressed gas cylinder overhaul/inspection

✔ AIS 99-03 dtg "not issued" see AIS 00-02

✔ AIS 99-04 dtg 161635z Jun 99 (current): authorized alternate paint for spot painting of the HGU-56/P helmet

✔ AIS 99-05 dtg 011932z Jul 99 (current): aviation life support equipment course

✔ AIS 99-06 dtg 152138z Sep 99 (current): rescind AIS 97-11 modification strap kit and instructions

✔ AIS 99-07 dtg 131635z Dec 99 (current): announcement of the M-45 mask fielding

✔ AIS 00-01 dtg 132205z Mar 00 (current): aviator and aircrew member laser eye protection

✔ AIS 00-02 dtg 011732z May 00 (current): aircrew survival vest components

✔ AIS 00-03 dtg 312126z Aug 00 (current): clarification of shelf/service life of lensatic compass NSN 6605-01-196-6971

If you have not received, or need copies of a PM-ACIS message(s) after the initial release of the message, you can obtain copies using www.peo aviation web site for additional news, system updates and for copies of the ALSE messages. The web site address is "**www.peoavn.redtone.army.mil/aes/_private/post_req/messages _req.html**"

Aircrew integrated systems point of contact for this message is Mr. John Jolly, SFAE-AV-LSE, DSN 897-4262 or (256) 313-4262. FAX is DSN 897-4346 or (256) 313-4346. Email **john.jolly@peoavn.redstone.army.mil** or SSG Adam Byington, SFAE-AV-AES, DSN 897-4655 or (256) 313-4655, FAX DSN 897-4346 or (256) 313-4346, **adam.byington@peoavn.redstone.army.mil**

# ACCIDENT BRIEFS

*Information based on preliminary reports of aircraft accidents*

## AH-64

### Class E
***A series***

■ Aircraft's shaft-driven compressor light illuminated in flight with loss of pressurized air system. Aircrew executed emergency procedure and landed to the nearest open field. Normal shutdown. Maintenance replaced shaft driven compressor. Aircraft released for flight.

## C-12

### Class C

■ Over temp indicated during flight. Maintenance performed post flight inspection. Engine replaced.

## CH-47

### Class E
***D series***

During cruise flight the No.2 engine chip detector light illuminated. The crew completed the emergency procedure and terminated the flight at the airfield. The engine was replaced due to excessive metal in oil.

■ During four wheel taxiing, hydraulic fluid began leaking within the flight control closet. Aircraft was immediately shut down. Maintenance found that No.1 flight hydraulic system pitch transfer tube O-ring failed. O-ring was replaced and aircraft was returned to service.

## OH-58

### Class A
***D-I series***

■ During a NVG terrain flight reconnaissance at approximately 130 feet AGL and approximately 3 knots indicated airspeed, the rotor speed drooped from 100% NR to 86%. The rotor drooped to the point that the crew was unable to sustain controlled flight. As a result, the crew lost tail rotor authority and directional control of the aircraft. The droop was unrecoverable based on the low altitude and low airspeed at the time of the droop and the rapid onset of the initial descent. The aircraft impacted into the trees and came to rest on the left side, nose down on a 30° slope resulting in major aircraft damage.

### Class B
***D-I series***

■ While cruising at 1,300 feet MSL, aircraft engine experienced a compressor stall, followed by engine failure. Autorotation was initiated, and aircraft landed hard. Four main rotor blades were destroyed, right skid and aft saddle mount were broken with some underfuselage wrinkling. Tailboom with tail rotor was broken off, both chin bubbles were broken, left side windscreen was cracked, and AN/ALQ144 destroyed.

### Class E
***A series***

■ During hover, aircraft's right rear door came open. Crew closed door, but door would not stay secured. Aircraft landed without further incident. Door was replaced.

***C series***

■ During low level flying, binding of aircraft's cyclic occurred. Aircraft was landed without further incident. Cyclic stick boot was replaced.

***D(I) series***

■ While on climbout during a mixed aircraft formation takeoff, chalk four of the flight encountered the lead aircraft's rotor wash. The aircraft began to settle to the ground. The pilot on the controls applied collective to stop the descent. The mast torque indicated 117% for one second. The pilot immediately broke formation, declared a precautionary landing, and returned to base. The aircraft was inspected. No damage found, and the aircraft was released for flight.

## RC-12

### Class B
***D series***

■ While being vectored by ATC for storm activity, aircraft was struck by lightning while descending from assigned cruise altitude. Post flight inspection revealed damage to the right prop, right inboard and outboard flaps, and trailing edge of right elevator.

## UC-35

### Class C
***A series***

■ While in flight performing an avionics test, aircraft was struck by lightning and hail. Aircraft was landed without further incident. Inspection revealed damage to nose cone and several small holes in de-ice boots.

## TH-67

### Class E
***A series***

■ During cruise, tail rotor chip illuminated. Aircraft landed without further incident. Replaced tail rotor gearbox.

## UH-60

### Class A
***K series***

■ Aircraft landed hard in brown-out conditions. Damage to landing gear, undercarriage and FLIR. One crewmember sustained minor injuries.

### Class B
***A series***

■ During a simulated engine failure at a hover in dusty conditions, aircraft landed hard. Damage to right landing gear strut. Aircraft came to rest upright. Crew exited without assistance. One crewmember injured.

### Class C
***A series***

■ Following roll-on landing, post flight inspection of aircraft revealed one main rotor blade had made contact with the AN/ALQ-144. Damage to rotor hub and droop stops.

***L series***

■ Aircraft's stabilator made contact with the ground during landing into open field.

### Class E
***A series***

■ While in level flight at 400 feet AGL, 120 knots, the No.2 Engine Fire light illuminated. Prior to illumination of the fire light, the aircraft had been flown through moderate to heavy rain. The aircraft was landed and shutdown without further incident. Maintenance replaced both No.2 Engine Fire Detection Sensors and the aircraft was released for flight.

# NEWS & notes

## Accident classification change

Effective 1 Oct 01, Army accident classifications as defined in paragraph 2-2, AR 385-40 (Dec 94), will be changed as follows:

**1. Class A:** No change.

**2. Class B:** Minor change. The Class B threshold for the number of persons hospitalized in the same accident is reduced from five to three or more persons.

**3. Class C:** No change to personal injury. Property damage changed from $20k to less than $200k. (This increases the lower threshold from $10k to $20k.)

**4. Class D:** No change to personal injury. Property damage changed to $2k to less than $20k. (This increases the upper threshold from $10k to $20k.)

The classifications are not effective until 1 Oct 01. All other requirements of AR 385-40 (Dec 94) remain in effect until publication of a revised document expected in late FY02. Contact your local Safety Office or your Major Army Command (MACOM) Safety Office for supplementary requirements in your organization.

—Msg DTG 081810Z Jun 01 subject: Clarification of Army Accident Classes

## AN/PRC-104B radio card

Need the operator instruction card for the AN/PRCB radio? CECOM has a limited supply and will send you one as long as their supply holds out. Send an e-mail to **Gloria.Richardson@mail1.monmouth.army.mil**

—PS Magazine

## Flight data recorders – Not just for accident investigation

When we think about flight data recorders, we usually imagine the "black box", that first thing that investigators look for after a major aviation accident.

Officials at the U.S. Army Safety Center, however, have discovered that cost savings can be a part of the package of current applications of flight data recorders, or FDRs.

Recently, the Safety Center's FDR Analysis section saved the Army over $350,000 through the use of flight data recorders. When a flight crew reported an engine over-torque on an OH-58D Kiowa Warrior aircraft, the fleet maintenance officer thought he would have to replace the aircraft's engine. The aircraft's engine history page on the Multi-function Display showed an over-torque of 122% for no time. Replacing the engine would have cost the Army over $350,000. However, downloading the aircraft's data transfer cartridge (DTC), in order to analyze the engine data, showed that the engine achieved a maximum torque that was less than the first reported 122% (119.925% for 0.8 seconds). Based on that information, the fleet maintenance officer determined that the aircraft's engine does not have to be replaced - saving the Army over $350,000.

—Joseph P. Creekmore, Jr, Chief, Flight Data Recorder Analysis Section, USASC, DSN 558-2259 (334) 255-2259, creekmoj@safetycenter.army.mil

## Tailplane icing video

Unit instructor pilots should provide in-depth classes on aircraft icing, tailplane icing and the different recovery actions between wing stalls and tailplane stalls. Until the Army can determine exact tailplane stall recovery procedures, fixed wing aviators can view a 23-minute video entitled 'Tailplane Icing' produced by the NASA Glenn Research Center Icing Branch (Website: http://icebox.grc .nasa. gov). This video tells what tailplane icing is, how you get into it, and corrective actions to get you out.

# Supervision and evaluation: ensuring effectiveness

The previous article in this series discussed the fourth step of risk management, i.e., how hazard controls can be implemented by various means of communications and rehearsal. The current article will discuss the fifth step of risk management, which involves the supervision and evaluation of controls.

Supervision is nothing more than monitoring and enforcing the execution of control actions. There are a number of monitoring methods including commander and leader presence, pre-combat inspections and checks, situation reports, spot checks, and back briefs. Effective monitoring should answer the following questions:

- Are the right people/units performing the actions?
- Are they doing these actions at the right time and place?
- Are they using the right procedures/equipment?
- Are their actions properly coordinated with the people and or /units providing support and/or being supported?

If at any time the answer to any of the above questions is "no", enforce the control by taking action that will get things back on track.

—Captain Wayne Gilstrap, USASC, DSN 558-3819 (334) 255-3819, gilstraw@safetycenter.army.mil

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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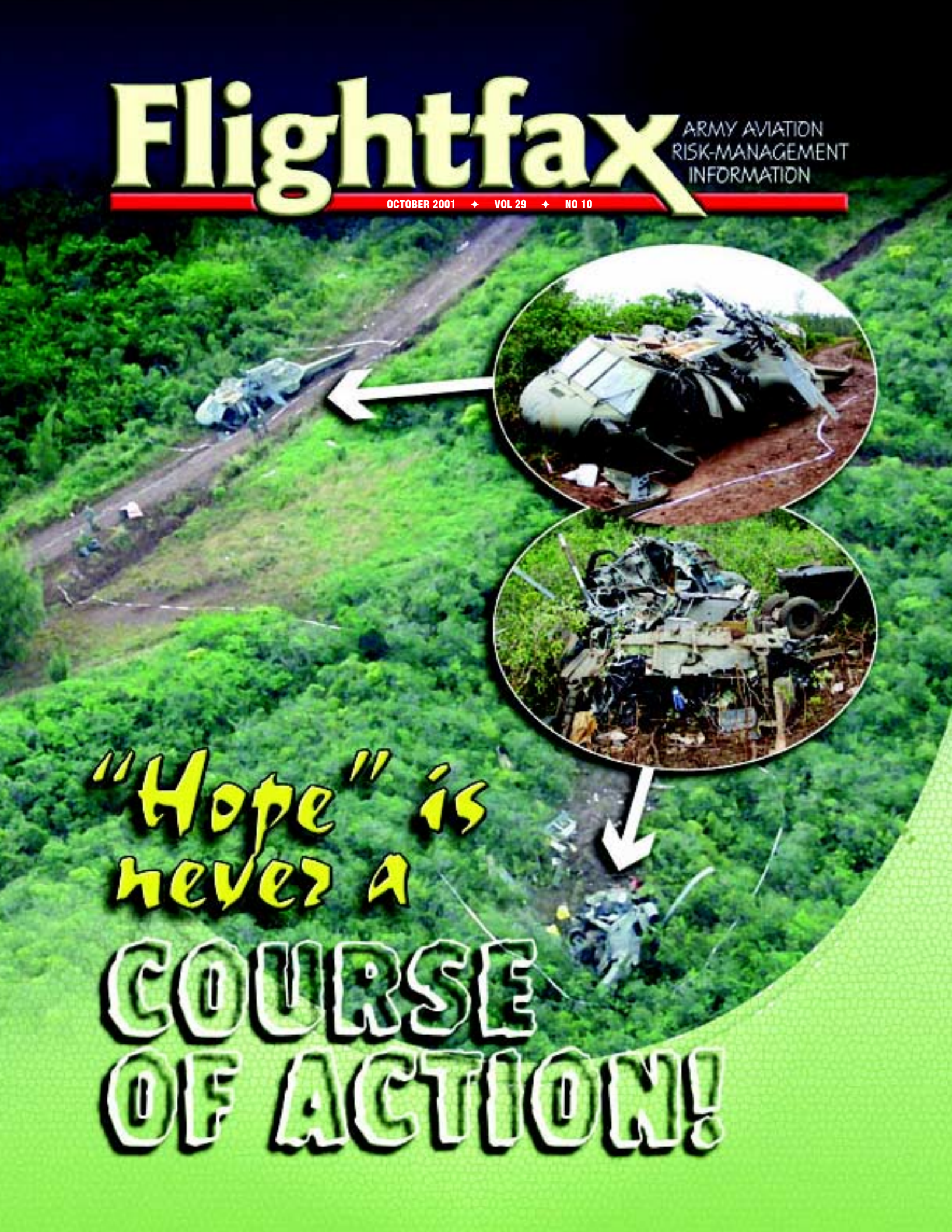

## "Hope" is never a COURSE OF ACTION!

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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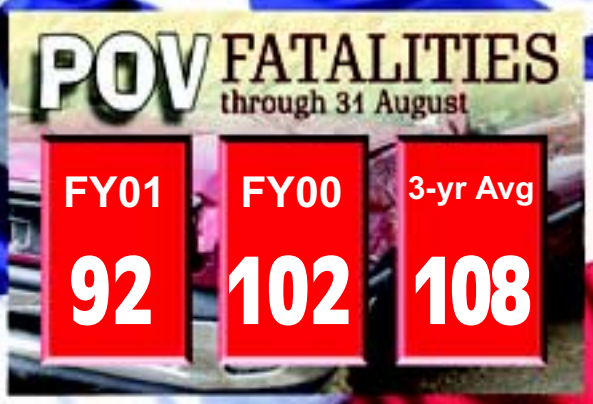


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James E. Simmons
Brigadier General, US Army
Commanding

# DASAF's CORNER

*from the Director of Army Safety*

## Know the limits of your aircraft

Having been in this job just a few short months, I can already see the truth in the old adage that "There are no new accidents." Accident investigations continue to reveal recurring problems—such as power management. The account of Black Hawk crashes in this issue of Flightfax shows that it's critical for aviators to clearly understand how power-limited aircraft will perform during all phases of assigned missions.

Understanding and applying available aircraft power throughout the mission is critical, and I do not know if we are doing a good job of either. The Army continues to deploy and operate in demanding environments; unfortunately, most of us who are deploying are accustomed to operating from installations located near sea level. When we arrive in a high altitude environment, such as Bosnia; a hot desert environment like Kuwait; or a hot, high environment such as Fort Irwin, we find ourselves operating in vastly different conditions.

It is crucial to know and fully understand the limits of your aircraft. Commanders must understand how power performance affects their aircraft and how it will affect the mission. Sending an aircraft out on a mission knowing it will not be able to hover out-of-ground effect until it burns off fuel because the demand for hover power exceeds the capabilities of the aircraft, and pilot, requires careful consideration and management of the risks. Commanders must use solid risk-based planning and evaluation processes that will reduce the hazards associated with operating in marginal-power conditions.

While commanders are ultimately responsible for mission success, pilots who operate their aircraft are responsible for planning and flying their aircraft safely based on known hazard within the environment in which they must operate. Pilots who fly the OH-58D, as well as the AH-64, are well aware of the fact that adding munitions to the aircraft increases weight, which puts you operating at or near your maximum gross weight for the aircraft.

Everyone knows how to complete a PPC (performance planning card), but do you really understand what those numbers on the card are telling you? They are telling you what power is available for the conditions you are operating in, what your maximum power limits are, and what conditions will place you at your maximum power limits. Those of us who flew single-engine attack aircraft know you can't power your way out of every problem. The idea of just pulling an armload of collective has to change.

With the weight and operating conditions of today's aircraft, you must evaluate each and every potential hazard associated with the environmental condition in which you plan to operate. In other words, landing with a heavy aircraft and a 20-knot tail wind can spell disaster. High gross weight, high altitude, high-density altitudes, and executing a downwind approach affect the aircraft performance—and that is something that you may not see

on your PPC.

Pilots who flew the older Army aircraft were taught and learned about power management using a stubby pencil. They also had the opportunity to learn from mentors who had already "been there, done that" and knew the skill it took to operate safely with limited power.

Power management problems are only going to get worse as we start using authorized automated performance planning programs, which are designed to perform the calculations and then print a PPC. Automation has resulted in the stubby pencil's demise. It's great that technology can do the calculations and give you the data, but the aircrew still must be aware of what the data actually means and how it will affect their mission.

Pilots who are assigned to Longbow units must remember that they have a mix of 701 and 701C engines, and the power available is different. If you fly an aircraft with a 701C engine and then you get into an aircraft with a 701 engine, you will now have less power. Know the type engine in your aircraft before you get into a situation that could require more power than your engine is capable of producing.

Training, continual awareness, and constant performance planning are key to preventing mishaps involving power-management procedures.

■ The initial Aircraft Qualification Courses (AQCs) are improving the performance planning training. However, units still need to focus on what the PPC is telling you and understand that it is not telling you what the maximum power the crew is going to ask from the aircraft will be. Everyone needs to have a full understanding of what the charts can give you.

■ The Safety Center has produced a video called Power Matters, PIN: 711267, which is available to you at your local TASC or via the Internet at http://afishp6.afis.osd.mil/dodimagery/davis/.

■ Simulators are good tools for teaching pilots about the power margins of what they have computed versus what they face in operating conditions, such as high gross weight, density altitude and so on. Use them! The new Longbow crew trainer is a long overdue system to help us in this critical area.

■ The Colorado National Guard teaches a high-altitude power management course. Their number is (970) 524-7702 ext 2915. Ask for CW4 John Such.

Pay attention; don't run out of airspeed, altitude, power, and great ideas at the critical time when you need all four. Fly safe.

**—BG James E. Simmons**

## POV accidents still number one killer

In this issue, we have included two pullout posters concerned with privately owned vehicle (POV) safety. POV accidents are the leading cause of death among U.S. Army soldiers. The Chief of Staff of the Army, General Erik K. Shinseki, has set goals to cut the numbers of POV deaths in Army families. The safety of you and of your families is paramount.

# "Hope" is never a COURSE OF ACTION

Aviation has proven time and again that it is the most maneuverable and lethal weapons system on today's ever-changing battlefield. During the last several years, Army aviation has found itself involved in a myriad of atypical missions. Atypical because the mission requested doesn't exactly fit into the unit's Mission Essential Task List (METL). These missions, rather than a one-time requirement, are becoming the "norm". As the force structure continues to shrink, and the mission load continues to grow, aviation units will continually find themselves asked to perform multifaceted, highly complex missions in unfamiliar airspace.

Select aviation units may be the "only show in town", and our inherent capabilities provide a dimension to the battlefield that no other Combat Arm can produce. And it is because of this complexity and variation that we must stay ever vigilant about mission execution. Leaders must guard against complacency, loss of risk assessment objectivity, or the failure to make risk management a continuous process. There is no substitute for thorough mission planning, detailed rehearsals, and strict adherence to risk reduction and control measures ... these things are an aviator's Intelligence Preparation of the Battlefield (IPB) ... and you ***MUST*** know your enemy.

Unfortunately, because of our high OPTEMPO, many units are forced to rapidly transition from one complex mission profile to another. Such frequency may cause the atypical missions to be perceived as routine, where unvigilant leaders allow these missions to be treated with less than appropriate planning and oversight.

An analysis of recent mishaps illustrates how shortfalls in the planning process, coupled with the absence of institutionalized risk management and leader involvement, can foster an environment of mission planning complacency. In two cases, the missions involved multi-ship, sling load operations under night vision goggles (NVD) conditions. Coincidentally, these units had successfully executed a number of varied missions in the preceding six months, which may have further contributed to their false sense of security. The units failed to recognize the cumulative effects of risk, and leaders allowed risk reduction decisions to be made at an inappropriate level. Instead both units relied on prior planning and crew experience to fill in the blanks for

basic, thorough, detailed planning and risk assessment.

In both cases the missions were received well in advance, and planning was assigned to junior officers. This was considered adequate because similar scenarios had just been executed without incident weeks earlier. However, we all know that the first step in sound mission planning is to conduct a complete mission analysis (MDMP). Planners must also ensure that all members understand the commander's intent, ground tactical plan, reverse planning sequence, risk assessment, and any control measures/abort criteria that can effect mission execution. This is commonly referred to as the 5x "W"s process: who, what, when, where and why. The "How" is determined by the commander and S-3. Once the plan is set the aviators must begin their task of thorough mission planning to execute the "How". Finally we must REHEARSE ... REHEARSE ... REHEARSE to ensure EVERYONE knows their role ... NO CONFUSION!

Unfortunately, this is where these units allowed their false sense of security to fly lead. As stated, these missions were planned as NVG, Air Assault missions into confined LZ's or unfamiliar terrain. On one particular mission, the winds were high, the clouds were low, and the rain was heavy. Somewhere in the decision cycle, in a flight of four aircraft flying a staggered right formation, it was determined that the heaviest, least maneuverable (HMMWV sling load) aircraft would fly as Chalk 4 instead of Chalk 1. Additionally, the ingress route was changed at the PZ because of deteriorating weather. This change now required the crews to negotiate a 180-degree right-hand turn to final at the LZ. In a similar incident, a UH-60 unit previously identified a weakness in their ability to execute NVG sling load operations. However, the command elected not to do anything about it, and the mission was attempted by an inexperienced flight crew. Subsequent to "brown out" during load pickup, the crew attempted to fly out of the cloud. Instead they allowed the load to hit the ground, and the Black Hawk ultimately crashed in a

right nose low attitude and rolled across the desert floor. Final result in one incident; six personnel dead, nearly a dozen injured, two UH-60s and one HMMWV completely destroyed. Final result in the second incident; five personnel injured, the aircraft and HMMWV were totally demolished.

In both scenarios, there was little supervision or mentoring during the mission planning process to ensure all facets (risks) of the operation were examined in depth, to identify hazards, and modify courses of action to implement the necessary risk mitigation/reduction controls. Both scenarios evidenced crew overconfidence in their ability to handle situations even as cumulative effects rapidly reduced the margin for error. Decision makers, (senior commanders, unit commanders/SPs/IPs) must remain objective enough to recognize the escalating cumulative effects of a number of seemingly benign individual risks. They are responsible for analyzing continuous feedback from mission focused subordinate leaders in order to identify risks that can adversely effect mission execution. Once the planning process is complete, it is absolutely imperative that every potential branch or sequel is played out and rehearsed. Crews and leaders at all levels must clearly understand the hazards, risks and controls that have been put into place to reduce mission risks. Without a clear understanding of these elements, all participants can't actively recognize and assess changing hazards and the associated increase in risk. A rehearsal is a key vehicle for establishing this common understanding and essential to mission success.

The Center for Army Lessons Learned (CALL), sites rehearsals as highly effective and an excellent tool in risk control and reduction. Moreover, it is fundamentally critical that all mission personnel attend and participate in the rehearsal. That is the time to voice concerns, ask questions, and iron out confusion. The rehearsal must cover all aspects of the mission: staging plan, loading plan, enroute plan, landing plan, FARP plan, battle position occupation, screen line establishment ... from primary ingress and egress routes, to any reasonably expected or anticipated contingency that may be implemented. It must be clear in everyone's mind exactly what will be required during every phase of the operation, and how outside factors can change mission requirements.

**The old adage is true: "The only stupid question is the one that isn't asked." Questions must be voiced regardless of the perception "these guys will think I'm dumb"...better dumb than dead**

Senior aviators/leaders and crewmembers have a professional, if not moral responsibility to voice all concerns, real or perceived, any time their "comfort threshold" is broken. The old adage is true; *"The only stupid question is the one that isn't asked."* Questions must be voiced regardless of the perception i.e. "*my suggestions are always ignored*" or *"these guys will think I'm dumb"* ... well, better dumb than dead!

Mission accomplishment is what we as leaders always strive to achieve. It must be balanced to ensure the safety of all involved. The primary method of accomplishing this is detailed planning, which includes in-depth rehearsals and everyone's input. Don't be a shrinking violet. When a point of concern becomes evident, such as deteriorating weather, stand up, be counted, and let your concerns be known. Never allow complacency, or fear of ridicule, determine your actions in and out of the cockpit… or let yourself become the guy that has to look in the mirror and say: *"If only I had said something, they might be alive today."* If you're struggling with the decision to stand up, picture yourself at a memorial service for the crew, or in an interview with the investigation board. Would you be equally convinced or could you justify your actions?… and if not, take action—do the right thing! Remember, ***"Hope is never a course of action!"***

# Cell phones are FOD, too

**There has been a lot of talk lately concerning hand-held portable electronic devices. I'd like to relay a story about cellular telephones.**

A lot of crewmembers carry a cell phone when they fly as an additional means of communications. Most of us know that these devices are not to be in the "on" position when we fly. *(See related story on page 9.)*

My story is about a routine training flight in a CH-47D. This particular flight had been scheduled previously, but was delayed by maintenance. If you aren't familiar with the Chinook, I will tell you it takes a while to get everyone and everything together to get "Ol' Windy" ready to fly. We completed the preflight, mission brief, and prepared for engine start. We had crammed a lot into a short time frame, but we were going to make our proposed take-off time and get the training underway. Everything was going normally now. We arrived at the landing strip, did our before landing, then made the approach to the training loads where the flight engineer (FE) and crew chief disembarked and rigged the load.

With the crew all back on board, we set the hook selector, and the FE guided us over the load. We did a "Shepard hook" with minimal directions, picked up the 10,000 pound load, checked our engine and transmission instruments, torque, then made the take-off. As we proceeded to turn crosswind, the SP stated, "I can't find my cell phone." He normally kept it in his right leg pocket and it now wasn't there. He continued to check all his pockets—no cell phone! We were on downwind now, performing the before landing checks and discussing where his phone might be (probably not a real great time to be discussing much of anything besides the task at hand), but with the checks complete, the load stable, we suggested that perhaps he had stuffed it into his helmet bag.

He thought about it for a moment, (we were now on final, hook armed) and he stated "No, I didn't put it in my helmet bag." We put the load on the ground, released the slings, hovered sideways and landed the aircraft abeam the load. Now that the FE and crew chief were no longer busy with their crew duties and the load, they checked the SP's helmet bag. NO PHONE! We talked about it for another minute in the LZ, and then we all decided to shut down and ascertain where the SP's phone really was.

We shut down and got out of our seats to begin the search. I got the idea to fire up my cell phone and call the SP's number. Even an aging aviator with some high-frequency hearing loss could pick up the ring of his cell phone coming from the aft pylon! The FE climbed on top, opened the right aft pylon access door, and there it was, just sitting on the bulkhead ringing away!

Thankfully, it wasn't anywhere that it would have interfered with the controls (like the pilot valve to the aft upper dual boost actuator)! We

# Carry-on electronic devices require AWRs

Speaking of carry-on electronic devices aboard helicopters… Pilots-in-command are responsible to ensure that such devices are not used aboard the aircraft unless an airworthiness release (AWR) has been issued by the Aviation and Missile Command (AMCOM) specifically authorizing its use. Electromagnetic testing criteria for Army helicopters are strict. The typical Army Com/Nav mission is tougher, so the electromagnetic testing standards are tougher.

Army Regulation 70-62, Airworthiness Qualification of U.S. Army Aircraft Systems, 7 July 2000, paragraph 2-7b (available from the U.S. Army Publishing Agency Home Page, http://www.usapa.army.mil/) specifies the types of devices that require airworthiness releases on all Army aircraft.

**—condensed from the Black Hawk newsletter**

retrieved the unharmed cell phone, turned our phones back off, secured the aft pylon access door, then we reviewed what had happened. As I mentioned, we split the preflight up between the three aviators for efficiency. The SP had checked the top, particularly the aft pylon. His pocket was inadvertently left open, and the phone popped out and into the aft pylon area when he climbed up to check the aft head.

Had he not been assertive and insist that he was sure it was not in his helmet bag or otherwise, we may very well have not elected to perform a shutdown and find his phone. He was mindful that he had not turned it off, it was not where he kept it, and insistent enough that he directed the crew actions which would affect the temporary delay in our training mission to locate it.

The rest is history. We finished our flight and de-briefed. We all learned several things that flight period, not just about the flight maneuvers.

**1.** Air Crew Coordination is paramount to the safe operation of our aircraft. When a crewmember expresses concern over any item that pertains to a flight, listen attentively. The experience and knowledge they share should perk your ears.

**2.** Humble pie is very filling and just one slice will do.

**3.** A little humility is better than a lot of accident.

**4.** Perform as a team—that's why all of you are there.

**5.** FOD is FOD. Phones are FOD!

**6.** May all of your crew errors end up as a learning experience, heightening your awareness of what simple little mistakes can lead to, rather than a mishap.

**—CW4 David C. Byorth, ASO, 7-158th Aviation Regiment (Heavy Helicopter) Bldg # 7027, Hood AAF Ft Hood, TX 76544-5081 (254) 288-5019, DSN 738-5019**

# Laser Q & A Session:

## Part III, Laser-Related Injuries

In the first two articles of our laser series, we answered questions on the nature of lasers and how you can protect yourself from exposure. The final question remains: What do you do if you're in the wrong place at the wrong time -if you think you've been lased?

**Q: What is the most important thing to remember if I am lased?**

A: Remain calm. Being lased is comparable to being hit by a sniper . . . it's sudden, unexpected and potentially very dangerous. But, the odds are very much in your favor. Most incidents produce temporary symptoms and no permanent loss of sight. While serious injuries can occur, they are atypical in flight scenarios.

**Q: If I am lased, what is the least effect I might experience?**

A: A temporary dazzle effect, similar to what you might expect from any sudden bright light in your face, or flash blindness, which can last up to minutes, are the least injurious effects you may encounter. While some loss of visual acuity may occur initially, neither condition will result in permanent loss of sight. However, at low altitudes, this can have catastrophic results.

**Q: What is the range of symptoms associated with laser injuries?**

A: Laser-related injuries depend upon the type of laser involved, its power and range from source. Injuries can range from temporary (minutes) loss of vision to serious retinal burns and hemorrhage (bleeding). Pain may or may not occur. Some of these injuries result in no discomfort other than a mild watering of the eyes. Injuries involving the cornea, even relatively mild ones, can result in excruciating pain. With or without symptoms, any laser exposure can be serious and should not be discounted.

**Q: What type of symptoms will I experience if I receive a retinal burn or hemorrhage?**

A: You may or may not experience pain depending upon the location of the injury. In the event of a retinal hemorrhage, your vision will begin to blur and become clouded as blood leaks into the middle of the eye. As hemorrhaging continues, vision may be totally obscured in the affected eye. While retinal hemorrhages are sometimes treated surgically, and the eye may remain clouded for several months, the eye is remarkably good at repairing itself.

For retinal burns, some vision loss may occur, again depending upon the location of the injury. In severe cases, such as those involving pulsed lasers, the intense heat produced will superheat the tissue causing mechanical disruption, spreading the damage to surrounding areas. The mechanical force involved can blow a hole through the retina resulting in additional hemorrhaging and possible severe vision loss.

**Q: Should physical damage be my only concern?**

A: As with any injury, shock and psychological trauma also can occur. This is especially true with any type of retinal hemorrhage. The trauma surrounding the event, and the fear of loss of vision, can be overwhelming. Over the long term, the psychological stress experienced will depend upon the aviator's initial response to the injury, his knowledge and training about laser weapons, and the treatment received. The emotional stress received from a laser injury should not be overlooked.

**Q: If I suffer a laser injury, are there steps I can take to reduce its severity?**

A: Although there is little you can do for laser exposures, there is a lot you should not do. DO NOT RUB YOUR EYES. Cases have been

reported where victims rubbing their eyes have actually caused abrasions and worsened their injuries. Keep hands and fingers away from the eyes to avoid possible contamination and sources of infection. Current medical advice is not to patch the eye.

**Q: Once I have landed, what should I do?**

A: Immediately report to the flight surgeon. While laser injuries can be minor, serious injuries are not always readily apparent. Medical complications can often be avoided by immediate treatment. It is important for the victim to remember that laser-related injuries are seldom life threatening and the chances for at least partial recovery are usually quite good.

**Q: What medical treatment might I expect?**

A: Initially, expect a thorough eye examination by a trained ophthalmologist. This is standard procedure and allows for extensive examination of both the interior and exterior of the eye. Burns to the cornea are often treated with antibiotic ointments, mild pain relievers, and intramuscular analgesics. Small non-foveal burns with little or no hemorrhaging are monitored, but no actual medical treatment is necessary. More serious burns and hemorrhaging may require surgical intervention.

**Q: Where can I go for further information?**

A: FM 8-50 Prevention and Medical Management of Laser Injuries (1990) is an excellent source of information, though somewhat dated. Additional information can be secured from the U.S. Army Center for Health Promotion and Preventive Medicine (http://chppm-www.apgea.army.mil).

## In summary

Laser rangefinders/designators are a vital part of effective tactical weaponry, however, accidental exposure is a serious potential. Also, the availability of inexpensive laser pointers increases the potential of laser exposure. While the external threat of laser exposure is increasing, it is worth noting that most laser eye injuries to date have been self-inflicted.

Laser protection is accessible and effective. Unfortunately, because of the variety of lasers available, protective devices must be coordinated with the greatest laser exposure risks. No one laser protective device can protect from all wavelengths and energies.

There are no simple answers for laser protection. For the aviator, the potential for laser exposure is just another situation that requires vigilance, training, knowledge and a cool head.

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–Jim Hauser, product engineer, PM-AES, DSN 897-4267, (256) 313-4267,

# ASOC UPDATE— It's not your father's ASO Course

The six-week Aviation Safety Officer Course (ASOC), as it is presented today, differs greatly from the course that produced many of today's ASOs. Many ASOs in the field have long since graduated the ASOC and are unaware of the current curriculum now taught. This article gives you an idea of how today's ASO course is presented in three phases.

## PHASE I

The first phase, "Safety Management", consists of a basic introduction of staff and students, along with homework assignments and daily questions. The Army Safety Program and other subjects like: Risk Management, OSHA, HAZCOM, Ergonomics, Environmental, and POV safety are introduced the first week. Students begin daily questions in the middle of the first week, as well as impromptu presentations. A swim test is administered for pre-dunker. Physical training is conducted three times a week while in the course.

## PHASE II

The second phase incorporates duties and responsibilities of an ASO. During this phase, students participate in 9D5 multi-place egress device (Dunker), and the 9B6 multi-station spatial disorientation demonstrator (MSDD) in Florida.

CW4 "D" Smith, the new ASOC director, has incorporated some practical exercises into the course that give students a feel for the real thing. One example is group participation in unit safety meeting presentations. The Aviation Branch Safety Office (ABSO), here at Fort Rucker, will visit during this block of instruction to explain who they are and what they are about. During this phase of training the class travels to another installation or facility to perform an Aviation Accident Prevention Survey (AAPS). These surveys have proven to be invaluable to both the students and the unit being visited. This training further enhances the ability of an ASO to understand the dynamics and the how-to in performing semi-annual surveys.

## PHASE III

The final phase is the investigation portion. It introduces students to the requirements of accident reporting and recording, and his or her responsibilities in the event an accident occurs within or outside their organization. All students participate in an accident investigation practical exercise that will be out-briefed upon completion. We also invite the Department of the Army Regional Representative (DARR) to give a short presentation towards the end of course. Additionally, Dr. Brenda Miller, Chief of the Training Division here at the Safety Center, briefs on the Career Program 12 course for civilians.

## THINGS TO THINK ABOUT

Considerations for those individuals who will be attending, or would like to attend, future ASO classes are:

■ First, enrollment in the course is done through your personnel administration center (PAC), or whoever coordinates training/schools (S3 or G3) within your organization. You must be registered in the Army Training Referral and Registration System (ATRRS) to get slotted for the course. The US Army Safety Center does not enroll students.

■ Classes begin on Monday (unless it is a holiday), and in-processing is done in our classroom (Room 7, Bldg. 5206) directly across from the UH-1H simulator building at Fort Rucker. We will sign you into and out of Ft. Rucker.

■ Ensure your orders state that "You are authorized variations to proceed to additional places as may be necessary to accomplish the mission. Dual Lodging Authorized." This is a must, because of the off-site training and your requirement to maintain lodging at Fort Rucker as well.

■ During the course, you will be given a large amount of reference material. If you are traveling by air, you may want your orders to contain authorization for mailing these books home.

■ Duty uniform is the Army BDU (not Aviation BDU) for military personnel, and dress slacks, and shirt with collar for civilians.

■ Bring your Army issued PT uniform, a swimsuit, and a current up-slip (DA Form 4186). All personnel should try to have these things as complete as possible before attending the course. The better prepared you are the easier the transition.

■ Because the ASO course is an MOS-producing course, you will be required to pass all examinations and attend all classes. Do not plan on scheduling routine appointments during training.

Information about the ASOC and points of contact are available on the safety center website at http://safety.army.mil. Just click the yellow button that reads Training, and then click Training Resources, then Resident Training Courses. You will see general information for the Aviation Safety Officer Course.

—Lee Helbig, USASC – Training, DSN 558-9868 (334) 255-9868, helbigl@safetycenter.army.mil

## Points of contact at the Aviation Safety Officer Course are:

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NCO CORNER

# Chinook Word of Caution:

**What you don't know about the center cargo hook can cause your forward & aft hooks to open.**

In the Chinook community there have been several Class B accidents involving the center cargo hook when the forward and aft hooks are being used for tandem load operations. Some crewmembers are rotating the center cargo hook up inside the aircraft to allow better viewing of both the forward and aft hooks. This action has caused two different problems resulting in tandem loads being jettisoned.

The first problem occurred when the center cargo hook was rotated up inside the aircraft, and placed on the floor out of the way, with the manual release handle in the "UP" position in accordance with the Operators Manual. As the center cargo hook was lowered back into its normal position it made contact with the manual release handle, causing both forward and aft hooks to open, which jettisoned the external load.

The second problem occurred when the manual release cable was stretched when the center hook was rotated up into the aircraft and placed on the floor. This action caused the cable to separate from the crimped end of the cable housing. As the manual release handle was lowered into its normal position the cable didn't reset itself into the cable housing. Without the crimped end of the cable actually being "crimped", this caused the fwd and aft cargo hooks to inadvertently release the external load.

Rotating the center cargo hook up into the aircraft onto the floor is not authorized. The hook may be rotated to allow for load hook-up and/or inspection, but should never be rotated past vertical.

**—MSG Curtis, USASC Cargo Branch, DSN 558-9853 (334)255-9853, curtisx@safetycenter.army.mil**

**—SSG Robert Simpson, DES Cargo Branch DSN 558-1439, Robert.simpson@rucker.army.mil**

## Maintenance Reminder

When performing any routine inspection, 10hour/14 day, 30 hour/42 day or 100 hour phase, etc. Ensure that all Technical Manual's (TM), Technical Bulletin's, (TB), Aviation Safety Action Message's, (ASAM) and Safety-Of-Flight (SOF) instructions are complied with.

A recent 30-hour, 42-day inspection found an item that should have been removed from service several years ago, at a 500-hour phase inspection, in accordance with a 1994 SOF message. The item, an elastomeric spindle thrust bearing, was found delaminated. Fortunately it was found and replaced before failure, but damage was done to the spindle. Accurate recording of inspection requirements mandated by TM's/TB's/ASAMS/SOF is imperative to prevent similar occurrences. Failure to comply with these messages is in violation of Army regulations and other maintenance standards. Special attention must be paid to aircraft in transit or being transferred between units. If there is any question whether the new procedures outlined in the ASAM's/SOF's/TB's have been applied, always assume that they have not been applied until proven otherwise.

**—Bob Giffin, System Safety Manager, Black Hawk, USASC, DSN 558-3630 (334) 255-3650, giffinr@safetycenter.army.mil**

# ACCIDENT BRIEFS

*Information based on preliminary reports of aircraft accidents*

## AH-1

### Class C
**F model**

■ Aircraft was in cruise flight when the crew heard a loud report, followed by extreme vibration and decay of aircraft's engine power. Crew initiated autorotation and aircraft landed hard in a cornfield. Aircraft engine was damaged. One crewmember was hospitalized for overnight observation.

## AH-64

### Class C
**A model**

■ Aircraft struck a large bird in flight. Aircraft experienced some vibration but was landed without further incident. One blade received a large dent near the tip; replacement required.

### Class E
**D model**

■ During a pinnacle approach to landing the aircraft struck a rock with the aft tailboom. Crew landed the aircraft without any further damage. The IFF antenna was replaced. The aircraft was released for flight.

## CH-47

### Class C
**D model**

■ Post maintenance test flight inspection revealed damage to aircraft's aft main rotor blade, blade damper and rotor head component damage. Aft green blade droop stop was found to be missing.

## MH-6

### Class B
**J model**

■ While conducting a night approach under Night Vision Goggles terminating with a landing to a sloped surface, the aircraft experienced an aft rolling motion that placed the aircraft in an unrecoverable position. Major damage occurred to aircraft. Two injuries.

## OH-58

### Class C
**D-I model**

■ While conducting NVG confined area operations and snow/sand/dust training, the IP elected to depart the confined area using a terrain flight take off, passing between two trees. The aircraft struck wires and landed hard, damaging the landing gear, tail boom, and stinger. The IP and PI were uninjured.

### Class B
**D-R model**

During manual field authorized digital electronic control (FADEC) operations, aircraft landed hard.

**D-I model**

■ During the termination phase of a simulated engine failure with turn to terminate with power, at approximately seven feet above ground level, the aircraft's rate of descent increased dramatically. The aircraft impacted the lane in a level attitude, sliding approximately 60 feet. The aircraft's front cross tube was broken at both mounting points, and the aft cross tube was bent into the fuselage. The aircraft's wire strike protection system and the UHF antenna were also damaged.

### Class E
**D-I model**

■ Aircraft was on Night Vision Goggle reconnaissance mission when the thermal imaging system failed. Attempts to regain system failed. Aircraft was landed without further incident. Maintenance troubleshooting on failed TIS was completed and aircraft was released for flight.

## UC-35

### Class E
**A model**

■ During cruise fight at FL 41O, crew heard a loud "bang" and cabin pressure VSI showed approximately 3000 fpm climb rate, then began to slowly stabilize. Crew put on oxygen and began rapid descent below 10,000 feet. Airplane was landed with no further incident. Co-pilot window was cracked approximately one-half inch down from leading to trailing edge.

## UH-60

### Class C
**A model**

■ During engine run-up, the No. 2 engine required two attempts to get it started. Then the engine failed the health indicator test check. The HIT Check was approximately 14 degrees celsius out of limits. The crew returned to parking to abort the flight. After retarding the No. 2 engine power control lever to idle, the engine made two low rumbling noises and flamed out. The engine borescope revealed damage to compressor blades. Foreign object damage is suspected, although no proof of FOD could be found. The engine was removed and sent to higher level maintenance for repair.

### Class D
**A model**

■ While on takeoff from a confined area, with PC at the controls in the right seat, aircraft struck a tree branch with the right side of the rotor. Aircraft made a precautionary landing at an adjacent landing zone without further incident. Upon inspection of rotor blades, rotor tip cap was found to be damaged. The blade tip cap was replaced.

## Aviation Related

### Class C

■ When an MH-47E aircraft departed landing pad, a 4'X 4' section of plywood became airborne and struck a construction worker who was in the area.

■ A team of six soldiers towed an aircraft from a hangar to a parking pad. The tow team did not install chocks. The aircraft rolled approximately 100 meters unattended down an incline, making contact with ground support equipment, stored aircraft auxiliary fuel tanks and a storage building.

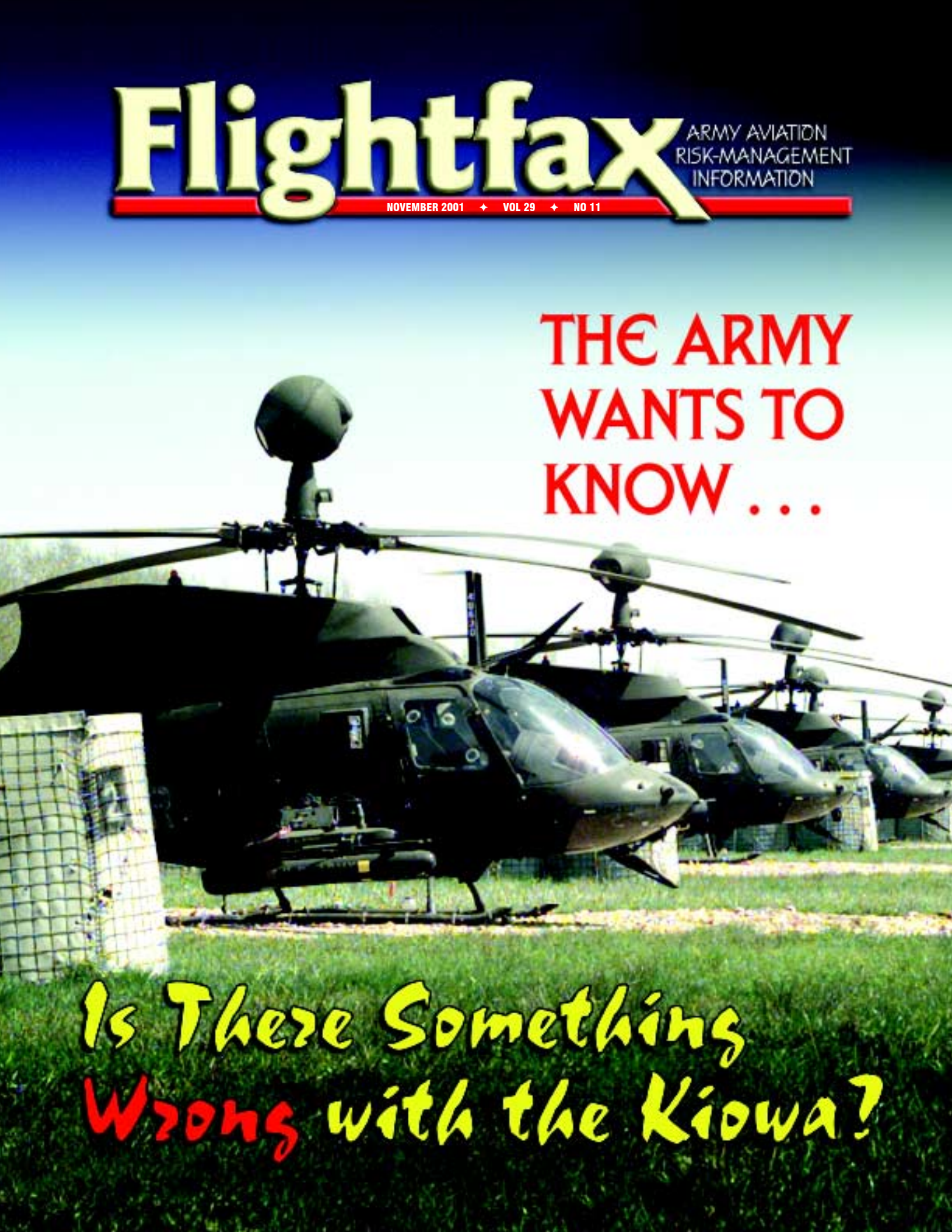
**We will emerge from this attack stronger—with greater resolve to prevail against the forces of hatred and darkness.**

— CSA Eric K. Shinseki

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

NOVEMBER 2001 ✦ VOL 29 ✦ NO 11

## THE ARMY WANTS TO KNOW . . .

## Is There Something Wrong with the Kiowa?

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

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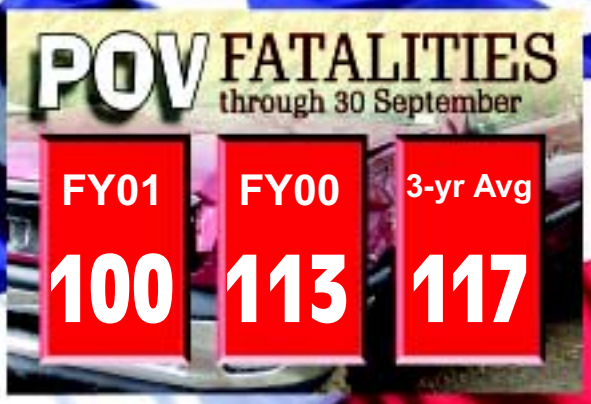


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James E. Simmons
Brigadier General, US Army
Commanding

# DASAF's CORNER

*from the Director of Army Safety*

## Readiness and safety are inseparable

As we enter this Thanksgiving season, reflecting upon recent events gives us an even greater appreciation for the fact that we have the opportunity to live in and defend the greatest country in the world. In the midst of our pain and anger, let us not forget the families and friends of our fallen comrades. Let us also pause to give special thanks for those who so willingly serve our nation with a level of devoted service unparalleled in any other profession. We truly are a magnificent Army.

For more than 220 years, the finest men and women in the world have faithfully fulfilled the Army's non-negotiable contract with the American people: to fight and win our Nation's wars. Those of us who wear the uniform today will do so again. This time it will be in a war of a different kind, on a different front, facing an adversary whose acts of terrorism have left us bloodied in our own homeland—but with an unshakeable resolve that these despicable acts of war will not go unpunished. The United States Army is ready to do its part.

Now more than ever, it's imperative that leaders and soldiers alike fully understand that readiness and safety are inseparable. We must stay focused on the tasks at hand. We must continue to ensure that safety and risk management are completely integrated into every mission and operation we execute. History tells us that in every major conflict, with the exception of Korea, we lost more soldiers to accidents than to enemy action. We cannot allow that to happen this time. The loss of a single soldier in a preventable accident represents a serious drain on our readiness.

The same 5-step risk management process that we adopted as our principal risk-reduction tool, and integrated into the Army in the 1990s, will continue to serve us well as we answer our Nation's call. We must diligently guard against reverting to a mindset of "this is war, and accidents are the cost of doing business." The risk management standard is also non-negotiable: an informed risk decision made at the appropriate level applies in combat as well. I challenge each of you to ensure that we continue to identify hazards to the fullest extent possible, that they are properly assessed, that risks in all missions are reduced to the lowest possible level, and that informed decisions are made at the appropriate level of command when accepting residual risks.

We are now engaged in what our Commander-In-Chief has declared the first war of the 21st century. Implicit within our warfighting mission is the requirement to do so with minimal losses. We're trained; we're ready. Let us now find the strength, discipline, wisdom, and skill to effectively use every available risk management technique and resource, to help us ensure the safety of all who are answering the call to avenge what many are labeling as the darkest day in American history.

**BG James E. Simmons**
**Director of Army Safety**

# Safety Alert Notification: OH-58D

Accident analysis by the US Army Safety Center indicates a significant increase in OH-58D Kiowa Warrior Class A-C accidents, throughout the fleet, from FY 99 to present. Fortunately, none of these recent accidents have resulted in a fatality, but aircraft have been destroyed and personnel injured. For this FY alone, OH-58D Kiowa Warrior Class A accident rates are more than five times greater than for any other aircraft. This trend points to a combination of material and human factors. Accident/Incident Summaries from FY 01:

***An OH-58D(I) at 1300 feet MSL experienced an engine surge followed by an engine failure. Analysis indicated the fuel boost pump arm of the inlet valve stem was bent and the boost pump was missing an umbrella check valve. TM states that if the umbrella valve is not installed, the engine may flame out when fuel is below the top of the canister and the fuel boost pump becomes inoperative.***

***An OH-58D(I) experienced an uncommanded power loss at 150 feet AGL during a recon mission. Rotor and engine drooped and aircraft crashed into trees. Suspected ESC anomaly caused power loss/droop. The aircraft had a history of "unable to duplicate" engine anomalies.***

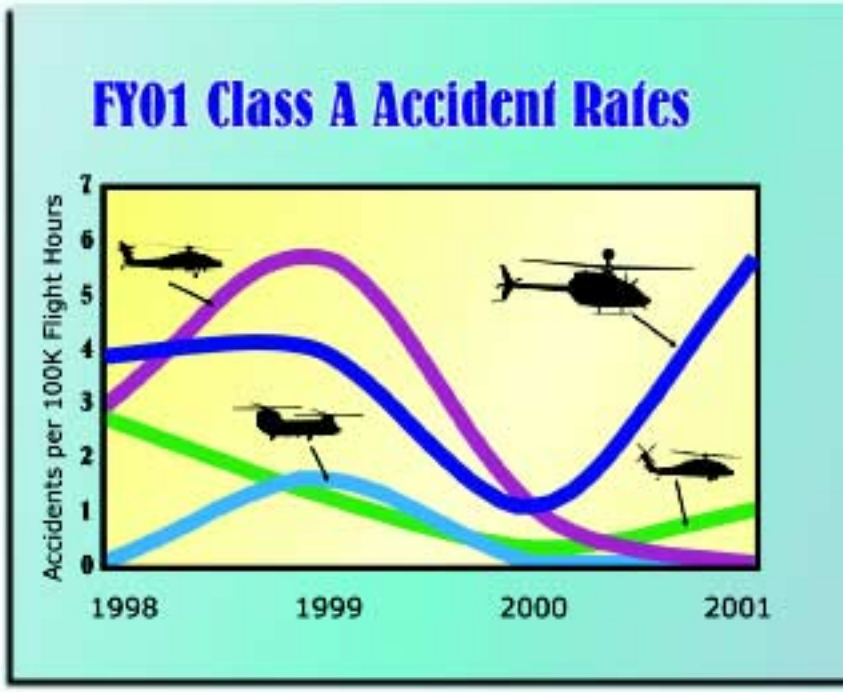
***As an MTP was returning from a test flight in an OH-58D(R), low rotor audio activated, and LOW ROTOR warning displayed on the MFD. Rotor RPM drooped to 94% NR. The engine recovered and the MTP landed safely. Determined that low rotor RPM resulted from the "already suspect HMU."***

***An OH-58D(R) experienced "Engine-Out" cockpit indication, after which the aircraft descended to the ground. Post-crash fire destroyed the aircraft.***

***During an OH-58D(R) qualification training flight, during FADEC manual operations, the rated student pilot allowed the rotor RPM to decay below 95% and the aircraft began a rapid descent. The IP took the controls but was unable to arrest the descent prior to ground impact.***

In response to this trend, the leadership of the Army convened an Army Safety Action Team at Redstone Arsenal in September. An Action Team has been formed to conduct a detailed analysis of the causal factors and identify interim and long-term control measures to reverse the direction the OH-58D fleet has been headed. Until the Action Team can develop a long-term plan, it is essential that commanders take appropriate risk management steps based on the additional information provided.

Recommend that commanders review their safety, maintenance, and training programs in light of this information. Commanders must look closely at their risk management procedures based on these accidents, and adjust their risk management decisions. I further recommend that commanders limit FADEC analog manual throttle training to in-ground-effect (IGE) demonstrations over hard surfaces on



improved airfields.

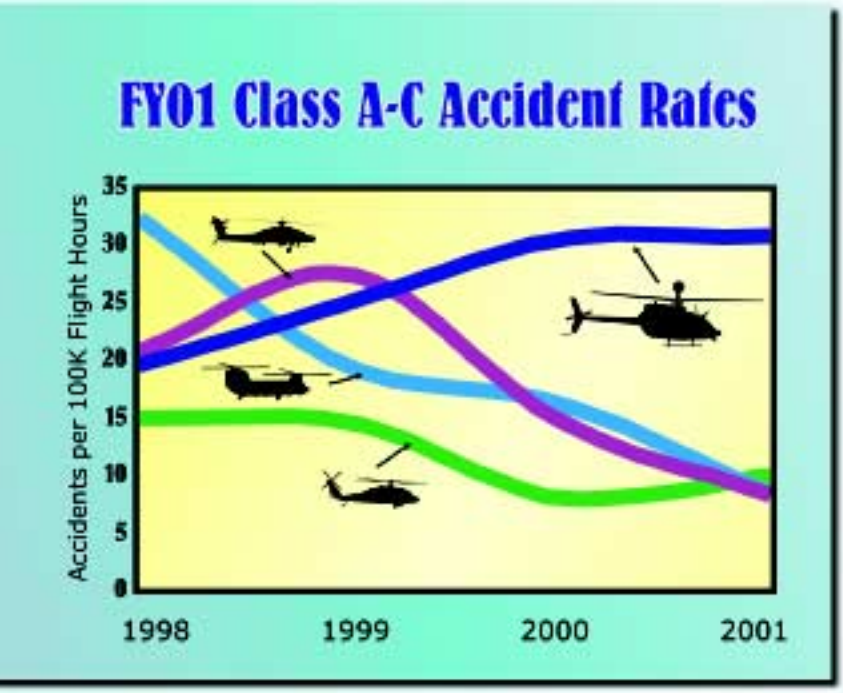
**Maintenance practices:** Accidents in the last three years indicate incomplete maintenance practices as a major contributing factor. These included "could not duplicate" write-ups and incomplete troubleshooting procedures. Commanders should ensure that by-the-book troubleshooting and maintenance procedures are conducted and supervised by the chain of command. Special emphasis should be placed on identification and maintenance management of individual aircraft with a history of unexplained and "unable to duplicate" engine anomalies.

Flight profiles and envelopes—a significant number of accidents during the last three years have involved individual training flights with an IP on board. The specific maneuvers involved include simulated engine failures and analog/FADEC manual throttle operations. Tactical flight profiles where power and control margins are minimal (NOE/OGE/Gunnery), and profiles that require flight close to obstacles are major contributors to the human factors portion of these accidents. Missions that include individual qualification/evaluation that require simulated engine failure or manual throttle operations should be considered high risk. Additionally, tactical flight requiring high power settings and limited control margins from obstacles should be avoided as much as possible.

The capabilities of the OH-58D Kiowa Warrior and its mission place the aircraft and crew in a position that creates very limited margins for error. Commanders must use every tool available to mitigate risk. Commanders must ensure that the aircraft and crew are capable of performing the mission prior to accepting it. Higher-level commanders must be willing to support those decisions.

The Action Team will provide an initial report to the Army Safety Action Team. As the long-term plan is developed and approved, it will be communicated to the field as soon as practicable.

**JAMES E. SIMMONS**
**Brigadier General, USA**
**Director of Army Safety**




## Kiowa Warrior Action Team

The Kiowa Warrior Action Team, made up of representatives from Aviation and Missile Command (AMCOM)(Engineering and Safety), the Scout/Attack Executive Office, US Army Aviation Center (USAAVNC) (Aviation Branch Safety Office; Directorate of Evaluation & Standardization) and US Army Safety Center, convened at Redstone Arsenal in late September. Their objective was to identify interim solutions to attack the rising OH-58D accident rate. With interim solutions identified, the group met again at Fort Rucker as an Army Safety Investment Strategy Team (ASIST) Analysis Group to conduct an in-depth analysis and identify long-term solutions. Participants included the people involved in the Redstone meeting and representatives from USAAVNC {Combat Developments; Training, Doctrine & Simulation; Aviation Training Brigade; Directorate of Combat Developments; Directorate of Plans, Training, Mobilization & Security}, Army Aeromedical Research Lab; Army Research Institute and the Army Research Lab. Results of this in-depth analysis will be published in a future issue of *Flightfax*.

# You and the national airspace system

US Army aircraft, operating under instrument flight rules (IFR) or visual flight rules (VFR), are authorized for flight in the national airspace system (NAS) provided they have filed a flight plan and received a discrete beacon code assignment by air traffic control (ATC). Flight without an appropriate discrete beacon assignment is not authorized. DoD Flight information publication (FLIP) flight plan filing procedures are in effect. It is essential that national flight data center (FDC) notices to airmen (NOTAM) be thoroughly reviewed prior to flight.

Army aircraft must have an operational transponder capable of transmitting and responding to the air traffic control radar beacon system (ATCRBS). Until further notice, aircraft without an operative transponder are not mission capable and are not—repeat not—authorized flight. This does not change the reporting criteria of AR 700-138.

Recent events have shown that immediate and positive identification of Army aircraft is essential (100% accountability) to our national security and critical for Force Protection. MACOM commanders, CNGB, and OCAR must ensure that adequate C2 procedures are in place to ensure the Army has that capability, and to quickly reinstate national control protocols if necessary.

VFR flight near (5 sm radius) critical infrastructure facilities such as chemical storage sites, nuclear facilities, dams, and water supply systems etc. is not permitted. Commander's guidance should be provided as part of the pre-briefing and risk assessment determination. MACOM and subordinate commanders have the prerogative to put more restrictive measures in place to satisfy their unique operating or geographical requirements.

**—HQDA POC is Mr. Yates, DSN 656-4867, 703) 806-4867, email: yatesr@hqda-aoc.Army.pentagon.mil or Roger_w_yates@belvoir.Army.mil.**

# Investigator's Forum

A recent ground accident involving a MH-6M (MELB) highlights the fact that aircraft equipped with a Full Authority Digital Electronic Control (FADEC) can be inadvertently started. In this case, a mechanic may have accidentally pressed the start switch while checking throttle travel, and the engine started automatically with the auto start feature of the FADEC. The aircraft spun on the ground during start up and struck a civilian aircraft and a tool stand, damaging the wing of the civilian aircraft and the tail rotor and tail boom on the MH-6M.

In another incident, an OH-58D with the blades folded, was inadvertently started in a ship's hangar when a crew chief accidentally pressed the start switch, with external power applied to the aircraft and the throttle open. Needless to say, both these accidents were unexpected by the maintenance personnel and could have potentially caused severe injury to nearby personnel.

Both the MH-6M and the OH-58D(R) are equipped with the FADEC systems. With the ignition switch on, circuit breakers in, and the FADEC in the AUTO mode, the FADEC auto-start start mode automatically initiates an engine start sequence when the throttle is in the idle detent position and the start switch is pressed for 2 seconds.

Both of these accidents could have been prevented if proper procedures were followed. Aircraft keys should only be signed out to qualified personnel, and keys should be inserted and turned on only if engine start is required. When stored in the hangar, or when maintenance is being performed on the aircraft, the STARTER, IGNITER and FADEC circuit breakers should be in the "OFF" position and battery disconnected.

Make sure your maintenance SOP outlines these procedures and ensure maintenance personnel know how to perform an emergency engine shut down. Use extreme caution when performing "power-on" troubleshooting procedures with a FADEC equipped aircraft!

**—Major Mike Cumbie, Chief, Scout/Attack Branch, USASC, DSN 558-3754 (334)255-3754, cumbier@safetycenter.army.mil**

# More or Less on Radar

When an aviation accident occurs, especially one resulting in fatalities, we need to understand and question all available investigative facts. A recent weather related, fixed wing accident resulted in questions about the airborne radar system being unreliable, as either underpowered or too "weak". Can onboard radar display weather less severe than the storm's actual intensity? How does this happen? How can a pilot determine the strength of the radar system?

Here is how this happens. First, the heart of airborne weather radar is the EMT (Electro Magnatron Tube). The more the EMT is used, the weaker it becomes over time. This cannot be changed. However, pilots can reduce unnecessary EMT degradation. Modern radar systems do not require a long warm-up (stand-by) time, as did the pre-1980's units. The stand-by position turns the EMT ON, without allowing it to transmit. If radar is not going to be used, or is no longer deemed necessary, turn the unit OFF! Leaving the radar in stand-by is like leaving the lights on with no one home!

Follow the manufacturer's recommended operating procedures.

Pilots can determine the strength of the airborne weather radar unit. Here's a quick review of these procedures:

1. In flight, determine your altitude AGL to the nearest 1000 feet.
2. Find the "square root" of the altitude (AGL) e.g. FL240 – 1000' = 23000 feet = 151.66 or rounded, 152 nautical miles. (Good math skills or calculator needed!)
3. Adjust the radar range ring to the next larger distance (i.e. 300/320 NM in this example).
4. Adjust the antenna tilt "down" to display the maximum range of ground clutter (GC).
5. GC should be painted or displayed slightly over the 150 NM ring or range for 100% EMT strength.

Assume the maximum ground clutter range was only 100 NM. Divide the 100 by 152 and the result is 66% EMT strength. Clearly, this radar unit's signal strength is unreliable and avionics should evaluate it for repair or replacement.

Important point—Just passing the recommended radar *ground* tests is simply not enough. Use the above *airborne* test to assure the strength and reliability of the weather being displayed.

Airborne Weather Radar is an active avoidance tool, but it is NOT a stand-alone system! Visual cues, storm scope, PIREPS, and updated ground-based reports are also valuable and should be incorporated for the in-flight decision-making process.

**—CW4 Paul Herrick, Flight Standards B Company 6th BN 52D Av Regt,Ft. McCoy WI DSN 280-5461 paul.herrick@usarc-emh2.army.mil**

# Pilot weather reporting—a lost art?

Following a recent accident, some of us are asking ourselves what we can do better in the future. We are still grieving the loss of two safety officers, two crew chiefs, a liaison officer and his assistant. My primary concern is to focus on what we can do better in the future to prevent similar mishaps.

First, we asked ourselves if there was a way to move the weather forecasting component out to the terrain flight training area (TFTA) in order to provide a better decision-making tool. After looking at the problem, the prospect of putting a manned weather observatory and other equipment in the TFTA is neither cost-effective nor geographically feasible, due to the poor trafficability of the road system in this region.

I have come to the conclusion that the answer to the problem requires the use of an age-old technique of helping your fellow aviator by submitting a pilot weather report (PIREP) to the forecasting agency. I realized that we overhear fixed-wing pilots giving PIREPs to controlling agencies all the time, yet I never hear rotary wing pilots following suit. This is especially true during tactical training exercises. I will point out to you that PIREPs are not regulatory or required, except in FAA (Federal Aviation Administration) airspace when ceilings and visibility are less than 5000 feet and 5 statute miles respectively. I refer you to FAR/AIM (Federal Aviation Regulations/Airman's Information Manual). PIREPs are, however, an invaluable source of information for the weather forecaster, who in turn properly encodes the information pilots provide and includes it in his next brief. In many instances, your PIREP will enhance the forecaster's prediction, thus giving aircraft commanders and mission planners a far better planning tool than the forecaster's calculations alone.

I talked with the senior forecaster at our Air Force Weather Detachment to get some raw numbers on how many PIREPs his station receives on a daily basis. The answer was "Zero". He went on to explain that his answer would be the same if I rephrased the question, substituting the word "daily" with "weekly", "monthly", or "annual" basis. In short, he told me that he never receives PIREPs.

This is something we can all do better. We pride ourselves as professional aviators, and as true professionals we should be concerned and helpful towards others in our profession. It only takes a moment to tune up your Metro frequency and call in a PIREP. There is no specific format to adhere to when submitting a PIREP. In most cases your weather forecaster/briefer will be appreciative.

I want to encourage all safety professionals out in the field to call your weather people and ask them what kind of interaction they experience with PIREPs. I hope the response you get is better than the one I got. I also want to encourage all of you with wings on your chest to help that guy who may be wrestling with a tough weather call before a dark and rainy mission.

**—CW2 Chris Bryant, ASO, WAAF, HI, DSN 456-9880, Daniel.Bryant@us.army.mil**

# A fuel cell is a confined space

Late one Friday afternoon, an individual crawled inside the aft fuel cell of an AH-64 aircraft to perform a Modification Work Order on an internal valve. His body was found the following Sunday afternoon. The individual was alone at the time, but decided to do this one check before departing for home.

Soldiers and other workers who enter aircraft fuel cells or fuel tanks to perform maintenance work are entering permit-required confined spaces. However, in many cases the required safety procedures are not followed, and no permit-required confined space entry programs exist. Also, current aviation maintenance technical manuals (TMs) may not cover all occupational health and safety requirements regarding fuel cell entry and work.

Permit-required confined space work is extremely dangerous. Fortunately, the number of confined space accidents is small in comparison to other occupational accidents. However, when they do occur, they more than likely result in death, not injury. And they usually result in more than one fatality because of unsuccessful rescue attempts.

Aircraft fuel cells and fuel tanks clearly meet the characteristics outlined in 29 CFR 1910.146, Permit-Required Confined Space Standard, classifying them as permit-required confined spaces. Fuel cells contain atmospheres that are potentially both toxic and explosive. Additionally, purging fuel cells to remove toxic vapors may create another hazardous atmosphere, one that is oxygen deficient. Gases such as carbon dioxide and nitrogen, used to purge toxic vapors, can displace oxygen in the fuel cell creating an oxygen deficient environment. The safe oxygen level for entry in a confined space is 19.5% to 23.5%. Care must be taken to avoid the creation of explosion hazards, as well as to prevent the inhalation and absorption of toxic chemicals. Toxic chemicals of most concern regarding fuel cells are kerosene, the other constituents of JP8, and solvents.

Therefore, it is critical that a permit-required confined space entry program be in place and enforced when performing work in fuel cells. A unit cannot maintain a permit-required confined space entry program by itself. Entering a fuel cell requires the collective efforts and expertise of a number of individuals including an industrial hygienist (IH), safety professionals, medical personnel, and fire department personnel. Requirements for personal protective equipment (PPE), including respirators, gloves, clothing, footwear, head gear, goggles, and hearing protection must be established. This should be determined by the industrial hygienist and/or safety professional. Merely having an individual stand by as a safety monitor during fuel cell entry, does not constitute a permit-required confined space entry program. Authorized entrants, attendants, entry supervisors, rescue/emergency personnel,industrial hygienists, safety professionals, and fire department personnel must be trained in the requirements of the permit-required confined space standard. Training is a critical part of a permit-required confined space entry program. Training must be provided before permit-required confined space entry work, when there is a change in duties, when an operation changes, and when the employer determines that some type of inadequacy exists and additional training is warranted. Additionally, simulated rescue operations must be performed at least annually.

Rescue from any permit-required confined space is very difficult, especially in the case of fuel cells such as the ones on Black Hawks and Apaches. These fuel cells are quite small and have a small entry point, making it impossible for rescue personnel to enter. The only two options for rescue are to cut the fuel cell open, or have some type of retrieval system. The Permit-Required Confined Space Standard, 29 CFR 1910.146, requires that a retrieval system be used in cases of non-entry rescue, unless the retrieval system itself would increase risk or would not contribute to the rescue of the entrant.

Other issues such as rescue and emergency equipment, non-sparking tools and equipment, and control of hazardous energy must be considered to ensure safe work in a permit-required confined space.

Despite the hazardous characteristics of permit-required confined spaces, work within them can be safely performed if all the requirements of 29 CFR 1910.146 are incorporated into a sound permit-required confined space entry program. Before you begin any type of maintenance work regarding fuel cell entry, ensure your unit has a permit-required confined space entry program. If not, do not enter the fuel cell. Contact your safety officer/manager or installation industrial hygienist for assistance.

—LTC Heidi Overstreet, USASC, DSN 558-2477 (334-255-2477) overstrh@safetycenter.army.mil

# What defines a confined space?

The National Institute of Occupational Health and Safety has published a summary of case reports regarding confined space accidents that can be found at the following web site: **http://www.cdc.gov/niosh/94-103.html**. In order for a space to be a confined space it must be large enough so that a worker can bodily enter it and perform work, have limited or restricted means for entry or exit, and is not designed for continuous employee occupancy. Note that the space must have all three characteristics for it to be considered a confined space. Note also, that by definition a confined space has no inherent health hazards. However, if a confined space contains or has the potential to contain a hazardous atmosphere; contains a material that has the potential for engulfing an entrant; has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or by a sloping floor that tapers to a smaller cross section; or any other recognized serious health or safety hazard, then the confined space becomes a permit-required confined space. At this point all the requirements of 29 CFR 1910.146, Permit-Required Confined Space Standard (http://www.osha-slc.gov/OshStd_data/1910_0146.html) must be met in order for a Soldier or other worker to enter the fuel cell or tank. (Remember, per AR 385-10, paragraph 3-1a. federal safety standards are adopted as US Army safety standards.) A confined space automatically becomes a permit-required confined space when it possesses just one of these characteristics. See the March 2001 issue of Countermeasure (http://safety.army.mil/home.html) for more information regarding the elements of a permit-required confined space entry program.

# WANTED

UH-60 pilots interested in participating in a study of laser vision surgery for rated Army Aviators. Please contact the USAARL Refractive Surgery Team at 334-255-6988, or by email at jennifer.franks@se.amedd.army.mil for more information.

# Laser Eye Surgery—Can I have it? —Will it work for Army Aviation?

The Army aviation community is considering refractive eye surgery as a potential alternative to glasses or contact lenses for soldiers who need correction to see well. Over the past few years, the Army has allowed individuals to enter the service if they have had photorefractive keratectomy (PRK) or laser in-situ keratomileusis (LASIK), although a few specialized career fields such as aviation are still restricting these applicants.

The US Army Aeromedical Research Laboratory (USAARL), Fort Rucker, Alabama, has initiated a study to evaluate laser eye surgery (refractive surgery) to determine whether it is a procedure that is compatible with the Army aviation environment. Refractive surgery involves procedures that modify the power of the eye in order to reduce dependence on glasses or contact lenses. There are numerous procedures available at present; however, only PRK and LASIK are being considered for the Army study. Procedures such as radial keratotomy (RK) or other incisional or implant surgeries are not being included in the study at this time. The study will look at applicants to the Army's rotary-wing flight program, and will NOT include currently rated aviators or other classes of flying personnel. *Current* AR 40-501 standards are *not* being modified.

**Refractive surgery involves procedures that modify the power of the eye in order to reduce dependence on glasses or contact lenses.**

Both the Air Force and the Navy are evaluating refractive surgery for their aviation environments. Currently, PRK is the only procedure allowed for USAF aviators. LASIK and RK are not authorized. USAF individuals do not need to be part of a study to have the procedure. In the Navy, pilots may have PRK but have to be part of a study. The Navy is evaluating approximately 250 pilots and 250 Naval flight officers (flying officers who are not pilots) who have had PRK, and will follow them in the training pipeline.

Individuals who have had PRK or LASIK and are interested in participating in the Army study should contact the Refractive Surgery Research Team at USAARL to initiate the application process. The Army study will include 100 applicants each who have had PRK or LASIK.

Enrollment is anticipated to take about two years, and it is estimated that the study will be completed in three years. The application packet can be found by going to the USAARL website **www.usaarl.army.mil** or to the US Army Aeromedical Activity website **www.rucker.amedd.army.mil/dept/aama.** Applications will be for consideration of an Exception to Policy for Refractive Surgery. The exception to policy is not a guarantee for entry into flight school, since there are no additional slots set aside for study participants. Flight school slots will still be competitive.

Those individuals who have not had PRK or LASIK surgery, but plan to in the future, may be considered for the study and should also contact USAARL's Refractive Surgery Study Team. However, refractive surgery should not be done for the sole purpose of getting into flight school. The decision has to be made based on a desire to reduce or eliminate a need for glasses or contacts, and should be made only after fully exploring the consequences of the procedure. A corneal surgeon (or two) should be consulted, and it is also suggested that the **www.surgicaleyes.com** website be reviewed regarding reports of poor outcomes. In a proposed addition to the current study, the Army will provide the surgery to qualified applicants at Walter Reed Refractive Surgery Center.

There are a few Army medical centers that have the mission to provide refractive surgery to specific communities under the Warfighter Refractive Eye Surgery Program (WRESP). Refractive surgery is not a Tri-Care benefit; therefore, individuals will have to determine their eligibility at their supporting medical center.

The USAARL Refractive Surgery Study Team can be reached at 255-6868 or 255-6876.

**—Dr. Corina van de Pol, USAARL, DSN 558-6876, (334) 255-6876, corina.vandepol@se.amedd.army.mil**

NCO CORNER

# Program Manager for Aircrew Integrated Systems Provides Aviation Life Support Equipment Computer Based Training

The Army's Aircrew Integrated Helmet System HGU-56/P has replaced the SPH-4 and SPH-4B helmet as the Army standard flight helmet. The HGU-56/P consists of a basic helmet, liner, earcups, dual visors, chin and nape strap, boom and microphone with speakers.

The Program Manager for Aircrew Integrated Systems located at Redstone Arsenal, Alabama, has contracted with Sigmatech, Inc., a Huntsville, Alabama training development firm, to produce Aviation Life Support Equipment (ALSE) computer-based training that will supplement the ALSE school curriculum taught at the Aviation Center and School, Ft Rucker, AL. This computer-based training will provide continuation training for ALSE technicians and qualified personnel who hold an H2/Q2 Additional Skill Identifier (ASI).

Users who attended the 2001 ALSE user's conference had an opportunity to participate in a demonstration of this computer based training.

Highly interactive computer-based training is near completion for the new helmet system, operation and maintenance of the AN/PRC-112 Survival Radio, and assembly, fitting and sizing of the Communication Earplugs (CEP). The CD-ROM will cover ALSE I, which consists of maintaining the HGU-56/P helmet; fitting of the HGU-56/P helmet to the M45 CB Mask; fitting and sizing of the Communication Ear Plugs; operations and maintenance of the survival radio, and the serviceability of the Aviation Battle Dress Uniform (ABDU).

The second CD-ROM will cover ALSE II topics, which include fitting /maintenance of the M45 protective chemical biological mask, training on the aircraft modular survival system (AMSS), and training on the high altitude oxygen system. Equipment users will be able to run the CD-ROM on their work or home computers and utilize the training as a refresher or as initial instruction.

The first series of ALSE computer-based Interactive Multimedia Instructional (IMI) CDs will be available to the field this year.

Development has begun for additional training in fitting of the M45 chemical and biological mask, procedures for ALSE in high altitudes, maintenance of survival kits and vests, understanding aircraft modular survival systems, and operation and maintenance of oxygen equipment. This training is due out to the field mid-year 2002.

**—John Jolly, PM-ACIS, Redstone Arsenal, AL, (256) 313-4262, john.jolly@ and Lois Adams, Sigmatech, Ladams@sigmatech.com**

# ACCIDENT BRIEFS

*Information based on preliminary reports of aircraft accidents*

## AH-1

### Class C
**F model**

■ Aircraft landed hard during emergency autorotation due to loss of engine power.

■ During out of ground effect (OGE) hover check, transmission was overtorqued. Transmission replaced.

## AH-64

### Class B
**A model**

During contour flight in mountainous terrain, aircraft contacted triple strand of power lines. The aircraft's wire strike protection system severed two strands of wire. After contact one wire remained connected to the aircraft. Crew executed precautionary landing.

### Class C
**A model**

■ Aircraft struck a large bird in flight resulting in unrepairable damage to one main rotor blade.

### Class E
**A model**

■ Gun was not returned to fixed forward after simulated harmonization and gun contacted ground upon landing. Mud was discovered in the barrel on post flight. No damage to gun or aircraft.

■ During aircraft run-up prior to flight, SIP engaged all digital automatic stabilization equipment (DASE) channels. Aircraft immediately began to move within the roll axis. Aircraft power levers were brought to idle, and aircraft was shut down without further incident. The DASE computer was replaced.

## C-12

### Class C
**T Model**

■ Crew reported bright flash off left wing while in flight at 13,000 feet above ground level, but experienced no instrumentation abnormalities. Post flight inspection revealed apparent lightning damage to propeller blade of No. 1 engine and FM5-800 GPS antenna.

### Class E
**D model**

■ Shortly after entering cruise flight, the pilot received a call from contract maintenance asking for the aircraft to return to base. Upon aircraft's landing, a mechanic boarded the aircraft and removed the floor panel access to the main wing spar area. Two large adjustable wrenches were removed from the interior of the access panel, the panel covers were replaced, and the aircraft was released for flight.

## CH-47

### Class C
**D model**

■ Post-maintenance test flight inspection revealed aft main rotor blade, blade damper, and rotor head component damage. Droop stop was found to be missing.

### Class E
**D model**

■ During hover, utility hydraulic caution illuminated simultaneously with loud bang from pump area. Aircraft landed without further incident. Utility hydraulic pump was replaced.

## OH-58

### Class A
**D-R Model**

■ Engine failed during OGE hover. Postcrash fire ensued and reportedly destroyed the aircraft. Both crewmembers egressed the aircraft with treatable/minor injuries.

### Class C
**D-I model**

■ Aircraft experienced an uncommanded descent from a 30-foot hover. Descent could not be arrested prior to impacting the ground.

## TH-67

### Class D
**A model**

■ During the student pilot's first unassisted VMC approach to the ground, the student froze on the flight controls at approximately 15 feet above ground level. The Instructor Pilot (IP) announced he had the flight controls 2 times, but was unable to raise the collective due the student pilot using it as leverage to push himself up in his seat as the ground approached. The aircraft contacted the ground hard and was shut down with out further damage.

## UH-1

### Class E
**H model**

■ During hover, aircraft's pedals had intermittent uncommanded force trim engagement. Aircraft was landed and shutdown with out further incident. Replaced tail rotor system magnetic brake. Test flown and released for flight.

## UH-60

### Class C
**A model**

During a training evaluation flight under NVGs at terrain flight altitude, crew allowed main rotor of aircraft to contact tree branch resulting in damage to three rotor blade tip caps.

### Class D
**L model**

Bambi bucket (660 gallon water bucket) fell in drop area during water bucket training. The flight crew returned the aircraft to parking and performed normal shutdown. The bucket was damaged. No damage occurred to aircraft.

### Class E
**A model**

During approach, aircraft's master fire light illuminated. Crew detected no smoke. Aircraft was landed and shutdown without further incident. Upper and lower fire detectors were replaced on No. 2 engine.

## Aviation Related

### Class C

During landing, UH-60L rotor wash blew two AH-64 main rotor blade boxes over, damaging the blades stored inside the boxes. Five UH-60s had previously landed without incident. The sixth aircraft's landing direction was changed. The altered approach path brought the UH-60 too close to the rotor blade boxes.

# NEWS & notes

## Desert Boots not permitted

The question has come up again about flying with desert boots. The short answer is "NO", it is not permitted—only all leather boots are acceptable. Just like the jungle boot (hot weather boot), the desert boots have nylon uppers that are a hazard in the event of fire. Even if you have managed to get your hands on some USAF series 790 desert boots, it does not matter that the US Air Force permits their flight crew to fly with them, they are not cleared for use by Army aircrews.

An all-leather desert boot is currently undergoing evaluation, but until it is accepted, protect the only feet you got issued and wear the proper footgear.

**—LTC Robert Noback, Flight Surgeon, US Army Safety Center, DSN 558-2763 (334) 255-2763, nobackr@safetycenter.army.mil**

## NO cold storage for batteries

If spare batteries are taking up space in the refrigerator, here's the word from the folks at CECOM—don't bother keeping batteries cold. Room temperature is fine for storing batteries. There's no need to take up refrigerator space in your Aviation Life Support Equipment (ALSE) shop, or any other refrigerated space, keeping them cold.

Moreover, keeping them in the freezer can actually shorten their life. Moisture is more likely to collect in the freeze-thaw process. Moisture is not a good thing in the life of a battery. So take them out of the fridge, and keep them out of the freezer, and they'll be more likely to deliver power when needed.

**—Ken Broeckel, US Army Communications Electronics command, Fort Monmouth, NJ, DSN 992-5431, Kenneth.broeckel@mail1.monmouth.army.mil**

# TRAINING & RISK MANAGEMENT

## Aviation Safety Officer Refresher Course (ASORC)

Twice a year, the US Army Safety Center (USASC) offers follow-on training for Aviation Safety Officers in the form of the Aviation Safety Officer Refresher Course (ASORC). This is a one-week course offered in September and December of each year. The final course this year occurs 3–7 December 01. Based on input from currently serving ASOs in the field, the course has gradually been revamped to serve as an advanced course in safety program management.

The "Modern Safety Issues" portion of the ASORC lasts 3 days. The Texas A&M staff will tailor the content to the needs of the attending students by examining the student's prioritized needs in updated information. Some examples include current OSHA standards; projected changes to OSHA standards; EPA standards and latest inspection feedback (lessons learned); confined spaces and permit required confined spaces; personal protective equipment (PPE) requirements; hearing protection standards; most recent government citations; federal facility compliance act; new hires; first aid issues; material handling issues, and renovation or construction issues.

Attendees must be graduates of the Aviation Safety Officer Course. You may register for a slot in the course through your S-3 training office. Please remember that class space is limited to 30 personnel, so register early!

**—Robert Dobarzynski, US Army Safety Center Training Directorate, DSN 558-9197 (334) 255-9197, dobarzyr@safetycenter.army.mil**

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

DECEMBER 2001 ✦ VOL 29 ✦ NO 12


# 2001 IN REVIEW— How did we do?

# Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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U.S. ARMY SAFETY CENTER

From all of us here at the US Army Safety Center, we wish you a truly happy and safe holiday season.

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James E. Simmons
Brigadier General, US Army
Commanding

# DASAF's CORNER

*from the Director of Army Safety*

## Collective Training and Safety

One of the great things about being here at the U.S. Army Safety Center is that it affords me the opportunity to interact with some of the most experienced aviators, senior enlisted, and civilian personnel that the aviation branch has to offer. The collective experience level, both in and out of the cockpit, of this assembled group of professionals would make the Wright Brothers proud.

Often the coffeepot discussions turn to *"How can leaders in the field integrate safety and predictability into their training when the OPTEMPO continues to rise and resources in terms of dollars, parts, and people continue to decline?"* This is a task that many of you face every day.

I would like to share with you a technique I have used both as a battalion and brigade commander. I have found it to be a useful tool in establishing a long-range training plan that not only provides predictability down to the platoon level, but it also puts the high-water mark on the wall for aviation maintenance and it affords for a robust Readiness Level (RL) training program.

Keep in mind that this model is simply a graphic example of how a squadron/battalion might formulate its collective training in order to provide predictability and ensure execution of a rigorous flying hour program. The model is not intended as a "be all to end all." It can, however, provide a framework around which

**Collective Training Model**

| TROOP | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|---|---|---|---|---|
| ALPHA TROOP | Troop Battledrill 6x Acft @ 4 Hrs/Acft (24 hrs flown) | RL Progression 2x Acft @ 4 Hrs/Acft (8 hrs flown) | PLT Battledrill 4x Acft @ 4 Hrs/Acft (16 hrs flown) | Sergeant's Time OPD/NCOPD All | Aircraft Maintenance Center |
| BRAVO TROOP | PLT Battledrill 4x Acft @ 4 hrs/acft (16 hrs flown) | Troop Battledrill 6x Acft @ 4 Hrs/Acft (24 hrs flown) | RL Progression 2x Acft @ 4 Hrs/Acft (8 hrs flown) | Sergeant's Time OPD/NCOPD All | Aircraft Maintenance Center |
| CHARLIE TROOP | RL Progression 2x Acft @ 4 Hrs/Acft (8 hrs flown) | PLT Battledrill 4x Acft @ 4 Hrs/Acft (16 hrs flown) | Troop Battledrill 6x Acft @ 4 Hrs/Acft (24 hrs flown) | Sergeant's Time OPD/NCOPD All | Aircraft Maintenance Center |
| TOTALS | 48 Hours Flown | 48 Hours Flown | 48 Hours Flown | | |

* The formula above is used for 3 consecutive weeks of training which equates to 144 hours flown / troop / month = 432 hours flown.
* On the fourth week of each month, the squadron executes a squadron battledrill to tie in the collective training already conducted in order to train on squadron METL tasks using the formula below. Total hours flown in the squadron: 432 + 80 = **512 hours**

| UNIT | MONDAY | TUESDAY | WEDNESDAY | THURSDAY | FRIDAY |
|---|---|---|---|---|---|
| SQUADRON | Issue Operations Order | Mission planning Sqdn prep | Squadron battledrill 20x acft @ 4 hrs/acft (80 hours flown) | Sergeant's time OPD/NCOPD All | Aircraft Maintenance |

realistic METL-based training can be conducted. Understanding that this model represents a perfect world with no training distracters, it still has application for general support, assault, cavalry, or theater aviation assets. Unfortunately, last-minute taskings that disrupt, delay, or delete scheduled training will occur. Aviation units that are either forward deployed or a one-of-a-kind unit may be the "only show in town," making them in high demand for short-notice taskings, which makes predictability that much harder to attain.

In the model, programmed training would slip to the right when unscheduled missions interfere with scheduled training. Readiness is not just our Operational Readiness (OR) rates; it is also a reflection of our ability to balance individual, leader/staff, and collective training against our aircraft operational readiness rate. Predictability provides the flexibility to achieve this balance. There will always be tension between RL progression, collective training, and flying hour production. But predictability allows every leader in the organization to have a common vision on how to manage this tension instead of it managing them. Safety in a unit is directly impacted by how effectively that unit manages change and operates with a common purpose. In both these areas, predictability contributes to our ability to integrate safety into everything we do. It is not enough to be able to recognize a safety issue; we must also understand and be able to implement risk reduction/mitigation measures to reduce the likelihood of an accident. Predictability inherently provides an environment where soldiers and leaders can plan and invest the time necessary to truly implement real risk mitigation controls and ensure everyone in the organization is involved. While change is inevitable, the true mark of solid training and safety programs is how well a unit can react and avoid being overcome by events in training and on the battlefield.

September 11th only further solidified that we live in a time of uncertain global stability, finite resources, and transforming military mission statements. We owe it to our nation, our Army, and our soldiers to do everything possible to increase readiness and reduce inherent risks. Our soldiers are our most precious resource, and we can ill-afford to let even one of them be injured or killed in a preventable accident. Predictability and safety need to be woven into unit culture to prevent daily distracters from having a detrimental impact on unit readiness and METL execution or derailing battle-focused training.

Fly Safe!

**BG James E. Simmons,**
**Director of Army Safety**

## Let us hear from you

***Flightfax*** **needs your input. Our goal is to bring you—the Army team, from the newest recruit to the Secretary of the Army—current information regarding potential safety issues.**

**The schedule inserted represents our annual strategic plan of where we think our publication should go in the coming months. . .but, we need your input. We want your stories, your experiences, and your insights. You are the ones that see systems for what they are. . .good and bad. We are all safety officers and if you have a better idea for doing business more safely and productively, we want to hear it.**

***Flightfax*** **is your publication, so why not have a voice? Don't worry about your ability to write, our staff of professionals can polish up any rough edges. If we use your story, not only will you get the credit, but we will also send you a certificate and specially minted Safety Center coin on behalf of BG James E. Simmons, CG, U.S. Army Safety Center. Send your articles to: flightfax@safetycenter.army.mil. (Articles must be received at least 60-days in advance to allow for layout and photography.)**

**—LTC Scott G. Ciluffo, Publishing Supervisor, DSN 558-2461 (334-255-2461), ciluffos@safetycenter.army.mil**

# Aviation Safety Performance Review

Overall in FY01, Army aviation experienced a seven percent increase in Class A-C accidents over FY00. The change was primarily due to an upsurge in Class A and B accidents. The number of Class B accidents more than doubled from FY00. Class A accidents jumped similarly, from 6 in FY00 to 13 in FY01, and fatalities nearly tripled, from 4 to 11. Fatalities were greater than usual, in part, because three of our Class A accidents resulted in multiple fatalities.

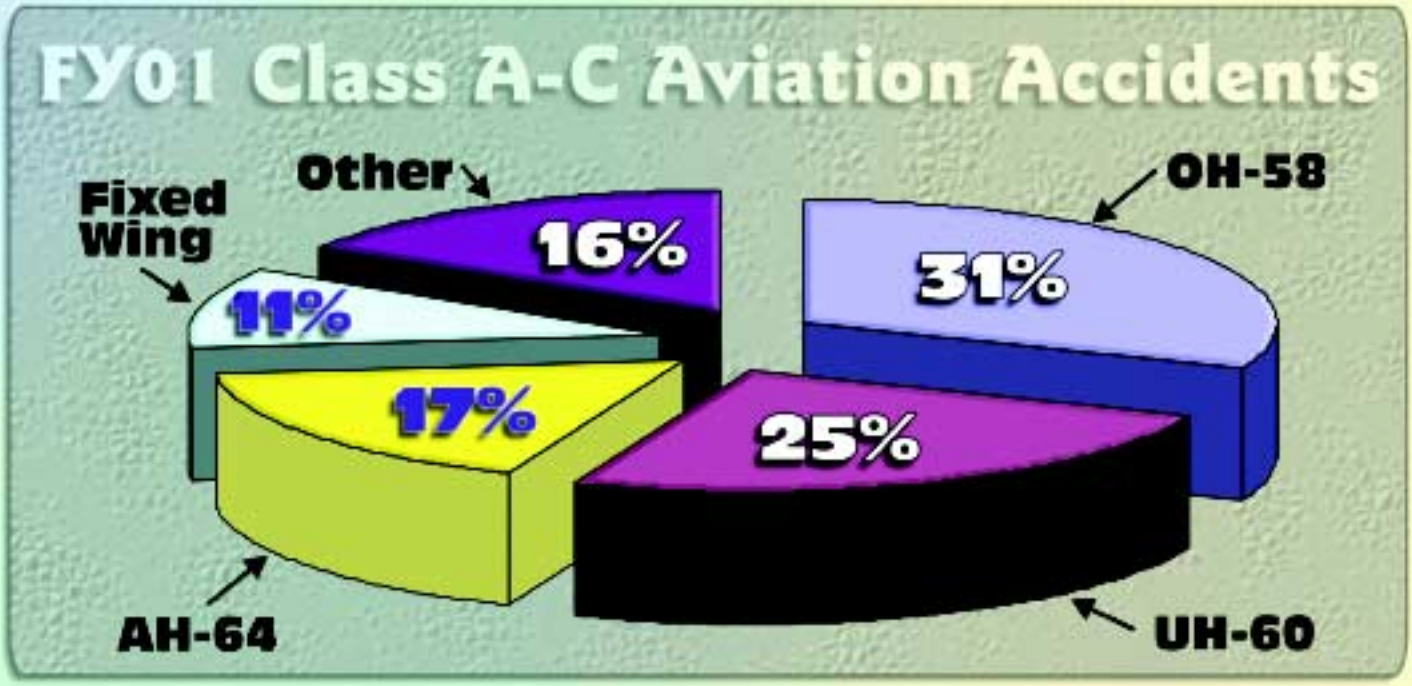
## Airframes

Nearly one third (31%) of the FY01 aviation accidents occurred in Observation Helicopters (OH-58A/C/ DI/DR), but primarily in the DI and DR models. Six of the 13 Class A aviation accidents occurred in the OH-58—which accounts for a significant 46%. Fortunately, none of these accidents resulted in fatalities this year. Interestingly, the numbers for the entire "OH" series are nearly identical to the figures for FY00. However, as reported by the Director of Army Safety in the November issue of Flightfax, the OH-58DI by itself has experienced a sizeable jump in accidents since FY00.

**Utility Helicopters** (UH-60A/L and UH-1H) accounted for 25% of the total aviation accidents. There were two Class A mishaps, which produced six fatalities. Although the number of Class As, (as well as the number of Class A-Cs), has not changed essentially since last year, the number of fatalities rose substantially, from two to six.

**Attack Helicopters** (AH-1F, AH-6J, and AH-64A/D) were involved in 19 Class A-C accidents this year. Fortunately only two of these were Class As with no associated fatalities, compared to the same number of accidents in FY00 that left two pilots dead. Overall, attack aircraft accounted for only 17% of the total aviation accidents.

Finally, the Fixed Wing community experienced the largest increase in Class A fatalities from FY00 to FY01, with the loss of five Army and 18 USAF Air National Guardsmen in the crash of a C-23, and two active Army pilots in an RC-12K mishap. This is in stark comparison to their zero Class As and zero fatalities during FY00. There was also a considerable increase in fixed-wing accidents—from 5 in FY00 to 12 in FY01, a 58% increase. However, fixed-wing mishaps made up a fairly small proportion of the total aviation numbers, 11% of all classes, and only 15% of Class As.




## Cause Factors

The central cause factor in Army accidents is generally underreported, and FY01 reports were no exception: only 43% of reports included the following information. For those reports, human error was by far the strongest contributor to accidents in each class. Specifically, 85% of Class As, 60% of Class Bs, and 58% of Class Cs were attributed to human error. Material failure was reported as a cause in only 30% of Class Bs and 32% of Class Cs. Material failure was not cited as a contributing factor in any of this year's Class A mishaps. Finally, environmental factors, as usual, were rare—and reportedly caused only one Class A, one Class B, and three Class C accidents.

## Conclusion

Overall, observation aircraft account for the largest percentage, almost one third, of aviation Class A-C accidents for FY01. Utility aircraft were a close second with 25%, attack aircraft 17%, and fixed-wing aircraft 11%. The remaining 16% of aviation accidents are attributable to other airframes, such as CH-47 and MH-6J. If only Class A accidents are considered, the number of accidents is spread evenly over the utility, attack, and fixed-wing fleets, and seriously over-represented in the observation aircraft. Fatalities, however, paint a much different picture. Utility and fixed-wing aircraft experienced the largest increase in lost lives, while attack aircraft showed a decrease, and observation aircraft stayed at zero. These figures are principally the same as those for FY00, with the exception of the increase in loss of life mentioned above. However, the upswing in OH-58DI accidents, which has been discussed earlier in this publication, continues to be thoroughly reviewed and investigated by the Army Safety Center Action Team.

When accident causes are examined, a major issue in aviation safety remains human error. Although training and leadership can often bear some of the responsibility, it is generally the case that soldier indiscipline, inattention, or the willful neglect of published rules or safeguards is cited as a contributing factor. In fact, indiscipline accounts for almost 28% of all aviation Class A-C accidents. Nearly all aviation mishaps by their sheer nature result in costly repair or destruction, but they are all the more tragic when they happen for some entirely avoidable reason, such as carelessness, overconfidence, or haste . . . don't become the next statistic in FY02.

—Operations Research and Analysis Division, U.S. Army Safety Center, Ft Rucker, Alabama

# Overview of Career Program 12 (CP-12) Safety and Occupational Health training

The safety and occupational health profession is at a critical point in its existence. Due to changing regulations and technology, many facilities are challenged just to keep up to standard on a daily basis. Leadership is in need of competent safety professionals with a comprehensive plan to support Army readiness, while staying in compliance with safety and occupational health statutes. The Career Program 12, Safety and Occupational Health Course recognized the need and formulated a training program to equip safety professionals.

The CP-12 vision is to meet the Army's Force Protection requirements, enhance mission accomplishment, and comply with statutory requirements by acquiring, training, developing, referring, and sustaining highly qualified Army safety and occupational health professionals. This vision is being realized by the career program's multi-dimensional training plan.

The CP-12 training program is tailored for Safety and Occupational Health interns, but it is also designed to meet the requirements of safety professionals and military members who need safety training. The course schedule is posted on the Safety Center website under the CP-12 hyperlink. Also on the website is a course catalog that contains course descriptions of all classes offered. To enroll, both civilians and military members should call DSN 558-3943 or commercial (334) 255-3943 or email Ms. Jenell Fuller **(FullerJ@safetycenter.army.mil)** to request a slot in a desired class. An original Department of Defense Form 1556 must be brought to class to obtain required signatures. Successful completion of all course requirements will entitle students to request college credit for most individual classes through the American Council on Education.

A partnership between Texas A&M-Commerce, Texas Engineering Extension Service, the OSHA Education Center, and the United States Army Safety Center provides an even greater opportunity for Safety and Occupational Health interns and safety professionals. By combining United States Army professional development courses and academic courses from the Texas A&M University System, interns are afforded the chance to earn a master's degree during their internship. A Master of Science in Industrial Technology Engineering and Safety Management can be earned through this innovative program of education and instruction in the area of safety management.

**By combining United States Army professional development courses and academic courses from the Texas A&M University System, interns are afforded the chance to earn a master's degree during their internship**

Career Program 12 provides safety professionals with combined intellectual knowledge and understanding of safety issues, advanced working skills, and credentials leading to rewarding professional opportunities in the United States Army. For further information, please visit the Safety Center website, or call Dr. Brenda Miller, Chief of Training and Education and Career Program Manager at DSN 558-3553 or (334) 255-3553.

— Krystal Hancock CP-12 Intern, USASC

NCO CORNER

# Sergeant Major of the Army sends…

***Subject: SMA Thoughts-n-Concerns***

These are busy days for all of us, but I recently sat through a briefing that made me pause and do some thinking. The briefing was on safety, and I'm again asking for your help.

If I can, I'd like to share with you what kept going through my mind as the briefer talked us through the slides, shared stories and statistics. During FY01, we learned 169 Soldiers died from accidents.

In my mind, I could see a company formation—a big, 169-person company. I imagined each of those Soldiers dead, I tried to envision that same number of funerals and headstones . . . and I wondered how many friends, spouses, children, parents and loved ones that big of a formation represented.

I was left saddened and determined . . . as in determined to put the word out and make a difference.

Some of our Soldiers may regard safety as an issue mainly impacting the TO&E Army. They say to themselves, "my unit doesn't have motor pools, we don't go to NTC and we don't deploy."

However, in reality everyone who works with Soldiers and civilians faces safety related issues. Our Soldiers and civilians face possible injury every day, performing tasks that are required for them to successfully perform their respective real world missions. We must remain vigilant in combating the enemy of safety - complacency in enforcement of standards.

Safety, in short, is not just an issue for the go-to-war Army. It's a soldier issue, a civilian issue, and it's an Active Army as well as a Reserve Component issue.

In the case of many safety related deaths, it was painfully obvious the cause was preventable, and that the person in the position most able to have prevented it was the dead soldier's first-line supervisor . . . A sergeant.

In more cases than I care to recall, something as simple as a seatbelt, a helmet, a ground guide or $20 worth of flashlights and road guard vests could have saved lives and prevented injuries. In other cases, adequate risk assessments, safety briefings, spot checks and closer involvement from an experienced leader would have likely been enough.

Anyone doubting this or wanting more specifics, the answer may lie no further than your dayroom's coffee table or your safety officer's in-box.

Each month, the Army Safety Center puts out its *Flightfax and Countermeasure* magazines, and they never fail to contain eye-opening examples of how poor discipline, poor planning,

poor preparation and poor leadership all contribute to far too many deaths. The center also runs an excellent Internet site at **http://safety.army.mil.**

I'd like for each of us to do all we can to ensure safety gets the visibility it deserves in our training, in our planning, and in the execution of everything we do.

In the past seven-or-so weeks, I've sat in a number of church pews near flag-draped coffins that contained the remains of Soldiers and civilians killed in the 11 Sept. attack on the Pentagon.

Sitting at the service and the graveside remembrances, I've felt the pain of these families and looked into the eyes of parents, spouses and children as they were handed the flag from their Soldiers' coffin.

It will take all of us—from private to sergeant major and lieutenant to general—to make a difference. The upcoming holiday season would be a good time to point out that safety impacts more than just what we do on ranges, in our motor pools and training areas.

Alcohol, speed, carelessness, snow-covered roads, fatigue, and other factors combine each year to claim far too many lives. Our behavior, and how we conduct ourselves in adverse conditions, are the factors that we can favorably impact with proper emphasis going into the holidays.

In addition to safety we should also add suicide prevention to our list of avoidable occurrences.

During the briefing I spoke of a moment ago, I was shocked to learn that a platoon of Soldiers—40 to be precise—had their deaths categorized as either suicides or suspected suicides so far in 2001. Perhaps not all of these could have been prevented, but I'm left wondering if a concerned word, a timely counseling, or simply a kind gesture could have been enough to make a difference to some of these Soldiers.

I'm no doubt preaching to the choir and a great many of you are in units where safety is priority one. But, even a single suicide or accidental death is one too many.

September the 11th was a hard day for us all, but it was prevented from being more tragic by the selfless acts of valor displayed by our fellow Soldiers and civilians. Late in October, Army Secretary White, Vice Chief of Staff Gen. Keane and I saluted our heroes by presenting them with the Soldiers Medal, the Defense of Freedom Medal, and other medals for their courageous actions at the Pentagon.

These brave men and women ignored danger, uncertainty, and pain, to come to the aid of their fallen comrades, just as Americans have performed on battlefields for more than 226 years. We should be proud of each of them.

On Oct. 9th, I was proud of the NCO Corps for a different reason. During a funeral for a soldier who died in the Sept. 11 attack on the Pentagon, I witnessed an act that—at least to me—epitomized our role in enforcing standards.

During the graveside portion of the funeral, Old Guard 1st Sgt. Robert Watson was set to receive the freshly folded American flag from the casket when he noticed a flaw. Few people watching would have noticed the flaw, and 1st Sgt. Watson might've been able to cover it with his hand.

But, while the family waited and before a number of VIPs—including the Army Chief of Staff—the first sergeant signaled for the flag to be refolded, a process that took several minutes.

I was deeply impressed by 1st Sgt. Watson's willingness to enforce standards, no matter how small the infraction, or who was watching.

I'd like us to let 1st Sgt. Watson be our example as we strive to never overlook a safety violation, or walk past an opportunity to use our positions and experience, to ratchet up on safety and develop procedures to identify and assist those that are in despair.

Together, we can take this on and make a difference simply by beginning to ask ourselves "when can I talk about safety," as opposed to "when must I talk about safety."

—Tilley, Jack L SMA [mailto:Jack.Tilley@hqda.army.mil]

Adapted from Sergeant Major of the Army's thoughts and concerns, 2 Nov 01

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# US Army Safety Center Points of Contact

**DSN 558-xxxx Commercial (334) 255-XXXX**

Director of Army Safety — **BG Simmons 2029**
Deputy Commander — **COL Warren 3075**
Executive Officer — **LTC Arnold 9493**
Sergeant Major — **SGM Griffith 3575**
Director of Operations — **LTC(P) Powell 2461**
Deputy Director of Operations — **LTC Ciluffo 2461**
Ground/accident investigation Division — **LTC Bowman 3562**
Aviation/accident investigation Division — **LTC McInnis 9552**
National Guard Liaison — **LTC Shea 1186**
Army Reserve liaison — **LTC Cianfrani 9864**
Fixed-Wing/Cargo helicopters — **MAJ Schoolcraft 9858**
Scout/Attack helicopters — **MAJ Cumbie 3754**
Utility helicopters — **MAJ Erker 9853**
Countermeasure — **Ms. Allman 2688**
Flightfax — **Ms. Wilson 9855**
Freedom of Information Act — **Ms. Hendrix 2373**
Help Desk — **Ms. Dyson 1390**
Industrial Hygiene — **LTC Overstreet 2477**
Legal — **LTC Henry 2924**
Media and Marketing — **Mr. Hooks 3014**
Flight Surgeon — **LTC Noback 2763**
Public Affairs Officer — **Ms. Wise 1129**
Publications Distribution — **Ms. Forehand 2062**
Operations Division — **LTC Sette 2194**
Research — **MAJ Sperling 1496**
Training Division — **LTC Robinson 1253**
Web site — **Mr. Harlow 2101**
**http://safety.army.mil**
**E-mail addresses:** ***lastnamef*@safetycenter.army.mil**

U.S. ARMY SAFETY CENTER

# Nomex and Polypro Don't Mix

Mixing the Nomex™ and the combat vehicle crewman (CVC) uniform with synthetic underwear, such as the issue-type polypropylene, is an invitation for pain! Nomex™ will withstand temperatures up to 700 degrees, whereas synthetic materials can melt at about 300 degrees. It is possible for Nomex™ to transfer enough heat to melt the polypro against your skin! Doesn't sound like a very comfortable way to survive a fire to me.

Okay, if I can't wear my polypro, what can I do? First, your only choice is to wear the aramid or 100 percent cotton underwear. Below is a table of national stock numbers for both types. Tell your supply folks to use an advice code of 2b. This code will ensure that you don't get a substitute made of synthetic materials.

Secondly, there are some "CVC look-alike" gloves available at clothing sales and other stores. These gloves are black in color; however, based on a recent test, they are not fire-resistant. Check your NSNs to make sure you have the proper glove.

Lastly, keep your CVC uniform clean. Oil, grease, or household starch will cause the fabric to burn. Cleaning the CVC uniform to remove these contaminates will restore its fire-retardant properties.

Don't be the aviator who survives a fire only to find yourself with melted polypro stuck to your skin, and third degree burns on your hands because of gloves that were not made from Nomex™. Worn properly, the CVC uniform will protect you from burns, should the unexpected happen.

**—POCs: MSG Michael H. Barksdale, Mechanized Infantry System Manager, Ground Systems and Accident Investigation Division, DSN 558-2959 (334-255-2959), barksdam@safetycenter.army.mil and Mr. Larry Hasty, Directorate of Force Development, Fort Knox, KY, DSN 464-3662**

### Drawers, 100% cotton, cold weather

| | |
|---|---|
| 8415-01-051-1175 | X-Small |
| 8415-00-782-3226 | Small |
| 8415-00-782-3227 | Medium |
| 8415-00-782-3228 | Large |
| 8415-00-782-3229 | X-Large |

### Undershirt, 100% cotton, cold weather

| | |
|---|---|
| 8415-01-051-1174 | X-Small |
| 8415-00-270-2012 | Small |
| 8415-00-270-2013 | Medium |
| 8415-00-270-2014 | Large |
| 8415-00-270-2015 | X-Large |

### Undershirt, Flyers, Man, Aramid

| | |
|---|---|
| 8415-00-485-6547 | Small |
| 8415-00-485-6548 | Medium |
| 8415-00-485-6680 | Large |
| 8415-00-485-6681 | X-Large |
| 8415-01-043-8375 | X-Small |

### Drawers, Flyers, Aramid

| | |
|---|---|
| 8415-00-467-4075 | Small |
| 8415-00-467-4076 | Medium |
| 8415-00-467-4078 | Large |
| 8415-00-467-4100 | X-Large |
| 8415-01-043-4036 | X-Small |

### Gloves, Combat Vehicle Crewman

| | |
|---|---|
| 8415-01-074-9428 | Size 5 |
| 8415-01-074-9429 | Size 6 |
| 8415-01-074-9430 | Size 7 |
| 8415-01-074-9431 | Size 8 |
| 8415-01-074-9432 | Size 9 |
| 8415-01-074-9433 | Size 10 |
| 8415-01-074-9434 | Size 11 |

# NEWS & notes

## Wildfire avoidance

Wildfire Flight Restriction Maps On The Web. It's that time of year again—time for thousands of brave men and women to risk their lives fighting wildfires around the country. A lot of this work involves high levels of flight activity as specially equipped aircraft drop retardant chemicals and water on fires. It also involves temporary flight

restrictions (TFRs) that can pop up pretty much any place. Often, real-time information on where TFRs are can be difficult to find. However, a new Web site established by the U.S. Forest Service's Bureau of Land Management aims to take much of the guesswork out of your pre-flight chores. The site is focused on the Pacific Northwest, but also has links to similar information maintained on TFRs for the rest of the U.S. Plus, a NASA drone may take some of the guesswork out of the firefight by beaming real-time images to crews on the ground. NASA has deployed the Altus II unmanned aircraft in its wildfire observation configuration. The platform employs military-type surveillance technology to collect and transfer imagery to computers, via satellite, and can loiter over a site for up to 24 hours at a time. The Altus II is a high altitude version of the USAF's RQ-1B "Predator" aircraft.

## Electronic test set

There is an Electronic Test Set available for testing and troubleshooting the SPH-4B, HGU-56/P Flight Helmet and Headsets. You plug your Flight Helmet into the Test Set, then check the Ohm acceptance range for the Microphone, then the Earphones. I have used this Test Set for several years and it has been a valuable tool troubleshooting the commo parts. Every 120 Day Inspection my Flight Helmets & Headsets are checked with this Test Set and I have found lots of parts on the edge of failing. Better to replace it in the shop than have an expensive mission abort due to a Helmet Comm Failure.

Specifications:

Test Set, Electronic Systems
NSN: 6625-01-251-8705
Cost: $289.62
AAC: D
SOS: S9E

**Doug Penovich, AASF #3 Peoria, IL**

## Send us your FOD

Got a FOD story? No, we really don't want the foreign objects—just the stories, please. Send your favorite (or most un-favorite) FOD story to **flightfax@safetycenter.army.mil**

## No Rides for Santa

A unit recently asked about using Army aviation assets for Santa to make an appearance at a military installation. Sorry, it's against regulations. According to AR 360-1, units may "not use Army aviation assets to transport persons costumed as Santa Claus, Easter bunnies, witches or any other holiday related character, whether the person is military or civilian, on or off a military installation."

So if your unit gets a request to fly Santa, or to provide a paratrooper to be Santa and make a grand entrance to the local tree-lighting ceremony, you will have to decline.

**—LTC Cindy Henry, USASC Command JAG, DSN 558-2924 (334) 255-2924, henryc@safetycenter.army.mil**

# ACCIDENT BRIEFS

*Information based on preliminary reports of aircraft accidents*

## AH-64

### Class A
**A model**

■ While conducting deep attack training, at NOE altitude using night vision systems, aircraft impacted trees and crashed. Extensive damage to aircraft, one fatality and one crewmember injured.

### Class B
**A model**

■ During Nap of the Earth (NOE) flight, aircraft contacted trees. Damage to aircraft's main rotor.

### Class C
**D model**

■ Instructor pilot (IP) detected burning odor and heard grinding noise from transmission area while aircraft was taxiing. Aviation power unit (APU) fire light illuminated during shutdown. IP pulled fire handle, crew egressed aircraft without incident. Postflight inspection revealed damage to APU, APU clutch, and No. 7 driveshaft.

■ During gunnery, aircraft experienced No. 2 engine failure while at a stationary out of ground effect (OGE)hover. Alternator failure suspected.

### Class D
**A model**

■ During cruise flight at 1500 feet MSL, a black smear appeared down the center third of the pilots night vision system of both the VDU and HDU displays. The IP terminated the night vision system training flight and returned to home base airport. Postflight inspection revealed that the PNVS shroud had been damaged. There was evidence (feathers and bird remains) of a bird strike.

## CH-47

### Class C
**D model**

■ Aft pylon access panels (clamshell doors) separated from aircraft during tactical slingload training. Crew was unable to locate doors. Doors replaced.

### Class E
**D model**

■ While lifting a Field Logistical Ambulance (FLA) during external load training, the vehicle rolled over on its side. After hooking the load and picking it up to "slings tight", the crewmember (CE) hooking the load determined that the aircraft was drifting right and released the load. After release, the FLA continued its sideward momentum and rolled over. No damage occurred to the aircraft. The FLA was not damaged other than a small hole/dent. Repairs totaled less than $25.

## OH-58

### Class B
**D-R model**

■ During an extended period of hovering flight, aircraft drifted and tail rotor struck a large rock. The aircraft sustained extensive damage after landing in a ravine.

### Class C
**A model**

■ Aircraft experienced windshear turbulence and subsequent engine/rotor overspeed (113% for 3 seconds) during a reported 3000 feet per minute vertical climb. Pilot executed corrective action and landed aircraft without further incident.

**C model**

■ Aircraft turbine outlet temperature (TOT) spiked to 850 degrees Celsius during engine start-up. Temperature peaked at 1000 degrees Celsius during engine shutdown. Aircraft was shut down without further incident.

■ While at a hover, following hot refuel, aircraft experienced a loud report, uncommanded yaw, and rapid descent. Hard landing resulted with damage to landing gear.

**D-R model**

Aircraft experienced NP overspeed of 120% for 2-seconds during FADEC manual throttle operations training. Maintenance to replace engine.

### Class E
**D-I model**

■ During low-level flight, TGT "High Temp" caution message appeared. When crew lowered collective, bringing TGT into normal range, and reapplied collective, message disappeared. A few seconds later TGT "High Temp" Time Limit appeared and TGT vertical scale went to full deflection. Engine monitor page TGT run showed 1095 for 14 seconds. Crew made a precautionary landing. Maintenance recovery team replaced left MCPU and aircraft was released for flight.

## UH-60

### Class E
**A model**

While conducting an Instrument Flight Rule (IFR) cross-country flight, aircraft's No. 1 FM radio started smoking. The radio quit smoking as soon as it was turned off. The aircraft was landed and shut down without further incident.

## O-5

### Class C
**B model**

■ Aircraft crew was executing a landing after performing an emergency landing gear extension procedure. After roll-out, the crew turned the aircraft around on the runway and began to back-taxi and restore the aircraft landing gear system to normal function. When the D3 circuit breaker was pushed in, the nose landing gear position light extinguished and the "gear unsafe" horn sounded. The aircraft nose gear collapsed and crew performed emer- gency shutdown. The nose of the aircraft contacted the runway, causing damage to the underside of the aircraft.

The failure was caused by a spike in hydraulic pressure in the nose wheel actuator system. A restrictor valve was not installed in the C2 port on the nose gear as required by Service Bulletin 7-32-74 or Service Bulletin 7-32-80.

# I Chose To Look The Other Way

I could have saved a life that day,
But I chose to look the other way.
It wasn't that I didn't care,
I had the time, and I was there.

But I didn't want to seem a fool,
Or argue over a safety rule.
I knew he'd done the job before,
If I called it wrong, he might get sore.

The chances didn't seem that bad,
I've done the same, he knew I had.
So I shook my head and walked on by,
He knew the risks as well as I.

He took a chance, I closed an eye,
And with that act I let him die.
I could have saved a life that day,
But I chose to look the other way.

Now every time I see his wife,
I'll know I should have saved his life.
That guilt is something I must bear,
But it isn't something you need to share.

If you see a risk that others take,
That puts their health or life at stake,
The question asked, or the thing you say,
Could help them live another day.

If you see a risk and walk away,
Then hope you never have to say,
I could have saved a life that day,
But I chose to look the other way.

—Courtesy of Don Merrell, J.R. Simplot Company,
Don Plant Training Center: dmerrell@Simplot.com