Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

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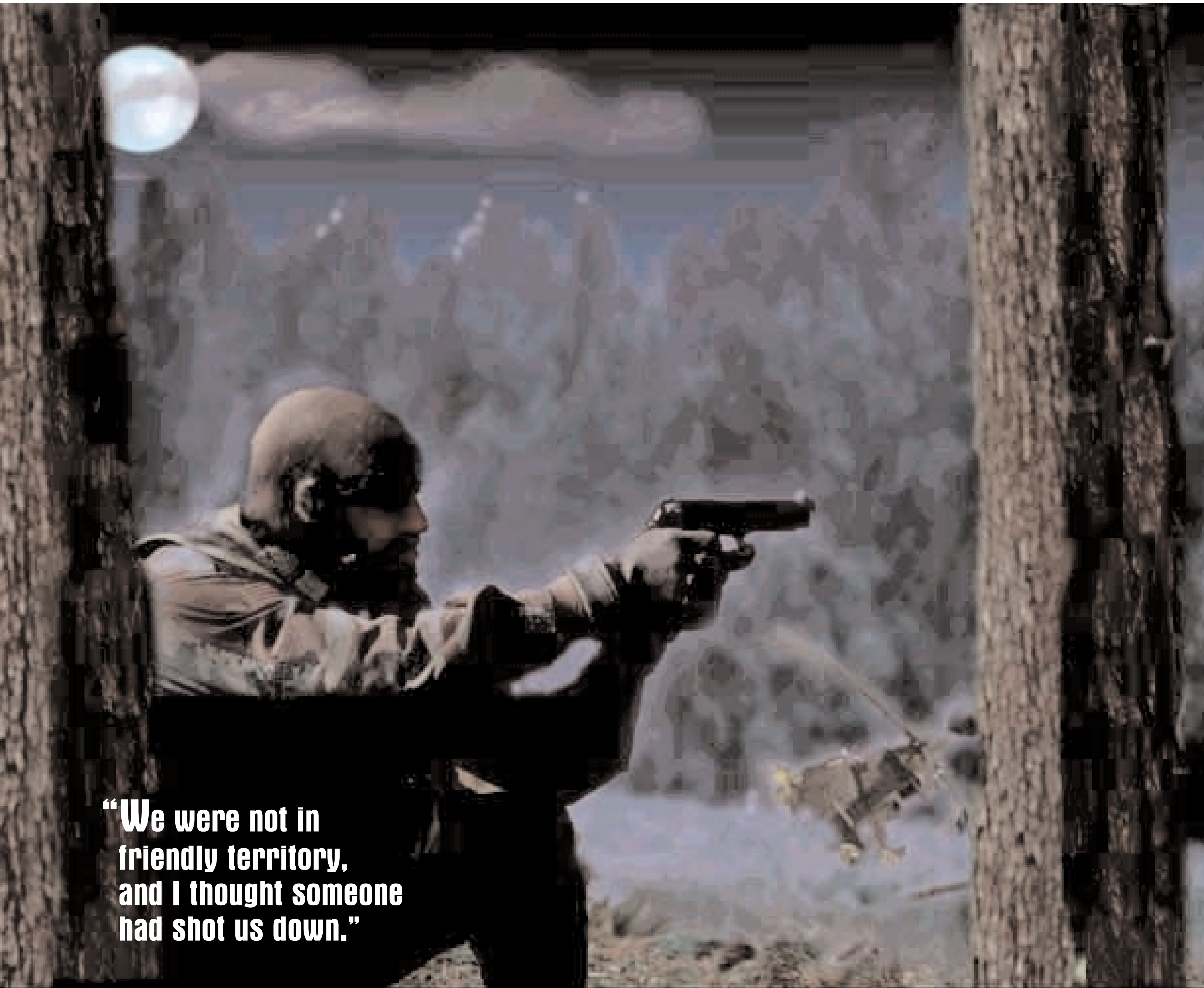


MISDIAGNOSIS CAN BE FATAL

***"It was dark** inside the OH-58D, but I could see my co-pilot moving around. I called to my co-pilot to close the throttle as I turned off both battery switches. I could not reach the fuel valve handle. We were not in friendly territory, and I thought someone had shot us down. It was time to exit the aircraft.*

I unbuckled my seatbelt and fell forward. I kicked a hole in the right front windscreen and crawled out. There were sparks coming from the aircraft. I yelled to my co-pilot to get out but he couldn't. I went back inside, unbuckled him, and pulled him out. We ran to the tree line.

After reaching the tree line, I told my co-pilot to chamber a round in his 9mm pistol. We then faced out to pull security as the AH-64 circled above us.

Most fields [here] are mined, and the only thing I could think of was getting out of there. But, I was glad the Apache was providing security for us. It was on short final for the field when I pulled out my survival radio.

When the aircraft landed in front of us, my co-pilot and I ran to the Apache and hooked up for emergency extraction. When fully strapped on I gave the back-seater the thumbs-up. The front-seater advised me to wait for the MEDEVAC aircraft because the area was clear and he would continue to pull security. My co-pilot and I went back to the tree line to wait.

At this time I was not feeling very good. I knew I was injured, and the situation was getting worse. It seemed like forever before the UH-60 Black Hawk arrived."

– recounted by the PC.

Misdiagnosis can be fatal

I am not speaking from experience, but I can only imagine that in-flight emergencies are the most stressful events in a pilot's career. The Army ensures that we pilots are, in the very least, minimally knowledgeable about how to deal with these emergencies. Annual APARTs and simulator flights help us to master the underlined and non-underlined steps of an emergency procedure, but most might agree that we are being tested only on the memorization of these procedures after the emergency has been identified. Diagnosis of emergencies (malfunction analysis) is a rarely taught skill, and it usually is left to the individual pilot to keep his diagnosis skills sharp.

Unfortunately, misdiagnosis of emergencies is very likely to cause harm. We have all heard the stories about misdiagnosing illuminated firelights as a real fire, causing a panicked descent from altitude. Or the shut-off of the wrong engine power lever or fuel control when it was the other engine that should have been shut off. These are not rare events. In fact, the 1997 "Wrong Engine" study, prompted by a UH-60 accident that involved misdiagnosis, brought out that misdiagnosis was one of most common pilot errors.

To illustrate this point, let's take a closer look at a recent OH-58D(R) accident. The PC has already described the aftermath of his accident for us. Without the benefits of the accident investigation results, the PC recounts the sequence of events leading to the accident. Then the US Army Safety Center Accident Investigation Board gives you the facts behind the accident and why the PC was led to believe the diagnosis the PI gave him.

From the PC – The Accident

"The aircraft was at 300-350 feet AGL, at 55-60 knots, with about 52% torque applied. I was wearing NVGs, with my mast-mounted sight page on the multi-functional display when I saw some flashes within 2 km. I turned my attention outside the aircraft. I felt the craft descend and looked inside. I asked my co-pilot, "What is the problem?" He said, "engine out!" as he lowered the collective.

When I saw the ENGINE OUT message, I quickly came

on the controls. I ensured the collective was full down and put the aircraft in an autorotational profile. My rotor speed (Nr) was in the yellow and dropping. There was no engine noise, no engine out audio, and no low rotor audio. I had no power turbine speed indication (NP) and no turbine gas temperature (TGT) indication. I knew there was something seriously wrong as I fell quickly to the ground. I headed for the field off the nose of the aircraft. The Nr appeared to stabilize, and I knew this would be my last chance to scan the instruments. I made a mayday call to my wingman while simultaneously decelerating the aircraft. At the altitude I thought was correct, I applied collective to cushion the landing.

Throughout the crash sequence I stayed on the controls. My shoulder harness locked as my head snapped forward. The NVGs came off my helmet, and the battery pack came forward as the cord ripped through the visor mount. The cyclic hit my kneeboard on my leg and bent it. After this very violent sequence, the aircraft came to a stop on its right side."

From the Accident Board – What they didn't know.

Unfortunately, the crew misdiagnosed their emergency. It is true that the aircraft generated an ENGINE OUT warning. Based on that warning, the pilot on the controls entered an autorotation. The PC, who was looking outside the aircraft, confirmed the ENGINE OUT warning and ensured that the collective was down and the throttle was open. He then began looking for a place to land. Fortunately, the crew was flying over an open field at the time. They executed the autorotation, and although the aircraft was totally destroyed, the crew sustained only minor injuries.

They responded to an erroneous ENGINE OUT warning without confirming the condition with other indications. The engine and all systems were fully operational, confirmed by data derived from the Map Data Unit. As the old saying goes, "they autorotated a perfectly good aircraft." This is not the first instance of an erroneous ENGINE OUT warning in the OH-58D(R). There have been at least two other reported incidents of this malfunction that did not result in an accident.

This story could have ended tragically. Had the crew been flying over mountainous or wooded terrain at the time of the accident, they might not have been around to tell the story. Their misdiagnosis of a perceived emergency situation might well have cost them their lives. What's the lesson learned? Under “Engine Malfunction - Partial or Complete Power Loss”, the OH-58D operator's manual contains a warning that reads:

> **Do not respond to the RPM audio and/or display on the MFD and/or MPD without first confirming engine failure by observing one or more of the other indications. Normal indications signify that the engine is functioning properly and that there is a malfunction in the engine or rotor sensing system(s).**

If you fly this aircraft, you already know that the OH-58D is an unforgiving aircraft if you delay lowering the collective in the event of an engine failure. Understandably, most pilots will not hesitate to enter an autorotation. How much time you have to confirm this condition with other indications is a function of your experience level and your particular flight profile at the time the incident occurs. How would *you* ensure that the engine has failed? There is a difference between memorizing your emergency procedures and understanding them.

A Complex Situation

This is not an attempt to find fault with the aircrew. Every Kiowa Warrior pilot is aware of the marginal autorotative characteristics of the aircraft. The OH-58D's low-inertia rotor system requires aircrews to rapidly lower the collective to prevent a dangerous and potentially fatal loss of rotor rpm. Add to the equation the fact that you might be flying in the caution area of the height-velocity diagram, in a hostile-fire area, at night under NVGs, and at 400 feet AGL. Additionally, pilots don't routinely train touchdown autorotations, especially NVG autorotations. As a result, you should expect to have very little time to "confirm the engine failure."

The complexity of the accident issue is clear: How can OH-58D pilots be expected to follow the guidance of the warning if the mission profile and aircraft envelope are working against them? Despite this paradox, the criticality of correct diagnosis of emergencies cannot be over-emphasized.

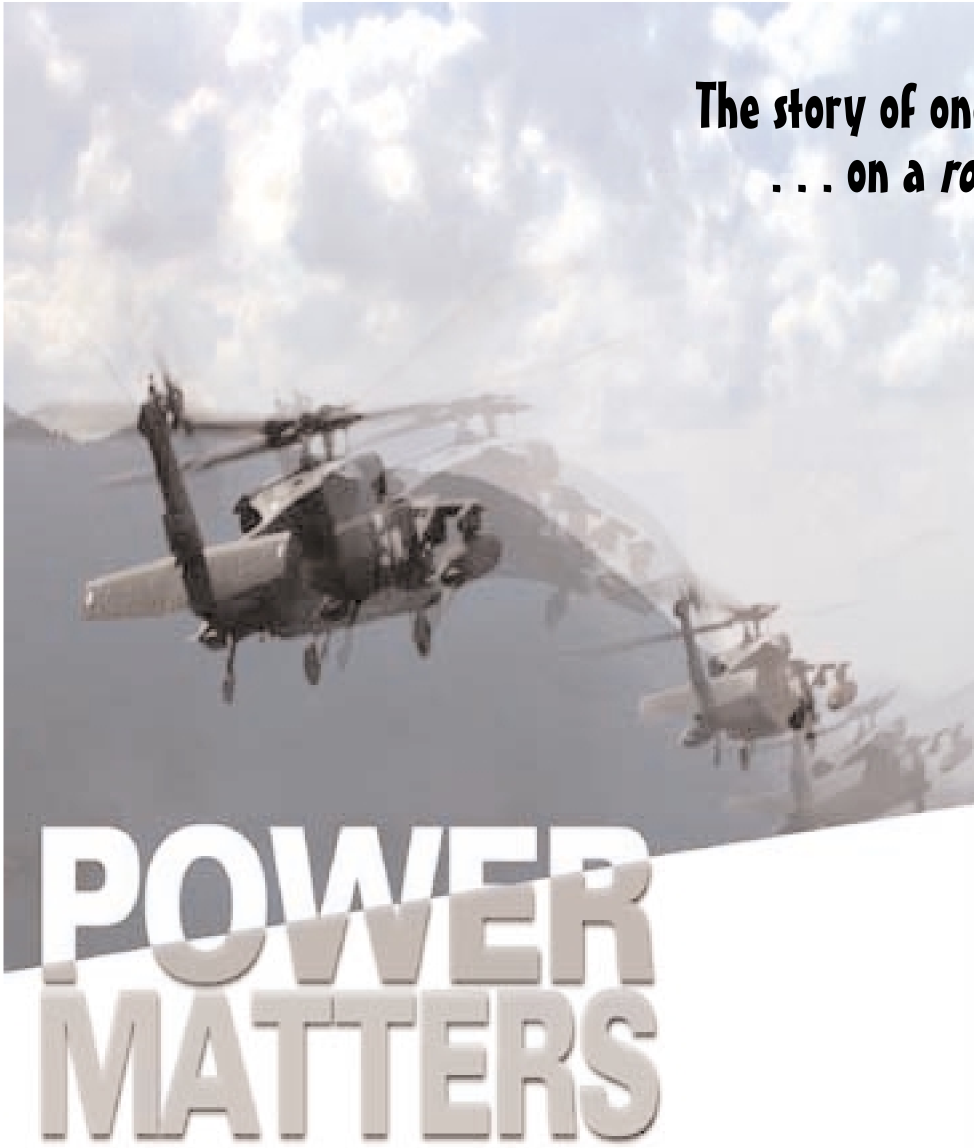
Understanding Emergency Procedures

In an emergency situation, your survival may depend on a rock-solid understanding of emergency procedures. This means much more than rote memorization of the tasks. It means understanding the possible ways that a given problem can manifest itself, i.e. correct diagnosis of the emergency. Understanding emergency procedures also means knowing what happens to the aircraft with every action you take. This understanding, coupled with effective crew coordination, will ensure that you accurately diagnose the problem and react accordingly.

What is the most important consideration in the event of an emergency? The textbook answer is aircraft control. Most of us would probably agree that aircraft control is the key to survival, which is the real overriding concern. If confronted with an emergency situation, are you prepared to properly recognize the emergency, react, and survive?

—CPT Stace Garrett, US Army Safety Center, DSN: 558-9853, Comm: (334) 255-9853 E-mail: garrets@safety-emh1.army.mil. **Thanks to the PC, who shall remain anonymous, for providing his account of the events.**

The story of one Blackhawk crew . . . on a *routine* mission.



GET THE VIDEO
Available January 2000 at these convenient locations

Visit the Army Safety website http://safety.army.mil.and follow the links.

Download POWER MATTERS Program of Instruction with simulator scenario

Get your own copy of the video
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- click on PIN / ICN Search and ask for PIN number 711267

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- Local TASC film libraries
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- National Guard Safety Managers

POC: Rebecca Nolin, nolinr@safety-emh1.army.mil,
DSN 558-2073, comm. 334-255-2073

RELIVE THE MISSION

Flying a disaster-relief mission loaded with ERFS tanks, the crew embarks on a routine mission. But as events unfold, their flight turns into one that is anything but routine.

In a unique first-person account, the PC of the aircraft looks at the different puzzle pieces that made up the accident.

Next, we hear from a Safety Center investigator, a DES Standardization Pilot, and a Human Factors psychologist, as they focus on three specific problem areas: Power management, Crew coordination and Risk management.

In conclusion, BG LaCoste, Director of Army Safety, highlights current problems areas in the Army dual-engine helicopter community.

You won't want to miss the wealth of information provided in this must-see video.

FLY THE MISSION

Download the Program of Instruction that accompanies this video from our web site http://safety.army.mil. As an added bonus, it contains a simulator scenario - place yourself at the controls and fly your way out of trouble.

Flying in the Snow

It's time to talk about snow. In some parts of the world, it's been here for months. In others, it's just getting ready to fly. Whichever is the case for you, it's never too late to get up to speed on winter flying.

Units that haven't reviewed training in cold-weather flying should do so immediately. Once an aircrew is involved in a whiteout during an approach, or experiences spatial disorientation over a snowy field, it's too late to talk about training.

Inexperience and lack of recent training are frequent contributors to snow-related accidents. If you are new to an area of frequent snows, get into FM 1-202: *Environmental Flight*, as well as all the local SOPs. Also ask questions of local safety folks and instructors—lots of questions.

Even if you have lots of winter flying experience, a few months time in temperate weather can erode winter flying proficiency. Remember, overconfidence can lead to an accident, just as surely as inexperience. Consider the following accidents:

Blowing Snow

The PC was confident in his abilities, and with good reason. He had more than 5,500 hours of military flying time, more than 2,400 in the UH-1.

He was at the controls when the Huey approached the designated landing area. There was a 400-foot ceiling, partial obscuration, snow, fog and estimated winds of 210 degrees at 8-10 knots. Using techniques outlined in FM 1-202 for snow operations, the PI terminated the approach at a high hover. He then maintained the hover for 1-2 minutes in order to blow away the new snow, which had freshly fallen on top of the 2 feet of crusted snow already covering the landing site.

When the Huey landed on the crusted snow, the rear of the skids broke through the crust, putting the aircraft in a nose-high, tail-low attitude. When the crew chief reported that the tail was only 2-3 feet above the snow, the pilots decided to reposition to another spot to level the aircraft. Because the PC had a good visual reference on a grassy area outside the right window, he took over the controls.

As the PC picked up to a 3-foot hover to reposition to a grassy area, he lost his visual reference in blowing snow. The aircraft began drifting left, and the tail rotor struck trees. As the PC attempted to set the aircraft down, the forward portion of the left skid struck the snow-covered ground, and the aircraft rolled over onto its left side.

The crew attempted to reposition their aircraft without a plan on what to do if they lost visual contact with the ground. The PC probably should have executed a take-off when he lost ground reference.

Lesson learned: A take-off under these conditions amounts to an instrument take-off. Practice ITOs until they are routine maneuvers.

Snow-covered landing areas

It was winter, and two flights of five UH-60s were on a troop insertion mission to unimproved landing areas. In one flight, the unit operations officer was piloting Chalk 3. Because of his unit duties, he had flown only 17 hours in the preceding 4 months. Moreover, he had not been able to attend mandatory unit training in which snow-landing techniques and procedures were reviewed, nor did he attend make-up classes or engage in hands-on snow landing operations training.

The flights were proceeding normally with 7 miles visibility and 1,000-foot ceilings in scattered snow showers. Then the two flights separated and began a series of false insertions.

Chalk 3's flight encountered a snow shower as they began a formation approach. Visibility was reduced to about a mile. The LZ was a large, open, snow-covered field with an apparent upslope in the direction of the landing. The crew of Chalk 3 could see a large amount of snow circulating through the rotor systems of the two aircraft ahead of them.

The pilot of Chalk 3 selected a touchdown point downslope and to the left rear of the lead aircraft. Using the upslope aircraft and distant tree lines as visual references, the pilot made his approach. A snow cloud enveloped the aircraft as effective translational lift was lost about 20 feet above the ground, with a left quartering tailwind of 15-25 knots.

The pilot decided to continue the approach without outside references and reduced power to put the aircraft on the anticipated upsloping terrain. In a complete whiteout condition the UH-60 touched down hard on a combination upslope to the front and downslope to the left. The helicopter rolled over and came to rest on its left side.

Several factors contributed to the difficulty of landing at this site:

- The flight was landing downwind to an upslope.
- The aircraft were landing during a snow shower to an LZ with very loose, dry snow.
- There were only limited stationary visual clues.

The worst thing that happened was that the pilot continued the approach when he lost visual contact with his ground references. He had to monitor two slopes and his position simultaneously. This would be a difficult task even if the pilot had a wealth of recent snow experience, which was not the case.

Moreover, the rate of descent was excessive, even if the approach had been to level terrain. FM 1-202 states that an approach to the ground should not be made in dry powdered snow unless the touchdown area is known to be level and free of obstructions.

In this case, the pilot was aware of both the slope and the looseness of the snow. However, he was not aware of his downwind condition.

Lesson learned: Approach and go-around planning are essential for any formation flight. They are crucial in snow environments. Planning should include:

- Instructions to execute a go-around if visual contact with ground references is lost, or if it becomes apparent that visual contact will be lost.
- Timing and spacing aircraft into LZs to reduce effects of blowing snow.
- Specific go-around instructions in pre-mission briefs (what direction to turn, where to land on subsequent approaches, and takeoff procedures.)

Other snow hazards

One of the most dangerous snow environments just may be the main airfield. The large open areas found at most airfields do not provide the contrast and definition needed to maintain orientation, especially when snow starts circulating through rotor blades.

Moving around the typical airfield is a little easier when you can "air taxi". When you are cleared to do so by ground control, just remember to keep a good scan going to keep from inadvertently descending.

Summary

Many aviators have their own ideas about how to mitigate the risks associated with blowing snow. As part of the winter academic program, it may be useful to survey aircrews to determine which hazards they consider the most severe, and evaluate the effectiveness of the controls that are in place. From such a survey, necessary upgrades to winter training plans and development of new controls can be put in place.

Winter has been a regular on the calendar for a long, long time. There's nothing we can do about that, even if we wanted to. In fact, the very predictability of changing seasons gives us time to plan our training for the different kinds of flying problems each season brings. If you haven't already done it, get your refresher training, review FM 1-202, and be alert to the hazards associated with winter flying.

—Adapted from CW5 (Ret) Bob Brook's original article that appeared in *Flightfax*, August 1997, Vol. 25, No. 11.

Above the Best

Since the dawn of this century, simply mentioning the fact that you are a military pilot often makes you the center of attention . . . even in the company of other soldiers or professional people. It is a heady feeling that strokes the ego, leaving you rightly proud of your accomplishments and proud of knowing you have joined an elite group, the long line of Army Aviators. You are one who can proudly wear the Silver Wings, one who can truly identify with the timeworn phrase, "Above the Best."

You could be doing a thousand other things with your life. Instead you have been chosen to do something extraordinary, something that demands intelligence, meticulous planning, and continuous, career-long, thoughtful effort in order to count yourself alive and successful at the end of the day. It is the stuff of legend, something highly desired and greatly treasured and, by nature, it is fun and exciting! No honest aviator would deny that. We probably wouldn't tolerate many of the hardships if it were otherwise.

That exhilaration comes at a price. Sadly, not all of us are willing to make that sacrifice for this great privilege. We have had some frightful incidents and accidents in the recent past because of that unwillingness. It is time to look at our individual attitudes, our professionalism, and the integrity of our actions.

Perception

You've heard it your entire career . . . you are a soldier first and always. What you do as an aviator is subordinate to that singular, distinguishable fact. It's that simple and it's that profound. This can't be overemphasized! If this is not your perception, then you need to seriously consider leaving the Army. There must be an unwavering commitment to this principle. Anything less is unacceptable and is grounds for dismissal!

Attitude

The great SPs I have known and worked with placed attitude preeminent on their scale of required aviator "skills." Among the many attributes and skills needed to be a proficient aviator, most can be strengthened or enhanced through study, practice, and guidance—with one notable exception, attitude. It is the age-old story, I can teach you to fly an ILS or to execute a VMC approach, but I can't fix your attitude. Only you can do that! It's a matter of the heart and only you can effect authentic and lasting change. If you have chosen to be a rogue aviator, the type who holds rules and guidelines in disdain, there is little hope of forcing you into a different mindset. Worse still, you simply can't be trusted with millions of dollars worth of equipment, the dependency of others on your mission performance, and most importantly, the priceless lives of your fellow soldiers.

Integrity

Can you be counted on—counted on to be realistic about your own or the crew's shortcomings, to maintain the knowledge necessary to be a professional aviator, and to be dedicated to the Army mission, whatever that might be on a particular day? Will you do the right thing when no one is watching? Regardless of the strength or weakness of the "command climate," a professional soldier and aviator will not violate the implied trust of those he serves. Vigilance must come from within; it should not need to be forced from without.

Duty and Honor

Some have snickered at the statement of the seven Army values, yet they form the glue that bond soldiers together in peace and, most especially, in war. These values are intangible elements, but they manifest themselves in very tangible consequences, good and bad, gratifying and tragic.

It is imperative the Army Aviation community solve its own problems without outside meddling from those who won't likely understand our unique requirements. Recent issues of Flightfax have made us aware of the consequences of disobedience and undisciplined flight. I'm encouraging you to aspire to greatness, to live on the other side of the fence from the rogue aviator, the one who wreaks havoc and destroys lives. Perform your flight, your mission, with honor and distinction.

Flying is fun and garners much personal attention, but it must be embraced as a sacred trust, and when that trust is violated disciplinary action must be swift and unwavering. The sheer joy of flight properly executed carries no guilt and is exhilaration undefiled. In the daily performance of this privileged assignment we must remain duty-bound and committed to integrity of action.

Contributed by CW4 William Barker, Ft Rucker AL, E-mail: barkerw@rucker.army.mil, DSN 558-1076, Comm. (334) 255-1076

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LTC Shea 1186

ARMY RESERVE LIAISON
LTC Smith 9864

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AVIATION LIFE SUPPORT EQUIPMENT
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CW4 Braman 9197

UTILITY HELICOPTERS
CPT Garrett 9853
CW5 Thorpe 9847

WEB SITE
Mr. Harlow 2101

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class C
A series

■ On post-flight, pilot found dent in tail rotor blade and hole punched in stabilator. Maintenance discovered one screw missing from tail rotor gearbox cover. The backing nut had failed and allowed the screw to come out, damaging the tail rotor and stabilator. The rotor blade and backing plate were replaced. The stabilator was repaired.

Class D
A series

■ The 30mm gun would not fire during Table VIII night gunnery. The aircraft returned to FARP. The bolt carrier was found to have been damaged by a chain screw that had worked loose in flight. The index drive rotor, sprocket and a pin were also damaged due to the sudden stop.

■ A crew chief noticed the UHF antenna beneath the aircraft was broken after an ATM training flight. The missing antenna piece was found buried in the ground in the area where slope training had been conducted on the previous flight. A minor crack was also found on the doppler radar altimeter antenna fairing.

Class E
A series

During hot refueling, refueler notified pilot of fuel leak. Aircraft was shutdown. Maintenance determined fuel system was overpressurized.

CH47

Class C
D series

■ Both generator shafts were found damaged. Transmission damage is also suspected due to sudden stoppage.

E series (MH-47)

■ During NVG mission training, aircraft's aft rotor system contacted trees during "confined area" approach/landing. Aircraft was repositioned, and a post-flight inspection found damage to all 3 aft main rotor blades.

Class D
D series

■ Crew was hovering with a 105mm Howitzer slingload. While at a hover with the slingload approximately 10 ft off the ground, one sling leg came loose. Crew set load on the ground and howitzer rolled onto its side resulting in damage to the equipment. Crew released sling from the hook and landed without further incident. Investigation revealed a flaw in the rigging by the supported unit allowing the chain links to slip off of the mounting point.

■ Squealing sound heard coming from forward transmission area during run-up. Aircraft was shutdown and driveshafts were lubricated. Same sound occurred during second start. No. 1 flight-boost pump was replaced.

OH58

Class A
C series

While in contour flight at 90 knots and approximately 50 feet AGL, the aircraft struck power wires in its flight path. The aircraft was destroyed in the crash. The crew escaped uninjured.

Class B
D series

■ While conducting FADEC manual throttle operations, crew reported NG/NP overspeed (128/124% readings respectively). Aircraft was landed without further incident.

Class C
D series

■ After pushing start button pilot noticed that the ignition circuit breaker was not in. Pilot then aborted start and pushed ignition circuit breaker back in. After waiting about 1 minute and 20 seconds before attempting a second start, pilot asked a crew chief to see if the fuel had drained from the combustion chamber. Crew chief reported fuel did drain and formed a puddle on the ground. The pilot then attempted second start. When start button was pushed TOT went to 1000 degrees. Pilot aborted start and maintenance was called.

■ During hover taxi to refuel, crew was notified by ground they appeared to have an open cowling. After landing crew observed damage to the right engine door that had opened in flight. Postflight inspection revealed that only one dzus fastener had been secured. Aircraft was released for one-time flight to home station.

■ During simulated engine failure at altitude PI reportedly exceeded engine torque limits at 132% for 1 second (Limits are 131% for 2 seconds.) Aircraft landed without further incident.

Class D
C series

■ During training autorotation, aircraft landed hard, bounced into air one time, touched down a second time in a slightly nose-high attitude, and came to rest upright. Postflight inspection revealed damage to drive shaft, isolation mount, crosstube, Wire Strike Protection System (WSPS), and tailboom.

Class E
C series

■ General segment light came on while aircraft was on the ground at engine idle. Aircraft was shut down. Maintenance found failed voltage regulator.

UH1

Class A
H series

■ Aircraft discovered just off runway shortly after radio contact with tower was lost. Aircraft was in final phase of second go-around. Two fatalities, two major injuries. Aircraft destroyed.

Class E
H series

■ Idle detent failed to engage on engine start. During engine shutdown, strong smell of electrical burning was

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.

noticed and emergency shutdown was performed. Odor came from burnt-out search light transformer.

UH60

Class C
A series

■ Post flight maintenance revealed damage requiring replacement to main rotor blades and spindles. Lightning strike in flight suspected. Crew did not detect lightning strike.

■ Tool was left in deice ring. During run-up for main rotor blade tracking, tool flew off and struck one blade, resulting in leading edge damage.

■ Crew heard loud bang on exterior of aircraft, along with CE observing what he thought was a bird exiting through the main rotor system. In-flight control check performed with normal response. Aircraft continued to destination. Post-flight revealed Blue Main Rotor blade dampener had failed and rotated on its mount. The BIM indicator, damper body, blade strap assembly and main rotor blade were damaged. Bird strike suspected.

Class D
A series

■ Aircraft was prepared for flight. While Test Pilot was getting flight information, maintenance personnel performing 10-hour maintenance inspection of aircraft failed to secure tail rotor driveshaft covers. Tail rotor driveshaft covers came open in flight. Ground personnel approached the aircraft at a hover, getting the attention of the crew chief but not the pilots. Aircraft was notified by radio.

Class E
A series

■ No. 1 engine was operating normally. While starting No. 2 engine, No. 1 engine starting light came on. Smoke entered cockpit and cabin. White wire to starter motion transducer was found to be broken. Further inspection revealed oil on engine deck and firewall. Starter was replaced.

C12

Class D
F series

■ During post flight inspection the maintenance personnel found damage to propeller blade tip.

Did Santa bring you one?

The Optiscan 2000 Inspector, NSN 2920-01-455-5480, provides maintenance personnel with the capability to inspect areas that can't be seen with the naked eye. The Inspector allows you to reach into small places and observe defects in equipment or find objects without the need to disassemble components. This can be invaluable in inspecting aircraft cockpits, engines, and closed electronics compartments.

The Inspector is a fiber optic instrument on an illuminated wand connected to an eyepiece. The eyepiece and wand are separated by four feet of fiber optic cable to allow you to see into tight areas. The illumination wand pivots 90 degrees to allow you to look behind and around objects which would normally obstruct your view. No more disassembly of components to complete a visual inspection. The eyepiece can be focused and provides 2X magnification.

For even greater magnification, check out NSN 2920-01-460-0429, which offers three times the enlargement capability of the Optiscan 2000. If Santa didn't bring you one, check with Stan Dillon, Defense Supply Center, DSN 850-2899, (614) 692-2899.

Aviation messages

Quarterly list update - Have you read these?

Aviation safety-action messages

October 99
AH-1-00-ASAM-01: Verification of Time – T-53 Engines
AH-64-00-ASAM-01: Inspect M/R Strap Pack Outboard Bolt
UH-1-00-ASAM-01: Tail Rotor Blade Life Extension
UH-1-00-ASAM-02: Verification of Time – T-53 Engines

November 99
AH-1-00-ASAM-02: T53 Chunk Screen Installation
AH-1-00-ASAM-03: Link Assembly
UH-1-00-ASAM-03: T53 Chunk Screen Installation
UH-60-00-ASAM-01: Inspect Main Rotor Hub Assembly

December 99
AH-64-00-ASAM-02: M/R Drive Plate Bolts/Holes
UH-60-00-ASAM-02: Cyclic Stick Wiring Bundle Relocation

Safety-of-flight message

October 99
AH-1-00-01: Retention Fitting Inspection
CH-47-00-01: T-62T-2B Auxiliary Power Unit

November 99
AH-64-00-01: Inspect Basic Configuration Hangar Bearings
AH-64-00-02: Inspect Main Transmission
CH-47-00-02: T-62T-2B Auxiliary Power Unit

December 99
AH-1-00-02: Interim Retirement Life – Impeller
AH-64-00-03: Inspect Main Transmission
AH-64-00-04: Inspect Basic Configuration Hangar Bearings
CH-47-00-03: Gear/Bearing Assemblies
UH-1-00-01: Interim Retirement Life – Impeller

Don't have one of these? Log onto the Risk Management Information System (http://rmis.army.mil). Your ASO or commander should have a password.

POV Fatalities through 30 Nov

FY99	FY98	3-yr Avg
14	24	18

HIGH-RISK PROFILE

Age & Rank:
19-23, E1-E4, O1, O2
Place:
Two-lane rural roads
Time:
Off-duty, 1100-0300
Friday & Saturday nights

TRENDS
1. No seatbelt or helmet
2. Too fast for conditions
3. Fatigue
4. Motorcycle accidents up

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WS • War Stories, CC • Crew Commo, SF • Shortfax

FY99 Aviation Accidents through 30 November

		Class A	Class B	Class C	Total
ACCIDENTS	Total* Avn Acdts	3	4	15	22
ACCIDENTS	Flight Acdt Rate	2.11	2.11	8.45	12.67
RATE COMPARISON	FY99 vs. FY98	50 %	200 %	20 %	38 %
RATE COMPARISON	FY99 vs. 3-yr avg	4 %	20 %	4 %	4 %
Aviation Military Fatalities					2

* Includes Flight, Flight-related, and Ground

U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

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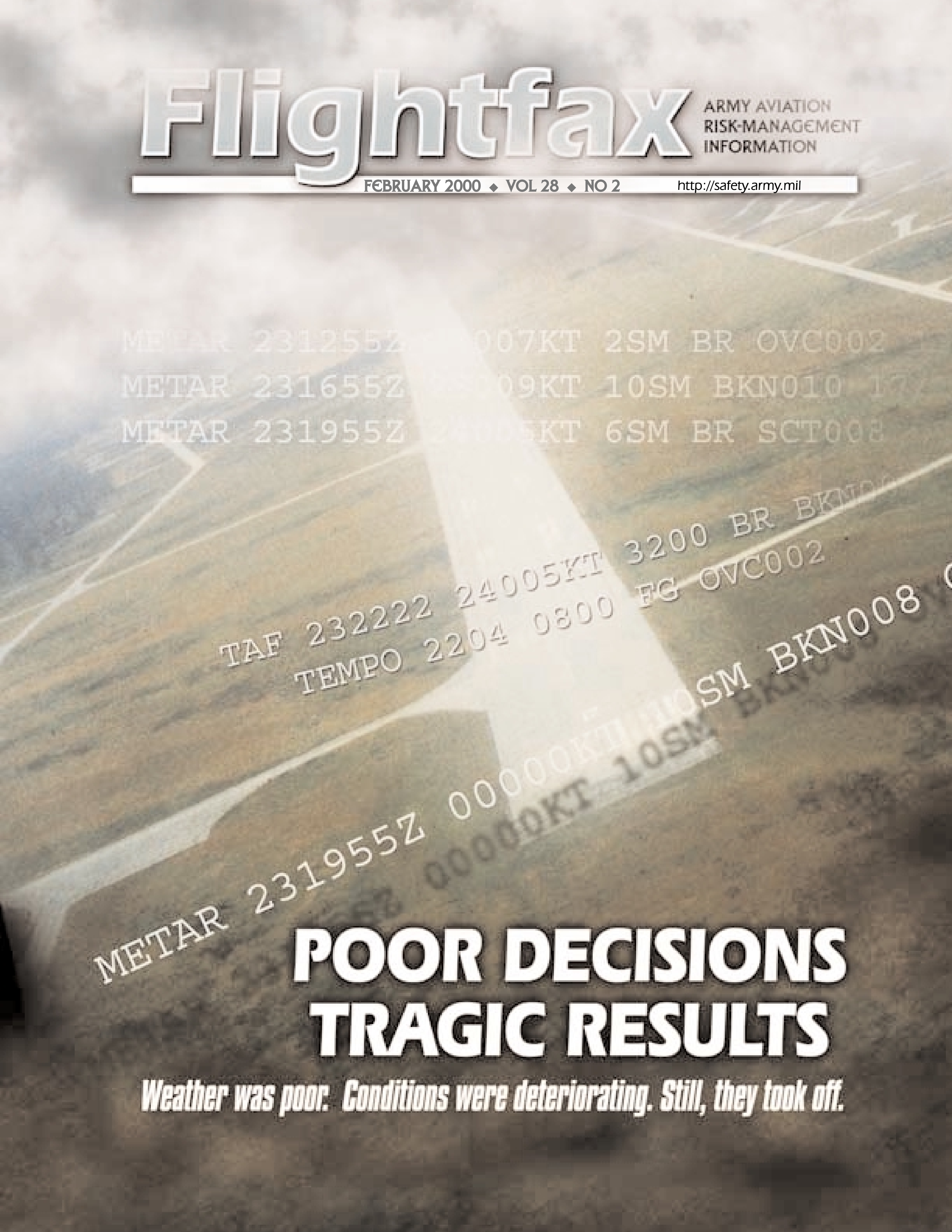


POOR DECISIONS TRAGIC RESULTS

Weather was poor. Conditions were deteriorating. Still, they took off.

Why did they take these risks?

A recent accident illustrates how risk-taking behavior can lead to a tragic chain of events. The result was destroyed equipment, crew injuries, and death.

Poor judgment does not reserve itself to any category of aviator. Low-time and high-time pilots alike can make poor decisions. When a poor decision is made, it can be fatal, not only for the offender, but for the crew and passengers as well.

The following account, which traces the mission and planning of an ill-fated flight, demonstrates the consequences, which arose from risk taking and violation of Army flight regulations.

A case in point

An instructor pilot with 3900+ hours was preparing for an instrument refresher training flight just before the Thanksgiving holidays. The weather had been poor for the previous three days and very few flights had launched. The pilot had approximately 450 hours and flew infrequently as a staff officer. Two crew chiefs were aboard the flight. The weather the day of the accident was poor in the morning, improved a little during the day, and then deteriorated again that evening. Ceilings were 200 feet overcast around 0900 with 2 statute miles visibility and a temperature/dew point spread of 13/13 degrees. Around 1300 the weather came up to 1000-foot ceiling, overcast, 10 statute miles visibility, and 17/14 temperature/dew point spread. By 1600 that day, when formal flight planning for the training mission began, conditions were still VFR.

Mission Planning

The aircraft assigned did not have a glide-slope receiver and at 1630 the IP directed the crew chief to physically inspect the aircraft to verify whether or not the aircraft had a glide slope. After their review of the aircraft, it was determined that the aircraft was not glide-slope equipped.

At 1710 the IP called the flight service station (FSS) for weather and received a forecast for his destination airfield at 1800 of winds variable at 3 knots, 2 statute miles visibility, mist, overcast 600 feet, temperature 15, dew point 14 and a temporary condition from 1800 – 2400 hrs of ½-statute mile visibility, fog, overcast at 200 feet.

Risk-taking behavior #1

Did not receive weather briefing from a military facility IAW AR 95-1 and local SOP.

He also received METAR (Aviation routine weather report) observations for his two en-route destinations for training approaches. The first airport was 55 miles to the east and was reporting winds 000 at 00 knots, ¼-mile visibility, fog, temperature and a dew point of 14 at 1650.

The second airport was 27 miles west of the first airport and 33 miles east of the departure airport. The second airport's METAR report cited winds 000 at 00 knots, 10 statute miles visibility, broken 800 feet and overcast 1100 feet, temperature 15 and dew point 14.

Risk-taking behavior #2

Did not associate hazards of a minimal temperature and dew-point spread, temporary condition, deteriorating forecast conditions, and added hazards associated with night instrument flight.

At 1715 the IP filed his flight plan with the FSS. Navigation equipment installed included a VOR and ADF. The planned approach at final destination had ceiling and visibility landing minima of 400-1/2. IAW AR 95-1 an alternate was required if ceiling and visibility were less than 800-1 1/4. The flight plan indicated 2 hours and 26 minutes of fuel on board.

Risk-taking behavior #3

No alternate airfield planned or filed in the flight plan, in contravention of AR 95-1.

Mission planning and training continued for the pilot using the general planning and FLIP until approximately 1800 hours, 15 minutes past the filed departure time. The IP turned in his DD 175, DD 175-1 and risk assessment to operations. The mission briefer approved the mission, and the crew conducted their preflight inspection of the aircraft at approximately 1805.

Risk-taking behavior #4

The mission briefer failed to ensure forecast weather conditions met the requirements of AR 95-1 and the local SOP. Specifically, a non-military facility provided the weather forecast, and an alternate airfield was required but not designated.

The Flight

The flight took off at 1832, using a standard instrument departure en route to the first airport, to conduct an instrument approach and a missed approach for training. At the second airport another training instrument approach and missed approach were to be conducted, followed by an instrument approach at their destination airport for termination of the flight.

The flight to the first airport was relatively uneventful. At 1906 the crew was conducting the VOR approach at the first airport. Radar showed the aircraft was on course and had no apparent difficulties executing the approach. The crew made the missed approach and continued to the second airport.

At the second airport, radar and ATC communications revealed the crew had some difficulty with identifying and intercepting the approach course. The approach clearance was cancelled, the aircraft was vectored to re-intercept the course, and the crew flew an ILS approach to localizer minimums at 1929. Radar data again shows the aircraft on course throughout the approach. The crew executed the intended missed approach and was given vectors for the return leg to their destination airport.

While en-route to their destination, the crew acknowledged having the current ATIS information – 100 feet vertical visibility, ¼-statute mile visibility, fog, temperature 13, and dew point 13. After being vectored onto the approach course, the crew executed an ILS approach to localizer minima, and then executed a missed approach at 1957 because they could not identify the runway environment. Radar data shows that the crew flew the approach course without significant deviation down to minimums. The crew requested vectors for a second ILS approach. At 2013 the tower radar identified the outer marker and the crew acknowledged the transmission as they began their second approach. This was the last transmission from the crew.

Radar data shows that the crew flew on course down to localizer minimums. Several hundred feet short of the runway the aircraft track began to veer left of course. The aircraft slowed to 60 knots and descended another 100 feet as it traveled 3/10 of a nautical mile past the runway approach end. At this point, radar identification was lost. From the last known radar position, the aircraft turned approximately 180 degrees and traveled the 3/10 nautical miles back towards the approach end of the runway. At 2017, 4 minutes and 20 seconds after crossing the outer marker, the aircraft impacted the ground. The aircraft was in a 30-degree nose-down level attitude.

The consequences

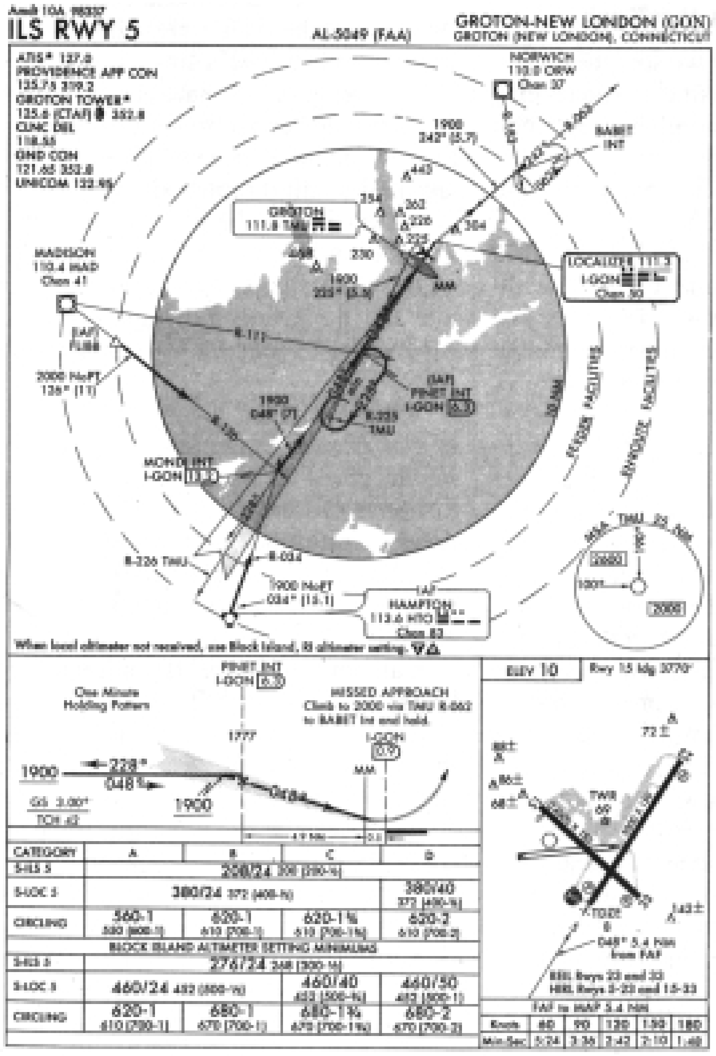
The resultant crash force was 57 G's. The IP and one crew chief were killed on impact. The pilot and other crew chief were ripped out of the aircraft as it disintegrated along the wreckage path. The expulsion of the pilot and crew chief dissipated resultant impact forces so that survival was possible. The pilot and surviving crew chief sustained serious life-threatening injuries. The aircraft was destroyed.

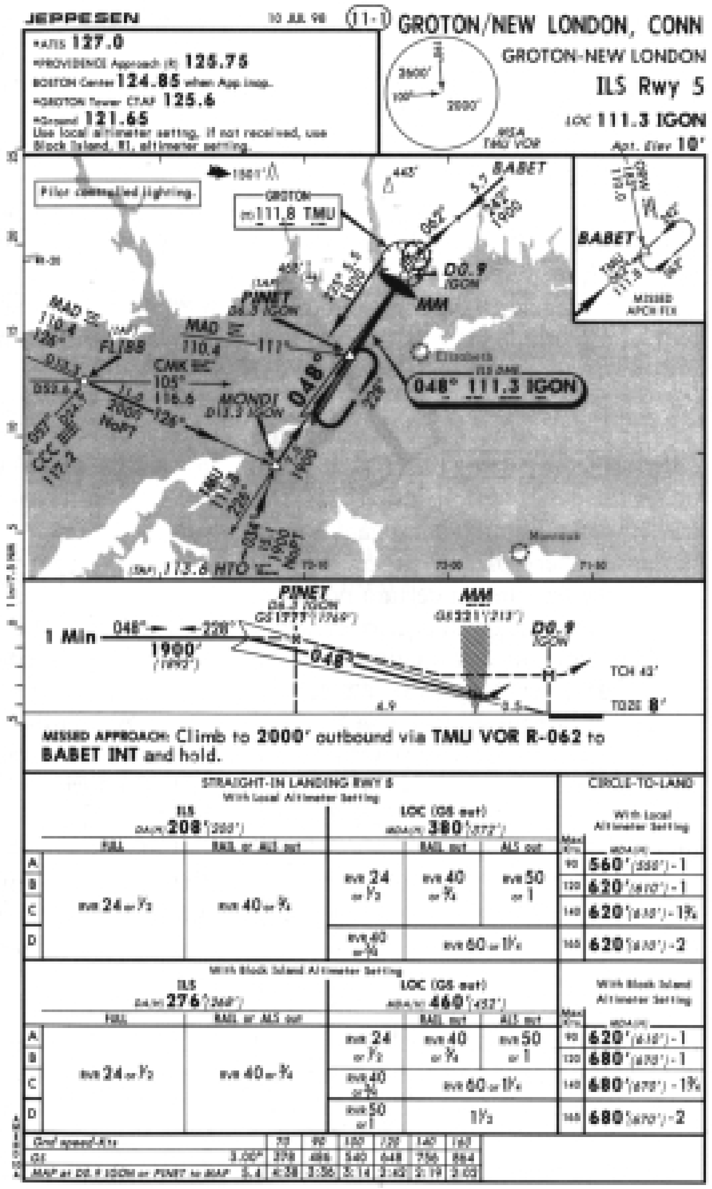
Conclusion

This accident was avoidable. Army flight operations are controlled and regulated for a reason. Major airlines and Part 135 operators use detailed operations manuals and procedures, just as we use SOP's and AR's, to reduce some decision making in the interest of safety and risk management. Major airline and military accident statistics strongly suggest that our operations are safer than General Aviation, because the military and Major airlines utilize more controls. If the SOP's and regulations are not enforced by supervisors and followed by our pilots, then we lose invaluable checks and balances to keep our operations safe.

IFR QUIZ • COLD ILS APPROACH

This ILS takes you across the frigid waters of Long Island Sound to the Connecticut coast.





1. The minimum safe altitude for this procedure is based on—
   A. TMU
   B. MAD
   C. HTO
   D. GON

2. Which of the following routes requires the execution of a procedure turn?
   A. When inbound from FLIBB to MONDI
   B. When inbound from HTO to PINET
   C. When outbound from TMU to PINET

3. What is 5.5 miles from TMU on a heading of 225 degrees?
   A. MONDI
   B. PINET
   C. BABET
   D. The missed approach point

4. You're on the transition from TMU to PINET at 1,900 feet. When crossing PINET, you should—
   A. Make the appropriate holding pattern entry and upon returning to the fix, make one turn in holding
   B. Make whatever course reversal is necessary to get established inbound
   C. Proceed to MONDI, reverse course and intercept the localizer inbound
   D. Make the appropriate holding pattern entry and upon returning to the fix, proceed straight in

5. Which of the following is not an initial approach for this procedure?
   A. TMU
   B. PINET
   C. FLIBB
   D. HTO

IFR QUIZ • COLD ILS APPROACH

❶ Activate on 125.6 when Twr inop.

❷ Closed to wingspan over 80' and/or apch speed greater than 120 kts.

TAKE-OFF

	Rwy 23		Rwy 5			Rwy 33			Rwy 15
			With Mim climb of 240'/NM to 400'		Other	With Mim climb of 280'/NM to 1900'		Other	
	Adequate Vis Ref	STD	Adequate Vis Ref	STD		Adequate Vis Ref	STD		
1 & 2 Eng	1/4	1	RVR 16 or 1/4	RVR 50 or 1	300-2	1/4	1	1500-3	300-1
3 & 4 Eng		1/2		RVR 24 or 1/2			1/2		

FOR FILING AS ALTERNATE
Authorized Only When Tower Operating

	Precision	Non-Precision
A	600-2	800-2
B	700-2	
C		
D		

CHANGES: Communications.

6. Which of the following is not an approved transition for this procedure?
   A. TMU R-225
   B. HTO R-034
   3. MAD R-111
   4. MAD R-126

7. What are the minimums for a Category B aircraft on the straight-in localizer using the Block Island altimeter?
   A. 380/40
   B. 460/24
   C. 380/24
   D. 460/40

8. The DME to identify PINET is based on—
   A. HTO
   B. TMU
   C. GON
   D. IGON

9. The DME to identify MONDI is based on—
   A. TMU
   B. IGON
   C. MAD
   D. HTO

10. DME can be used to identify the missed approach holding fix.
    A. True
    B. False

11. The missed approach holding pattern is standard.
    A. True
    B. False

12. The ILS uses a standard three-degree glideslope.
    A. True
    B. False

13. What is the elevation of the touchdown zone?
    A. 10 feet
    B. 8 feet
    C. 42 feet
    D. 5 feet

14. This airport can always be used as an alternate.
    A. True
    B. False

15. Which statement is correct regarding the alternate minimums?
    A. The precision approach alternate minimums are non-standard for Category B, C and D aircraft; the non-precision approach alternate minimums are standard.
    B. The precision approach alternate minimums are standard; the non-precision approach alternate minimums are non-standard.
    C. The precision approach alternate minimums are standard; the non-precision approach alternate minimums are standard.
    D. The precision approach alternate minimums are non-standard; the non-precision approach alternate minimums are non-standard.

16. This airport has a departure procedure.

    A. True
    B. False

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ANSWERS

1. A is correct. The MSA is based on TMU VOR.

2. C is correct. When proceeding from TMU to PINET, a course reversal is required.

3. B is correct. There is a published transition from TMU to PINET at 1,900 feet.

4. D is correct. After making the appropriate holding pattern entry, it isn't necessary to make any turns in holding if you're already at the minimum altitude. ATC expects you to proceed straight in when crossing the fix unless otherwise authorized.

5. A is correct. There is a published transition from TMU to PINET, but TMU is not an IAF.

6. C is correct. The MAD R-111 isn't an approved transition.

7. B is correct. The Block Island altimeter localizer minimums are: an MDA of 460 feet and RVR of 2,400 feet.

8. D is correct. When crossing PINET, localizer (IGON) DME is used.

9. B is correct. Both charts show IGON DME 13.2 at MONDI.

10. False. The missed approach hold is based on a radial from TMU, which doesn't have a DME.

11. False. The missed approach hold is non-standard.

12. True. Both charts show a glideslope angle of 3.0 degrees.

13. B is correct. NOS shows this on the airport diagram adjacent to the approach end of Runway 5, while Jepp lists the TDZE on the profile view.

14. False. You can file this airport as an alternate when the Class D airspace is operating.

15. A is correct. The alternate precision approach minimums are standard for Category A, non-standard for Category B, C, and D.

16. False. No separate departure procedure is listed.

We were all asleep!

On standby for Desert Storm, our date of departure was about two weeks away. The Division had decided to modify three UH-60 aircraft, which required about four days at Shreveport, Louisiana. With only 2 weeks left in country, no one wanted to spend that much time away from family. So the three crews were composed of all of the WO1 pilots in the company, with a solitary CW4 sent along to supervise.

He just happened to be our Instrument Examiner and always in a bad mood. All Army pilots know what I am talking about when I call him a " screamer." Too many years at Fort Rucker as an Instructor Pilot.

We were supposed to leave Hunter as a flight of three at about 0800. We arrived at work earlier than normal and prepared for our trip. Various maintenance delays resulted in an 1800 departure.

We arrived at one of our planned stops in Meridian, Mississippi at approximately 2200. We had one more leg to go, but all of the WOJGs decided that we were too tired to continue on and started taking our overnight bags off the aircraft. Then the screamer came over and started screaming. We discussed crew rest and duty day extensions. Against our will, he called and got authorization to continue. Of the five WO1 pilots in our group, all had been made PICs in the last six months. I had been a PIC for only a month and knew that butting heads with one of our Instructor Pilots was a bad idea. Besides, we were getting ready for a war.

We departed Meridian at about 2300 for our last hour of flight. We decided to fly on an instrument flight plan, each aircraft leaving about five minutes apart. Once we were airborne and climbed to 4000 feet, I commented about how smooth the air was. The UH-60 is very easy to fly on nights like this. One very rarely has to touch the controls. About 45 minutes into the flight I heard ATC calling our tail number, asking our intentions. That is when I realized that I HAD BEEN ASLEEP! I looked at the other pilot - he was slumped over in his seat. HE WAS ASLEEP TOO! I looked in the cabin and saw our crew chief lying on the passenger seats having sweet dreams. THE ENTIRE CREW HAD BEEN ASLEEP!

I called ATC back and asked for vectors for our approach. When advised of our location, I realized that we had been asleep for at least five minutes. Fortunately for us, we were still on course and altitude. Thank God for Flight Path Stabilization and smooth air.

We landed at Shreveport and never mentioned what had happened to anybody. But that experience really made an impression on this inexperienced aviator. Five months later, I was a CW2 PIC in Saudi Arabia. Because of the nature of our business, I was placed on missions that had us out for days at a time. We shuttled the Division staff around the country as they prepared for the ground war. I called back to our operations every day and let them know where I was. I was crewed with another CW2, and we were pretty much on our own. On several occasions, dust storms would roll in, and we would fly for hours in terrible conditions.

One particular day we ended up flying north to the Iraqi border from the Division Rear. The weather was terrible the entire flight. After about six hours of picking our way through sucker holes, at less than 200 feet off the ground, we arrived at our destination, and our Staff officers went to their meeting. The crew broke out their sleeping bags and claimed a spot in the aircraft. I was sure we were done for the day.

After about an hour the Colonel and his staff reappeared. They asked us how soon we could depart back to the rear. That would involve at least a three-hour flight with Night Vision Goggles. I did the math in my head. I could call back and get a duty day extension, but should I? The weather was not getting any better. I considered my options. I remembered my enlisted days as a grunt at the 2/ 502nd Infantry. We complained about pilots and their need to sleep. I realize now how foreign the concept of crew rest is to those raised on the Ranger mentality that sleep is an optional luxury. But the Shreveport experience was still fresh in my memory.

I told the Colonel that I thought it would be unwise to fly back tonight. I blamed it on the weather. I explained that we could depart after about four or five hours of sleep, given that the weather would improve, and he would be back by mid-morning. He walked away and talked to his staff. I heard some laughing. He came back and told me that he was borrowing a car and that his staff would enjoy driving him for the next ten hours, while he slept. He said the car would be more comfortable anyway. They packed into a nice Toyota Landcruiser and drove off.

We arrived at the Division Rear by 10:00 the next morning. I reported to the Colonel, expecting some grief. Not saying a word about the drive back, he informed me of the flying that was to be done today. I found out later that he had discussed the situation with my bosses earlier that morning, and they had backed me 100%. In fact, later on that year, after the war was over and we were waiting to leave Iraq, I heard that the Colonel had bragged about the young CW2 that made him drive (or at least his staff drive) for ten hours. I guess he kind of respected that.

On numerous occasions since that experience, I have been forced, as every Army Aviator has, to make decisions that concern the safety of others and myself. Some have been very unpopular with the soldiers that I was supporting and my chain of command. But I have learned that you end up coming out ahead in the long run. I believe I may be alive today because of the lesson that I learned on that flight to Shreveport, Louisiana.

—CW3 Paul Kahler, Tennessee National Guard, DSN 768-3694 (615-355-3694), kahlerpa@pa.arng.army.mil

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 Alan Gollmyer

1st Cavalry Division, Ft Hood TX

CW3 Alan Gollmyer was performing duties as an Instructor Pilot in an AH-64D Longbow Apache. On extended final approach, the APU fire button illuminated and the voice message enunciated. Both cockpits began to fill with smoke.

Although the written procedure for an APU fire was to land as soon as possible and perform an emergency shutdown, the aircraft was approximately 400 feet above the ground at 30 knots airspeed. CW3 Gollmyer realized that it would take too much time to land before the fire in the APU compartment spread beyond containment.

In direct contradiction to the published emergency procedure, CW3 Gollmyer pressed the APU fire button and immediately discharged both fire bottles into the compartment. He immediately expedited his descent and made a mayday call to the control tower.

The front seat crewmember was having difficulty seeing in the smoke-filled cockpit and opened his canopy door to the intermediate position. CW3 Gollmyer landed the aircraft and told the co-pilot to egress the aircraft. As he did so, his kneeboard lodged on the cyclic. CW3 Gollmyer maintained positive control of the cyclic and again instructed the co-pilot to egress and clear the cyclic. As the co-pilot egressed, CW3 Gollmyer performed an emergency shutdown of the aircraft's engines. When the rotor RPM had slowed sufficiently, he applied the rotor brake. When he exited the aircraft, he left the battery on so that the force trim on the controls remained on.

The fire department arrived three minutes later and found that the core of the fire was already extinguished. Their analysis, which was confirmed by the accident investigation, revealed that if CW3 Gollmyer had not taken the action he did, the aircraft would have certainly been lost, and quite probably, the lives of the crew as well.

The operator's manual did not address the use of fire bottles to extinguish an APU fire during flight. In fact, taking action other than the steps listed in chapter nine could result in accident investigation findings against the pilot. CW3 Gollmyer's knowledge of the APU system and the fire-warning system provided the wisdom he needed to save both his aircraft and his crew. His actions required knowledge, courage, confidence, and quick reaction time.

Note: The emergency procedures governing this situation have since been changed in the TM. Though the Safety Center applauds CW3 Gollmyer's outstanding airmanship and application of his experience and knowledge of AH-64D systems to successfully work through his emergency, executing emergency procedures as published will normally offer the aircrew the best option to maintain aircraft control and increase survivability.

—LTC Earl Myers, Chief, Aviation Systems and Accident Division

AH-64 BUCS Update

In the September 1999 issue of *Flightfax*, we gave you the facts pertaining to the AH-64 back-up control system (BUCS) situation. It is time to update you on the efforts of the Red Team and the other DA-level contributors. In this issue, we follow-up with a report on the Red Team's deliberations, provide flight crews operational information on the use of BUCS/EBUCS, and advise you of forthcoming actions.

Recapping the issue

The back-up flight control system (BUCS) and enhanced BUCS (EBUCS) are emergency back-up, fly-by-wire control systems. BUCS is installed on PV530 and subsequent AH-64A Apache aircraft and EBUCS is installed on all lot-2 and later AH-64D Longbow Apache aircraft. (For the purposes of this article, BUCS and EBUCS are synonymous, and the term BUCS can refer to AH-64A or AH-64D model systems.) BUCS permits continued flight in the event of jammed or severed primary mechanical flight controls. Following a recent Apache mishap, HQDA directed a Red Team to assess the AH-64A/D flight control system vulnerabilities with emphasis on lower mechanical controls to include BUCS.

Red Team findings

The Red Team was chartered by DCSLOG and the Safety Center, is led by AMCOM and includes representatives from USAAVNC, DCSLOG, PEO-AVN, TSM Longbow, ARL, and Boeing, with the Safety Center as a consulting member. After four months of analysis and deliberations, the Red Team identified materiel (reference LVDT issue in AH-64-00-ASAM-05), training, and soldier issues and specific actions that are required to reduce risk.

The Red Team reviewed AH-64 aircraft historical flight control system design specifications, combat vulnerability studies, flight control training/operational materials, and mishap statistical data relative to flight control integrity, and noted the following:

1. The primary flight control system on the Apache is a single-path hydromechanical system with limited-authority electrical stability augmentation. This primary system was designed with reduced strength components assuming redundancy provided by a back-up system.

2. The back-up control system is a single-channel, non-redundant, fly-by-wire back-up system that permits controlled flight in the event of a jam or severance in the primary system. The Army, however, is currently operating a mixed fleet of Apaches, some ***with*** BUCS active systems and some ***without*** BUCS active systems.

3. The first 529 A-model Apaches were produced without an active BUCS system due to specification-compliance issues. In 1995, following resolution of aircraft specification issues, the remaining 320 A-models were produced with an active BUCS system. System design improvements resulted in the enhanced BUCS (EBUCS) being developed for the AH-64D Longbow. Incorporation of the design improvements did not come early enough, however, to catch the initiation of the D-model line, and the first lot of D-models (26 aircraft) were produced without an active BUCS system; all subsequent D-model aircraft have an active BUCS system.

4. Army analysis indicates that vulnerability is reduced and that survivability and flight safety reliability are enhanced with BUCS.

The things you should know

Generally, you should understand the following three characteristics:

1. The BUCS system engages in each axis independently and operates only in the axes of a jammed or severed (disconnected) flight control. For instance, a jam or severance in the pitch axis will engage BUCS only in the pitch axis.

2. Once BUCS is engaged, it cannot be disengaged. Specific ground maintenance actions are required to return the primary flight controls to normal operation.

3. The pilots who participated in the BUCS qualification flight tests reported ***similarities*** between flying in BUCS and flying in the

normal mechanical mode with the stability augmentation system (SAS) off. ***To prevent sudden, abrupt control inputs during an in-flight BUCS engagement, the system incorporates easy-on times, one second for severances and three seconds for jams.***

How it works

In addition to the three characteristics above, you should understand how BUCS operates during different situations/ emergencies. Below are five different BUCS activation situations. See if you understand why the BUCS has these characteristics during these situations.

1. BUCS activation by PI decoupling SPAD (AH-64A) or ARDD (AH-64D)
   - The pilot will have control.
   - The copilot/gunner (CPG) can obtain control if the CPG decouples his SPAD/ARDD and activates the CPG BUCS select switch. Control cannot be transferred back to the pilot.
2. BUCS activation by CPG decoupling SPAD (AH-64A) or ARDD (AH-64D)
   - The CPG will have control.
   - The pilot can obtain control by decoupling the applicable pilot SPAD/ARDD.
3. BUCS activation by severance **between** crewstations
   - The pilot has mechanical control.
   - The CPG can obtain control by activating the CPG BUCS select switch.
4. BUCS activation by severance **aft** of the crewstations
   - Either pilot obtains control as soon as a mistrack is sensed.
   - There is a one second easy-on delay to achieve 100% control.
5. BUCS activation by CPG using BUCS select switch
   - BUCS is engaged under CPG control.
   - Control cannot be transferred back to the pilot.

Emergency techniques

Now you need to know some techniques involving BUCS activation during the following four emergencies.

1. Flight control axis jammed If it is determined that a BUCS engagement is warranted due to a jammed flight control axis, make an aggressive application of force in the jammed axes. If more than one axis is jammed, decouple the axis that has the highest priority first. After decoupling the control, center the control. Do what comes naturally and fly the aircraft. Some control will be immediately available and full control will be phased in over a 3-second period. Note that stability augmentation will be lost in the axis engaged in BUCS.

2. Flight control axis severed If it is determined that a BUCS engagement is warranted due to a severed flight control, the aircraft will automatically engage BUCS once the mistrack criteria is met. The flying pilot will most likely discover the aircraft to be in BUCS soon after the severance. Fly the aircraft and wait for full control to be phased in over a 1-second period. Note that stability augmentation will be lost in the axis engaged in BUCS.

3. BUCS ON message or light If the BUCS ON message or light is presented, the pilot and CPG should establish communication. The CPG should extend cyclic stick if stowed and coordinate the transfer of controls as necessary. Lastly, the crew should perform the appropriate aircraft emergency procedure for BUCS ON.

4. BUCS failure notification If the BUCS fail message or light is presented, pilot and CPG should establish communication and avoid rapid or erratic flight control inputs. The CPG should extend the cyclic stick if stowed, and the pilot should attempt to reset the BUCS fail by toggling the appropriate SAS channel on the ASE panel. Lastly, the crew should perform the appropriate aircraft emergency procedure for BUCS FAIL.

The path ahead

Now that you understand the issue, the characteristics of BUCS activations, and the failure modes, you are probably wondering where the Army goes from here. The general path ahead, defined by the Red Team, is to keep BUCS and capture the benefits of reduced **vulnerability**, enhanced **survivability**, and flight safety **reliability**. It is the Army's intention to fix the overall BUCS issue by addressing all materiel issues, by updating manuals, by improving resident training at the schools, and by providing augmented sustainment training to the field.

Specific training changes will occur in the AH-64 aircrew qualification and aircraft maintainer's courses. Currently, TC 1-214, the AH-64A aircrew training manual, and TC 1-251, the AH-64D aircrew training manual, are in rewrite and are scheduled to go to print in FY 00. They will include tasks (oral and flight) related to the back-up flight control system and will be mandatory for all units equipped with BUCS aircraft.

Additionally, on-site training will be made available and scheduled for operational units. It will entail a DES standardization instructor pilot flying with unit instructor pilots to familiarize them with the flight tasks in a ***train-the-trainer*** role. The training team will also leave each unit with a CD-ROM training package that will cover all related-system operation of the back-up flight control system.

—Adapted from AH-64-00-ASAM-04

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH1

Class E
F Series

■ Aircraft master caution light and engine chip detector segment light illuminated at cruise altitude. A precautionary landing was made to a nearby airfield. A second chip light occurred during engine maintenance checks. Nr and size of particles exceeded allowable limits, so engine was condemned.

AH64

Class C
A series

■ Aircraft contacted wires at approximately 150 ft AGL. Lower wire was cut by lower WSPS; upper wire was only partially cut by the upper WSPS. Aircraft was landed without further incident and flown back to unit station following damage inspection. Extent of damage: Main rotor blade and antenna.

■ On postflight, pilot found dent in tail rotor blade leading edge and hole punched into stabilator. Maintenance discovered one screw missing from tail rotor gearbox cover. The backing plate nut had failed and allowed the screw to come out, damaging the T/R and stabilator. The rotor blade and backing plate were replaced, and the stabilator was repaired.

Class E
A series

■ On postflight inspection, crew discovered evidence of a bird strike on gearbox fairing. Fairing was cracked, latches loose, but fairing remained on aircraft. Crew did not hear or know when bird strike occurred. There were no cockpit indications of any malfunction.

■ During hovering flight, crew heard a grinding noise, felt a slight vibration in the airframe, and smelled fumes in the cockpit. Aircraft was landed immediately. Just after landing, No. 2 generator failed. Operator manual emergency procedure was performed, and aircraft was shut down immediately. Postflight inspection revealed smoke was rising from No.2 generator. Parts of the generator were strewn through the transmission bay.

■ Pilot master caution light illuminated during flight with no associated caution/warning lights. Aircraft was landed without further incident.

■ During run-up, no NG indication in either crew station.
Aircraft was shut down without further incident.

■ During hover, the utility hydraulic light illuminated. Aircraft landed without further incident.

■ During run-up, transmission chip light illuminated. Aircraft was shut down without further incident.

■ During cruise, the NR tachometer failed. Aircraft landed without further incident.

■ During run-up, the utility hydraulic bypass light illuminated. Aircraft was shutdown without further incident.

■ During hover, the hot battery light illuminated. Aircraft landed without further incident.

CH47

Class E
D series

■ The aircraft did not respond properly to power steer inputs after landing. The flight engineer checked the right aft wheel and found the tire was flat. Maintenance found the tire tube valve stem had been cut. The tube was replaced.

■ During reposition for flight, No.1 engine normal beep trim static failure occurred. No. 1 engine responded to emergency trim. Aircraft was landed to taxiway, then No. 1 engine torque and N1 rose with no input. Aircraft returned to parking without incident. Problem could not be duplicated.

■ While in cruise flight, the pilot's attitude indicator showed a ten-degree nose-low attitude and the aircraft went into a left turn with heading select engaged. The emergency procedure for VGI failure was completed.

■ During engine start sequence, the No.2 engine would not start. Maintenance replaced the ignitor box.

■ Aircraft was chalk 2 in a flight of four during air movement with M998 cargo HMMWV as slingload. During flight tarp and bow flew off HMMWV and struck bottom of the aircraft, causing damage to the fuselage and rescue hatch door. Load was landed in LZ. Aircraft was repositioned to survey damage. Crew returned aircraft to airfield.

■ During flight, moderate turbulence was encountered with strong up/down drafts. During postflight, it was discovered that the forward yellow dampener was empty due to blown seal. Additionally, the aft left squat switch was installed improperly, causing it to malfunction on landing.

■ During run-up, No.1 generator would not come on-line. Maintenance replaced the generator control unit, and the aircraft was returned to service.

■ During run-up for air assault mission, pilot's torque gauge was inoperative. Maintenance replaced torque gauge, and aircraft was returned to service.

■ While at a hover, IP noted hydraulic fluid on the windscreen. Aircraft was landed. Replaced forward swivel actuator. Bled No. 1 and No. 2 hydraulic flight control systems.

■ During straight and level flight, flight engineer heard loud squealing noise in cabin area. Maintenance panel had Utility Pump Fault light illuminated. Pilots started APU and aircraft returned to home airfield. Utility Hydraulic Pump shaft had sheared.

■ During hover check, No. 1 engine transmission hot light illuminated. Aircraft landed and emergency engine shutdown procedures were completed.

■ During start of No. 1 engine, FE noticed traces smoke coming from engine exhaust. When the PI advanced the ECL to ground and actuated the

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.

start switch, flames were observed coming from the engine exhaust and burning fuel ran down side of aircraft. Crew aborted start attempt and extinguished fire.

■ After performing HIT check, No. 1 ECL caution capsule would not go out with ECL in flight. Aircraft taxied to parking. Loose wire was repaired, and aircraft was returned to service.

■ On approach to a soccer field, aircraft downwash blew a tent into a parked police car. The ground security team had been told not to put the tent up until after the aircraft landed.

E series

■ (Downgraded from Class C.) During NVG mission training, aircraft's aft rotor system contacted trees during "confined area" approach/landing. Aircraft was repositioned, and a post-flight inspection found damage to all three aft rotor blades.

OH58

Class C

D(R) series

■ During simulated engine failure at altitude, PI reportedly exceeded engine torque limits at 132% for 1 second. (Limits are 131% for 2 seconds). Aircraft landed without further incident.

Class E

C series

■ While in traffic pattern on base leg, transmission oil hot light illuminated. Aircraft was landed to taxiway and shut down without further incident. Maintenance inspection revealed thermo switch failed. Switch was replaced and aircraft was released for flight.

Class E

D(I) series

■ While performing a PAR approach to airfield, the crew noticed a low oil transmission caution message illuminate. The aircraft was landed as soon as possible to a nearby open field. Postflight revealed transmission fluid covering fuselage of aircraft. A DART team was launched. Upon inspection, a fitting on the transmission oil pressure line was found loose. The fitting was torqued and the transmission was serviced with 4 quarts of oil. MOC was OK and aircraft was flown to destination.

Class F

D(I) series

■ As aircraft came to OGE hover, pilot detected a high-pitch howling noise from the engine compartment. No vibrations or abnormal feedback noted. Aircraft landed and recovered from field via ground transportation. Maintenance discovered severe FOD damage to first-stage axial compressor.

UH1

Class E

H series

■ While on the ground master caution came on and would not reset. The Armature relay shorted out the master caution box. They were both replaced.

UH60

Class C

A series

■ Tool was left in deice ring. During run-up for main rotor blade tracking, tool flew off and struck one blade, resulting in leading-edge damage.

Class D

A series

■ While in cruise flight, the aircraft's left oil cooler access door separated from the aircraft, made contact with the main rotor blade, and then impacted the leading edge of the right side of the stabilator. Crew heard the impact and landed at a nearby airport. Access door separated due to failure of its forward hinge.

Class E

A series

■ Flying at an altitude of 250 feet AGL and about 10 knots, the No. 1 engine produced a loud bang. Instruments displayed everything as normal. The pilot then turned right and increased airspeed to 100 knots. Five minutes later, No. 1 engine anti-ice light illuminated. Aircraft landed, then returned to base with no further incidents.

L series

■ Aircrew noticed unusual lateral vibration during formation flight, then again on approach to landing. Aircrew landed and decided not to continue flight. Maintenance discovered that the scraper seal on the blade dampener had failed. Maintenance replaced dampener.

C12

Class D

H series

■ During level flight, the IP noticed an apparent fuel leak on the top of the No. 1 engine cowling. The crew landed without further incident. Maintenance personnel cleaned and inspected the aircraft, noting no maintenance problems. The aircraft was released for flight.

Class E

H series

■ During level flight at 10,000 feet, the PI noticed excessive oil leaking from top of the No.1 engine cowling. The PC confirmed the leak and checked the engine instruments. The crew elected to shut the engine down to prevent a possible fire or damage to the engine from oil loss. The crew executed a single-engine landing without incident. Maintenance found the No.1 engine oil filler cap was loose. After inspecting and servicing the engine, the aircraft was released for flight.

PA31

Class C

■ During landing, all four propeller blades on No. 1 engine contacted the runway. Aircraft completed landing without further incident and taxied to parking.

Corrections to USASC Points of Contact

DSN 558-xxxx
Commercial 334-255-xxxx

Fixed Wing and UAVs
MSG Briggs 3703

Help Desk 1390

Human Factors
LTC Noback 2763

Media and Marketing
Mr. Hooks 3557

Operations System Research
LTC Hunsaker 1496

Safety Awards
Mr. Lovely 1235

Statistics
Mr. Michael 3881

Training
CW5 Wootten 2376

Official Army Publications Web Sites

Now that it's the 21st century, get the Army pubs info you need online.

Electronic Technical Manuals

The Army Materiel Command's Logistics Support Activity (LOGSA) now has the library of technical and equipment publications (except engineering and medical) online. They can be found at

http://www.logsa.army.mil

After entering the site, select Publications and Forms. There are two electronic technical manual links:

* ETMs Bulletin
* ETMs On-Line

The ETM bulletin gives information on the program, and a list of fielded compact discs with ordering information.

Check out these other online sites for official Army publications.

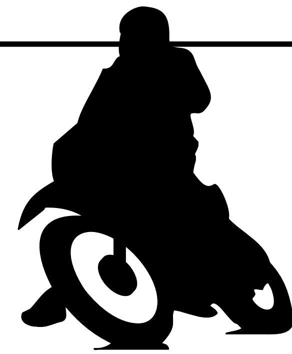
http://www.usapa.army.mil
Administrative departmental publications and forms

http://155.217.58.58
Army doctrinal and training publications

http://www.usace.army.mil-docs
Army engineering publications

http://www.armymedicine.army.mil
Army medical publications

—Wilma Fields, USAMC LOGSA, Redstone Arsenal, AL, DSN 645-8586 (256-955-8586), logetm@logsa.army.mil



POV Fatalities through 31 Dec

FY00	FY99	3-yr Avg
18	36	27

HIGH-RISK PROFILE

Age & Rank:
19-23, E1-E4, O1, O2
Place:
Two-lane rural roads
Time:
Off-duty, 1100-0300
Friday & Saturday nights

TRENDS
1. Speed
2. Traffic rule violation
3. No seatbelt or helmet

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WS • War Stories, CC • Crew Commo, SF • Shortfax

FY00 Aviation Accidents through 31 December

		Class A	Class B	Class C	Total
ACCIDENTS	Total* Avn Acdts	3	5	18	26
	Flight Acdt Rate	Flying hours through 31 Dec are not yet final. 1st Qtr FY00 acdt rate data will be published in Mar.			
RATE COMPARISON	FY00 vs. FY99				
	FY00 vs. 3-yr avg				
Aviation Military Fatalities					2

* Includes Flight and Non-flight aviation accidents.

U.S. ARMY SAFETY CENTER

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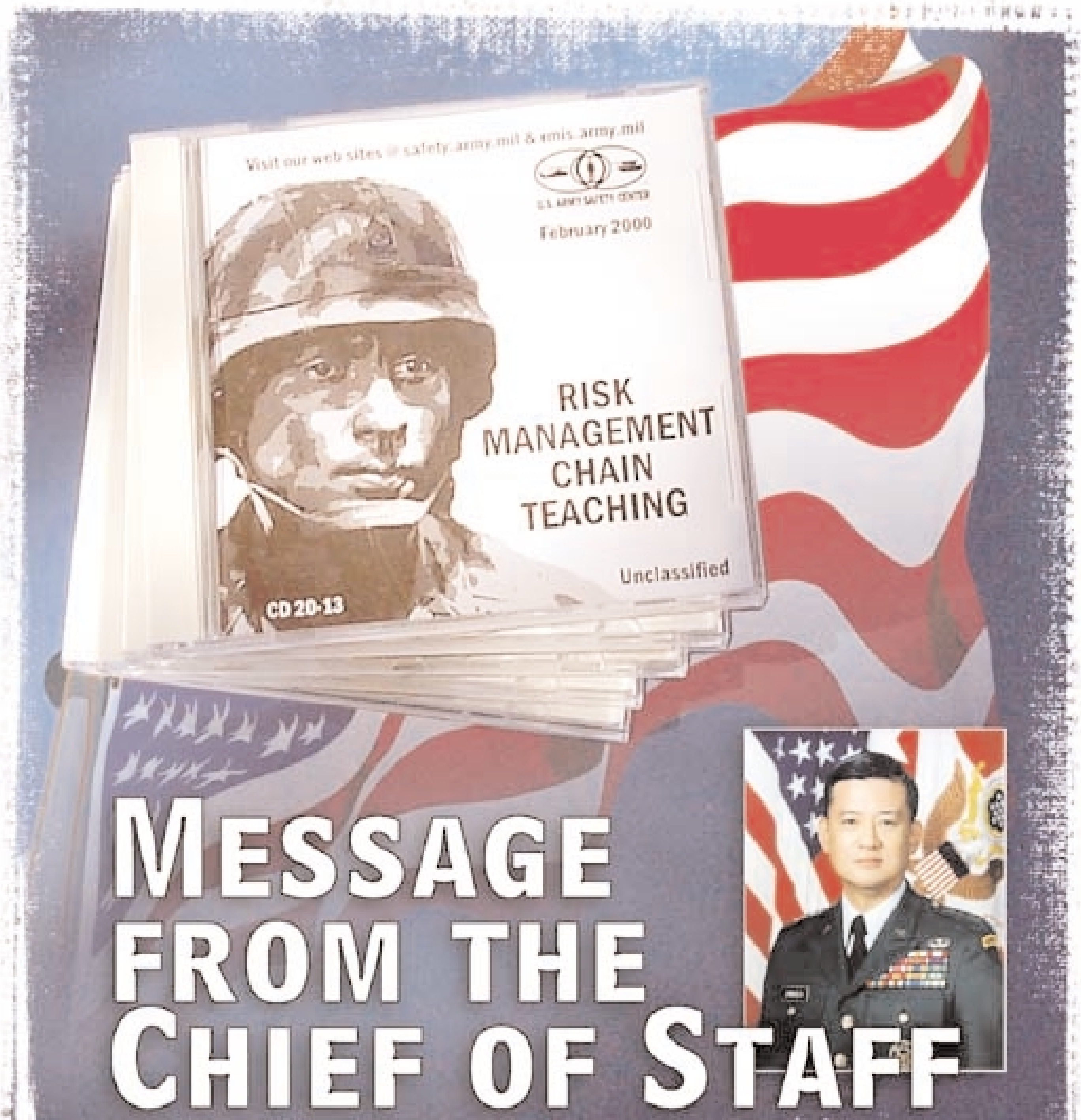
Gene M. LaCoste
Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

MARCH 2000 ◆ VOL 28 ◆ NO 3

http://safety.army.mil



Message from the Chief of Staff

Message from the Chief of Staff

I need your help to ensure that commanders at every level are focused on safety and are using the risk management tools that have been developed to prevent accidents.

The Army accident rate is rising, specifically in the number of vehicle (both military and POV) and aviation accidents. We need to implement the following measures:

Brief all fatal accidents (on and off-duty) to the first general officer in the chain of command. The intent is for senior leaders to "AAR" the accidents and develop or reinforce procedures from the lessons learned.

■ Train each soldier on risk management. We have developed a chain-teaching packet which will be available on CD from the Army Safety Center. All soldiers should receive this training by 1 July 2000.

■ Ensure compliance with the Army six-point POV accident prevention program. This is a comprehensive program designed to aid commanders in reducing the risk of POV accidents.

■ Develop standardized, drivers' training programs. Many new soldiers are entering the Army without driver's licenses. We need to ensure soldiers develop driving skills that will allow them to competently and confidently operate under all conditions.

■ Ensure aircrew coordination training is sustained. The Aviation Center is building an exportable training package. Review your requirements, and enforce the training standards established by aircrew training manuals.

■ Use the safety professionals assigned to your organization. They are a valuable asset for assisting commanders with the planning and execution of an effective safety program. An effective safety program focuses on positive, preventative measures taken to reduce risk, rather than reacting to accidents after they occur.

We have developed a chain-teaching packet which will be available on CD from the Army Safety Center. All soldiers should receive this training by 1 July 2000.

■ Ensure compliance with accident-reporting procedures. We need accurate information from the field to focus on the right problems and develop the right solutions.

In closing, please remind your commanders that safety and risk management are their programs. Focus on safety by the chain of command will occur only if there is focus by commanders. Every soldier is a combat multiplier—we cannot risk one life unnecessarily. The objective is simple—enhance combat readiness through proactive risk management.

Persuasive in peace, invincible in war!

General Eric K. Shinseki

***Editor's Note:** If you have not received your chain teaching package, contact Dr. Brenda Miller, USASC, DSN 558-3553 (334-558-3553), millerb@safety-emh1.army.mil*

...a study from our past major conflicts reveals that we have two enemies on the battlefield: them and us. In every modern conflict except Korea, more than 54% of the Army's casualties resulted from accidents. — RMIS webpage

Battery Acid Package Failure

Gallon-size bottles of battery acid with these NSNs

6810-00-823-8008 Grade 2 50%, 1-gallon bottle

6810-00-249-9354 Grade 3 37%, 1-gallon bottle

6810-00-236-0702 Grade 4 29%, 1-gallon bottle

6810-00-418-1697 Grade ¾ exception, 1-gallon bottle

may be in danger of breaking or leaking. The Army's shelf life administrator advises that the plastic containers for these items have been found to become brittle with age.

The Army's shelf life administrator requests that you make it a priority to check out your supplies of this commodity. The item is managed by the Defense Logistics Agency Supply Center, Richmond.

The shelf life is to be changed to Type I (non-extendable) 60 months, which will show up in LOGRUN, DLSC, SAMMS, and FEDLOG as shelf life code "S".

Depot stocks of this and other packages of this commodity will be screened to see what impact a change in shelf life will make on stock levels.

Kenneth Pillar, Army Shelf Life Administrator, US Army Logistics Support Activity, DSN 795-7685, (570) 895-7685 kenneth.pillar@logsa.army.mil

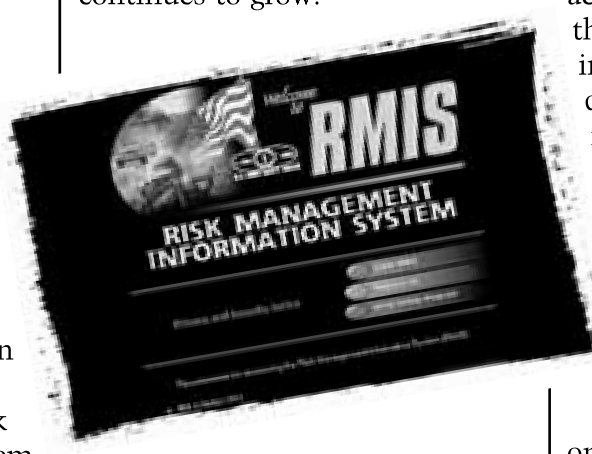
Risk Management Information System

The past safety successes achieved by the Army demonstrate the commitment and dedication of its leadership to protecting the force and multiplying combat effectiveness. Our goal is to continue the downward trend in the number of accidents. The U.S. Army Safety Center's Risk Management Information System (RMIS) is a powerful risk-management tool with the potential to help leaders and their staffs maintain this trend in accident rates.

Aimed at helping meet Department of Defense and Army goals for accident prevention, RMIS has been fielded and in use for about a year. It is an Internet-based risk-management tool that makes available to leaders worldwide a powerful "intelligence" system that offers significant help in identifying hazards and implementing controls to optimize force protection and multiply combat readiness.

RMIS, available in both a public and a restricted version, is designed to be a centralized, one-stop shopping source of near real-time information on hazards, risks, and controls. Still in its infancy, RMIS continues to grow more robust as sections are expanded and new sections are populated with data. As evidenced by its heavy use (104,434 requests from 23,423 users during the month of January, 2000), RMIS has become an invaluable tool in helping leaders and their staffs do the tough missions and do them safely.

Following is a recap of major additions and improvements as this risk-management tool continues to grow:



a. Systems. This section now contains direct links to the Army accident database and information on the Army's primary systems (tracked vehicles, wheeled vehicles, and aircraft). Also included are other safety links to risk management assessment tools, prioritized system hazards, and accident profiles.

b. Privately owned vehicles (POVs). This section was designed by a process action team to help Army agencies address POV accidents, the largest source of soldier losses. Included is the latest six-point program directed for use by the Chief of Staff Army. This section also contains a library of attention-getting accident photos that can be used for safety briefings.

c. Training. Significant improvements include five-minute safety briefings on a variety of subjects, ranging from hazardous materiel handling to electrical systems, the latest "hot news", and listings of available professional safety training.

d. Safety messages. Ensuring everyone "gets the word" has always been an Army wide problem. Safety messages are now available for aviation, night vision, and life support equipment. Also included are safety alert messages: Director of Army Safety notifications to the field of accident trends identified through the centralized accident investigation process and through detailed analysis of accident data reported to the Safety Center.

e. Help link. The Safety Center's help desk is readily accessible via this system to answer any technical or non-technical questions regarding risk management of systems and operations.

f. RMIS Training. Information on availability of and training on RMIS is provided at every civilian and military professional course taught by the U.S. Army Safety Center. Also, training to MACOMs and field agencies is available on request. RMIS is also briefed as a primary risk-reduction tool to all division commanders, students at the Aviation Pre-Command Course, the Aviation Warrant Officers Advanced Course, and students attending the Air War College. A brief overview of RMIS is provided to students attending the Inspector General School.

For further information on RMIS or to schedule training on the system, contact Mr. Dwight Lindsey, Program Manager, at DSN 558-1373, (334) 255-1373, or lindseyd@safety-emh1.army.mil. User notification and password access can be obtained through Ms. Wanda Thornton at DSN 558-2920, 334-255-2920, or thorntonw@safety-emh1.army.mil.

—Dwight Lindsey, Program Manager for RMIS, US Army Safety Center, DSN 588-1373, 334-255-1373, lindseyd@safety-emh1.army.mil

Crew Resource Management

Don't you just love the way most *Flightfax* stories start: "It was a beautiful, clear, sunny day. . . ." Well, this one doesn't. It was 900 overcast, 2 miles with rain showers, and the forecast was for it to get worse within 2 hours.

The field was barely VFR and we had a check-ride to complete. We were feeling the time crunch of trying to rush through our planning, weather, filing, risk assessment, and pre-flight while trying to make the weather window. This was our third attempt at finishing a check-ride, we were short IP's and we wanted this one to be a go.

Making Assumptions

I was from a different unit, so I didn't really participate in much of the planning duties. This effectively took me out of the Crew Resource Management (CRM) mix of responsibilities. Remember, CRM is supposed to use all the resources at your disposal. Don't assume the co-pilot is just along for the ride.

After hurrying through the aforementioned normal administrative items, we walked out to the aircraft. It was raining, heavier than forecast, and neither of us had a raincoat. Sound familiar? How often have you done the same, thought you'd be just a few minutes on a quick pre-flight? We had two sets of eyes, and were just staying in the pattern, so a really thorough pre-flight wasn't warranted.

We then proceeded to do a non-standard, not-by-the-book pre-flight. "You check the top. I'll check the bottom." Not exactly how the dash ten checklist is written, but how many of you do the same thing, dividing up the duties to speed up the pre-flight?

The light dawns

After completing our rainy duties, we strapped in and began the STARTING ENGINE checklist. Unfortunately, we failed to re-read the pre-flight checklist to confirm each pilot's work and the tasks he'd completed.

Another complication was that the unit had limited crew chiefs available. We had a fireguard for the APU start only, and he had his head down to avoid the rain when he gave us his clear, thumbs-up signal. He quickly departed the area once the APU was running.

After a normal engine start, we completed a BEFORE TAKE OFF check. The Number 1 engine checked out within limits and very close to the previous day's HIT. Our day became interesting when the Number 2 engine showed 100 degrees hotter TGT. We scratched our heads for a minute. Then a light dawned and I said "You don't think we left the inlet cover on, do you?"

I offered to hop out and visually check the inlet, but neither of us really thought we could make such a foolish error. (Don't those bright red covers have big REMOVE BEFORE FLIGHT streamers?)

Sure enough, plastered against the swirl vanes, was the engine inlet cover. We performed an emergency engine shutdown, and ground taxied back to the tie-down area on one engine.

What if?

Our haste and failure to follow procedures almost cost us an $800,000 engine or worse. What if we had not noticed the HIT check, or disregarded it? What if we had launched for our traffic pattern flight experienced inadvertent IMC and lost the Number 2 engine? Think about how close we were to a potential disaster. How many eyes should have caught that inlet cover? Was it haste, poor CRM, or simple complacency? Probably all of the above.

Flying is as safe or as dangerous as we make it. Completing tasks by the -10, using proper CRM techniques such as delegation and walk-around inspections, and taking your time, will help keep us all safe.

—CW3 Spiro Davis, MA ARNG, 508-968-5863

Simple Green's Not For Aircraft Washing

Don't Use "SIMPLE GREEN" to wash aircraft or aircraft components.

It has been brought to the attention of the AMCOM Depot Maintenance Engineering Team that numerous units are using the commercial product SIMPLE GREEN as an aircraft wash. STOP! This product has been through DoD testing and was determined to be highly corrosive on aircraft aluminum. It can also be a catalyst for hydrogen embrittlement in high strength aircraft alloys.

While it is a highly effective cleaning agent for floors and non-aluminum/non-high strength alloy vehicles, this product is not approved for aviation usage.

If your unit has been using SIMPLE GREEN on a regular basis, it is recommended that a thorough fresh-water wash with the approved cleaners per the appropriate airframe maintenance manuals be accomplished as soon as practicable. This should be followed up with a corrosion inspection/treatment and application of approved CPCs.

Insure that no unauthorized cleaning products are being used on your aircraft or in the shops as a component cleaner.

—Mr. Richard Cardinale, DSN 861-4041, (361-961-4041), corrosion@amcom-cc.army.mil

No High Pressure, Please

Some units are using high pressure washers to clean aircraft. That's a no-no. Para 3-3.9 of TM 1-1500-344-23, Aircraft Weapons System Cleaning and Control, says to use no more than 175 PSI nozzle pressure when you use a water hose. Pressure washers can develop very high pressure, sometimes in excess of 1,500 PSI. That pressure can harm numerous items on aircraft, including bearings, composite panels, and painted surfaces. A soft spray, no more than 175 psi nozzle pressure, is all an aircraft can handle—the softer, the better.

Here are some other targets to keep in mind when your aircraft needs a bath.

- DON'T OVERDO THE CHEMICALS. You need chemicals to clean the aircraft (see accompanying article about detergents) but don't overdo it. The right amount cleans the area intended. Too much causes run-off that can damage wiring and bearings, as well as doing potential harm to the environment.
- START WITH A DAMPENED CLOTH. If the dirt is stubborn, add water to dampen the cloth some more. If there's danger of run-off, you can protect the areas prone to get damaged with some waterproof paper, NSN 8135-00-753-4662, and preservation sealing tape, NSN 7510-00-852-8180.
- NO LINT, PLEASE. Any old rag might be fine for some cleaning chores, but an aircraft needs lint-free cloths. Lint can clog a filter, ruin an electrical contact, or pollute a vital fluid. Don't take that chance.
- STANDING WATER CORRODES. Any standing water left on the aircraft after cleaning needs to be wiped up. Water corrodes—standing water corrodes absolutely.
- PREVENTING CORROSION. The aircraft is clean, everything's fine-right? Hold one, the job's not finished until CPC (corrosion prevention compound) has been added to all those areas called out in your TMs.

—PS Magazine

Ergonomics Conference

The Department of Defense Ergonomics Best Practices 2000 Conference is set for 25 April 2000 in Bethesda, MD. With a theme of "Preserving Tomorrow's Global Reach Today!", the setting is the Uniformed Services University of the Health Sciences auditorium, 4031 Jones Bridge Road, Bethesda MD.

Open to all DoD and federal agencies free of charge, the target audience is safety and occupational health personnel.

A sample "tool kit" containing samples of the latest products produced by the DOD Ergonomics working group will be available – one kit to an installation or agency.

For additional information, check out the CHPPM Training website:
http://chppm-www.apgea.army.mil/trng/describe.crs/d8801.htm

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class C
A series

■ Electrical fire during APU run up resulted in avionics damage.

Class E
A series

■ During cruise flight at approximately 700' AGL, crew observed smoke entering the cockpit through environmental control unit (ECU) ducts. Shaft driven compressor (SDC) caution light illuminated within 10 seconds after onset of smoke. Aircrew initiated immediate approach for landing. Smoke continued to fill cockpit, obscuring pilot's ability to maintain visual contact with landing area. Pilot utilized night vision system (NVS) and helmet mounted display (HMD) to land aircraft. Emergency shutdown was performed without starting APU. No damage to aircraft.

■ During flight the automatic and manual stabilator modes failed and the stabilator indicator was erratic. The pilot returned to the airfield and landed without further incident. Maintenance personnel found water in the lower stabilator actuator. Actuator assembly was not sealed as required by maintenance information message (MIM) that is at least 3-4 years old. Aircraft was repaired and returned to service.

CH47

Class C
D series

■ During takeoff, the aircraft's rotor wash resulted in damage to Main Rotor Blades of a parked aircraft.

■ Aircraft entered wake turbulence during take-off, and transmission torque limitations were exceeded.

Class E
D series

■ On climb out with external load crewmembers identified fluid leak from aft area. On approach, crew noted decrease in aft transmission oil pressure to 10 PSI. Crew landed external load, then landed aircraft to sod area. A loose oil line to transmission was tightened.

Class E
E series

■ Crew detected smoke during post phase run-up. Inspection revealed seals were blown throughout the engine, resulting in oil leaking onto tail cone.

■ No. 1 engine firelight illuminated. No fire associated with light, aircraft returned to parking. Thermocoupling wiring harness replaced.

■ C-Box chip light activated in-flight. Precautionary landing made. Combining transmission seized during shutdown.

OH58

Class C
D(R) series

■ Aircraft experienced an engine overtorque during simulated engine failure with power recovery training.

■ While correcting for an uncommanded yaw at an OGE hover, the pilot overtorqued the engine and mast.

Class E
D(R) series

■ At a 3 ft hover, while conducting manual throttle operations, the SP in the right seat on the controls felt the throttle go slack. No throttle movements from the right seat correlated to the indicated RPM, which remained 103%. The IP (left seat) switched from manual to auto and regained control of the RPM. The SP landed the aircraft. Maintenance inspection revealed missing snap O-ring from base of collective/throttle.

UH1

Class E
H series

■ During cruise flight at 2,500 MSL 90 knots indicated airspeed, aircraft yawed left sharply followed by a change in engine noise. RPM warning light illuminated and the low audio sounded heard. N2 and rotor were still joined at 6200 RPM. Pilot on the controls initiated a descent and landed in open field with power. An emergency shutdown was completed with no other abnormal indications. Maintenance personnel examined engine for FOD, engine anomalies and loose connections. MTP could not duplicate event. Aircraft was signed off and released for flight.

UH60

Class C
A series

■ Aircraft engine temperature exceeded limitations during start-up.

Class C
L series

■ Preflight inspection revealed damage to two rotor blade tip caps. Suspect tree strike during APART evaluation.

Class E
A series

■ No. 1 engine experienced a stall with successive loud reports during ground run. No. 2 engine was at idle for 2 minutes; No. 1 engine was at fly; collective flat pitch; TGT increased from 750 degrees C to 825 degrees C during stall. No other abnormal indication. No. 1 engine power control lever was immediately retarded. Stall ceased and TGT decreased. No. 1 engine was shutdown.

■ After shutdown, crew noticed aircraft was sitting on a large rock near the center of the cabin area. No damage was apparent. Aircraft was repositioned and shut down again for further inspection. Crew noticed only scratched paint. Maintenance at home station found further damage.

■ While bringing PCLs to idle, No. 1 engine failed. Aircraft was shut down with no further incident.

C12

Class C
F series

■ While in flight at FL 250, No. 1 engine reportedly had an overtemp and N1 overspeed, which was later confirmed from engine data recorder.

Class E
D series

■ During takeoff roll, PC noticed No. 1 engine prop RPM was not increasing above 1900 rpm. Takeoff was aborted and aircraft returned to parking without further incident. Maintenance determined faulty overspeed governor was limiting prop RPM.

Class E
F series

■ At FL 160, cruise flight, 180 KIAS, pilot 's side (LH) inner windshield ply shattered. Pilot immediately began descent to 10,000 feet MSL and crew performed appropriate procedures IAW USAF-1. Pilot transferred the flight controls to the pilot stationed in the right seat for the remainder of the flight. Aircraft diverted and landed without further incident.

■ Approximately 10 minutes after departure, during climb out, right side windscreen outer ply shattered, OAT –22 C; windscreen heat was placed in the normal position just after takeoff and defrost heat was on. Aircrew landed with no further incident.

■ The No. 2 engine compressor stalled when power was increased prior to takeoff.

C23

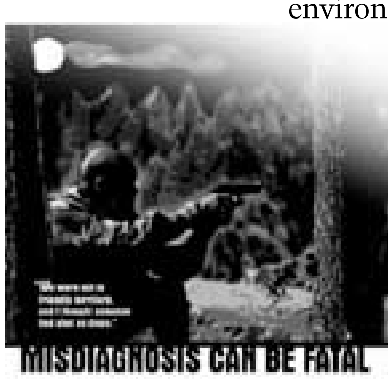
Class E
B series

■ On third traffic pattern, during take-off roll, crew felt aircraft decelerate slightly with no change in engine noise. On rotation with main wheels on the ground and nose wheel airborne, crew could feel a positive deceleration. IP assisted on the controls and lowered the nose back to the ground and scanned engine instruments. Aircraft again decelerated. IP announced abort and retarded engine power control levers to idle. Aircraft decelerated normally. While exiting the runway crew felt aircraft slowing without any brakes being applied. When aircraft was stopped on the taxiway, the left main tire deflated. Hydraulic system was serviced before flight. It is suspected that overservicing caused brakes to activate. The tire deflated due to overheating of the brakes.

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.

Misdiagnosis–a Follow-up

Flightfax has received numerous questions from the field regarding the recent article "Misdiagnosis Can Be Fatal", published in the January 2000 *Flightfax*. We certainly appreciate the feedback and are encouraged that the publication is reaching our intended audience (the aviators and maintainers in the field). The following supplement to the original article is provided to answer some of the questions that have been raised.



First, it cannot be overemphasized that the article was not written to find fault with the aircrew. The intent was to show how inaccurate diagnosis of a problem is a recurring problem that has the potential to produce catastrophic results.

In this particular case, the crew's memory of the accident sequence differed substantially from what the recorded flight data revealed. Undoubtedly, you will draw your own conclusions, but keep in mind that the crew was operating in an unfriendly environment, at low altitude, under night vision goggles.

The fact that the PC felt the aircraft descend was a function of the pilot reducing the collective without announcing the emergency. The ENGINE OUT message did appear and then disappeared. The system is designed with a minimum three-second activation of the message to allow the aircrew to recognize what message was displayed. The ENGINE OUT message disappeared after three seconds. The cause of the erroneous ENGINE OUT activation was an anomaly and is still being addressed by the appropriate agency.

Despite what the PC recalled, the rotor did not immediately begin to decay. In fact, activation of the LOW ROTOR warning occurred a full seven seconds after the ENGINE OUT warning message was first displayed. Extensive analysis of the autorotation using recorded flight data failed to reveal why the momentary rotor droop occurred. Finally, recorded data showed that the TGT, NG and NP values remained consistent with normal, powered flight throughout the maneuver, confirming that the engine was operating normally at the onset and during the perceived emergency.

So what is the right answer? Unfortunately, we can only reiterate that the operator's manual states that you must confirm the condition with other indications. In the above incident, the PC thought he had multiple indications, but, in fact, the data showed that he didn't.

—CPT Stace Garrett, Systems Manager, Utility Branch, USASC. DSN 558-9853 (334-255-9853), garretts@safety-emh1.army.mil

Camouflage Face Paint

The question has come up again and again: is it okay to wear camouflage face paint while performing flight duties? It's a valid question, because aircrews are very interested in minimizing the hazard of burns in aircraft-related fires. We wear special fire-retardant clothes, boots, gloves and a helmet with visor. We fly helicopters with crash-worthy fuel systems that reduce the potential for post-crash fire. Then we smear camouflage paint on our faces. Is that really a good idea?

The experts at the Soldier Biological Chemical Command at Natick, MA, in coordination with the office of the Surgeon General, tested the ingredients of face paint before it was approved for your use. The contents are:

- Compact form: ceresin wax, caster wax, mineral oil, talc, and pigments.
  - (NSN 6850-01-262-0635)
- Stick form: hydrogenated castor oil, carnauba wax, mineral oil, lanolin, talc, and colorants.
  - (NSN 6850-00-161-6202 – green, light, or sand)
  - (NSN 6850-00-161-6201 – loam or white)
  - (NSN 6850-00-161-6204 – green, light or loam)

A review of the Materiel Safety Data Sheets (MSDS) for the face paint shows the melting point to be 158 degrees F or above and its flash point to be 400 degrees F or above, which means it will melt off before igniting. Health hazards are listed as "none."

Some aviators reportedly use insect repellent as a base before applying camouflage face paint. Before doing so, be sure to read the label for the flash point of any insect repellents.

The bottom line is, face paint available through the Army supply system has been thoroughly evaluated for hazards. The same can't be said for face paint that you may buy commercially. Beware of petroleum-based face paint you might be tempted to pick up from local sources. Don't take a chance on petroleum-based face paint lighting up your life. Use only the Army supplied version for aircrew duties. The bottom line is that the use of face paint in no way degrades your survivability during a post-crash fire.

—SFC Ralph McDonald, ALSE NCO, USASC, DSN 558-3650 (334-255-3650), mcdonalr@safety-emh1.army.mil

POV Fatalities through 31 Dec

FY00	FY99	3-yr Avg
18	36	27

HIGH-RISK PROFILE

Age & Rank:
19-23, E1-E4, O1, O2
Place:
Two-lane rural roads
Time:
Off-duty, 1100-0300
Friday & Saturday nights

TRENDS
1. Speed
2. Traffic rule violation
3. No seatbelt or helmet

Beginning with this issue, Aviation statistics will be published quarterly.

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WS • War Stories, CC • Crew Commo, SF • Shortfax

FY00 Aviation Accidents through 31 December

		Class A	Class B	Class C	Total
ACCIDENTS	Total* Avn Acdts	3	3	20	26
	Flight Acdt Rate	1.35	0.90	7.22	9.47
RATE COMPARISON	FY00 vs. FY99	-4%	92%	18%	19%
	FY00 vs. 3-yr avg	-1%	-25%	4%	-1%
Aviation Military Fatalities					2

* Includes Flight and Non-flight aviation accidents.

U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

APRIL 2000 ◆ VOL 28 ◆ NO 4 http://safety.army.mil

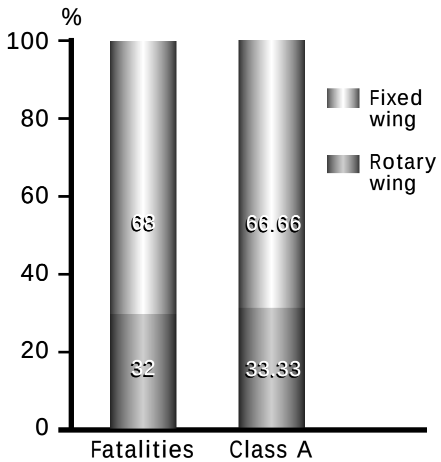
IFR Accidents—Where's the Risk?

This article is drawn from information from the Safety Center database, and from a study conducted for the Flight Safety Foundation of approach and landing accidents worldwide. Summary statistics, conclusions of the study, and approach tips and techniques are presented to highlight the risk involved and possible ways of assessing and dealing with that risk.

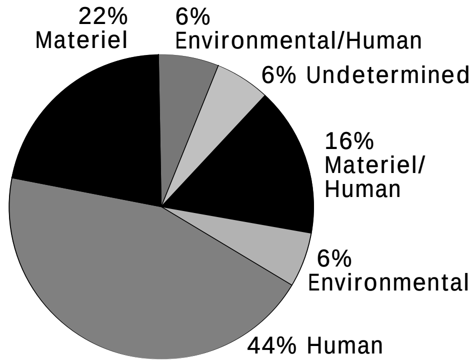
USASC Data

A review of US Army Safety Center accident data of IFR accidents since FY80 provided the basis for the following results. The review encompassed all Class A accidents involving Army aircraft on instrument-flight plans. The data did not include any data associated with inadvertent IMC mishaps. Since FY80 there have been 18 Class A IFR accidents. Of these accidents, 33% were rotary-wing and 67% were fixed-wing. There were 25 fatalities with approximately the same ratio of rotary-wing/fixed-wing fatalities- 32% and 68% respectively.

IFR Accidents FY80 to Present



Accident Causal Factors



Of the solely human-factor accidents, 62.5% occurred during the approach or missed-approach phase of flight, and 37.5% were at cruise altitude. One accident involved a mid-air collision and accounted for 12% of total fatalities for the period.

Highest Risk Areas

The approach and missed-approach phases of flight accounted for 71% of all fatal accidents. Of those, 80% were at night. From the data, it is apparent the two most critical phases of flight are the approach and the missed-approach. Additionally, night IMC operations increase risk disproportionately, even for an experienced aviatior. The average total time for the PC of the fatal approach accident aircraft was 5,763 hours.

Flight Safety Foundation Data

The Flight Safety Foundation (FSF) is an international organization dedicated to the continuous improvement of flight safety. They chartered an Approach and Landing Accident (ALA) Reduction Task Force to study 287 fatal accidents occurring worldwide from 1980 to 1996. These resulted in 7,185 fatalities. Of note is that of the 118 accidents where the type of approach was known, over 75% were on approaches where a precision approach aid was not available or not used.

The study provided eight conclusions for preventing approach and landing accidents. Although the study involved large jet and turbo-prop aircraft world-wide, the results and recommendations have relevance for Army aviation as well. Three of the eight conclusions are especially pertinent to operational pilots.

Coping Strategies

CONCLUSION #1: The risk of ALAs is higher in operations conducted in low light and poor visibility, on wet or otherwise contaminated runways, increasing susceptibility to optical or physiological illusions. The study recommends that crews use a risk-assessment checklist to identify approach and landing hazards and are trained adequately before conducting operations. The study suggests that the accident rate at night is nearly three times greater than for day, which is similar to Army experience.

The Army has no specific risk-assessment checklist for approach and landing operations. The following thoughts may prove useful for your personal assessment for the approach and landing. By assigning a numerical factor or risk level to each area and condition, a simple, but practical, assessment checklist materializes. Add categories based on your experiences and personal limits.

ILLUSIONS

Night, weather and runway environment illusions are an ever-present risk. However, the risk is significantly increased when executing an approach at night in weather close to or at minimums for the approach being flown. Anticipating the illusions, using glide slope and VASI systems, and maintaining instrument proficiency provide the best defense against spatial disorientation. Spatial disorientation (SD) is an individual's inaccurate perception of position, attitude, and motion relative to the center of the earth. *(See article on pages 6 and 7.)*

SUGGESTED ASSESSMENT AREAS

During planning and update enroute:

- Day or night
- Wx Conditions, LIFR, IFR, MVFR, VFR
- Aircraft equipment: VOR, ADF, GPS, ILS
- Familiarity with approach

Prior to arrival (descent):

- Approach briefing, thorough and complete

During approach:

- Approach stabilized: heading, altitude, airspeed, and descent rate (see **Suggested Stabilized Approach Checklist** for defining a stabilized approach)
- Missed approach committed to memory
- Intentions in case of a missed approach; another attempt, alternate, etc.

Sample Planning Matrix

Condition	VFR	MVFR	IFR	LIFR
Day	L	L	M	H
Night	L	M	H	EH
Highest Risk Value				

VFR= >3000' CIG, > 5 sm VIS; MVFR= 1-3000' CIG, 3-5 sm VIS; IFR= 500-<1000' CIG, 1<3 sm VIS; LIFR= <500' CIG, <1 sm VIS.

Equipment	VFR	MVFR	IFR	LIFR
Non-Precision	L	M	H	EH
Precision	L	L	M	H
Highest Risk Value				

Approach Familiarity	Routine Use	Seldom	Never
Non-Precision	L	M	H
Highest Risk Value			

Airborne Checklist

APPROACH ASSESSMENT CHECKLIST	YES	NO
Planning remains the same:		
Day/Night		
Nav equipment		
Approach brief complete prior to arrival		
Missed approach memorized		
Missed approach intentions planned		
Approach stabilized		

VESTIBULAR ILLUSIONS

The vestibular system, associated with the ear, poses the greatest problem in spatial orientation. One of the more dangerous vestibular illusions is the oculogravic illusion from linear acceleration. Suppose you're flying an approach in poor weather and a missed approach is initiated. The acceleration from applying power during the maneuver forces the hair cells in your otolith organs aft. This creates a false sense of the aircraft nosing up. If the pilot reacts to this sensation without cross checking his/her instruments they will most likely dive the aircraft. If you are on an ILS and at 200 feet AGL, there is very little room for error.

The most dangerous vestibular illusion is the coriolis illusion. The coriolis illusion can take place anytime a climbing or descending turn is initiated, such as executing the missed approach. Fluid in one semicircular canal in each ear is stimulated when initiating a turn. If the pilot then makes a head motion in another geometrical plane, the fluid in the two other semicircular canals in each ear is stimulated. This results in the pilot sensing roll, pitch and yaw simultaneously and causes overwhelming disorientation.

Other illusions of concern are visual, and may include:

- Confusion with ground lights, or stars
- Runway width, Runway/terrain slope,
- Featureless terrain, and Structural illusions.
- Lights along roads, on moving cars or trains, may be mistaken for approach or runway lights.
- Runways wider than normal create the illusion the aircraft is lower than it actually is.
- Conversely, narrower runways lead to flying lower approaches and increase the risk of landing short, or impacting obstacles in the approach path.
- Up-sloping runways or terrain create the illusion that the aircraft is higher than it actually is,

Any "no" checks mean the approach may be rushed and risk is increasing. Time should be allowed to assess the "no" status and its impact to the successful outcome of your flight.

and leads to lower approaches as well.

■ Down-sloping terrain has the opposite effect.

■ Featureless terrain, such as dark areas and snow-covered terrain, or executing an approach at night, in the rain, with few visual cues, will create the illusion of the aircraft altitude being higher than it actually is. These increase the risk of making a lower-than-normal approach.

■ Structural illusions caused by rain or other obscurations on the approach and landing may lead to increased susceptibility to other illusions, such as perceiving greater distance to the runway than actual, or misjudging airport features.

CONCLUSION #2: Unstabilized and rushed approaches contribute to ALAs. Recommendations from the study included defining parameters of a stabilized approach and executing the missed approach if parameters are exceeded. Further, flight crews should "take time to make time" when the cockpit situation becomes confusing or ambiguous. This means climbing, holding, requesting vectors for delaying purposes, or executing missed-approach early.

Except for fixed-wing operations, the Army does not stipulate or recommend an approach checklist or briefing to follow for instrument flights. The approach checklist in fixed-wing operator manuals does not define parameters of a stabilized approach. Below are some suggestions for defining a stabilized approach for the readers' use and contemplation. This checklist is not intended to replace current ATM standards or regulation, but does provide general guidance for safe, professional approaches. In addition, the design of some approaches may require adjustments to the checklist (for example, descent rate) based on mission planning.

In one Army airframe of the modernized fleet, the Kiowa Warrior, you're in an emergency situation if you go IMC. The fact that a Kiowa Warrior pilot is not supposed to go IMC does not mean someone won't find himself or herself in that situation. One thing for sure, if "Murphy" is out there, pilots will find themselves in an emergency situation. It will serve them well if they have maintained their instrument skills and knowledge of radar capabilities available from ATC.

Rushed approaches are easier to prevent than unstabilized approaches. If ATC asks you to accept vectors putting you in too close for the turn to final, necessitating steep turns, then don't accept—request longer legs or vectors. If you rush yourself, recognize it, and then fix it. Request holding, vectors, going missed early, etc. You are in charge of the aircraft, so take charge. Five or seven more minutes in the air to execute a well-flown, stabilized approach will increase the safety of the flight. It should also avert having to execute a missed approach because of poor course alignment, confusion, or not reaching MDA in sufficient time to see the runway environment, and so on. It will save you time in the final analysis.

SUGGESTED APPROACH TIPS

Before reaching the IAF-

Review weather (ATIS, AWOS, current altimeter)

- Identify and verify correct approach plate
- Set up avionics
- Brief the approach (direction, time, MDA/DH)
- Review missed-approach instructions

Review 5 T's after all turns and crossing IAF

- Turn (new course)
- Tune (select course)
- Time (if necessary)
- Torque (as required)
- Talk (to ATC as required)

Crossing FAF/OM-

- Review 5 T's
- Establish stabilized descent
- Verify altitude when crossing OM on ILS
- Make altitude call outs above MDA/DH - 500 ft above, 400, etc.
- Maintain awareness of position on approach (use all avionics available)
- Execute an immediate missed approach if confused, uncertain, or the approach becomes unstabilized

SUGGESTED STABILIZED APPROACH CHECKLIST

- By 1000' HAA, HAT, or HAL:
- Intended flight path; only minor changes in heading/pitch required, no more than two dot deflection of glide slope/localizer
- Speed; no more than +10/-5 of recommended approach speed
- Power settings; The aircraft is in approach configuration
- Descent rate; no more than 1000 fpm
- All briefings and checklists performed

CONCLUSION #3: Failure to recognize the need for and execution of a missed approach, when appropriate, is a major cause of ALAs. The FSF recommends that company policies specify visibility minima to proceed past the final approach fix (FAF) or the outer marker (OM), and an assessment at the FAF or OM of crew and aircraft readiness for the approach.

AR 95-1 states an approach may be initiated, regardless of ceiling and visibility. An assessment of crew and aircraft readiness for the approach, however, is not specified. Your judgment reigns here. How much fuel is available to proceed to your alternate and meet reserve requirements? What is the status of your navigation equipment? Did you short-change yourself by not filing an alternate? What is your personal minimums-time since last flown in low IFR? What is the state of readiness for your pilot? Is he undergoing refresher training? Does he have high- or low-weather time? And so on. Serious thought before takeoff should go into your planning and risk management for the flight. *(See the sample planning matrix/airborne checklist)*

Perhaps as hazardous as any aspect of instrument flight is the missed approach. AR 95-1 is very clear on when a missed approach is required. You may not descend below the MDA or DH unless the approach threshold of the runway, or approach lights or other markings identifiable with the approach end of the runway or landing area, are clearly visible, **AND** the aircraft is in a position to make a safe approach. Delay in initiating the missed-approach procedure, when it is required, elevates the associated risk exponentially.

Conclusion

Risk assessment and risk management are continuing processes that go far beyond filling in a risk assessment worksheet and filing it away in operations. Risk management is an iterative process, which changes with every decision made, from pre-flight planning through mission debrief. Recognition of hazards, taking action to mitigate and control the risk associated with the hazards, and adjusting the mission as necessary for successful completion, is at the heart of safe operations. This is true risk management.

IFR accidents are a real threat to Army aviation. Our data shows that the landing and missed-approach phases of flight produced 71% of fatal IFR accidents from FY80 to the present. The distribution of IFR accidents is roughly 1/3 rotary-wing and 2/3 fixed-wing aircraft. The Flight Safety Foundation ALA Task Force's goal is to reduce the number of ALAs by 50% over 5 years. Their study provides eight conclusions and recommendations that are low-cost and universally applicable to achieving this goal.

The three conclusions presented in this article apply particularly to operational pilots as well as to Army aviation as a whole. The tips, techniques, assessments, and ideas are food for thought for your use. Tailor them to your specific situation for the improvement of safety and accident prevention.

—MAJ Don Presgraves, Chief, Cargo/Fixed Wing Branch, Aviation Division, US Army Safety Center, DSN 558-9858 (334-255-9858) presgrad@safety-emh1.army.mil

SUGGESTED MISSED-APPROACH TIPS

- Always plan to fly the missed.
- Select several alternates.
- Get weather updates during the flight to weigh your options.
- Don't fly more than two approaches if weather is at minimums.
- Don't fly more than one approach if weather is below minimums.
- Commit yourself to not going below minimums.
- Recompute fuel and time to alternate.

Final Exam on IFR

1. You are en route on an IFR flight plan when ATC advises, "Radar service terminated." What action is appropriate at this point?
   a. Set transponder to 1200
   b. Resume normal position reporting
   c. Activate the IDENT feature to reestablish radar contact
   d. Set transponder to STANDBY or OFF

2. Which of the following reports should not be made to ATC without a specific request when in radar contact?
   a. When leaving any assigned holding fix or point
   b. When leaving the final approach fix inbound on final approach
   c. The time and altitude or flight level upon reaching a holding fix or point to which cleared
   d. When an altitude change will be made when on a VFR-on-top clearance

3. Which factor was the largest cause of accidents since FY80?
   a. Materiel
   b. Environmental
   c. Human
   d. Undetermined

4. At what point should the timing begin for the first leg outbound in a holding pattern at the intersection to two VOR radials?
   a. Abeam the holding fix or wings level, whichever occurs last
   b. Abeam the holding fix or wings level, whichever occurs first
   c. When the wings are level at the completion of the 180-degree turn outbound
   d. When abeam the holding fix

5. Why is Frost considered hazardous to flight operation?
   a. The increased weight requires a greater takeoff distance
   b. Frost changes the basic aerodynamic shape of the airfoil
   c. Frost decreases control effectiveness
   d. Frost causes early airflow separation resulting in a loss of lift

6. What is the most dangerous spatial disorientation illusion?
   a. Leans
   b. Graveyard spiral
   c. Coriolis
   d. Elevator

7. AR 95-1 states an approach may be initiated regardless of—
   a. Ceiling
   b. Visibility
   c. Both a. and b.
   d. None of the above

8. Select the answer that best describes when to use the Risk-Management process.
   a. Before the flight
   b. Continuously
   c. After takeoff
   d. It is no longer needed

9. How many IFR accidents are rotary wing (roughly)?
   a. Two-thirds
   b. One-half
   c. One-third
   d. One-quarter

10. The Safety Foundation Approach and Landing Accident's Task Force's goal is to reduce the number of approach and landing accidents by 50% over how many years?
   a. Three
   b. Four
   c. Five
   d. Six

Answers:
1. b, 2. b, 3. c, 4. d, 5. b, 6. c, 7. c, 8. b, 9. c, 10. c

Aeromedical Training Combats Spatial Disorientation

The pre-mission planning, crew briefing, and aircraft pre-flight procedures were completed. The crew was going to conduct night instrument training in their local flight-training area. The crew had met the requirements outlined in Chapter 5, AR 95-1, before departure on the instrument training flight. It was shortly after 1830 hours when the crew had run up the aircraft, taxied into position and was awaiting clearance for departure. The training proceeded as planned until their last missed approach. The aircraft was a quarter of a mile past the departure end of the runway when it impacted the ground. At 2030 hours the aircraft was lying on its side in a densely wooded area. The co-pilot (CP) was dead. The pilot-in-command (PC) escaped with serious, but survivable, injuries. Questions were running through the pilot-in-command's mind: What went wrong and why?

After several successful instrument (IMC) take-offs and landings, the crew was ready for one more approach before calling it a night. Even though the weather had deteriorated, the crew was executing a missed approach for a return, straight-in approach. As the aircraft accelerated, it entered instrument meteorological conditions. The PC perceived that the aircraft had entered an excessive nose-up attitude. Instinctively, the PC nosed the aircraft over. This action put the aircraft into a dive. The attention of the CP was diverted, and he did not detect the descent. Before the PC could correct the mistake, the aircraft had stuck the trees off the departure end of the runway. The crash ended violently.

Although this accident is fictional, accidents or near misses like these have occurred in the not so distant past. Why do they happen? In this hypothetical case, spatial disorientation (SD) was the significant contributing factor. What is Spatial Disorientation? SD is an individual's inaccurate perception of position, attitude, and motion relative to the center of the earth (FM 1-301, 1987, p. 8-1). This is a classic case of unrecognized spatial disorientation. The pilot does not consciously perceive any of the manifestations of disorientation, i.e., pilot(s) are unaware that they have an inaccurate perception of their position, attitude, or motion.

Research and Statistics

The type of accident mentioned above led to research conducted jointly by the U.S. Army Aeromedical Research Laboratory (USAARL) and the U.S. Army Safety Center (USASC) into SD. A retrospective analysis examined Class A-C Army helicopter accidents during an eight-year period from 1 May 1987 through 30 April 1995. The analysis presented a number of disturbing facts: 1) 30 percent of the Class A-C accidents considered SD a significant factor; 2) One hundred and ten lives were lost in these accidents; 3) Costs were estimated at 468 million dollars; and 4) 43 percent of the accidents occurred during flight using Night Vision Devices (NVD). USAARL surveyed 299 Army pilots about their experience with SD. The results included the following: 1) 78 percent of the pilots had experienced SD during their flying career, 2) 22 percent had experienced SD in the previous four months, 3) 33 percent reported that the mission was adversely affected, 4) 2 percent reported that the mission had ended in mishap, 5) 44 percent had experienced the leans, and 6) 13 percent had experienced brownout, whiteout, or inadvertent entry into instrument meteorological conditions (IMC). The information gathered in the case studies contributed to a growing concern that SD played a far greater role in aircraft accidents and incidents than previously thought.

Control Measures

SD control measures can be separated into four major categories: education, training, research and equipment. Although control measures in research and equipment have continued, the most significant step forward initiated by the Army is in the categories of education and training. Specifically, it was the development of an SD demonstration sortie to augment ground-based training.

Instruction and Training

After the completion of the SD sortie demonstration evaluation in June 1997, it was included as part of the Program of Instruction for the IERW (initial entry rotary wing) flight students. Training is conducted by the US Army School of Aviation Medicine instructors, and is flown by IPs/PCs from 1/212th Aviation Regiment, Aviation Training Brigade (ATB), U.S. Army Aviation Center and School. Since its adoption, more than 700 IERW flight students have received this training. Four hours of didactic SD instruction is provided to all IERW students. Also, one hour of in-depth SD refresher instruction is provided to all rotary-wing advanced aircraft qualification courses, instructor pilot courses, and fixed-wing qualification course. These courses provide the cornerstone for the prevention of accidents involving spatial disorientation. The advantages of SD training are emphasized by a comment made by a Standardization Instructor Pilot (SIP). "The demonstration was extremely beneficial because it so clearly demonstrated the physical limitations of our orientation system. As an instructor, I am enthusiastic about the potential benefits to aviator training. We can attribute many accidents to failures to maintain aircraft position."

In addition, USAARL has developed SD Awareness Training Scenarios for visual flight rules in the AH-64, CH-47 and UH-60 simulators. The scenarios were developed from research gathered from real-world accidents. They allow IPs to train other aviators on how to overcome SD, once encountered. Future spatial disorientation demonstration flights will be conducted by IPs during the primary flight or instrument training portion of the IERW course.

Conclusion

Spatial Disorientation plays an undeniable role in accidents, and is a significant factor in Army aviation operations. It is clearly a hazard requiring risk assessment and continuing emphasis must be placed on identifying appropriate control measures in the areas of education, training, research, and equipment. However, the vital link in preventing SD related accidents is the continuation of realistic SD training in Army aviation operations, in the classroom, in flight training, and at the unit.

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The U.S. Army Flight Surgeon

An Integral Part of the Commander's Aviation Accident Prevention Plan

Is your flight surgeon doing everything he/she is supposed to do? How often do you see the flight surgeon—annually to get your flight physical, or only when you go to the clinic to get an up-slip? Some flight surgeons participate in unit activities, but many don't.

What is the most important duty of the flight surgeon? Completing the flight physicals? Participating in the Commander's Accident Prevention Plan (CAPP)? Performing as a crewmember? Investigating accidents? I say it is participation in the CAPP.

The flight surgeon is an important person in the aviation CAPP. All of the flight surgeon's duties are a part of preventing aviation accidents. Completing flying duty medical exams (FDMEs) ensures that all crewmembers meet the medical qualifications for aviation duties. Flight surgeon participation in the safety and standardization council meetings ensures the councils have expert advice in reaching decisions and eliminating or reducing hazards. When flight surgeons participate in aerial flight they evaluate crewmembers to detect personality traits or crew interaction that could be hazardous. The flight surgeon is an expert in aeromedical and physiological aspects of flight, and should be used to teach classes on these subjects as part of the Aircrew Training Program (TC 1-210) or during unit safety meetings. Everything flight surgeons do, even the flight physical, is part of the CAPP, but not every flight surgeon is active in unit activities outside the clinic.

In the Army Aviation community, there is a wide range of uses of the flight surgeon's knowledge and expertise. In many cases flight surgeons don't have time to participate in the non-clinical functions that their position requires. They are bogged down in the clinic completing physicals, writing aeromedical summaries to obtain medical waivers, or working in a clinic in the Medical Treatment Facility (MTF) seeing non-aviation patients. All of this work is important, but flight surgeon duties are more than clinical—there are unit requirements necessary to support an aviation commander.

Different Bosses' Needs

Flight surgeons work for different bosses, no matter where they are assigned. It is difficult to please everyone, and flight surgeons know this better than anyone. When a doctor is assigned to an aviation unit, he/she works for the unit commander. However, it's the MTF commander who credentials the doctor (allows them to practice medicine) and provides the resources (workspace, civilian clerks, equipment, medication, etc) to run a garrison clinic. If the flight surgeon is assigned to a MTF, the doctor works for the MTF commander but is needed to provide support to the aviation unit commander. Both commanders compete for the flight surgeon's time and knowledge. Often, the flight surgeon is stuck in the middle of this struggle, trying to please two bosses. It is imperative that the aviation unit commander and the MTF commander talk to each other to understand each other's wants and needs and to set the work schedule for the flight surgeon. It isn't good leadership to put the flight surgeon in the middle.

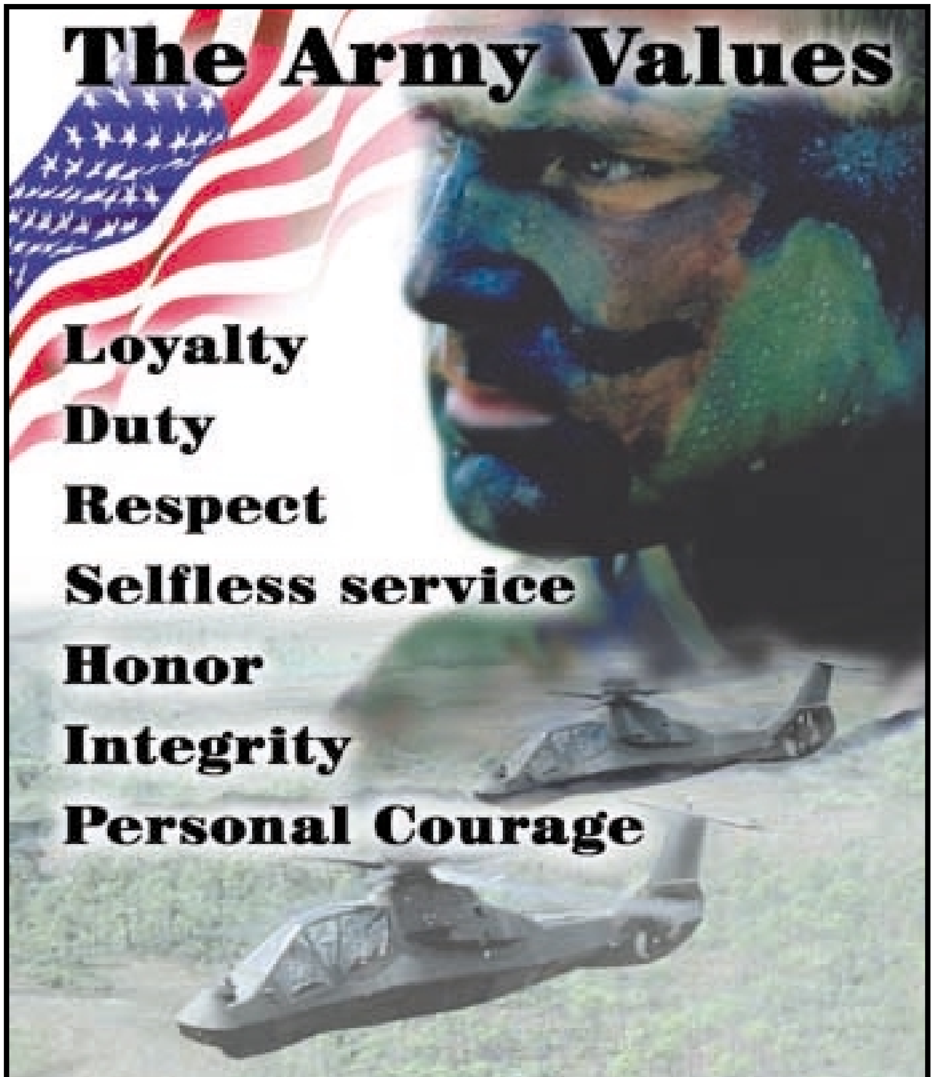
The flight surgeon's non-clinical duties are listed in various Army Regulations. Army Regulation 40-501, *Standards of Medical Fitness*, provides the guidelines for completing physicals and for advising the commander on health of the command. However, AR 385-95, *Army Aviation Accident Prevention*, provides the guidelines for participation in the unit's CAPP. Chapter 1, paragraph 1-6g lists fourteen duties that the flight surgeon performs outside the clinic. These two regulations don't cover everything a flight surgeon should do, but illustrate the flight surgeon's duties and responsibilities.

Another good source for discovering the flight surgeon's duties and responsibilities is the *Forces Command (FORSCOM) Aviation Resource Management Survey (ARMS) Commander's Guide*. The guide is a checklist for completing ARMS inspections, and also lists the references that cite the requirements. The checklist is located at: http://www.forscom.army.mil/avn

Flight surgeons aren't just doctors, they are members of the unit. And they are an important part of the Commander's Accident Prevention Plan. Are you getting all you need out of your flight surgeon? Do you know what the flight surgeon's duties are? Educate yourself along with your flight surgeon and improve the CAPP. The next life you save could be your own.

—MAJ Matthew Mattner, US Army Aviation Resource Management Survey Inspector, Fort Rucker, AL. DSN 558-7418 (334-255-7418) matthew.mattner@se.amedd.army.mil

Army Values and Aviation Safety—They Go Together



In 1997, GEN Dennis J. Reimer, Chief of Staff of the Army, codified a revised list of Army Core Values. This specific list is now quite familiar to soldiers worldwide. Yet, the application and importance of these values in the daily conduct of operations still have to achieve full recognition. This article addresses how some of those values play a vital role in Aviation safety, and illustrates how broadly the Army Values apply and how vital their application is to the Army's meeting its basic missions.

Loyalty, Duty, Respect, Selfless service, Honor, Integrity and Personal Courage don't necessarily seem like things that would directly affect Aviation safety. Tragic accidents show that they do. These values particularly affect aviation safety through their impact on crew coordination and situational awareness.

Where Values Were Lacking

One example of where lack of Respect, Loyalty, Honor, Duty, Selfless Service, and Integrity contributed to disaster came in the crash of a helicopter during a night flight to practice terrain navigation. Two aircraft were involved. The pilot-in-command (PC) of the lead aircraft had a reputation for treating his subordinates harshly. The unit's standing operating procedures (SOP) required the crew of the wing ship in a two-ship flight to monitor the lead's navigation, and call a code word over the mission frequency if they detected any deviation from the planned route. On a prior mission, the crew of the wing ship had done this. When that mission was over, the PC reprimanded them for breaking radio silence. On this mission, when the wing ship saw the PC deviate—even having to reverse course twice—the crew discussed calling the code word. The PC of the wing ship reminded them that the lead PC had just chewed them out over radio discipline. They agreed to let him fly a few more minutes before calling the code word. Less than a minute later, the lead ship hit wires and crashed. The lead PC's lack of respect for his fellow soldiers bred dissension. The lack of loyalty and integrity on the part of the other crew, and their failure to do their duty as prescribed by the unit SOP, let the lead aircraft get into a disastrous situation.

No One Took Action

Lack of Duty, Honor, and Integrity were clearly present in a fatal accident involving an OH-58A on a cross-country training flight. The PC was seen flying the aircraft at 90-100 knots and about five feet above a lake surface. A materiel problem had imposed a restriction of 400′ AGL as a minimum altitude for this series of aircraft. The pilot outranked the PC and was the acting unit commander. The pilot told the PC he was flying too low but let the PC divert his attention to the map. Seconds later the aircraft crashed. The accident investigation showed that the PC had been the subject of six operational hazards reports in the previous years, all for high-risk flying. The PC had a reputation in the unit as someone who would often deviate from standard practices. He became defensive anytime anyone approached him about his flying. Despite this observed behavior and common assessment of his behavior, no one took action to prevent him from flying. Failing to do their duty by insisting on adherence to standards and failing to do what everyone knew was the right thing cost someone his life, as well as losing an aircraft.

Fatal Results

Simple neglect of Duty can easily have fatal results. During a night vision goggle (NVG) air assault raid, one rappeller was killed because an experienced pilot failed to recognize the inexperience of the crew chief (CE) and the air mission commander (AMC). During the pre-mission briefing, the AMC did not follow the unit SOP by requiring two people on Chalk 2 to clear ropes. The PC of Chalk 2, who had co-written the SOP, did not call the AMC's attention to his oversight. Nor did the PC adequately review the detailed procedures with the CE for ensuring that rappellers were clear before departure. As a result, the CE became overwhelmed by his tasks during the insertion. In a rush to see if the rappellers were clear, he looked under the belly from the left side to clear the right-side ropes. He failed to see that the last rappeller was still on one of the right-side ropes. The CE gave the "clear" signal to the PC, who began to depart the landing zone. The rappeller eventually lost his grip and fell 130' to his death.

Positive effects of Army Values

Examples of successful recoveries from dangerous situations show the positive effects of expressing the Army Values. An example where Loyalty, Duty, and Personal Courage prevented a disaster occurred when an AH-1F on a daylight, cross-country training mission entered inadvertent instrument meteorological conditions (IMC). The PC, flying from the back seat, continued looking outside the cockpit in an apparent effort to regain VFR conditions. The enlisted crewman in the front seat immediately focused on his instruments. The attitude indicator showed the aircraft in a nose-down, left-bank attitude. The AH-1F was descending at 2500 feet per minute, and the PC seemed to be fixated. At 500' AGL the crewman told the PC they were in a dive. The PC jerked back the cyclic but was unable to control the aircraft with use of the instruments and began to panic. The enlisted crewmember began speaking calmly to the PC, talked him through the procedures to regain control, and pointed out the deviations in attitude, altitude, and airspeed until they were able to land. By his Loyalty, Duty, and Personal Courage, the enlisted crewman probably saved both their lives and their aircraft.

Team Effort

An example where Loyalty, Duty, and Respect probably prevented an accident occurred when one of two AH-1Fs on a night-flying mission experienced a hydraulic system failure. Because of threatening weather conditions, both pilots decided to return to base and conduct a closed traffic-pattern landing. The lead aircraft gained spacing from the second, made a normal approach to the middle of the runway, and was beginning a takeoff as the second aircraft approached. On climb-out, the lead pilots heard a loud pop and saw the master caution and No. 1 hydraulic pressure segment warning lights go on. The PI transferred the controls to the PC, who leveled the aircraft and notified the tower. The second aircraft cleared while the incident aircraft PC and PI began executing Dash-10 checklist procedures for a hydraulic failure below 40 knots. The PC tried to circle, but the pedals became unmanageable. The PC then decided to extend the downwind leg and try a run-on landing above 50 knots. Visibility was poor; and, when the PC asked the tower to turn up the intensity of the runway lights, the tower could not comply. On final, the PC executed a run-on landing as the PI continuously updated altitude, airspeed, and rate of descent. The team effort allowed the PC and PI to make a safe run-on landing. Their mutual Loyalty, performance of Duty, and Respect for each other made that team effort possible.

These are only a few examples from among many incidents in the annals of Aviation safety that show how soldiers do or don't express the basic Army Values; clearly Values can make the difference between success and disaster. So, the next time you head for the flight line, remember: Don't leave your Values behind. Lives depend on them.

—Brian Michaud, Graduate Division, Aviation Training Brigade, and Dr. Jim Williams, Aviation Branch Historian, Fort Rucker, AL, DSN 558-5306 (334-255-5306) williamsj@rucker.army.mil

Shortfax
Keeping you up to date

Don't Mix up Fuel Cans

Mistaking a five-gallon fuel can for a five-gallon water can will lead to serious problems, including burns and fires. Use the following information to help tell the difference between the two cans.

Fuel and water cans have the same footprint and dimensions. Both cans are labeled with an "X" on each side. The "X" has a circle in the middle that surrounds the identity of the liquid in the can: "WATER" for the water can and "FUEL" for the fuel can. Fuel and water cans can be the same color so it is not always useful to identify the liquid in the container by its color.

Fuel cans can be distinguished from water cans in several ways. First, the cap assemblies are different. The water can cap has two smaller caps within it. The fuel can cap is smooth on the top (minus the retaining strap). Second, the number of handles per can is different. Fuel cans have three handles per can while water cans have just a single handle. Third, the marking on the two cans is not the same. "WATER" protrudes from the water can, while "FUEL" is embossed inwardly. Fourth, the odor of fuel is present in used fuel cans. Be aware of that smell when distinguishing the two cans.

Your senses can be used to tell the difference between the two cans. Remember to use your senses if you are not sure which can you are using.

- **Sight:** Note the number of handles and the "FUEL" or "WATER" label
- **Touch:** Number of handles, difference in caps and the embossing
- **Smell:** Fuel odor versus water odor
- **Hearing:** A fuel can will make a hissing sound when its cap is opened.

Do not taste the liquid inside the can. Accidental ingestion of fuel can be damaging to your health.

Fuel cans may also be labeled with different colors, according to which fuel they store. Some soldiers use yellow cans and black writing for diesel fuel. Others use red cans and white writing for MOGAS. Remember to get your CO's approval before painting and stenciling your can.

—Ms. Carey Mitchell, Petroleum and Water Business Area, US Army TACOM-TARDEC, AMSTA-TR-D/210, Warren, MI 48397-5000, DSN 786-4154 (810-574-4154).

Accident briefs
Information based on *preliminary* reports of aircraft accidents

CH47

Class C
D series

- During Maintenance Test Flight, right side pilot door came off and struck one blade and aft pylon. Aircraft was landed without further incident.
- During landing to a snow-covered ridge, aircraft ramp and cargo hook sustained damage when they contacted a rock.

OH58

Class C
D (I) series

- Aircraft descended into trees while on live-fire range. Post-flight inspection revealed damage to tail rotor blades.
- During aircraft run-up, DC generator caught on fire. Crew used fire extinguishers to attempt to control fire. Installation fire department extinguished remaining fire.

Class C
D (R) series

- During simulated engine failure at altitude, engine torque peaked to 133% for 1 second and was verified by data playback at end of the flight.

UH60

Class A
L series

- Crew experienced brownout conditions on take-off. Aircraft contacted the ground nose low. Several occupants sustained reportable injuries. Aircraft destroyed.

Class C
A series

- Aircraft landed in extremely dusty conditions in rough terrain at patient pick-up point during an urgent MEDEVAC mission. The on-board medic reported a loud thumping noise. Mission transporting patient was continued. Aircraft was refueled prior to terminating mission. Post-flight inspection confirmed damage to undercarriage at three locations, and separation of the searchlight.

Class C
L series

During landing to a dusty LZ without illumination, main rotor blades contacted trees at approximately 30 ft AGL; aircraft was landed without further incident.

Class D
A series

- ALQ144 cover was in oil cooler compartment when aircraft was started. Cover wrapped around driveshaft and struck other aircraft components within the compartment. Both fuel lines were pulled from their breakaway valves, causing fuel starvation of both engines. Fuel lines, main fuel crossfeed breakaway valves and oil cooler line were replaced.
- During pre-flight, the crew found both cables for the AN/ALQ-144 had come loose from their static mounts and wrapped around the No.2 tail rotor drive shaft, causing damage.

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.

Aviation messages

Most recent safety messages issued by AMCOM

Aviation safety-action messages

December 99

AH-64-00-ASAM-03: M/R Rotor Drive Plate Bolts/Holes
AH-64-00-ASAM-04: BUCS Update
AH-64-00-ASAM-05: Inspect BUCS Servocylinders
UH-60-00-ASAM-03: Primary Servo Assemblies

January 00

AH-1-00-ASAM-04: Inspection of Anti-Drive Bellcrank
AH-64-00-ASAM-06: Inspect BUCS Servocylinders
AH-64-00-ASAM-07: Inspect No.2 Generator Power Cables
AH-64-00-ASAM-08: Inspect Fire Extinguisher Tubes for Corrosion
AH-64-00-ASAM-09: Tail Rotor Hanger Bearing
OH-58-00-ASAM-01: Oil Cooler Support/Oil Cooler Fan

February 00

AH-1-00-ASAM-05: Inspect for Relay – Solid State
AH-1-00-ASAM-06: Tail Rotor Yoke Assembly
UH-60-00-ASAM-04: Inspect Tail Landing Gear/ Shock Strut

General

00-GEN-01: Night Vision Goggles

Safety-of-flight messages

December 99

AH-1-00-03: Interim Retirement Life-Impeller
AH-1-00-04: Life Limit – Critical Rotating components
UH-1-00-02: Interim Retirement Life - Impeller
UH-1-00-03: Life Limit – Critical Rotating Components

January 00

AH-1-00-05: Life Limit – Critical Rotating Components
CH-47-00-04 Engine Transmissions Records
UH-1-00-04: Life Limit – Critical Rotating Components

February 00

AH-1-00-06: T53 Turbine Wheel Components
AH-64-00-05: Inspect M/R Blade attach pin
AH-64-00-06: Inspect Vertical Stabilizer Hardware
UH-1-00-05: Inspect Tail Boom Vertical Fin Spar Assembly
UH-1-00-06: T53 Turbine Wheel Components

Don't have one of these? Log onto the Risk Management Information System (http://rmis.army.mil). Your ASO or commander should have a password.

Learn from the mistakes of others; you won't live long enough to make them all yourself--

—Aviation Safety Vortex.

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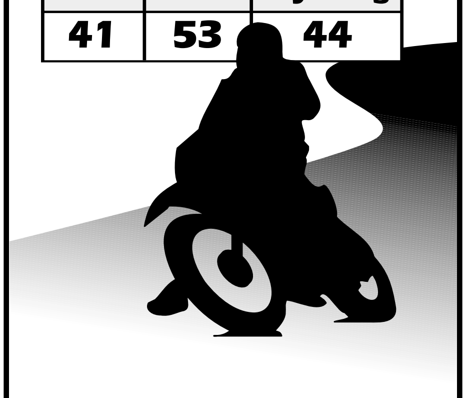
WS • War Stories, CC • Crew Commo, SF • Shortfax

POV Fatalities through 29 Feb

FY00	FY99	3-yr Avg
41	53	44



U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

MAY 2000 ◆ VOL 28 ◆ NO 5 http://safety.army.mil

Let's continue to meet this year's challenge head-on by remembering that risk management is everyone's responsibility. So far, it's making a difference and saving lives...

...and that's good news!

Good News

There's good news from the Safety Center operations research systems analysts. A mid-year review of the Army Safety Program showed that Fiscal Year (FY) 2000 ground and aviation accident rates are lower than FY99 and the previous 3 years.

Relative to this time last year, we are seeing reductions in the number of accidents in nearly every category: Total aviation/ ground accidents, military fatalities, off-duty accidents, and privately owned vehicle (POV) accidents. These numbers are direct results of leaders integrating risk management into training and battlefield operations, as well as off-duty safety.

As of 31 March 2000, total aviation and ground Class A accidents are 10.1 percent lower than FY99, and equal to the three-year average. Total military fatalities are also reduced 7.5 percent from last year, but still are 1.4 percent higher than the 3-year average.

Making a difference

Leadership involvement at all levels is making a difference in integrating safety into operations and making risk management work. To continue this positive trend, we must maintain our focus on standards and discipline.

Effective crew coordination can mitigate the effects of design complexity and crew experience. Commanders must stress crew coordination and ensure integration and enforcement of the crew coordination program at unit level if we are to further reduce the aviation accident rate.

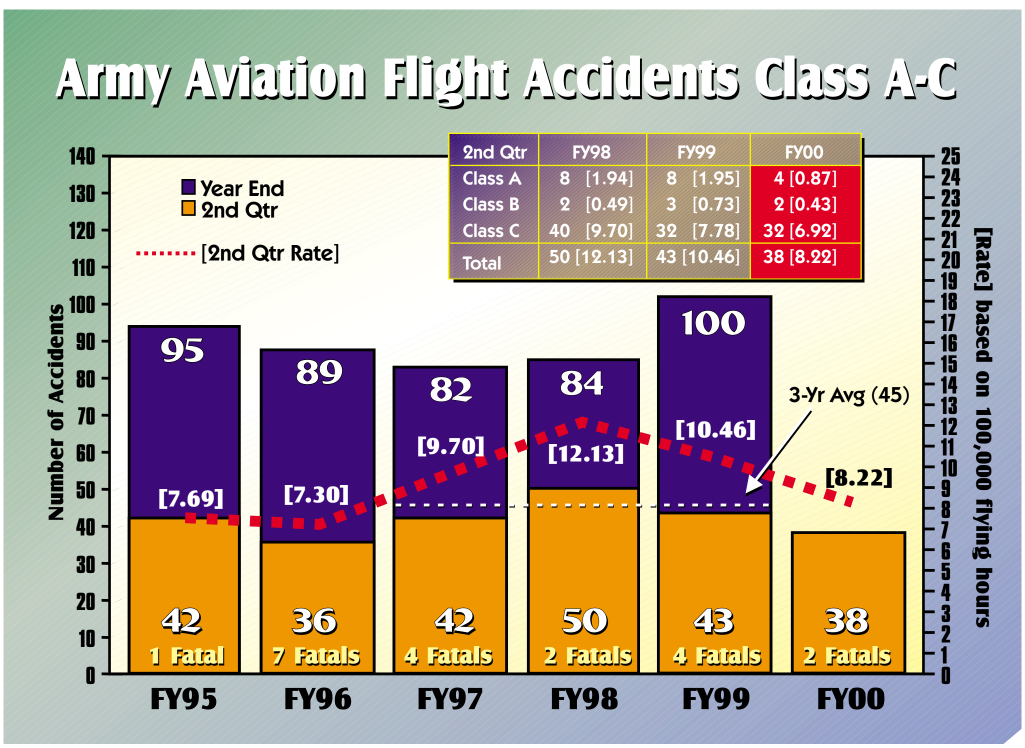
Relative to this time last year, the aviation rate for Class A and B accidents is 51 percent lower than the first quarter FY99 and the three-year average.

As we enter the summer months and prime training opportunities are capitalized upon throughout the Army, we can expect to see our exposure for mishaps increase. That, coupled with the fact that new personnel will arrive who will probably lack skills that are unique to your mission and environment, tends to also increase a unit's risk factors. Units can effectively manage these risk factors by integrating risk management into every phase of your training program. Such training programs are a direct result of a comprehensive evaluation of individual and collective skills that are required to execute the unit mission. Visibility and consideration of Armywide trends that were evident last FY, such as poor power-management techniques, must be kept in the forefront to ensure they are mitigated.

Recent analysis of Army aviation accidents has identified the following major risk factors in aviation operations:

1. Complex aircraft design
2. Lack of experience within Army aviation

As aviators, it is of vital importance that we remember the complexity of not only the aircraft we fly, but also the missions we find ourselves involved in daily. Routine missions are never "no-risk", and we must approach them with the same attention to detail that we do for our "high-risk" missions. We must not let complacency gain the upper hand.



Leadership involvement is making a positive impact on off-duty safety. POV accidents for FY00 are down 22.1 percent from the previous year and down 4.6 percent from the three-year average. Military fatalities from POV accidents are down 19 percent from FY99 and down 1.9 percent when compared to the three-year average.

Despite the progress we have made, some trends remain constant. The profile of our most at-risk soldiers remains the 19 to 24-year old males, E-2 through E-5. These young soldiers have yet to realize their mortality; they consistently underestimate their personal risk and are over-confident in their personal ability.

Individual discipline remains a factor in the severity of POV accidents. Twenty-three percent of soldiers killed in off-duty POV accidents during FY99 were not using seat belts or motorcycle helmets. Unfortunately, this trend continues.

Chain teaching

The Chief of Staff, Army, has directed that every soldier be trained on risk management by 1 July 2000. The Safety Center has developed an excellent chain-teaching packet on compact disk that is available now for

commanders and small group leaders. Contact Dr. Brenda Miller, DSN 558-3553 (334-255-3553) or e-mail millerb@safetycenter.army.mil if you have not received your CD.

As we move into the "100-Plus Days of Summer", and the critical time of year when we normally suffer the greatest number of accidents, what can we do to ensure this positive mid-year trend continues?

As evidenced by the lower accident rates in FY00, leadership is making a difference and we must continue to emphasize leadership, standards and discipline. Leaders at all levels must be on the front lines to look for ways to break the chain of events that leads to an accident.

Our focus on discipline (seatbelt use, drinking and driving, complacency, violation of rules/standards) must continue and complement our emphasis on the proper application of risk management techniques.

Most accidents are due to identifiable and predictable causes, not from uncontrollable circumstances. Let's continue to meet this year's challenge head-on by remembering that risk management is everyone's responsibility. So far, it shows and it's saving lives. And that's good news!

NOTE: The statistical data reflects cumulative information beginning on 1 October through 31 March of each fiscal year.

—Mr. Ed Heffernan, Safety and Occupational Health Manager, US Army Safety Center, DSN 558-2970, (334) 255-2970, hefferne@safetycenter.army.mil

Risk Management—Shoulda, Coulda, Woulda

How many times have you heard someone say, "I should have done this" or "I could have done that", after they had done something else, or done nothing at all? Too often it's heard after an accident occurs. The same applied to the word "would." Before reality raises its ugly head to bite you, think a bit the next time you hear or say:

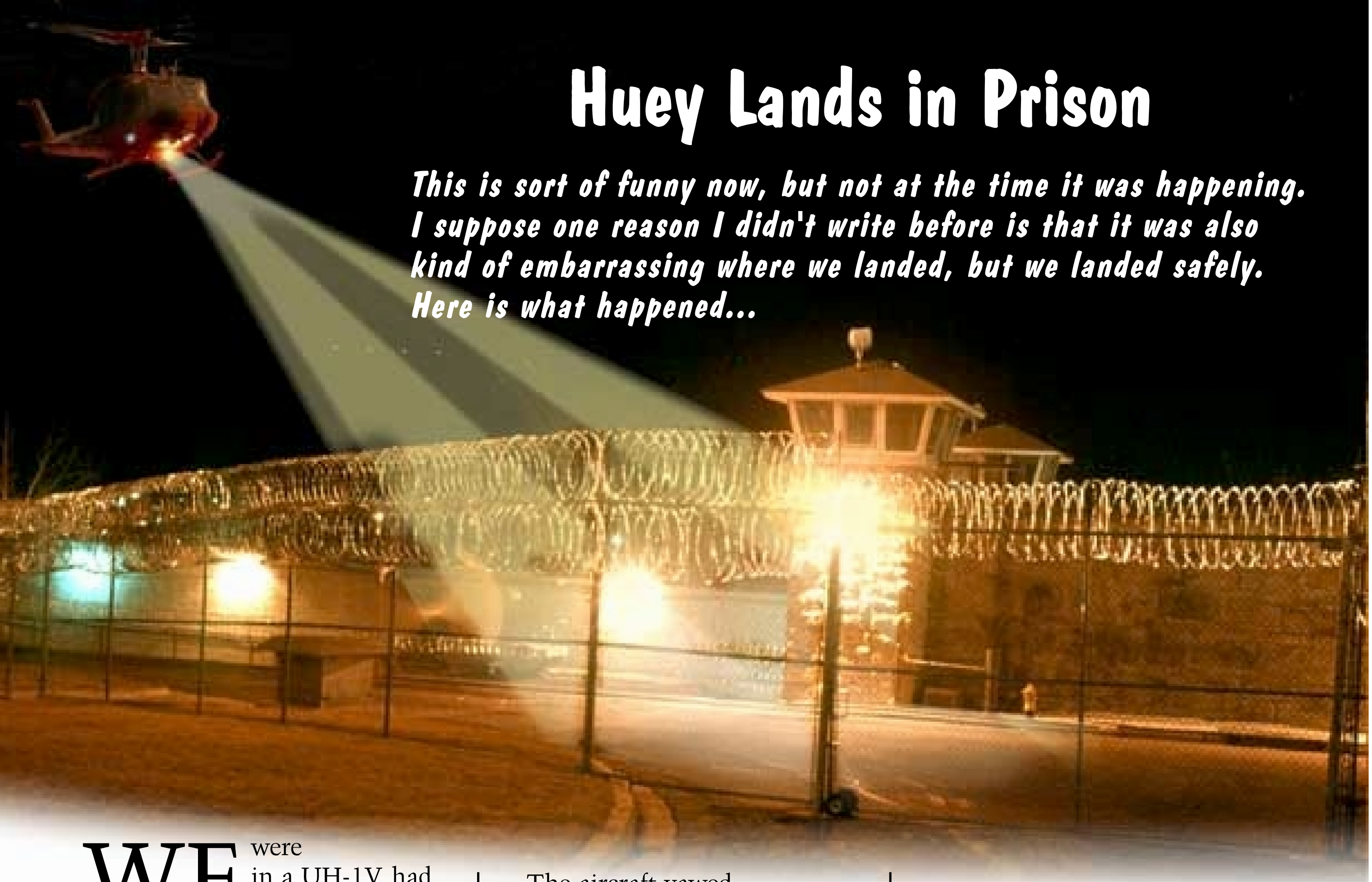
- I should have checked the weather more closely before I left.
- I should have taken a bit more time checking the condition and the rigging of the slingload.
- I could have cleared the trees coming out of that confined area if I'd had a bit more power.
- I would have planned the flight differently if the "head shed" hadn't put pressure on me to get the mission accomplished.
- I could have made it with a bit more fuel.
- I would have written up that anomaly, but we needed to complete the maintenance and get the aircraft up.
- I should have made sure my passengers were appropriately briefed.
- I should have spoken up when I realized the mission would extend well beyond my crew day.
- I should have known the dust would cause a brownout.
- I should have known that loose net would get airborne.
- I should have told him about the rotor blades.
- I would have worn my survival vest, but it was just a routine mission.
- I should have checked the survival radios.

Hindsight is great for lessons learned, but foresight is the key to accident prevention. Identifying hazards and developing and implementing controls to eliminate or reduce risks before and throughout the mission are the best ways to avoid lamenting what you coulda, shoulda, woulda, done, after the painful bite of an accident. Turn your coulda, shoulda, woulda statements into control measures, before an accident happens.

—Concept courtesy of Aviation Safety Vortex

Huey Lands in Prison

This is sort of funny now, but not at the time it was happening. I suppose one reason I didn't write before is that it was also kind of embarrassing where we landed, but we landed safely. Here is what happened...



WE were in a UH-1V, had just dropped off a patient at Tripler Army Medical Center, and were en route back to Wheeler AAF. On board we had two pilots, one crew chief, one medic, and one civilian medical technician (the only one without a headset). It was about 2000 hours and we didn't fly with goggles. I was on the controls with another CW2 as the PC.

ATC cleared us for a H1 transition back to Wheeler and an altitude of 1500. As we turned from a small valley to H1 and climbed through 800 feet, I noticed the master caution light come on. The PC confirmed it was a chip light. I told the crew in the back to start looking for a suitable area to land while the PC contacted ATC. Just as the ATC asked if we were declaring an emergency, the panel lit up like a Christmas tree!

The aircraft yawed about three times to the left and right and lost about 200 to 300 feet in altitude. Bells were going off, and irregular sounds were heard from the engine. (I thought the engine noise was going quiet, while someone else thought it sounded like compressor stalls, and another thought it sounded like it was overspeeding.) More lights came on. I said, "We have more than a chip light now", and heard the PC answer ATC "Roger, we are declaring an emergency."

My first instinct told me we had an engine failure and that I should immediately start an autorotation. But something in the back of my mind said remember to confirm. I quickly looked at the gauges. No help there. Some of the gauges were flat lined (including the torque gauge).

I reduced the collective a little, and we were able to maintain the altitude with reduced power setting. Now I knew we had partial power.

I was trying to figure the best place to go. It was dark below us, but I could see an interstate highway. There was a large hill to the left that I wasn't even considering climbing over (it was also a military housing area.) Straight ahead were some high-tension wires about 400 feet high. Then to the right there was an industrial park. I had a brilliant thought; an industrial park equals large parking lots. So I thought. I stated I was turning right. Everyone cleared right and continued to look for a suitable area.

A place to land

Though at a reduced power setting, we were still flying, but I knew time was running out. The PC announced "large field at 12 o'clock" about the same time I saw it—a large field, brilliantly lit, about a mile ahead of us. I thought it was a baseball field and figured they were having a night game. As we got closer we could see power poles everywhere, except on the one large field in the center of what appeared to be a large surrounding complex of buildings and fences. I continued with my silent prayers for the engine to continue running as I began the approach, aiming for the center of the lit-up area.

When at about 50 to 75 feet above the surrounding buildings, I found myself looking into a guard tower on my left, I realized we were landing in a prison. We had a good approach angle and rate of descent going, and were committed to landing, prison or not. I was reluctant to move the collective if I could avoid it, so I used the cyclic to trade off airspeed for altitude until we cleared the last fence, when I reduced the collective and allowed the aircraft to settle to the ground. We had a ground run of about 20 feet.

As we did an emergency shutdown, the crew chief came on the radio saying, "I couldn't stop him." Apparently the civilian medic unfastened his seat belt and ran. We didn't have a chance to do anything about that. The crew concentrated on the aircraft. We grouped together at the side and for a few seconds stared at each other and the aircraft. There was some nervous laughter.

Meanwhile, the civilian ran to the guards and told them to call the fire department. He didn't know the aircraft dumps fuel upon shut down. When he smelled fuel, he thought we had a major fuel leak.

Crew coordination

When we all got together and talked, everything that happened was pieced together. The cooperation of the civilian authorities was outstanding. The fire department, police department, and the EMT supervisor were all on site within 15 minutes. Our battalion commander was also there within 20 minutes. He just happened to be walking into Tripler when he heard irregular sounds from the aircraft and saw it was one of his.

The next day, a CH-47 slingloaded the aircraft home. When the crew chief took the chip detector out, it was covered with metal. Our maintenance officer said, "I don't know what made you think of not increasing the collective, but if you had, the engine probably would have seized."

Though it seemed the time elapsed was about 15 to 20 minutes, it actually all happened in about 2 minutes. The crew worked as a team without being told what to do.

If there was one thing I could have done differently, it would have to be to ensure the civilian takes directions from the crew and knows what's happening. Every civilian medical technician is taught aircraft procedures, but most are not faced with flight emergencies. This incident taught me a few things:

a. Rely on your training.

b. Know where you are.

c. Crew coordination is important.

d. Things happen fast.

We never did find out what caused the problem. I am still curious.

—Anonymous

Instructor Pilot Complacency

A dictionary defines complacency as "contented to a fault; self-satisfied and unconcerned." To a pilot, these traits are undesirable and could have deadly results. Yet, many accidents occur every year with the primary cause determined to be "pilot complacency."

As a Chinook instructor pilot (IP), I have the job of teaching and evaluating various procedures of helicopter operations. One of the more dangerous areas of instructing is emergency procedure training.

As a new instructor pilot, I was very cautious when I simulated an emergency procedure. One of the more dangerous of these is the simulated engine failure. This procedure is even more dangerous while utilizing night vision goggles (NVGs). Performing simulated engine failure, the IP retards the engine condition lever (throttle.) By doing so, he risks the possibility of the engine actually failing or the trainee/evaluee responding incorrectly. Therefore, it is imperative that the IP maintain a high level of awareness.

As time went on, my experience level and confidence as an instructor pilot flourished. One night, I was assigned to fly with a pilot while using NVGs in order to start his NVG refresher training. The pilot had about 75 hours of flight time while using the NVGs, but hadn't flown with NVGs for two years. I knew the pilot well and I had progressed him to RL1 (readiness level). Furthermore, I had about 15 hours of flight-time with this particular pilot. I had begun the training with classes on the NVGs, and he was well prepared for the training. The next step was to hit the flight line.

Ready to go

After the daily ritual of pre-flight, flight planning, and checking weather, we were ready to go. It was a beautiful night—you could see every star and the moon was about 60% illuminated. Not a cloud in sight and the forecast was severe-clear!

We climbed in the cockpit and began the run-up process. Before long, we were beating the air into submission. For his first flight in 2 years, he was hovering very well. Soon, we took off from our base station and flew to a small airfield about 20 minutes away. I have done many NVG training flights at this small airfield. Although it was late and the tower had already closed, I had communication with crash/rescue, which is required by U.S. Army regulations prior to conducting emergency procedure training. So, after a couple of traffic patterns with no interference from the IP, I was ready to see how he could handle emergency procedures. Since he was doing so well, I would start off with a simulated single engine failure. After all, I had given him the same emergency procedure numerous times during the day and he had performed fine.

With the before-takeoff checks complete, the pilot increased the thrust and off we went. On the downwind leg of the traffic pattern at 700 feet, traffic pattern altitude, I initiated the emergency procedure by retarding the No. 2 engine condition lever to ground idle. The pilot called out the first step of the emergency procedure, "Thrust adjust." Normally, the thrust is usually reduced to regain rotor RPM. I was sitting back waiting for the completion of the procedure when I noticed the rotor RPM continued to decrease to a dangerous point, a point when the main generators would come off-line. I then looked over and noticed he had increased the thrust.

> **"The greatest of faults, I should say, is to be conscious of none."**
>
> —*Thomas Carlyle*

Before I knew it, the aircraft was going out of control. I then announced "I have the controls," but he became unresponsive and unwilling to relinquish the controls. I continued to increase the rotor RPM to within safe limits, but was ineffective due to the amount of thrust he had pulled. I noticed our climb rate increase to a rate of 2000 to 2500 feet per minute and the altimeter was rising rapidly. Again, I said, "I have the flight controls!" and still the pilot would not relinquish the controls.

What is going on?

The flight engineer, growing concerned, said, "What is going on?" as he felt the aircraft going out of control.

I looked outside the window and all I could see were stars, indicating we were now in a nose-high attitude. Suddenly, the pilot let go of the controls, and I reduced the thrust and regained control of the aircraft. After I established a level flight attitude, I noticed we had climbed from 700 to 3000 feet in what seemed to be a matter of seconds. The pilot asked, "What happened?" I recovered the engine and proceeded to land the aircraft.

Once on the ground, I explained to the crew what had happened. After we all got a chance to catch our breath, I demonstrated the simulated engine failure, discussed it in detail, and he performed another without error.

After the flight, I mentally went over the portion of the flight that will be forever etched in my memory. I was slow to react to a potentially fatal situation because I was complacent and was not expecting anything like what had happened. I had performed the procedure many times with this same pilot under a different flight mode, and he performed it flawlessly. I should not have taken such a lax position in the cockpit, knowing that the pilot at the flight controls was not familiar with this flight mode. After experiencing so many uneventful simulated emergency procedures, it took an alarming situation to reveal my complacent self. Thomas Carlyle, a Scottish essayist, said, "The greatest of faults, I should say, is to be conscious of none." This is true today, as it was when he wrote it in the 19th century. Finally, don't let a situation develop before you realize your complacency.

—CW3 James K. Scala, 5th Bn, 158th Aviation Regiment, Box 478, APO AE 09182

Perishable Skill—Currency is Not Proficiency

Perishable skills. We have all heard the phrase, "That's a perishable skill", but what does it really mean? I have heard it for almost 20 years and always thought of my golf swing as my most "perishable skill." But a recent accident investigated by the Safety Center brought the phrase back to mind in a much more appropriate way.

This UH-60L accident serves as a prime example of how perishable some skills really are. It involved a crew that no one ever expected to have an accident.

The instructor pilot had over 8,000 hours of rotary-wing experience; the PI was young but highly thought of; and all the crew members had flown together many times in the past. Both aviators were qualified and current for the night vision goggle environmental training mission.

The problem? Neither crewmember had significant recent experience in NVG flight. The hostile conditions overcame their skills. They became disoriented during a takeoff and crashed, destroying the aircraft. Fortunately, everyone on board will fully recover from their injuries.

We are all aware of "NVG currency" requirements as stated in the Aircrew Training Manual (ATM) for each aircraft. Instructor pilots and unit commanders constantly monitor aviators to ensure that everyone remains current by flying at least one hour every 45 days under goggles. As long as we maintain that standard, we can report combat-ready goggle crews to the chain of command every month.

But, in the back of our minds, we all know that one flight every 45 days does not maintain the proficiency necessary to execute the tough missions we may be called upon to complete. This mission is a perfect example.

If any one of the conditions—low recent experience, dust, winds, or low illumination—had not been present, perhaps the accident would not have occurred.

If, If, If . . .

The aviators involved in this accident were NVG current. They met the ATM standards required to conduct the mission. However, neither crewmember had flown more than 3 hours of NVG flight in a single month for over 7 months. We have all seen this in our units at one time or another. Other mission requirements, administrative obstacles, or flight time restrictions have put nearly everyone in this position at some time. Most often we manage to get the mission accomplished when called on. The problems arise when an aviator who is just maintaining currency is placed in conditions with which he is unfamiliar and that require real proficiency rather than currency.

In this case, we put these aviators in a dusty, windy environment, with low illumination, with little recent experience under NVGs, and all these things added up to a situation primed for an accident. The cumulative effect of the risks associated with this mission exceeded the capability of the crew, and a major accident was the result. If any one of the conditions—low recent experience, dust, winds, or low illumination—had not been present, perhaps the accident would not have occurred. If the aircrew had more recent experience, they would have been better able to deal with the harsh environment. If the illumination had been better, their low recent experience might not have been a factor. If the conditions had not been as dusty, perhaps the crew would not have become disoriented. If, If, If…

The key lesson to be learned is that there are perishable skills. Night vision goggle flight is one of the most perishable skills in our business. When circumstances force us to maintain NVG currency rather than proficiency, we must be aware that those aviators are not ready to proceed directly into harsh environments. Commanders must transition through the crawl, walk, run scenario. NVG currency is the crawl. NVGs in adverse conditions, such as the desert or other severe environments, are Olympic events. We can't expect aircrews to go straight from one to the other.

—LTC W.R. McInnis, Chief, Operations Division, US Army Safety Center, DSN 558-2194, (334) 255-2194, mcinnisw@safetycenter.army.mil

Broken Wing Award Requirements

AR 672-74, Army Accident Prevention Awards Program, outlines the requirements for a Broken Wing Award.

To be eligible for the award, an aircrewmember must, through outstanding airmanship, minimize or prevent aircraft damage or injury to personnel during an emergency situation.

An emergency will not be considered for an award if-

- It is self-induced.
- It actually occurs during a simulated emergency requiring no skill to land the aircraft successfully.
- It occurs because of non-compliance with published regulations or procedures.
- It is determined that no emergency actually existed.
- A lack of discipline or aviator judgment may have induced the emergency.
- The aircraft was in a phase of flight with no unfavorable circumstances to prevent a safe landing.

Nomination requirements

Nominations must include the following information:

- Full name, SSN, and crew duty of the person actually on the controls during an emergency.
- Date, time and location of the emergency.
- Mission type, design, and series of the aircraft involved.
- Type of mission.
- Phase of flight when the emergency occurred.
- Kind of terrain over which the emergency occurred.
- Obstructions, dimensions, type and condition of the landing area.
- Altitude above ground level.
- Density altitude.
- Wind condition (direction and velocity).
- Gross weight of the aircraft when landing.
- Concise description of the emergency from inception to termination.
- Action taken by the nominee to cope with the emergency and what was done to recover from the emergency or minimize damage or injury. The circumstances surrounding the occurrence must be documented to show the skill, knowledge, judgment, and technique required and used in recovering from the emergency.
- Lapsed time from onset of the emergency to termination.
- Drawings, other supporting documentation, if available.
- Copy of the abbreviated aviation accident report (AAAR) if required and submitted.

Submitting nominations

The unit commander or installation or unit safety manager should initiate nominations for the Broken Wing Award. Normally, only one person will be nominated to receive the award for a single in-flight emergency. However, if more than one crewmember materially contributed to successful recovery from the emergency, all those involved should be considered for nomination.

Nominations for the Army Aviation Broken Wing Award should be forwarded through command channels to the US Army Safety Center, ATTN: CSSC-OR (Broken Wing Award), Building 4905 (Fifth Avenue) Fort Rucker, AL 36362-5363.

Nominating evaluations

A panel consisting of the Director of Army Safety, or his representative, and at least five aviators will review the nominations. The panel may include senior enlisted crew-members when appropriate. At least one panel member will be qualified in the mission type and design of the aircraft involved in the emergency.

—Mr. Dick Lovely, US Army Safety Center, DSN 558-1235, (334) 255-1235, lovelyr@safetycenter.army.mil

NCO Corner
"It Could Have Been Me!"

After being at the Safety Center almost 2 years, I've had enough time to get used to the questions about the patch above my right pocket and then the almost inevitable, "Safety Center? What's that?" To tell the truth, when I got the phone call to come here, I had the same reaction: "The Army Safety Center? What in the world is that?"

Of course, I knew all about safety. After all, I'd heard about it my whole career. Units had safety officers and NCOs put up safety posters on the bulletin boards. They would check the fire extinguishers to make sure they were up to date. Safety people were harmless enough, really. But that post safety officer! His mission seemed to be to make my life as miserable as possible. If he wasn't coming around doing a safety inspection, he was telling me why I couldn't get a mission done the way I wanted because it wouldn't be safe. What was his problem anyway? The Army is a risky business. If we aren't willing to accept a little risk, what are we doing in the Army? Sure, now and then someone is going to get hurt, but isn't that the cost of doing business?

Since reporting to the Safety Center, I have changed my mind. The Safety Center has a good system for processing and computerizing accident data. All the cold, official language of accident reports eventually ends up stored for easy access in an efficient computer database. Everything gets so well categorized that it sometimes seems that the Army could determine in a few minutes how many soldiers got hurt last year tripping over cracks in the sidewalk while wearing Santa Claus suits. At first, this all looked to me like one more bureaucratic waste of money.

Then one day, I had to retrieve data on cold weather-related accidents and injuries for a Countermeasure article. Naively, I decided to look at several years in order to get enough information to establish any trends. I ended up with an overwhelming pile of computer printouts covering cold-weather injuries, cold-weather vehicle accidents, tent fires, and all the other ways in which soldiers manage to hurt themselves when the cold season comes around each year.

Laboriously, I sifted through the reports, and I began to understand several things. First, the cost of these accidents was greater than I had ever imagined, whether measured in purely economic terms or in human costs. Secondly, almost all the accidents could have been prevented if someone had followed proper procedures, used a little common sense, or taken a little more care. More often than not, there was an NCO or officer who could have acted to prevent the accident. Finally, there were similarities. After a while, I could read a few lines of a report and almost predict the outcome.

Before I could get too self-righteous in dismissing all these soldiers and their NCOs as the victims of their own lack of good judgment, I realized uneasily that, in too many cases, I was seeing myself. I had done many of the same things they had. The difference was that I was lucky and got away with it. Obviously, I had not recognized the odds against me when I trusted the welfare of my soldiers as well as myself to blind luck. It wasn't long before I noticed the same similarities in other kinds of accidents.

"I had done many of the same things they had. The difference was that I was lucky and got away with it."

Being a soldier is riskier than being a civilian. There is nothing glamorous or macho or professional about being hurt or killed in an accident, on or off duty. I have pledged that I will never again accept risk blindly. From now on, I want to know ahead of time what the risks of an operation are—whether conducting a water-crossing or mowing grass at home. When I can eliminate a hazard and still get the mission accomplished, I will. I will try to minimize the risks that I can't eliminate, and I will do my best to ensure that those around me do the same.

POC: SFC Michael R. Williams, Ground Systems and Accident Investigation Division, USASC, DSN 558-2959 (334)255-2959, williamm@safetycenter.army.mil

Warm Days Ahead—Secure Your Gear

Several years ago I recall that a UH-1H had taken off in a flight of five aircraft, somewhere in the Ft Campbell, KY training area, with the cargo doors open. It was really beginning to get warm, and nothing beats nature's air-conditioning. The deal in those days was to carry your steel pot, LBE and other paraphernalia with you in the aircraft.

It just so happens that this was a beautiful warm spring day, when you wished you were teeing off on the local golf course instead of...

On take off at about 500 feet, while just entering cruise flight, a poncho became loose in the passenger compartment and flew out the door. The poncho became tangled in the tail rotor, and the aircraft crashed. Unfortunately, there were several fatalities.

Let's ensure that while reading your checklist you mean what you say. When it comes to "Crew, passengers, and mission equipment—Check", it should mean just that. All rotors like clean air and no FOD! It could save your life.

—Robert Giffin, Systems Manager, Utility Branch, US Army Safety Center, DSN 558-3650 (334) 255-3650 giffinr@safetycenter.army.mil

Aviation Safety NCO Training

You may have noticed in the new AR 385-95, *Army Aviation Accident Prevention*, dated 10 December 1999, that the aviation safety NCO is no longer required to possess the additional skill identifier (ASI) A2. It does require the NCO to be safety-trained and appointed by the unit commander, in writing, to assist the aviation safety officer.

There are numerous ways for a safety NCO to get trained. The standard for aviation safety NCO training is successful completion of the Aviation Accident Prevention Course, or the NCO Safety and Risk Management Professional Development Course, offered by The Army Safety Center, or NCO Academy training. Existing local installation or MACOM training programs meet the requirements for training aviation safety NCOs.

In October 1999, The Army Safety Center implemented the NCO Safety and Risk Management Professional Development Course. During the last several months, nearly 700 NCOs and officers have received this training.

The Fort Rucker NCO Academy will instruct four NCO Safety and Risk Management Professional Development courses this fiscal year at the BNCOC level. The long-term benefit of this initiative will be safety training for all CMF 67 and 93 BNCOC graduates.

The Aviation Accident Prevention Course is taught by several certified vendors. A listing of these vendors is on our homepage. For NCO safety and risk management professional development course scheduling, or certified vendor information, go to the USASC public web site, http://safety.army.mil

—CW5 Butch Wootten, Director, Aviation Safety Officer Course, DSN 558-2376 (334) 255-2376 woottend@safetycenter.army.mil

Website Sources of Help

■ The NEW Petroleum website is http://www.quartermaster.army.mil/pwd
If you only wish to reach the Quartermaster Center and School, drop the "pwd".

■ For additional assistance pertaining to Petroleum And Water Systems (PAWS), there is a Help Desk. Their phone number is commercial (810) 574-4143/4229 or DSN 786-4143/4229. Their web address is: http://www.tacom.army.mil.

■ To obtain AMC/TACOM equipment Safety of Use Messages, Maintenance Advisory Messages http://aeps.ria.army.mil/aepspublic.cfm

■ The AMCOM Safety Office's web page is: http://www.redstone.army.mil/safety/home.html

—Jim Lupori, US Army Petroleum Center , DSN 977-6445, (717) 770-6445 jlupori@usapc-emh1.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class E

A series

■ During engine run-up, as power levers were moved forward to Fly, the No. 1 and No. 2 generators dropped off line simultaneously. Generator No. 1 would not reset. Generator No. 2 momentarily reset and then shutdown. Power was brought back to idle, APU started and both generators were reset successfully. SDC light would not extinguish, so flight was aborted. Cause of generator failure was not determined.

■ During cruise flight, the CPG master caution light and No. 1 engine caution light flickered on and off. Aircraft landed without further incident.

■ During post-flight inspection, crew noted excessive oil residue on No. 1 generator. Maintenance personnel determined that the seal between the generator and accessory gearbox had failed. The seal was replaced. Aircraft maintenance operational system checked out and aircraft was returned to service.

D series

■ During cruise flight, the crew received the Manual Stabilator Advisory along with a slight forward pitch in attitude. Shortly after-ward, multiple instrument failures and warning lights were noted. Upon landing the #2 generator took over all loads. Maintenance discovered that the spline adapter had failed and replaced the spline adapters with modifications directed from manufacturer. Aircraft was released for flight.

■ During cruise flight the crew received voice warning of BUCS failure and FMC channel disengagement. The No. 2 generator failed. During the approach to an open field, the No. 1 generator failed. All four MPD's went blank, there was no symbology on the HDU's, and the UFD continued to operate normally until the battery died approximately 7 minutes later. Maintenance replaced the spine adapters on both generators with the modifications directed from manufacturer. The aircraft was released for flight.

■ While advancing the power levers to fly during engine run-up, the No. 2 engine overspeed voice warning was announced and the No. 2 engine overspeed was displayed on the UFD. The No. 2 engine overspeed warning was displayed on the DMS warning page and NP overspeed was written on the exceedance page. Crew completed a normal shutdown with normal indications on the engine page and notified maintenance. Maintenance discovered that the No. 1 system processor was causing erroneous information to be sent to the data management system. Maintenance replaced system processor and released aircraft for flight.

■ Navigation lights failed during aircraft run-up, prior to night system training flight. Circuit breaker on HPSM popped and was reset. Circuit breaker popped 5 seconds after turning lights on. Mission was aborted. Aircraft shut down without further incident. Maintenance inspectors revealed the tail navigation light's filament had folded over inside the bulb, causing the circuit breaker to pop. The light bulb was replaced and the aircraft returned to flight.

CH47

Class C

D series

■ During maintenance test flight, right side pilot's door came off, striking the blade and aft pylon.

Class E

D series

■ While hovering over slingload, aircraft No. 1 engine RPM rapidly climbed to 110%, and No. 1 torque climbed to 120%, with a decrease in No. 2 engine torque to 25%. IP on the controls recognized the N2 Governor failure, and through application of thrust and manual manipulation of the engine condition lever, brought the No. 1 engine RPM back into normal range within 5-10 seconds. Aircraft was returned to the airfield, and maintenance replaced N2 Actuator.

OH58

Class C

Series D (R)

■ During simulated engine failure at altitude, engine torque peaked to 133% for 1 sec.

UH60

Class C

A series

■ Suspected tree strike during landing to a dusty LZ in brownout conditions. All 4 main rotor tip caps revealed damage.

■ Aircraft main rotor system contacted a tree during masking/unmasking scenario. Aircraft was landed and shut down without further incident. Damage to three main rotor blade tip caps and two blades.

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.

Memorial day Concert

This year's National Memorial Day Concert, telecast on PBS, will feature a special segment commemorating the 50th anniversary of the Korean War, plus tributes to all Americans who fought in the wars of the 20th century.

A blend of musical performances, archival footage and dramatic readings, the concert will be broadcast overseas by the Armed Forces Radio and Television Service. It will air on public television stations nationwide at 2000 hours, 28 May.

1999 Quad A Awards

Congratulations to the 1999 Army Aviation Association of America national award winners.

OUTSTANDING AVIATION UNIT OF THE YEAR (ACTIVE):
2nd Battalion, 227th Aviation Regiment, 4th Brigade (Aviation), 1st Cavalry Division, Fort Hood, TX 76544. LTC Donald M. MacWillie III, commander; CSM Jimmy G. Ruiz, senior NCO.

OUTSTANDING AVIATION UNIT OF THE YEAR (ARNG):
24th Medical Company (Air Ambulance), 2400 NW 24th Street, Lincoln, NE 68524. MAJ Scott A. Gronewold, previous commander; 1SG Troy Johnson, senior NCO.

OUTSTANDING AVIATION UNIT OF THE YEAR (USAR):
8th Battalion, 229th Aviation Regiment (Attack), Operation Joint Forge, Comanche Base, Bosnia APO AE 09789/Fort Knox, KY 40121. LTC John E. Valentine, commander; CSM James H. Robinson, senior NCO.

ROBERT M. LEICH AWARD:
US Army Scout-Attack Helicopter Product office and predecessors, US Army Aviation and Missile Command, Redstone Arsenal, AL 35898. LTC William M. Gavora, product manager; Mr. John Guenther, deputy product manager.

ARMY AVIATOR OF THE YEAR:
CW3 Daniel R. Zimmermann, A troop, 2nd Squadron, 6th Cavalry, 11th Aviation Regiment, APO AE 09140

AVIATION SOLDIER OF THE YEAR:
SFC William G. Sikes III, D Company, 1/260th SOAR (A), Fort Campbell, KY 42223

JOSEPH P. CRIBBINS DEPARTMENT OF THE ARMY CIVILIAN OF THE YEAR:
Ms. Gerri Shelp, 21st Cavalry Brigade (AC), Fort Hood, TX 76548

JAMES H. MCCLELLAN AVIATION SAFETY AWARD:
CW4 Greg S. Schneider, HHC, 5-158th Aviation, APO AE 09182

TOP CHAPTER OF THE YEAR:
AAAA Tennessee Valley Chapter, BG(P) Joseph L. Bergantz, Chapter president, Redstone Arsenal, AL 35808

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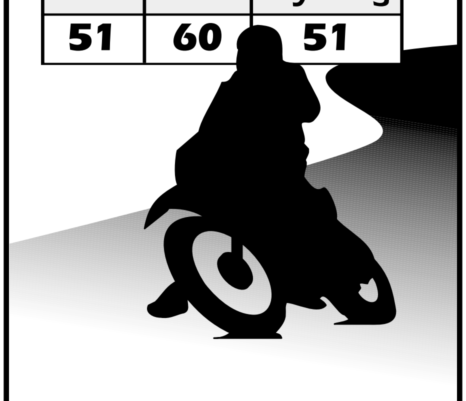
POV Fatalities through 31Mar

FY00	FY99	3-yr Avg
51	60	51



U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

JUNE 2000 ◆ Vol 28 ◆ No 6 http://safety.army.mil

In this issue, we take a closer look at some areas, that though important, can be overlooked. So let's take . . .

a second look at maintenance and refueling

Take a second look at safety and maintenance

Those of us who work in the maintenance arena know all too well the crisis management we have come to accept as the norm. But during the daily routine of putting out all the little fires, do we really stop and think about the decisions we make, about soldiers we may be putting at risk, and equipment we may risk damaging?

Yes, I too can look back and remember times when in the haste to "just get it done", things may not have always been completed in the safest manner. Anyone who has worked maintenance knows that at times we have to improvise, suck it up, just do it. When you as a leader hear these words or phrases, STOP. Look at the implied tasks. You were not told to put soldiers or equipment at risk—quite the contrary. As leaders we are charged with the well-being of our soldiers and equipment.

Just getting it done

With more and more of our maintenance time being eaten up by other activities, it is more important now than ever that we keep track of what is going on around us. How many times has one person started a job only to be pulled off the job before it is completed? Someone else has to finish it, if it gets finished. What sort of hand-over is happening?

In Korea, Delta Companies routinely work a day shift and a night shift. When one shift ends and the other one starts, is there a good hand over? When questions come up, do we just put them to the side, or do we ask the right people the right questions? Do we always match the right person to the job? If we don't have time to do it right the first time, then we surely don't have time to do it twice.

Nobody wants to look stupid in front of others, but the questions not asked can result in major consequences. Encourage people to ask when they're not sure. Let them know that if it doesn't look right, it probably isn't. The next soldier who gets hurt, or the next piece of equipment that gets destroyed is just around the corner unless someone speaks up. We look to Delta Company to perform some of the heavier maintenance that comes due on a unit's aircraft. But are we as maintainers and leaders doing our part? Take for instance new mechanics coming into a unit straight from AIT. Where do we assign them? The argument is made, that the line companies don't have the time or personnel to properly supervise new people. So where do we assign them so they can gather skills and the have the actual wrench-turning experience needed on a daily basis in a maintenance unit? That's right, we assign them to Delta Company, where the only experience they can gather is from all the other brand-new mechanics.

The United States Army Military Occupational Specialty schools do a fine job of turning a young person into a basic aircraft mechanic, not a crew chief. It is up to us to mold these soldiers into maintainers. Let's not put all the responsibility of the continued training of these new mechanics on the unit's support company. Remember, Delta Company is working on your aircraft. Line platoons, step up to the plate. Help train your replacements. The sharp maintainers of today may not be here tomorrow.

Forgotten equipment

Let's look at other ways to reduce risk in the maintenance areas. What is the most under-maintained equipment in the Army? In my opinion, that would have to be ground-support equipment (GSE). Who maintains this equipment?

The answer often is, nobody who has ever been trained on the maintenance of GSE. Improperly maintained GSE presents a risk and potential for an accident. So how can we limit that risk? We can keep those maintenance stands inspected, properly maintained, painted and marked. We can make sure that we use the rails when using work platforms or maintenance stands—they were put there for a reason. Look at those tugs; designate people to ensure that the tugs are inspected first thing in the morning. You wouldn't drive your car for months on end without at least checking the oil. And what about those AGPUs (aviation ground power units)? Do the soldiers operating them really know what they're doing? When was the last time that AGPU was looked at? I know, you're thinking that if you don't have enough time or people to do what you have to do now, how can you afford to cut a person loose to look at the tug or an AGPU? Well, look at it this way. Your soldiers use that GSE. They climb on it, they drive it, and they operate it. Get one of them hurt and life just got tougher. We have a thing called Sergeant's time. Why don't we use it to do refresher classes on the operation of some of our equipment? Talk about things like servicing the hydraulic reservoir on the AGPU, the differences in the hydraulic fluids, and why we use the types we do. Teach soldiers some of the safeguards we have to keep impurities out of our aircraft hydraulic systems.

Tomorrow's standard

Those of us in the maintenance world sometimes have our own way of doing things. We as a community need to open our eyes to safer ways of accomplishing the mission.

When I look back over the years, I wonder if it was fate, or did we just master the wrong way of doing things, the "just get it done" way? So, think before you send Joe to Delta Company to work on your aircraft, or to drive that tug or operate equipment that hasn't been looked at for quite some time. The "just get it done" way that you show to your soldiers today will be the standard for the way the Army does business tomorrow.

—CW4 Todd Toth, USASC, DSN 558-2781, (334) 255-2781 totht@safetycenter.army.mil

Take a second look at FOD!

Numerous articles have been written concerning foreign object damage (FOD) and command emphasis has always been to reduce the number of FOD incidents through FOD walks, thorough pre-flights, and education. However, do we really place an emphasis on ensuring our aircraft are safe from FOD?

The purpose of this article is not to point fingers or to place blame, but rather to heighten awareness to a problem that pilots, maintenance personnel, and other flight line operators overlook.

Recently here at Fort Rucker, the "Home of Army Aviation", we exposed ourselves to an unnecessary FOD risk. The airfield street sweeper was in maintenance for a long duration, resulting in the ramps being unswept and allowing debris such as rocks, small branches, and safety wire to accumulate.

How did this breakdown occur? There must have been hundreds of aircrews who walked along the ramp and overlooked the easily ingestible debris lying on it. Let's face it—FOD is boring! We are all busy with preparing for training, a mission, or talking about the day's flight. How as aviation leaders can we prevent the needless damage in an era of budget cuts?

Training, education, and monthly FOD walks are ways that have prevented FOD incidents in our unit. It was during our monthly FOD walk that we discovered how bad the ramp had become. Training and education is key to FOD prevention. It only takes one fouled engine to get the command's attention. Posting of FOD incidents and an SOP that covers the unit's FOD policies are good starting points. Another good way to educate aircrews is to place FOD in the crew brief. A simple statement indicating that the crew will look around the aircraft for debris prior to beginning the preflight might mean the difference between a FOD incident or a safe engine start. Another way towards prevention is to use your FOD Officer/NCO effectively. This individual walks the flight line and schedules the unit's monthly FOD walk. The unit's monthly FOD walk does three things: first it removes debris from the flight line, second it places FOD on everyone's mind at least once a month, and last it shows the command's commitment to preventing FOD. The FOD Officer should work hand-in-hand with the Safety Officer. Two people actively looking for problems on the flight line will do better than one.

How often do we concentrate on "Safety" without thinking about FOD? Most of the time, we think of safety as memorizing emergency procedures, planning our missions thoroughly, conducting recons, and operating our aircraft in a responsible manner. Failure to think of these could result in loss of life. Failure to see that piece of debris below an engine intake could also result in loss of equipment or worse, loss of life. It is too expensive to overlook FOD. Together working proactively as a team, we can reduce most airfield FOD, thereby reducing accidents and incidents.

—CPT Scott Nowicki, USAAMC-AAD, Fort Rucker, AL DSN 558-8187 (334) 255-8187, scott.nowicki@se-amedd.army.mil

FOD—You are what you eat

This incident happened quite a while ago. This article has been sitting in my in-basket longer than I care to admit because I couldn't decide how to word the lessons learned, the part that ties everything together. Here's what happened.

We were conducting training for the external transport of cargo, using the helicopter's single point cargo hook. We performed operational power checks on all three engines en route to our operating area. The power checks would tell us how much torque each engine could produce. It was a cool winter day, and the MH-53E aircraft was relatively light, so this procedure was almost a mere formality. All three engines produced ample power, though the No. 2 engine was considerably weaker than the other two. I noted that piece of information, probably insignificant, to the crew, filed it away in the lesser-accessed regions of my mind as well as on my kneeboard, and continued onward.

Operations proceeded uneventfully enough at the LZ. The student pilot (SP) hovered over the load for his third lift. The load was a metal I-beam, weighing in at around 8,000 pounds. The student was an enthusiastic naval aviator, weighing in at around 170 pounds. It was his job to overcome the devious metal I-beam.

On the first lift, the I-beam, though still on the deck, kept moving below the helicopter, jinking to the left and right, forward and back. Understandably, the SP was forced to constantly shift his hover, in a near-futile effort to stay immediately above the load.

By the third lift, the metal I-beam must have gotten tired of fighting, and our hover was considerably more stable. Very stable, in fact. The student was doing a good job of controlling the aircraft.

A loud bang

There we were, hovering at about ten feet. The four-man ground crew had just attached the straps on the I-beam to the helo's single point external cargo pendant. We started to climb straight up to put tension on the load. The ground crew was to stay beneath the aircraft at this time, ensuring the rigging didn't get tangled. We would thus ensure that they cleared out from the area before we actually lifted the load off the deck. I, for one, wouldn't want to stand next to 8,000 pounds of building material as it begins to swing through the air.

As we increased power and started to climb into a higher hover, a loud bang came from the cabin. It had to have been loud, because we heard it. Softer sounds, like those heard at a rock concert, are barely audible over the helicopter's freight train roar. The SP froze the controls as I profoundly and sincerely uttered over the ICS, "What was that?"

My first thought was that something was wrong with the rigging—perhaps a strap frayed and snapped. But I was looking at the load in my mirror, and everything looked fine. (MH-53Es have adjustable mirrors on appendages off the nose of the aircraft, like catfish whiskers. Designed for monitoring minesweeping equipment, they're also useful for external operations.) My second thought was that a window or door had slammed shut, something a crewman would soon inform us of.

After a few seconds of silence, my concern grew. And I took the controls. Although the SP was flying well, this was his first time to conduct such an operation in this aircraft, and there wasn't much room for error. Remember that we still had the load attached, and there were still four people underneath us. Inadvertently lifting the I-beam or letting the aircraft settle to the ground would be on the "bad" end of the good/bad continuum.

No sooner had I taken the controls than the aerial observer, who was an experienced crew chief, notice the No. 2 fuel gage reading zero. He immediately, not to mention profoundly and sincerely, uttered over the ICS, "Number two engine."

Hearing this, I immediately looked at the torque gauge and saw that the No.2 engine wasn't producing any power. Loud bang plus no torque equals compressor stall. To confirm the compressor stall theory, I glanced at the T5 gauge and noticed the needle rising like a second hand going through nine o'clock, an overtemp condition and typical symptom of a compressor stall. Fortunately, the remaining two engines easily produced enough power without allowing any settling or perceptible drop in rotor speed.

I immediately (I use this word frequently because this all occurred in about ten seconds) pickled the load. Once again, the mirror proved valuable, as I was able to ascertain that the load was completely released without having to get confirmation from a crewman. I then announced that we had a No. 2 compressor stall, and we were going to land. As pre-briefed with the ground crew for an emergency in a hover, we slid forward and to the left before landing.

Ordinarily, I would wait a few extra seconds until landing before executing any other emergency procedures, but a compressor stall, especially with the No. 2 engine, presents a high probability of an ensuing engine compartment fire. Consequently, I instructed the co-pilot to secure the No. 2 engine. The SP reacted quickly and properly by placing his hand on the No. 2 engine speed control lever, getting dual confirmation from me that this was the correct engine, and securing the engine. The crew cleared us below, and we softly landed in the grass.

Where's the fire?

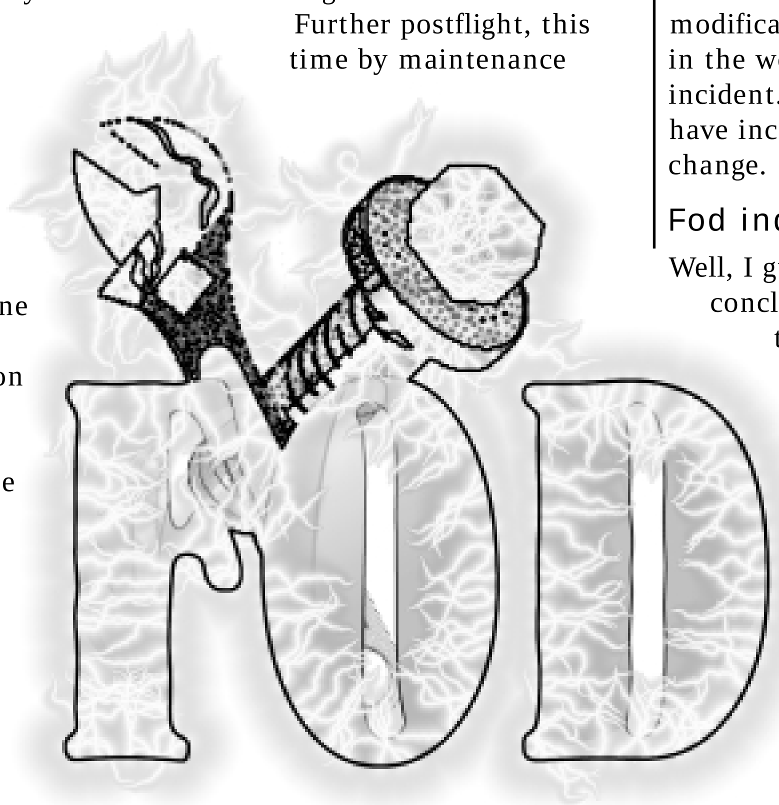
Still concerned about a possible fire, I eloquently asked over the ICS, "Anybody see any smoke or anything around the engine?"

A crewman responded, with equal eloquence, "I think we got some smoke around the number two."

The SP got ready to blow the fire bottle, placing his hand on the No. 2 engine fire T-handle. Pulling the T-handle, located on the cockpit overhead, and pressing another switch, would discharge a fire-extinguishing agent into the engine compartment. I then asked the crew about the status of the fire, to which the crew chief responded something along the lines of, "Don't think we got a fire back here. Don't see any more smoke."

With that bit of good news, we did not use the fire bottle, but did expeditiously secure the engines and rotor. Post flight inspection revealed that there had been a flash fire in the engine compartment, and it would have gotten quite a bit worse if the engine had been left running much longer.

Further postflight, this time by maintenance personnel, revealed the probable cause of the compressor stall. At the intake of each engine, the H-53E has something called an engine air particle separator (EAPS). It's a complicatedly simple device designed to prevent the engine from ingesting such FOD as bolts, rivets, and washers.



Ironically, it was probably a bolt from the EAPS that became FOD, and caused the compressor stall. We had preflighted the engine intake and EAPS barrel, but it was a cursory preflight. Upon postflight, maintenance found a missing rivet at the front end of the EAPS. Needless to say, we hadn't previously noticed it missing or loose.

As a result of this potential mishap, squadron pilots and aircrews are paying closer attention to the EAPS barrels during preflight. The squadron has designated personnel to specifically examine the EAPS as a part of daily inspections. Furthermore, a minor design modification of EAPS was already in the works at the time of this incident. All squadron aircraft have incorporated this airframe change.

Fod indigestion

Well, I guess it's time for the conclusions. We already know that if an engine eats FOD, it'll become nothing more than a useless collection of nuts, bolts, gears, and nicked compressor blades. Needless to say, poor preflight inspections are inexcusable, but preflights can reveal only so much. I should have noted the power the engines had produced on previous flights, and returned to base when I noted the weak No.2 as a new abnormality. In retrospect, I think that the control transfer added an unnecessary complication. It would have been easier to diagnose the problem and execute the appropriate emergency procedures while not having to maintain a stable hover. We were fortunate to have not learned more serious lessons at a much higher price.

—LT Kevin Gallo, US Navy, Marine Helicopter Training Squadron 302, MCAS New River, Jacksonville NC, DSN 750-6957 (910) 450-6957 gallokm@2mawnr.usmc.mil

This little FARP should have been a piece of cake…

(A lesson in how quickly a simple refueling can turn ugly.)

Our unit was executing its first forward area refueling point (FARP) operation since recovering from deployment in support of Operation Allied Force and Joint Guardian. Unit morale was high; we had completed this very tough deployment and brought all soldiers and equipment home unscathed.

Morale in the 3/5 platoon was particularly high—during the deployment we had pumped over 900,000 gallons of fuel and self-deployed over treacherous mountain roads from Albania to Macedonia without incident. This little daytime FARP in the unit's own back yard would be a piece of cake, just a chance to train some newbees. By the end of the day, however, even the most salty officers and sergeants would have a lesson in just how quickly a simple little FARP could turn ugly.

The FARP was set up to support a flight of five UH-60 Black Hawks executing a day tactical mission in the local helicopter training area. The plan, as briefed, was that all five aircraft would cycle through a four-point FARP set up in a fly-through configuration. If everything went right, four aircraft would refuel simultaneously and be out of the FARP in less than five minutes.

Initially everything went by the plan. The FARP was set up, fuel was tested and the site was safety'd well before the expected arrival time of the inbound aircraft. The aircraft arrived at the FARP on time with refuelers standing by the four points ready to execute. The first four aircraft landed directly to their points, in chalk order, and refuel nozzles plugged into the aircraft.

Three minutes into the refuel, it all still seemed to be going like clockwork.

The trouble begins

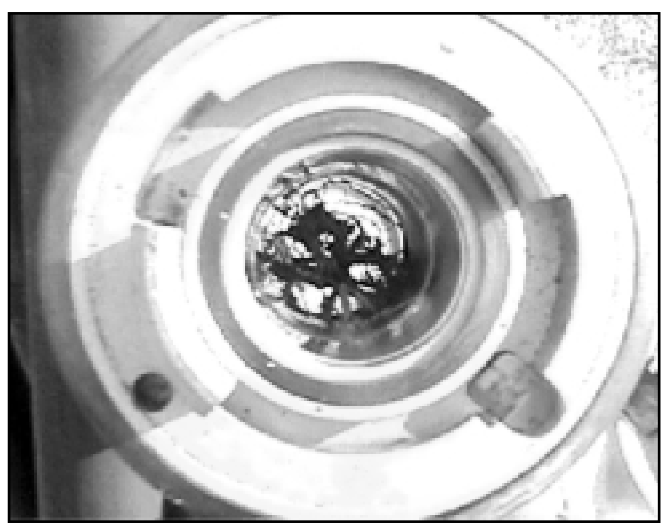
The first sign of trouble was at point one. When the chalk one aircraft D-1 refuel nozzle was disconnected, it immediately started spraying the aircraft and refueler with gallons of fuel. Moments later the same thing happened to the aircraft in point two and before you could say "Shut the fuel off" points three and four had also suffered the same fate. In the course of less than 30 seconds the simple little FARP had four running aircraft and refuelers drenched in fuel!

All four aircraft were immediately shut down. Crewmembers quickly egressed to assist in pouring frigid water, from the five-gallon cans at the points, onto the fuel-drenched refuelers. Once the refuelers were cleared out of the area, water was also applied to the fuel-sprayed side of the aircraft. A call to the local fire department brought a tanker truck to the scene. The fire truck further stabilized the fuel spill and brought racing heart rates back down to normal. Now it was time to figure out what had happened.

An open invitation to nest

The likely cause of the problem became apparent on visual inspection of the chalk one's fuel point. There, in the D-1 nozzle's shut-off valve, was a small twig. A further inspection of the aircraft fuel tanks showed more sticks and grass floating on top of the fuel in the main tank. It was the same

As a side note, the 15-ft hose should never have been used in the first place. Use of this extra hose disrupted the self-bonding feature of the -100 HTAR systems.



Brush filled HTAR T-fitting taken off the FARP sight

story for all the aircraft down the line.

The next obvious question was how could so much debris have possibly made it through the screens, filters and safety checks? Further investigation revealed the probable chain of events that lead to this near catastrophe.

A visual inspection of the HEMTT showed no traces of floating debris in the main tank. The D-1 fuel nozzle and 50-foot collapsible hoses seemed an unlikely source for contamination, since it was confirmed they were capped and plugged when they came out of the storage bin. This left the 15-foot non-collapsible hose as the primary suspect. The platoon normally used a 15-foot hose from a storage trailer, plugged together in an O-shape, but for this FARP, the truck's hose was used. A look at the HEMTT's hose storage area showed that there were no hose plugs or caps for the 15-foot hose on the truck. Further investigation of the rest of the battalion's HEMTT fleet illustrated the systemic problem. None of the HEMTTs in the motor pool had caps or plugs on their stored 15-foot fuel lines.

Additionally, a third of the storage tubes on the trucks had an unserviceable latch for the door that closed off the hose storage tube. This pair of deficiencies was equivalent to placing a "VACANCY" sign out for any bird in the nest-building mode.

Historically, the final line of defense for debris in the fuel lines would be an inline screen upstream of the D-1 nozzle. However, the unit was using the newer -100 HTARS fuel system that does not use an inline screen. The accumulation of the chain of events allowed a large bird nest from the 15-foot line to be pumped directly into the four refueling aircraft. The debris also disabled the automatic shut-off valve of the HTARS D-1 refuel nozzle, ultimately causing a fuel spill at all four points.

The end result was that one small, feathered saboteur, who was just "lookin' for a home", soundly beat a slice of US Army Aviation might on the training battlefield.

—CW4 Gregory Schneider, 5-158 Aviation, Wiesbaden, Germany, DSN 352-7589, 5-158@12avn.wiesbaden.army.mil

Don't Use JP-8+100

Here's the latest word on JP-8+100 from the Army—don't use it. The Tank-Automotive Command Research, Development and Engineering Center (TARDEC), Aviation and Missile Command (AMCOM), and the US Army Petroleum Center have completed an evaluation of the Air Force aviation fuel additive +100. The Department of the Army has issued a message maintaining a No-Use Policy for the additive.

TARDEC has determined that the use of this additive in ground equipment can lead to a failure of filter/coalescer elements. Moreover, no practical test exists to determine the concentration level of +100 in JP-8. Consequently, all US Army activities must protect their fuel from accidental +100 contamination.

Where aviation is concerned, the use of the +100 additive is not detrimental to the performance, reliability, or safety of aircraft. Nonetheless, the inability to detect the additive, the probable negative consequences if used in ground equipment, and the fact that many US Army activities are using JP-8 for both aviation and mobility purposes, necessitate continued adherence to a No-Use Policy.

In the event of inadvertent JP-8+100 refueling, document the incident and quantity of JP-8+100 received, and register the incident with the Petroleum Center. This will allow them to identify, and fix, systemic problems.

An aircraft can operate with this additive without damage, and will be considered free of the additive after three refuelings with JP-8. If circumstances call for aircraft defueling, transfer the JP-8+100 into another aircraft. If this is not possible, the JP-8+100 must be disposed of in accordance with hazardous waste policies.

For ground equipment, defuel the JP-8+100 and treat it as hazardous waste. After defueling, consume one tank full of JP-8, then immediately replace filter/coalescer elements.

—Del Leese, US Army Petroleum Center, DSN 977-8580 (717) 770-8580, dleese@usapc-emh1.army.mil

A second look at fuel-handlers

Each day new soldiers enter the military. These new soldiers may be training to do a number of things—fight as infantry soldiers, or become a crew chief on an aircraft. But there are other personnel that support the mission so that these soldiers can make it to their objectives. Those soldiers are the fuel handlers. The Army cannot move, shoot, or communicate without the fuel handlers. But even the fuel handler may not know what extra training is needed to safely refuel trucks, helicopters, or ground support equipment. Let's take a look at the selection, training, testing, and licensing of the fuel handler.

Selection

■ **The first step** — Conducting a records review is the first step in selecting an operator. Check for poor driving record, mental or emotional instability, physical handicaps and alcohol or drug related incidents. All these factors need to be considered.

■ **The second step** — Interviews will be conducted by the commander or an authorized representative. Some areas of concern include maturity, attitude, past driving record, hearing, and nervousness. If medication is used by the candidate on a regular basis, check with medical personnel to clear up any doubts or concerns about medication.

■ **The third step** – Check physical examinations and physical evaluation measures. Fuel handlers may have restrictions if they have pathological, psychological, or physiological problems. Operators are responsible for reporting any problems they have, which must be annotated on their DA Form 348 (Equipment Operator's Qualification Record).

Training and Testing

Operators will not participate in any hands-on vehicle or equipment training without a valid OF 346 stamped with the words, "ARMY LEARNER." All training for vehicles and equipment will be documented on a DA Form 348 prior to issuing an OF 346 (U.S. Government Motor Vehicle Operator's Identification Card). Units operating under the Unit Level Logistics System (ULLS) will use the automated form. The driver must successfully complete an installation/unit drivers training program before being issued a permanent license.

All operators will be given academic training as well as hands-on training. Upon completion of the training, the operator must successfully complete a written examination and a driver's performance test. Upon passing these tests, the student may be issued an OF 346 Standard Permit or ULLS equivalent.

Licensing

Military commercial driver license requirements include familiarization with passenger carrying, air brakes, combination vehicles, HAZMAT, and tank vehicles, as well as general driving knowledge. Since the operator is hauling fuel they must be trained in HAZMAT and have a hazardous material endorsement. (Per Title 49 of the Code of Federal Regulation). If operating on the flight line check out FM 1-300, *Flight Operations and Airfield Management* for special vehicle and driver requirements for ramp operations.

Other Resources

These TC's are available on the Internet in the Army Doctrine and Training Digital Library (ADTDL) at http://155.217.58.58.

■ Training Circular 21-305, *Wheeled Vehicle Accident Avoidance*

■ Training Circular 21-305-3, *M939-series 5-ton Cargo Truck*

These CDs can also be ordered over the Internet from the Defense Instructional Technology Information System (DAVIS/DITIS). The web site is http://dodimagery.afis.osd.mil/ Once there, click on Search DAVIS/DITIS and follow the ordering info.

■ CDR 55-01 — *Wheeled Vehicle Accident Avoidance*

■ CDR 55-15 — *M1083, 5-Ton Medium Tactical Vehicle (MTV)*

■ CD 55-21 — *M939, 5-Ton Cargo Truck*

■ CD 55-22 — *M813, 5-Ton Tactical Cargo Truck*

—Mr. J.A. Brown, Traffic Safety Manager, USASC, DSN 558-2046 (334) 255-2046, brownj@safetycenter.army.mil

Behavioral Safety

In previous issues of *Flightfax*, we have discussed organizational safety culture and its implications for commanders. Here, we explore two other important issues: first, the question of why so many soldiers engage in poor safety behaviors, and second, strategies for changing such behaviors. The more we can translate our knowledge of the behavioral causes of accidents into effective strategies for changing these maladaptive behaviors, the further we will advance our safety campaign.

"Organizational Safety Culture: Implications For Commanders," (October 1999 *Flightfax*) outlined how distributed concern for safety needs to be representative of all unit soldiers. This is nothing new. Indeed most soldiers are at least somewhat aware that inadequate safety practices have the potential for disaster. Nevertheless, these behaviors are widespread–even epidemic–in the Army. So, why do soldiers ignore the evidence and continue to behave in unsafe manners? Why are these habits so deeply ingrained?

Why are poor safety behaviors so widespread?

Unsafe habits can often be traced to leaders and first-line supervisors who have modeled unsafe behaviors. The Army is a constant learning environment, and unit leaders and NCOs are typically a soldier's most influential role models. Research reveals a strong relationship between unsafe habits in leaders and their soldiers. While other factors also contribute to this relationship, observational learning certainly plays an important causative role.

Soldiers also tend to be overly optimistic about their immunity to major safety problems. Unfortunately, unrealistic optimism undermines legitimate worry about risk; it may reduce the likelihood that soldiers will engage in accepted safety behaviors or accept safety interventions. Curiously, while soldiers are inclined to underestimate the risks associated with their own unsafe habits, they tend to have a much clearer impression of the potential catastrophic effects of such behaviors in others.

Another reason why poor safety habits are so widespread is that soldiers often have little reason or incentive to practice safe behaviors. In fact, many are recognized for their ability to "get more done with less" and for finding "innovative" solutions to such problems.

Rewards and recognition from superiors are highly reinforcing. Behaviors that are reinforced tend to be repeated. The adverse effects of these safety shortcuts may have little or no noticeable impact on safety and routine operations for many years. Yet, as these practices get repeated, the association between the unsafe behavior and risk loses focus—until its too late.

Thus we see that several factors work together to establish and maintain unsafe behaviors. So, how can we develop strategies to modify and change these behaviors?

Changing safety-damaging behaviors

As you can imagine, it is not an easy task to change behavior. All of us know of soldiers who, in spite of clear evidence that they are endangering themselves or others, continue to engage in unsafe behaviors (e.g., driving over the speed limit). An important step in getting soldiers to modify or eliminate their unsafe habits is to provide sufficient motivation to fuel such positive change.

Fear for safety

Fear appeals have often played a major role in efforts to motivate people to change their behavior by changing their attitudes toward safety. All of us have been exposed to fear campaigns to stop smoking, eat healthier, drink less, and other media efforts at health promotion. Persuasive safety-promotion messages with moderate fear appeal can also be effective in changing safety attitudes and behaviors. Fear of high-risk behaviors, together with knowledge about effective preventive practices, will result in both significant increases in safer behavior and substantial reductions in the rate of accidents. Research has shown that informational campaigns may be most effective when they (1) are colorful and related to real life (e.g., use case histories), (2) avoid statistics and jargon, (3) are short, clear, and direct, (4) present strong messages at the beginning and end of the message, (5) state conclusions explicitly rather than merely implying them, and (6) are delivered by a prestigious and trustworthy individual.

No short-term solutions

History shows that change will not occur overnight. Such efforts are generally more effective in changing attitudes than behaviors. However, such campaigns have some important benefits that are likely to show up in the long run. First, they will acquaint soldiers with the risks they might not have been aware of associated with their behavior. Such messages can and do have a cumulative effect over time in modifying both the Army's collective attitude about safety and eventually the safety behavior of soldiers. For example, it is now clear that Army attitudes toward smoking in government buildings, illegal drug use, and driving under the influence of alcohol have changed appreciably in recent years due to hardline, negative, zero-tolerance campaigns.

Because poor safety habits are so deeply ingrained and widespread, it is understandable that efforts to change safety-impairing behaviors by changing people's attitudes are often not sufficient. To push safety in a positive direction, hardline policies and procedures can provide the incentive or motivation to behave in a safe manner. Yet such practices often fall short by not providing the specific behavioral skills to accomplish this goal. Various behavior therapies are based on the belief that bad habits are learned via the same principles that govern the learning of positive behavior. Leaders and safety professionals must focus on the target safety-impairing habits. They can be changed by modifying the conditions that cause and support these harmful behaviors.

In a future article, I will explore the cultural changes that can be used to change poor safety habits into safe behavioral practices.

—Major Robert Wildzunas, US Army Center for Preventive Health Medicine, DSN 343-7593, (301)619-7593, robert.wildzunas@det.amedd.army.mil

Informational campaigns may be most effective when they:

1. **Are colorful and related to real life (e.g., use case histories)**
2. **Avoid statistics and jargon**
3. **Are short, clear, and direct**
4. **Present strong messages at the beginning and end of the message**
5. **State conclusions explicitly rather than merely implying them**
6. **Are delivered by a prestigious and trustworthy individual**

NCO Corner Safety is NCO Business

As NCOs, our job is harder than most. We must see that our soldiers stay alive and uninjured while preparing for combat. We must train our new soldiers to follow correct procedures, retrain those who don't, and enforce the use of proper procedures in every task.

Every day in a garrison or field environment, we hone our soldiering skills to a fine point. We take inexperienced soldiers and transform them into highly-skilled crewmembers. As we train, we teach correct procedures and relentlessly enforce their use. We are constantly aware that such things as boredom, routine training, and laziness can lead soldiers to take shortcuts that could result in accidents.

Our business is to keep soldiers alive, intact, and able to fight. Only through positive action can we do this. Too many times, we let safety become a late Friday afternoon class that takes 10 minutes to present. Why? Because it's a requirement. We must look at reality. Accidents will continue as long as NCOs consider safety as one more required class to teach during mandatory training time. We need to take the time to convey to our soldiers realistic hazards that are potentially harmful or fatal.

Everyone has experienced an unfortunate situation at one time or another that may have resulted in loss of life or serious injury of another soldier, friend, or relative. As unfortunate as they may be, we can use them as a foundation for future prevention measures and teach our soldiers the importance of safe, precautionary methods of performing our duties.

NCOs must address safety daily in a no-compromise manner, teach soldiers to perform to standard, and check and correct any deficiencies found. All NCOs must accept that it is our job to supervise soldiers to safely accomplish our mission. We have a responsibility to the stripes we wear. If a soldier sees an NCO who doesn't perform to standard, whose fault is it if that soldier has an accident? The NCO stands responsible.

Safety is not a careless turn of events. It is hard work, dedication, performance to standard, and a sincere belief that accidents don't just happen but are caused by things that are allowed to continue uncorrected. We NCOs must take charge, because safety is NCO business.

(Reprinted courtesy of *Countermeasure*.)

—MSG Terry Smart, Ground Systems and Accident Investigation Division, USASC, DSN 558-1243 (334) 255-1243, smartt@safetycenter.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class B
D series

■ During maintenance operational check, warning system activated, followed by uncommanded forward cyclic. Main rotor blades contacted pilot night vision system.

Class E
D series

■ During run-up, No. 1 starter overheated. Aircraft was shut down without further incident. No. 1 starter was replaced.

CH47

Class C
D series

■ During aerial recovery of a UH-60, main rotor blade separated from the sling-loaded aircraft.

Class E
D series

■ Fuel was observed leaking from heater exhaust vent during hover. Aircraft landed without further incident. Ignitor plug was replaced.

■ Forward transmission developed high frequency vibration during hover. Aircraft landed without further incident. No. 1 flight boost pump was replaced.

OH6

Class B
J series

■ Aircraft struck trees and crashed while conducting aerial gunnery. Major damage to airframe. Minor injuries to crew.

OH58

Class E
C series

■ During hover, it was observed that the turbine outlet temperature gauge was not accurate. Aircraft landed without further incident. Turbine outlet temperature gauge was replaced.

■ Cyclic was binding during hover. Aircraft landed without further incident. Tail rotor pitch bell crank was replaced.

■ Rotor tachometer failed during cruise flight. Aircraft landed without further incident. Short connector on rotor tachometer was replaced.

■ During hover, tachometer gauge failed. Aircraft landed without further incident. Dual tachometer replaced.

■ Generator failed during cruise flight. Aircraft landed without further incident. Generator was replaced.

■ While on the ground with engine running, transmission oil was found leaking from rotor tach generator. Aircraft was shut down without further incident. Tachometer generator was replaced.

UH1

Class E
H series

■ While flying nap of the earth, master caution light illuminated with no segment light. The aircraft was landed safely. It was determined that the master caution panel still functioned. On recovery, a one-time flight back to home station was authorized. On the return flight, the master caution light and transmission segment light illuminated. The aircraft was landed and another master caution box was installed.

■ On postflight, crew discovered hydraulic fluid reservoir was empty, and hydraulic fluid dripping from transmission well. No warning or caution lights or control feedback had been observed during flight. Maintenance replaced hydraulic line from reservoir to pump.

■ Main transmission was found to be leaking during hot refueling. Aircraft was shut down without further incident. Transmission internal filter gasket was replaced.

■ Fuel leak was observed during cruise flight. Aircraft was landed without further incident. Fuel line was replaced.

■ Smoke and fumes were observed in the cockpit during cruise flight. Aircraft landed without further incident. Gyro ASN-43 was replaced.

UH60

Class C
L series

■ Nose compartment door opened during flight, striking windshield, damaging wiper systems, all windshields, FAT gauge, and nose compartment door.

Class D
A series

■ Aircraft was hovering over a barge while preparing to hook up external load. The barge shifted due to the rotor wash. A metal stanchion on the starboard side of the barge contacted the right main gear. A small cut was made into the rim of the wheel.

Class E
A series

■ During cruise, APU advisory backup pump illuminated. Aircraft landed without further incident. Schrader valve replaced.

■ During low level flight, No. 2 hydraulic pump failed. Aircraft landed without further incident. Hydraulic pump replaced.

■ While on the ground, engines running, No. 1 engine failed. Aircraft was shut down without further incident. Replaced No. 1 fuel control.

■ During cruise flight, APU fire warning indicator illuminated with the corresponding master caution light. Aircrew confirmed no visible signs of fire existed and aircrew returned to home station. Maintenance personnel determined that the time flame detector had failed.

■ Stabilator failed during taxi. Aircraft was shut down without further incident. Airspeed transducer replaced.

■ Radar altimeter became inoperable during taxi. Aircraft was shut down without further incident. Radar altimeter was replaced.

■ Damage to right MLG strut, faring, and main rotor blades discovered during preflight. It is suspected that damage occurred during a hard landing when main rotor blades struck the ALQ-144.

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.

New e-mail addresses for Safety Center

The US Army Safety Center's e-mail addresses have been updated. There will be a transition period of several months, during which either address should get through to us.

For example, our old *Flightfax* address was: flightfax@safety-emh1.army.mil

Our new address is:
flightfax@safetycenter.army.mil

Please note the change, and keep those cards, letters and e-mails coming.

FY00 Aviation Accidents through 31 March

		Class A	Class B	Class C	Total
ACCIDENTS	Total* Avn Acdts	4	4	38	49
ACCIDENTS	Flight Acdt Rate	0.87	0.43	6.71	8.01
RATE COMPARISON	FY00 vs. FY99	-56%	-41%	-14%	-23%
RATE COMPARISON	FY00 vs. 3-yr avg	-48%	-55%	-17%	-25%
Aviation Military Fatalities					2

* Includes Flight and Non-flight aviation accidents.

Test your Safety eye-Q

True or False

1. Aircrew members are most at risk when flying nap of the earth.
2. A pair of polarized sunglasses can protect the eyes from harmful ultraviolet (UV) rays.
3. Bottle rockets are the most dangerous type of fireworks.
4. Most objects that cause eye injuries are smaller than the head of a pin.
5. Eye injuries occur to off-duty personnel more often than on-duty.
6. Football is the most dangerous sport for eye injuries.
7. Wearing a visor can provide protection from bird strikes as well as UV rays.
8. Eye diseases, such as glaucoma, are the leading cause of blindness in the U.S.
9. Refractive surgeries (RK, PRK, and LASIK) can decrease night visual performance.
10. Colored contact lenses provide adequate protection from harmful UV rays.

ANSWERS:
1.False. Air crewmembers are most at-risk when involved in off-duty activities.
2.False. Polarized sunglasses do not block UV rays, they only decrease the amount of light entering the eye.
3.True
4.True
5.True
6.False. Basketball and baseball cause the most eye injuries.
7.True.
8.False. Eye injury is the leading cause of blindness.
9.True. Night vision is severely affected by this UNAUTHORIZED surgery.
10.False. Most contact lenses do not provide adequate protection from UV rays. Eye health organizations recommend they be worn with UV blocking eyewear.

Source: Mr. Clarence E. Rash, Research Physicist. US Army Aeromedical Research Laboratory DSN 588-6814, (334) 255-6814, clarence.rash@se.amedd.army.mil

(The views, opinions, and/or findings in this quiz are those of the author, and should not be construed as an official Department of the Army position, policy, or decision.)

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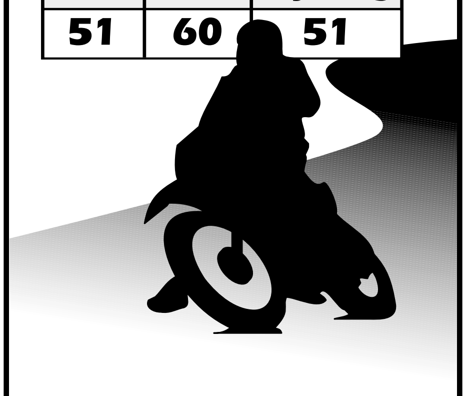
POV Fatalities through 31Mar

FY00	FY99	3-yr Avg
51	60	51



U.S. ARMY SAFETY CENTER

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Commanding

Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

JULY 2000 ◆ VOL 28 ◆ NO 7 http://safety.army.mil

Mother Nature's summer aviation hazards— from bird strikes to thunderstorms

12th Aviation Battalion, one of the Army's premier operational Support Airlift helicopter battalions, provides air support to the Military District of Washington and the National Capital Region and operates Davison Army Airfield located at Fort Belvoir, VA.

The Birds were winning

Recently, we at 12th Aviation Battalion have concentrated a considerable amount of attention to the problems associated with geese on the airfield. Preventing the mixture of aircraft with geese has driven the battalion to develop and implement a wildlife management program.

Bird strikes have become a major concern and hindrance for both military and civilian aircraft within the United States. To date, bird strikes have claimed over 300 lives in air-crashes since the first known crash resulting from a strike in 1912[1]. In addition to this tragic figure, more than 4,900 bird strikes are reported from U.S. based aircraft annually. The distribution of these reports indicates similar numbers for civil and military aircraft. The reports have captured a per-year average of over 2,500 bird strikes by U.S. military aircraft each year, along with about 2,400 bird strikes reported for civil aircraft from 1991-1997[2]. The National Transportation Safety Board indicates that this may just be the tip of the iceberg when it comes to actual strikes. They believe that the number of strikes reported by civil aviation is about 20% of actual strikes, leaving approximately 80% of actual bird strikes to U.S. civil aircraft unreported.

They also estimate that reported strikes cause over $300 million in damage to U.S. civilian and military aviation annually. Over the last eight years, the Federal Aviation Administration and the Bird Strike Committee USA have undertaken numerous programs designed to decrease bird strike incidents in Northern America. Their programs have significantly increased the awareness of the problem; however, the drastically increasing population of birds in North America continues to outpace their valiant efforts. It is becoming painfully obvious that, at least for the near future, the birds will continue to be a major presence and threat. In light of this, it is imperative airports and airfields, such as Davison, find innovative ways to safely operate around them.

The wake-up call

Davison Army Airfield (DAAF) at Fort Belvoir, VA, is located about 20 miles south of Ronald Reagan National Airport in Washington, DC. DAAF, which has land coverage of just over 500 acres, is the transient home to many bird species including an abundance of ducks, seagulls, pigeons, and migrating Canadian geese. Over the past few years, we at DAAF have implemented a variety of measures in an attempt to control the bird hazards on the airfield. Unfortunately, when it came to controlling these birds on or near our runways and aircraft movement areas, we were more reactive than proactive. We would do airfield checks several times an hour to detect any birds in these areas and then deter them using the deterrents of vehicle/human presence and pyrotechnics. During these early stages, we felt like we were doing all we could to reduce the threat to aircraft and human life.

It was not until a near-fatal accident in October 1998 that we truly realized how dangerous our operating environment was to aircraft at or near the airfield. The incident that piqued our awareness began as a routine night approach to our primary runway by a C-12 (twin-engine passenger plane). Unaware of the presence of a gaggle of Canadian Geese (Branta Canadensis) at the approach end of the runway, the tower cleared the aircraft to land. Neither the tower nor the crew of the aircraft saw the geese because they were obscured in the darkness. Upon touchdown, the aircraft collided with several of these birds resulting in over $300,000 damage to the C-12 and a dozen dead geese. Fortunately, there were no human fatalities, but it was painfully clear that we needed to improve our management of the geese population that existed at DAAF.

Wildlife management program

Immediately we set out to develop

a program that would meet two primary objectives:

- Provide a safe operating environment for all aircraft utilizing DAAF.
- Reduce avoidable bird strikes on the airfield by exhausting every method available to control and/or eliminate wildlife from DAAF.

With these objectives in mind, we developed a program that consists of a combination of the three facets of wildlife management. These are **detection**, **harassment**, and **deterrence**. With these three elements as the framework for our wildlife program, Davison Army Airfield now utilizes a multifaceted approach to eliminate bird strikes on the airfield.

You have to see them to avoid them

The most obvious disadvantage an airport faces is the ability to see and avoid our feathered adversaries. Because of their size and natural camouflage, even during the day it is difficult to be able to spot flocks of birds and warn aircrews about their proximity to the runway or traffic pattern. And while it is difficult during the day, this ability becomes nearly impossible at night and during times of limited visibility. In addition, their flocking tendencies and unpredictable flight patterns pose continuous threats to moving aircraft and, ultimately, the crew and passengers within those aircraft.

At Davison, we established wildlife patrols from our airfield services section which ventured out throughout the day and night to detect wildlife on the airfield. As one might expect, this worked very well during the daytime, but was ineffective at night and during limited visibility. Because the accident with the C-12 occurred during the hours of darkness, we quickly surmised that we needed a more reliable method to be utilized during these times. That's where the use of thermal imagery devices came to our rescue.

Thermal devices

In general, thermal imaging (infrared) devices can be used to allow ground and tower personnel to pinpoint bird locations day or night, thus giving the airport operators the ability to launch countermeasures or simply warn the aircrews. This technology is currently available, and the once-prohibitive cost of these devices has dropped significantly in recent years as technology, capabilities, and availability have continued to increase.

Thermal Imagery use

The use of thermal imagery with infrared capability to detect all hazards on the airfield quickly became the foundation of our detection techniques. We have acquired the use of and are currently in the testing stages of various types of these thermal devices. The thermal device is placed on top of our control tower where it is secured on a tripod and a motorized 360-degree mount for obtaining a maximum observation area.

The device is controlled remotely by a computer (located in the tower) for automatic continuous surveillance and targets are viewed on this computer's screen. The system also has a manual override for close up viewing of targets. The complete detection system can be configured in many different ways to produce the desired results. Our system works effectively with just the thermal imager and monitor in the tower. When configured this way, the tower can do a manual scan of the runway and surrounding area prior to an aircraft taking off or landing. In addition to this device, we have tested 'hand-held' thermal devices (they look similar to home video cameras). Our method of utilizing this asset is to use them while driving around the airfield in airfield services vehicles during our periodic airfield checks.

The initial device tested, provided by the Night Vision and Electro-Optics Directorate from the U.S. Army Communications-Electronics Command Research and Development Center, is a test thermal device called "Loris" made by Inframetrics. This device will detect a human at 6.5 kilometers and a goose at about 3 kilometers 24 hours a day in almost any weather condition. Positioned above the tower, this device can clearly recognize just about any heat source on the airfield under nearly any visibility conditions.


Loris

The use of thermal imaging equipment has proven to provide airfield personnel the ability to see all activity in the area that could pose a hazard to approaching or departing aircraft. Since its incorporation into our wildlife management program, the "close calls" for bird strikes have essentially disappeared, as has the potential for tragic collisions of aircraft with flocks of birds.

To win, you have to keep them off balance

Now that we had a better way of detecting the geese on the airfield, we shifted our focus to limiting their presence. To effectively control the wildlife population at DAAF, we implemented an aggressive program that combined harassment techniques with habitat manipulation. Our progress on managing the geese through these methods is nothing short of amazing.

We now use a vast array of non-lethal harassment techniques and deterrent methods. At the heart of our harassment program is the use of highly-trained Border collies. DAAF and Fort Belvoir hired a goose hazard management company called *Windchazer*, *Inc.* to provide a continuous presence of these Border collies on the airfield. Debra Marshall, president & trainer, has the responsibility of providing constant pressure to any gaggles of geese that land or attempt to land anywhere on the airfield. She and her ubiquitous, highly trained dogs are keeping most of the geese from even landing. But if they do get a chance to land, the geese are on the ground for only a short time before the dogs chase them away.

Debra, who now manages 11 collies, typically releases four dogs at one time to keep the pressure on the geese. She practices a constant rotating of the dogs as they chase geese. This will keep the dogs from getting tired and will maintain an effective pressure on the geese.

Non-lethal harassment

In addition to the Border collies, we use pyrotechnics, gas cannons, report shells, bird-scaring cartridges, and distress calls. The combination of these non-lethal means of harassment is extremely effective in keeping the birds off guard and scaring them out of the danger areas in the vicinity of the runway and the aircraft movement areas. Of these methods, the gas cannons are the most effective. These cannons are placed in four separate locations around the airfield and can be set on a timer to periodically fire, or can be remotely fired from the tower or from an airfield services vehicle. The distress calls are used in the same way as the cannons and are effective on species of birds other than geese. The other devices are deployed by our roving patrols within airfield services when needed.

The final aspect of our wildlife management program concerning birds is the employment of various forms of habitat management techniques. These techniques are employed in an attempt to reduce or eliminate the attractant nature of the airfield for the geese. One of the most significant attractants on the airfield was a pond with freestanding water located very close to our active runway. This pond had historically been a favorite location for resident and migratory geese and ducks. In order to eliminate it as an attractant, the pond was drained and vegetation was planted in some areas and allowed to grow in others where the pond was located. This effectively altered the area where it is no longer a large body of water. In addition, we have incorporated new grass-cutting strategies where we attempt to maintain the grass height throughout the airfield between 11 and 14 inches. This additional height, both of the vegetation around the pond and of the grass on the airfield, acts as a deterrent for the birds because it makes it difficult for them to land with such tall obstacles in their landing areas.

One of the biggest lessons learned through our involvement in the wildlife management arena is that there is not one perfect technique to eliminate the bird hazards on an airport or airfield. The success of 12th Aviation Battalion's wildlife management program at Davison Army Airfield is the result of a combination of many different techniques that each contributes in its own way. It is this combination of aggressive efforts that has produced the results needed to effectively maintain control of the geese and provide a safe operating environment for aircraft utilizing Davison Army Airfield.

—CPT James R. Ivey, 12th Aviation Battalion, Davison Army Airfield, Fort Belvoir, Virginia DSN 656-7512, (703) 806-7512, 12bnsafe@belvoir.army.mil

[1] Matthews, Anna W. , "Battles Between Airplanes, Birds Hit New Heights", *The Wall Street Journal*, Tuesday, August 10,1999

[2] FAA, *"FAA Wildlife Strikes to Civil Aircraft in the United States"*, www.lrbcg.com

For more information on thermal devices and/or information on bird control, contact the sites below.

www.inframetrics.com (http://www.inframetrics.com)
www.raytheon.com/rtis/docs/thermal.htm
www.faa.gov/arp/birdstrike
www.airsafe.com/
www2.acc.af.mil/
www.birdstrike.org
www.lrbcg.com/nwrcsandusky/strike.html

Kamikaze bird strikes

A Kamikaze (literally, "divine wind") is commonly understood as a member of a World War II Japanese air attack corps. Their wartime objective was to make a suicidal crash on a target, like a ship or a building. Often they delivered their bombs via the plane itself, destroying the aircraft and killing the pilot in the process.

When I was stationed at Camp Humphreys, Korea, the airfield was infested with ring-neck pheasants. These beautiful birds have colorful plumage and a unique white ring around their neck, resembling the white scarf of a kamikaze pilot. Their erratic behavior, waiting on the edge of a runway to dart out in front of passing airplanes and helicopters, intensifies this resemblance.

A game of chicken

During my two years at "The Hump", I hit or grazed one or more of these big, beautiful, and deadly birds. On one occasion, we were flying an RC-12 on a normal VFR approach to runway 32. Everything looked and felt great. At the most precise portion of the approach, just prior to wheels touching, traveling down the runway at 101 KIAS, we spotted two of the feathered enemy. The pair of them headed out onto the runway from the right, just daring us to hit them. At 2,000 feet before reaching their position, we were relieved to see them exit the runway to our left. Whew! It was almost like a game of chicken, no pun intended. We had seen this same game many times in the past.

This time, though, just after our sighs of relief, the two pheasants executed a quick 180-degree turn and darted right into the path of our aircraft. We heard "thump-thump", but didn't know where the hit took place. We had plenty of runway, and didn't want to ingest the carcasses into our engines, so we completed the stop without reversing the props.

After taxiing off the runway, we found the ring-neck couple nestled nicely together in the brake linings of the left landing gear. Maintenance, familiar with the routine, had the RC-12 cleaned up in 30 minutes. Luckily, that's all it cost us this time. Other possibilities could have been very costly and potentially very dangerous.

Visions of vultures

On a different occasion, we were flying an ILS instrument approach with a circle to land maneuver at night in a UH-1H. We were headed into Fort Rucker, AL, with our orange cargo doors open. After completing the approach, we started the circling maneuver to the west, keeping our heads on a swivel. While we were concentrating on our intended touchdown point, looking out our right door, "WHAM!" A huge vulture plowed his way into the exact center of our windscreen. (Luckily for us that's where the metal support is.) The bird slid down the windscreen, from center to left, down the fuselage, and plopped right into the cargo compartment. There were guts everywhere! It looked like a scene from a gory movie, like "Predator" or "Alien." There was nothing to do but pass the controls off to my co-pilot, declare an emergency, land, and shut down. A close call and a real attention getter.

Bird Factoids

Because of these experiences, I got acquainted with Bird Strike Committee USA. This is an organization concerned about bird strikes in the aviation environment, which utilizes a risk management process similar to the Army's. Here is some of what I have learned:

Bird strikes to aircraft have been a concern since the first recorded fatality due to a bird strike in 1912. More recently, bird strikes led to fatal accidents for large military aircraft in 1995 and 1996, and for a commercial airliner in 1988.

Increasing North American bird populations such as geese and ducks have led to significant increases in threat to aircraft, particularly on and near airports.

I was surprised to learn the following facts:

- Bird strikes to aircraft have resulted in over 300 people dying.
- Wildlife strikes are estimated to have cost over $380 million a year, 1990-1998.
- More than 2,500 bird strikes are reported by the US Air Force each year.
- Over 2,500 bird strikes yearly were reported for US civil aircraft, 1990-1998.

■ An estimated 80% of bird strikes to civil aircraft go unreported.

■ A 12-lb Canada goose struck by an aircraft traveling 150 MPH at lift-off generates the force of a 1,000 lb weight dropped from a height of 10 feet.

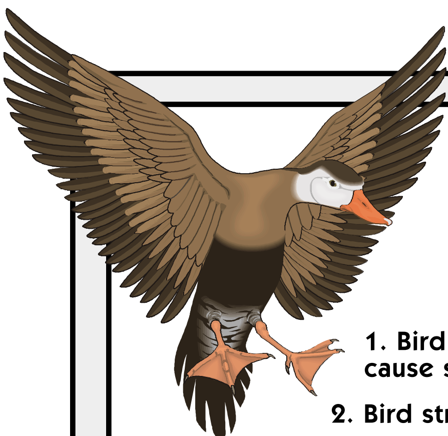
■ About 90% of all bird strikes in the US are by species federally protected under the Migratory Bird Treaty Act.

■ More than half of bird strikes occur at less than 100 feet (30 meters) above ground level. The highest reported bird strike was at 37,000 feet. The highest reported bird sighting was at 54,000 feet. About 6% to 7% of all bird strikes result in aircraft damage.

■ While any airport may have bird strikes, airports adjacent to wetlands or wildlife preserves are at higher risk.

For more information, check out the Bird Strike Committee website, www.birdstrike.org

—CW2 Don Dewitt, Aviation Safety Officer course, Fort Rucker, AL



Bird strike Final exam

True or False

1. Bird strikes cannot cause serious accidents.
2. Bird strikes are rare.
3. Bird strikes are less of a problem than 30 years ago.
4. Large aircraft are built to withstand all bird strikes.
5. If a bird flies into an engine of a large plane during takeoff and the engine quits, the airplane will crash.
6. Nothing can be done to keep birds away from airports.
7. It is legal to kill any bird just to protect aircraft.
8. If birds are a problem at an airport, killing them all will eliminate the problem.
9. Bird strikes are more than a nuisance to airline operators.
10. Bird strikes are a concern to people other than those in aviation.

Answers:

1. False. Since 1975, five large jet airliners have had major accidents in which bird strikes played a significant role. In one case, more than thirty people were killed.

2. False. About 20,000 bird strikes to civil aircraft in the US were reported to the Federal Aviation Administration 1990-1998. It is estimated that the 20,000 figure represents less than 20% of the number that likely occurred.

3. False. In North America, bird strikes are increasing. Because of successful wildlife conservation and environmental programs, bird populations of many species have increased dramatically. Species like non-migratory Canada geese have tripled in the last 12 years. The double-crested cormorant population on the Great Lakes has increased a thousand-fold. These and other increases have led to an increase in the number of birds in the vicinity of airports.

4. False. Large commercial aircraft, like passenger jets, are built to withstand the impact of most, but not all, birds. Large modern jets are required to be capable of landing safely after being struck by a 4-lb bird anywhere on the aircraft at normal operating speeds, even though substantial and costly damage may occur.

5. False. Large commercial jets are designed so that if any one engine is unable to continue generating thrust, the airplane will have enough power from the remaining engine or engines to safely complete the flight.

6. False. There are a number of effective techniques to reduce the number of birds in aircraft environments. The three most effective techniques fall into three categories: making the environment unattractive for birds, scaring the birds, or reducing the bird population.

7. False. Some North American bird species which are not protected, such as pigeons or starlings, may be killed if they pose a threat to aircraft. Most birds, such as ducks, geese, gulls, and herons, may be killed in limited numbers by an airport authority, only after obtaining appropriate permits and demonstrating that non-lethal techniques are not adequate. *Endangered species may not be killed under any circumstances.*

8. True. However, even if it were legal to do so, killing off all birds will create other problems. An airport is a part of an ecosystem, and in all ecosystems, each plant or animal species plays a particular role. Eliminating any one-problem species will only lead to some other species taking its place. A combination of bird control measures that take habitat management into account is a superior long-term solution.

9. True. For a modern jet airliner, even minor damage can lead to significant costs. The FAA estimates that bird strikes cost civil aviation over $300 million per year in the United States.

10. True. The issue of bird strikes is tied into a wide range of policy issues that go beyond aviation. In addition to environmental issues, aircraft accidents as a result of bird strikes can have devastating effects.

Aviation Safety Officer Course

The Aviation Safety Officer Course (ASOC) curriculum provides the fundamental skills necessary to be an effective aviation safety officer and manage aviation safety programs from company to brigade. In the ASOC you will learn about various elements of the Army's Safety program, including risk management, accident investigation and reporting, safety office administration, safety awards, and accident prevention programs. The U.S. Army Safety Center (USASC) has provided the ASOC for the past 24 years. Each year USASC trains nearly 200 ASOs to fill TO&E positions in warfighting units Armywide.

The Army Safety Center conducts four 6-week resident aviation safety officer courses; two 2-week correspondence phase II courses and one 1-week refresher course.

INTERESTED? HOW TO APPLY

Submit a DA Form 4187 through your Personnel Administrative Center (PAC) to request the ASO Course. Course information is contained in DA PAM 351-4: *U.S. Army Formal Schools Catalog*. You must be projected to go into an ASO position or currently serving in an ASO slot to attend the course. Course quotas are set by Department of the Army strength requirements and filled by NGB, PERSCOM, USARC, and IMSO.

To attend the Phase II ASO Course, you must first complete the Phase I Aviation Safety Officer Correspondence Course IAW DA PAM 351-20: *Army Correspondence Course Program Catalog*. Once completed, you must submit a DA Form 4187 through your PAC to request attendance for Phase II. You must complete Phase I and have course completion validation before you submit your request.

The ASO Refresher Course is open to any school-trained ASO who has been in the field as an ASO more than 4 years or has been out of an ASO position more than 2 years. The ASO refresher course is designed to provide an update on modern safety issues, risk management, regulations, and automation technologies.

Requests for attendance for these courses can be accomplished through your S-3/G-3 training personnel who have access to the Army Training Referral and Registration System (ATRRS).

REPORTING REQUIREMENTS AND PREPARATION

Students attending any of the ASO courses will report to Building 5206, Room 7 at Fort Rucker (USASC classroom annex). All courses begin promptly at 0800 on the designated start dates outlined in the ATRRS. When reporting, you will sign in to the U.S. Army Safety Center.

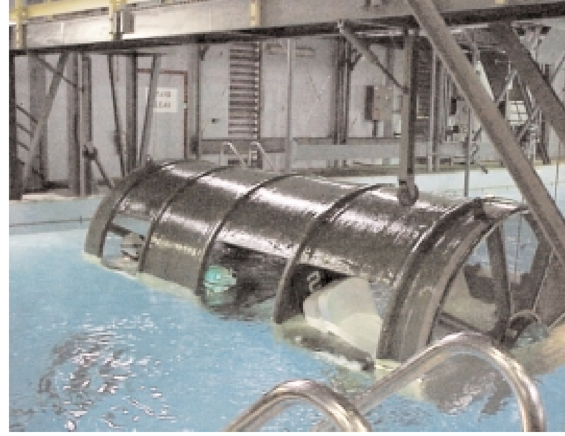
Before arriving for the course, you should be familiar with the following regulations: AR 385-10, *The Army Safety Program*; AR 385-40, *Accident Reporting and Records*; AR 385-95, *Army Aviation Accident Prevention*; and DA PAM 385-40, *Army Accident Investigation and Reporting*.

COURSE SCHEDULE

Visit our web site for course dates:

http://safety.army.mil

Note: The courses normally end at approximately 1200 on the designated end dates. Those using commercial air should not plan departures prior to 1400 to allow sufficient time to make your connections.



Dunker training at NAS Jacksonville

DUTY UNIFORM AND ADDITIONAL REQUIREMENTS

The duty uniform for all courses is BDU. In addition, for the 6-week course, ASOC 7K-F12, the Army Grey PT uniform is required for weigh in and scheduled physical training. For officers attending ASOC, do not forget to bring cold weather PT gear for winter months (i.e., black knit cap, gloves, and Army Grey PT sweats).

The 6-week course includes a trip to the Navy 9N5 Dunker at NAS Jacksonville or NAS Pensacola. You must bring your last up-slip (DA Form 4186) with expiration through the end of the course and a copy of your current physical. You will also need to bring a swimsuit and towel.

TRAVEL ORDERS

The 6-week course students will travel for off-site training at other installations to conduct Aviation Resource Management Surveys (ARMS). To assure that you will be reimbursed for the overnight stays, ensure that your orders include the statement "You are authorized variations to proceed to additional places as may be necessary to accomplish the mission. Dual lodging authorized."

During the course, you will be given approximately 40 pounds of reference material. If you are traveling by air, your orders must contain authorization for mailing these books home.

COURSE COMPLETION REQUIREMENTS

The ASO course is an MOS-producing course; therefore, you will be required to pass all examinations, attend all classes, and facilitate (via small group discussion) a human resource management topic and complete a writing assignment. Do not plan on scheduling routine appointments during training.

—CW5 Butch Wootten, Director of ASO, USASC, DSN 558-2376, (334) 255-2376, woottend@ safetycenter.army.mil

— Mr. Helbig, DSN 558-9868, helbigc@safetycenter.army.mil

—Mr. Dobarzynski, DSN 558-9197 DobarzyR@safetycenter.army.mil

Dusty crash kit

Once a month, I pull out the Crash Investigation Kit, dust it off, open it up, and double-check the things inside. Then I close it up and put it away. That monthly exposure to the light of day is about all the excitement it sees.

Why is that, I wonder?

Why does our crash kit so rarely see the light of day? At first glance, it seems we have a lot working against us.

Our manning, both full- and part-time, is underwhelming. We fly in either blistering heat or bone-chilling cold and in darkness that makes a coal mine seem like a cathedral lit for Easter service. We're either out of fuel money, or AFTP money, or money for copier paper, or some other thing. Parts are scarce, and the QC shop is forever printing out another SOF or ASAM to ground a fleet that just can't seem to get past its latest spate of bugs. Not ideal conditions to allow the Crash Investigation Kit to get dusty. Is it just luck? A few nights ago, the answer came to me in a very unexpected way.

A ROUTINE FLIGHT

One day, I got a late-afternoon phone call asking if I'd like to fly that evening. With the way things are going, it's a rare opportunity to actually fly a real aircraft, so I jumped at the chance. "I'll take the left, and you take the right, Mark," said the captain. Checklist in hand, we started our respective parts of the preflight. Nearly done with the right side, I noted the captain was still fretting over the tail rotor.

"Look at the PC link that's on top. Tell me what you think," said the captain. Sloppy was the word that sprung to mind, though that's certainly not the technical term for it. The mechanic agreed, and we sought the solace of the hangar for the book answer on axial and radial play.

ACTIVITY IN THE HANGAR

The hangar was alive with activity that night. Perhaps it was some residual excitement from the assistance visit we had just received. Perhaps it was just a coincidence that all the mechanics were at one end of the hangar. While we were thumbing through the book, one of the mechanics, Frank, was rummaging for a dial indicator and set of feeler gauges. From an adjacent bench, Frank asked, "Were you at Harmon's the other night?"

I had to think for a moment. Certainly, the grocery store was on the way home. "Ah, yes—I stopped for some bread on the way home" I replied. And, I'll admit, got hooked at aisle six, looking at the toy helicopters. Frank pressed, "I said to my family, 'That's one of my pilots! He's in my company!' "

The words rang, as I replayed the mental tape, and that my word stuck—twice.

The fact that I wasn't technically in Frank's line company didn't matter. I was his pilot, in his company. We made other small talk, and I watched Frank tend to the nose gearbox he was working on, while my mechanic continued to find exactly the right dimensional reference for the aircraft part that brought us to the hangar to begin with.

The captain and I helped the mechanics—our mechanics—tug the aircraft into the hangar for repair. The facility commander came out, and after a few claps on the back for "a good catch" during a flashlight pre-flight, we eased the hangar door closed and headed for the warmth of the operations office and the required paperwork.

SO THAT'S WHY

I had my answer, but I wasn't expecting to find it in such a casual way. Of course, not every mechanic, pilot, cook, driver or clerk feels as Frank does. But enough of them do. I am my Brother's keeper. I am his pilot. And he is my mechanic. We have an obligation to one another that doesn't quite translate into the written word found in the "Responsibilities" section of the SOP. But that ownership, that obligation to take care of each other, I'm convinced, is the chief reason why the Crash Investigation Kit gets dusty each month.

—CW4 Mark W. Grapin, BN ASO, 1-211, UT ARNG, DSN 766-3663, (801) 816-3663

NCO Corner

Prevent hydraulic fluid contamination

Since the May 2000 *PS Magazine* article (see below) "AGPU joins AOAP" was prepared, the Army has recognized a serious deficiency in our programs to properly maintain the hydraulic systems in our helicopters. While the recently-published AOAP inspection interval for the Aviation Ground Power Unit's (AGPU) hydraulic fluid is now set at 365 days, maintaining the required water content will require an immediate AOAP inspection and frequently recurring inspections.

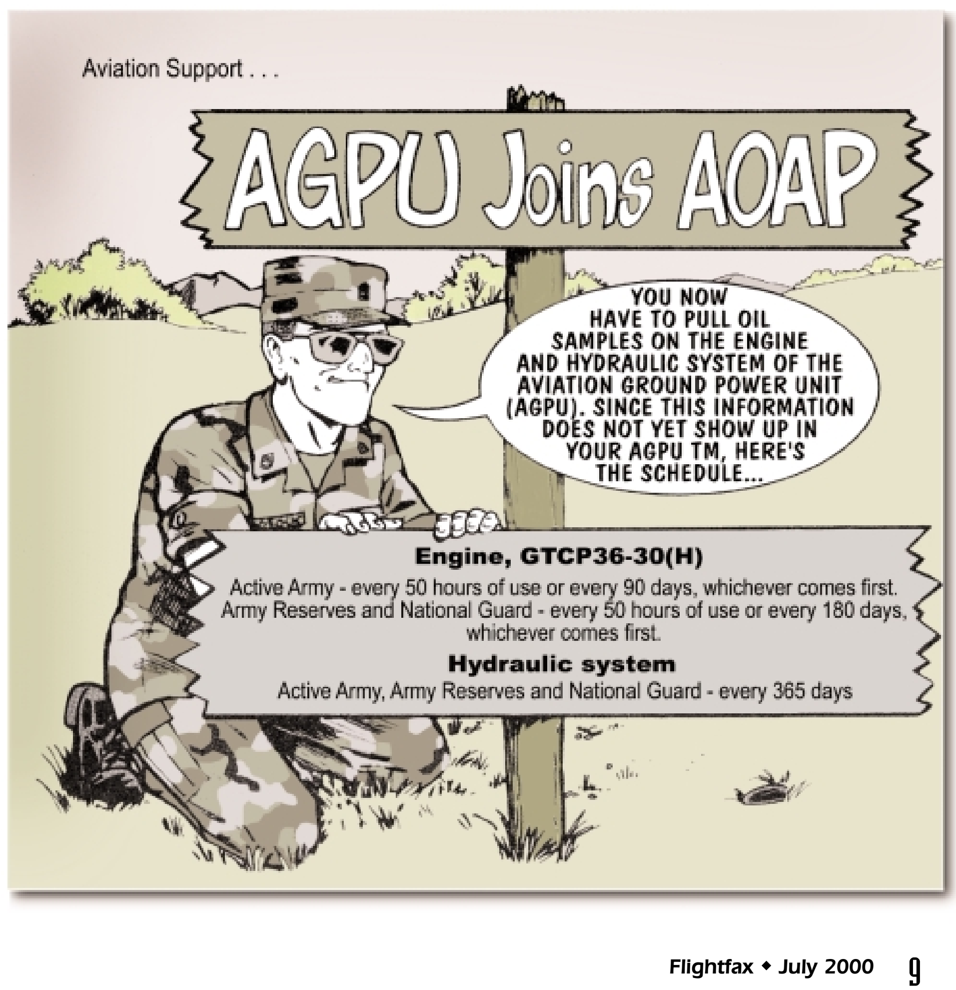
The Army has experienced numerous in-flight control mishaps over the past few years that have been linked to hydraulic fluid contamination affecting flight control servos and actuators. Water is one of the most significant elements that can cause additional contamination. Once water gets into the aircraft hydraulic fluid, the existing aircraft filters cannot remove it.

An improperly maintained AGPU can be the source of contamination for every aircraft it services. The AGPU has a vented hydraulic reservoir. A canister filled with desiccant is installed on the vent to keep the hydraulic fluid in the AGPU from picking up moisture as the reservoir breathes. When the desiccant is saturated, it allows moisture to enter the AGPU vent and be absorbed by the hydraulic fluid. The next time an aircraft is serviced, some of this water is transferred to the aircraft's sealed system, causing corrosion. **It is very important that before any aircraft hydraulic system is serviced that the hydraulic vent dryer is checked to be sure that at least 25 percent of the desiccant is still blue.** If not, replace it with new desiccant. NSN 6650-00-680-2233 gets you a 1.5-lb can of grade H, high adsorption capability, impregnated with a humidity indicator.

While the AGPU has a 3-micron output filter, it can also be a source of particulate contamination through improper handling of the output hoses and connectors. All hose ends need to have their cap or plug installed whenever not in use. All hoses, including the adapter hoses, need to be flushed before being attached to an aircraft to be sure all air is removed and particulate captured in the AGPU's filters. AMCOM is currently working on "turnaround" adapters to assist in flushing all hoses at the same time. The adapter hoses are required to be used whenever the aircraft system is being flushed and should be used whenever either the primary or utility is being pressurized.

To protect the aircraft systems from overpressure, the pressure relief valve should always be set to no more than 10 percent higher than the servicing pressure. This setup is described in the AGPU TM 55-1730-229-12. Also, the relief valve must be set higher than the service pressure, so that the pump pressure compensator is controlling the servicing pressure. Using the relief valve to control the servicing pressure will cause the AGPU hydraulic system to overheat.

—Jerome Smith, US Army Aviation and Missile Command, DSN 897-4926, (256) 313-4926, Jerome.Smith@redstone.army.mil



STRESS

When we hear about stress in the cockpit, we automatically assume that stress is part of the job. As Army aviators, we are unable to escape this burden, given the mission requirements that are expected of us in today's Army. If you complain about stress, you are labeled as a weak link in your unit. Every one of us can read about stress in FM 1-301 *Aeromedical Training for Flight Personnel*, where we learn about the important need-to-know information. Why it is important? Is it because it sounds like a good APART question? How often do we consider it in high regard when we are flying a mission and want to land safely on the ground afterwards?

What is stress?

Stress is the effect of physiological, psychological, or mental load on a biological organism. It causes fatigue and tends to degrade proficiency. If "biological organism" sounds too much like a dictionary definition, substitute the word "pilot." Degrading pilot proficiency sounds pretty real in an aviator's life.

Stress can be acute or chronic. Acute stress is short-term and intense. Chronic stress takes place over a long time and, for the most part, goes unnoticed. The more debilitating of the two is chronic stress, to which we usually simply adapt. Many things, such as duty assignments, home life, or illness, can cause chronic stress.

Stress and personality

Now think about what kind of personalities make up the aviation field. A typical pilot possesses a Type A personality: a perfectionist, competitive, aggressive, with a fear of making mistakes and of being criticized. Do you really think your Type A buddy is going to turn down much-needed flight time just because his home life is bad?

Or how about someone with a persistent medical problem? Would that person turn down a mission, and risk having the rest of the aircrews say that person was weak?

I speak from experience. When you are trying to be a part of the team, and you have a prolonged illness which nobody thinks is important, what happens when you stop and say "Wait a minute. I don't think I should fly"? You are no longer part of the team. So you push yourself to the limit, trying to hold on as long as you can.

Flight-or-fight response

The occurrence of a stressor activates the sympathetic nervous system's fight-or-flight response. It is characterized by many things—adrenaline release, increased heart rate, and increased respiratory rate, to name a few. This alarm stage is normally followed by a resistance stage, during which the body repairs itself from the damage caused by stress. However, the problem for aviators arises when the arousal continues, as in chronic stress. The body remains in a constant state of readiness, which eventually leads to exhaustion, or burn-out.

Every person has a threshold for stress. Do you know what yours is? Stress affects each person differently. We each have a unique threshold. A threshold is not something you can test. It won't necessarily be the same each time.

Every pilot can handle a certain number of distractions and still be able to control the aircraft and navigate successfully. But if the situation in the cockpit gets too complex, the pilot will surpass his or her threshold and start making mistakes. Mistakes and aviation do not mix.

Stress and focus

Significant life events, which can cause chronic stress, have proven to intrude on attention and distract the pilot from properly monitoring instruments. The term for this is "tunnel vision effect." It has been found that stress can cause an aviator to give an isolated area undivided attention, when the aviator's attention should be more widely distributed. As stress increases, an aviator's ability to attend to secondary tasks decreases and attention becomes more narrowly focused. How many missions have you flown in which you were not task-saturated at one time or another? Something has to give. If a pilot is focused solely on one task, what happens to the others?

Stress can kill

Stress can kill pilots—not in a violent, obvious way, but rather like a toxic gas—quietly, and usually without a trace. So keep an eye on your fellow aviators, and help them recognize a potential problem. Be aware in the back of your mind that they may be too proud to slow down, or they may simply not realize that they are under stress.

Managing stress is like managing risk. It can be handled if you recognize the problem and take appropriate steps to keep it from becoming catastrophic.

—CW2 Ronda Breneman, 3-7 Cavalry, Fort Stewart, GA, DSN 870-4475, (912) 767-4475

Thunderstorms—a primer

Various terms have been used to describe lightning, but few capture the awesomeness of this natural phenomenon. It's hard to believe that several thousand of these shows of force are flashing at any one time somewhere in the world. They provide a spectacular show, particularly if you're in an aircraft.

Lightning can occur almost any time, but statistics show that lightning occurs most often in clouds, within about 5,000 feet of freezing, in light rain and some turbulence, and within 8 degrees Celsius of the freezing level. Most lightning strikes on helicopters occur below 6,000 feet, but some have occurred as high as 9,000 feet. Rarely are aircraft struck when operating below 1,000 feet AGL.

The risk of a lightning strike seriously injuring a person onboard an aircraft is relatively insignificant. Typical injuries include mild electric shock from the strike and, more likely, temporary blindness from the flash. Such blindness usually occurs at night and lasts only 30 seconds or less. (It's interesting to note that night-vision devices will recover from a lightning flash even faster than the eye.)

There's a chance that a lightning strike could cause physical damage to an aircraft. Lightning is most likely to strike sharp or pointed areas, such as wing and rotor tips, elevators, and rudders. Theoretically, a lightning bolt should pass through aircraft metal structures without causing damage. But that is not always the case, as evidenced by the occasional wrinkled, burned or split aircraft skin, shattered structures such as radomes, and damage to wiring or electronic equipment.

The best protection against a strike is to avoid lightning altogether, and doing so isn't as difficult as one might think. Lightning rarely occurs without some or all of the following conditions being present:

- Clouds
- Precipitation, particularly the icy kind
- OAT near zero degrees Celsius
- Progressive build-up of static
- Light turbulence
- Altitude between 10,000 and 15,000 feet

If combinations of these conditions cannot be avoided, take as many of the following actions as possible:

- Avoid areas of heaviest precipitation
- Reduce airspeed to slow static build-up
- Avoid freezing level by at least 8 degrees Celsius
- Turn up cockpit lighting

If a strike occurs, monitor equipment for malfunctions. In addition, if you encounter unforecast conditions, report them so that other aviators can be warned.

***Note:** Weather posters are available for download from our website:*
http://safety.army.mil

—Reprinted from March 1998

Tips on Thunderstorms—When in doubt, turn about

For aviators, the safest course of action is to turn away from a thunderstorm area. To go a few miles away out of your way, or land and wait it out, is far smarter than taking the shortest and most direct way through a storm area. Thunderstorm tips include:

- **Lowering ceiling and rain showers may indicate thunderstorm activity.**
- **Don't be fooled by gentle winds and rain; you could be flying into the teeth of a severe thunderstorm.**
- **Excessive radio static is a sure sign of lightning, telling you a thunderstorm is in the area. The ADF needle will point in the direction of a thunderstorm when lightning is present.**
- **Don't land or take off in the face of an approaching thunderstorm. Associated low-level turbulence or wind shear could cause loss of control of the aircraft.**
- **Don't attempt to fly under a thunderstorm, even if you can see through to the other side. Turbulence and wind shear under the storm could be disastrous.**
- **Remember, destructive hail can be tossed from thunderstorms into adjacent clear areas. Bear this in mind if you're ever tempted to sneak between thunderstorms.**
- **Don't trust appearance to be a reliable indicator of the degree of turbulence associated with a thunderstorm.**
- **If a thunderstorm is identified as severe, avoid it by at least 20 miles.**

The most deadly threat soldiers face in peacetime is traffic crashes. Privately owned vehicle (POV) crashes kill more soldiers than all other accidents—on- and off-duty—combined. The Chief of Staff, Army has made clear his determination to end this needless loss of soldiers and the adverse impact it has on readiness.

Preventing POV deaths

The Chief of Staff, Army outlined the following six-point model program aimed at reducing POV accidents and directed its use in every unit as the minimum standard.

1.COMMAND EMPHASIS: Positive, unrelenting emphasis by leadership at all levels is imperative. When junior officers and noncommissioned officers take advantage of daily opportunities to assert positive influence on how, when, and where soldiers operate their POVs, it can have a lasting effect. They should know where their soldiers go, what they do, and then assert positive influence on how, when, and why they operate their POVs.

2. DISCIPLINE: Negative behavior such as traffic offenses, alcohol abuse, misconduct, and poor performance often are indicators of potential POV accident victims. Leaders' intervention by identifying "at risk" soldiers, counseling them, and taking proactive measures to modify their risky behavior has been effective in units successfully combating POV accidents.

3. RISK MANAGEMENT: Use risk management. The POV Risk Management Toolbox for Commanders and Leaders provides leaders and safety personnel support in the form of tools, training, guidance, accident data, and print and audiovisual media. You can find the toolbox at **http://safety.army.mil/pages/pov/index.html** and the Risk Management Information System at **http://rmis.army.mil.** Use it and make it available to leaders at all levels.

4. STANDARDS: Set high and unmistakable standards. Enforce them. Be uncompromising on the use of seatbelts and motorcycle safety equipment. Educate soldiers on the risks of speed, fatigue, and use of alcohol. Conduct mandatory POV safety inspections and random roadside checks. Emphasize the use of designated drivers for social events.

5. PROVIDE ALTERNATIVES: Provide alternatives for soldiers driving POVs and using alcohol. Schedule activities on post to keep soldiers on post and off the road. Keep gyms, recreation centers, and other places soldiers use off-duty open later. Promote use of alternate transportation methods to POV use. Prominently post public transportation schedules. Where possible, use morale, welfare, and recreation services to provide buses or vans to transport soldiers to the places they go when off-duty. Explore arranging reduced hotel rates in nearby communities to encourage soldiers to remain overnight on weekends and stay off the highways late at night.

6. COMMANDER'S ASSESSMENT: Following every fatal and serious-injury POV accident, the Chief of Staff, Army directed that commanders conduct an assessment of the accident with the involved soldier's chain of command. Determine what happened, why it happened, and how it could have been prevented. Implement corrective and preventive measures. Publicize lessons learned.

—Mr. James Brown, Traffic Safety Manager, USASC, DSN 558-2046, (334) 255-2046, brownj@safetycenter.army.mil.

The key to successful POV accident prevention programs is the commander's active involvement. Positive, hands-on leadership at all levels is imperative, particularly at the squad leader or first-line supervisor level.

Vehicle Refueling Fires

The dispensing of gasoline into the fuel tank of a motor vehicle is a safe operation. Americans pump gasoline into their cars between 16 and 18 billion times a year generally without incident. The oil companies' track record in this regard is enviable.

I am now in my twenty-second year at the Petroleum Engineering Institute (PEI). Up until September, 1999, the only refueling fires that were reported to me were caused either by an open flame (smoking), lack of electrical continuity between the nozzle and the grounded dispenser, or a spark from the engine compartment (motor running).

From September, 1999 through January 22, 2000, 36 ignitions of gasoline vapors during the refueling process were reported to me at PEI. All occurred during dry weather. There were no open flames and the engines were off. Continuity was verified between the nozzle and dispenser. People that investigated the cause of these accidents concluded that static electricity was the source of ignition in all cases.

These fires raised questions about why they are occurring now and didn't occur in the past. They include:

■ **Fuel chemistry**. Has the chemical composition of gasoline changed in a way that the conductivity of the fuel has also changed?

■ **Finish of the driveway or forecourt.** Is the paved surface of the refueling area sufficiently dissipative?

■ **Tires.** Tires are being made with less carbon (conductive) and more silica (non-conductive). Does this make a difference?

■ **Electrically insulated conductive components**. Are all conductive parts, and in particular all metal parts, in the area of the vehicle's tank system connected in an electrostatically dissipative manner so that the insulated conductors are not a source of ignition? We hear that this can be a problem even if the vehicle is grounded.

■ **Plastic filler inlets**. Today, some fuel tank filler necks are made of non-conductive plastics with a metal trapdoor opening. Some are connected to molded fiberglass fuel tanks. Could refueling transmit a charge to the insulated plastic filler neck that, in turn, might cause a spark to jump to the grounded nozzle?

■ **Customers re-entering their vehicles during refueling.** An electrostatic charge is generated through friction between clothing and the car seat to such an extent that electrostatic discharges to the vehicle body or to the filling nozzle are possible, especially if the motorist is wearing rubber-soled shoes. A Midwestern oil company warned of this hazard in a November 24, 1999, memo stating: *" . . .a flash fire can result from this discharge if sufficient flammable vapors are present. Therefore, customers should be discouraged from re-entering their vehicles while fueling is underway."*

About half of the fires that have been reported to PEI involved the motorist re-entering the vehicle at some point during the refueling process.

Although Americans pump gasoline into their cars between 16 and 18 billion times a year without incident, the fact that these fires were occurring in the first place—and with what occurred to be greater frequency—caused PEI to gather additional information about the circumstances surrounding these fires. We asked our newsletter readers and others to report to us all refueling fires presumably caused by static electricity.

What we found out

PEI received 47 first-hand reports of refueling fires attributed to static electricity. We also obtained information from the National Traffic Safety Administration database on similar incidents occurring between 1993 and April 1, 2000. Seventy-six percent of the fires occurred during the five months between November and March.

In all the reports we were able to verify, no open flames, running motors, or electrical continuity problems were involved. All but one of the accidents occurred with conventional (not Stage II vapor recovery) nozzles. Driveway surfaces included concrete, asphalt, stone, crushed rock, and dirt. Fires occurred with many different types of nozzles, hoses, breakaways and dispensers. No cell phones were involved. The refuelers wore a wide variety of clothing. In 94% of the accidents for which footwear was identified, refuelers were wearing rubber-soled shoes.

Why does this happen?

I am not an expert on static

electricity. It does appear to many people in the industry, however, that electrostatic charging was the probable cause of these fires. In many of the reports we received, the refueler became charged prior to or during the refueling process, through friction between clothing and the car seat, to such an extent that electrostatic discharges to the vehicle body, fuel cap, or dispensing nozzle occurred. Twenty reports described fires that occurred before the refueling process began, when the fueler touched the gas cap or the area close to it after leaving the vehicle. Twenty-nine fires occurred when the fueler returned to the vehicle during the refueling process and then touched the nozzle after leaving the vehicle. Fifteen fires do not involve either of these two situations.

PEI has recently received five excellent articles written over the last four years, which attempt to explain these types of fires. Most were written in response to similar refueling fires in Germany, the United Kingdom, and France from 1992 through 1997.

Where do we go from here?

PEI will continue to collect reports of fires, as well as theories and studies about why these fires happen. A summary of many of the documents I have referenced here is available on the PEI web site: www.pei.org

I will mail a full set of these documents on request.

—Robert N. Renkes, Executive Vice President and General Counsel, Petroleum Engineering Institute, Tulsa, OK (918) 494-9696, rrenkes@pei.org

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH1

Class E

F series

■ During two-minute cool down following a maintenance test flight, transmission oil pressure caution light illuminated. Aircraft was shut down. Maintenance replaced transmission oil pump.

■ At the end of the training period, IP selected emergency governor for emergency governor training. Governor would not go into emergency mode. Aircraft was taxied to parking pad and shut down. Failure was caused by shorted wire in emergency governor wire harness.

AH64

Class E

A series

■ During run-up, target acquisition designation sight (TADS) would not boresight. Aircraft was shut down without further incident. TADS unit was replaced.

■ While on the ground, engines running, aircraft's shaft driven compressor light illuminated at shut down. Aircraft was shut down without further incident.

■ During taxi, main transmission chip light illuminated. Aircraft was shut down without further incident.

■ During run-up, Pilot's Night Vision System (PNVS) was found to be inoperable. PNVS turret assembly was replaced.

D series

■ Stabilator failure occurred during run-up. Aircraft was shut down without further incident. Flight management computer was replaced.

■ The trailing edge of a blade was found damaged after the completion of a training flight. The crew had been operating on an unimproved landing surface and a confined area.

CH47

Class C

D series

■ Lowered ramp contacted the ground during landing sequence. Left ramp strut mounting bracket was dislodged from the mounting point. Structural damage was identified at the attaching points.

Class E

D series

■ Following rapid fuel operations, PC noted No. 1 engine N1 gauge at 0% and #1 engine oil pressure at 0 PSI. When engine was shut down, noises were heard coming from No. 1 engine. Crew was unable to lag the rotor system. Maintenance suspects failure of No.1 engine oil pump resulting in failure of bearings within the N2 section of engine. Maintenance replaced engine.

■ During multi-ship air-assault, pilot noticed a static failure of the No. 1 engine. PC continued adjusting N2 with manual beep trim adjustment and returned to home station. Maintenance replaced the N2 actuator.

■ During attempted load hookup, master caution capsule illuminated with no corresponding segment light. Master caution capsule could not be reset. Aircraft was returned to field site. Maintenance replaced the master caution panel.

■ During cruise flight, aircraft had a 12% torque split when N1s and fuel flows were matched. When power was reduced, the torque split became 40% and could not be matched with the normal beep trim. Crew switched to emergency engine trim on No. 1 engine and returned to airfield without further incident. Maintenance replaced No. 1 engine and No. 2 actuator.

■ During cruise flight, small bird flew into aft rotor blade, impacting leading edge of blade.

OH58

Class C

D (I) series

■ During demo autorotation, the engine was overtorqued.

D (R) series

■ While conducting calibration checks in hovering flight, the FADEC audio warning activated, followed by an engine and rotor overspeed.

■ During manual throttle training at a hover, engine torque spiked to 134%.

Class E

C series

■ During hover, RPM switch was found to be inoperable. Aircraft was shut down without further incident. Replaced linear actuator.

■ During NOE flight, transmission oil light illuminated. Aircraft landed without further incident. Replaced freewheeling unit power takeoff seals.

■ High amp reading occurred during hover. Aircraft landed without further incident. Generator field circuit breaker wire was replaced.

■ While on the ground, with engines running, gyro was found to be inoperable. Aircraft was shut down without further incident. Radio bearing heading indicator was replaced.

■ While on the ground with engines running, engine chip light illuminated. Aircraft was shut down without further incident. Magnetic plug was replaced.

D (I) series

■ During hover, DC generator fail message displayed. Aircraft landed without further incident. Replaced DC remote control circuit breaker.

■ During takeoff, PI felt binding in the cyclic when moved left. During downwind both pilots felt severe control feedback in the cyclic and burning smell entered the cockpit. A precautionary landing was made and the aircraft was shut down without further incident. Maintenance repaired hydraulic pump.

■ During flight at NOE, aircraft experienced an engine overtorque of 126% for 3 seconds, and a mast overtorque of 120% for 3 seconds. After precautionary landing, aircraft was inspected by maintenance personnel and returned to flight. Mission was delayed. Suspect high winds/turbulence contributed to this incident.

TH67

Class C

A series

■ During hover training, aircraft contacted the ground. Hard landing resulted in damage to landing gear and tailboom.

UH1

Class E

V series

■ The aircraft was in straight and level flight when the fire warning light illuminated. The aircraft landed immediately without incident. The aircraft was landed in a field and an emergency shut down was performed.

UH60

Class C

L series

■ During approach for landing, rotorwash blew a blade box cover into a parked AH-64A, damaging one tail rotor blade, vertical fin, and stabilator.

Class E

A series

■ While at cruise flight, main transmission pressure dropped down to 20 PSI with a corresponding temperature that also increased indicating up to 130°. Aircraft landed with no further events. Maintenance inspection revealed the main MDL, No. 1 and No. 2 input MDLs and the No. 1 and No. 2 accessory MDLs needed to be replaced. Aircraft was recovered back to base.

■ No. 1 engine fire light illuminated on short final. Fire was not present. Aircraft was shut down and inspected. Maintenance analysis confirmed no fire existed. Fire sensor was disconnected and reconnected to reset system. Suspect sunlight shining on photo sensor activated fire detection system.

L series

■ Stabilator failed in flight and would not reset. During one-time flight back, stabilator failed again in flight and would not slew below 30 degrees down. Lower stabilator actuator replaced.

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.

Post Script to "The U.S. Army Flight Surgeon"

In the May issue of *Flightfax*, I wrote about how important it is for the flight surgeon to participate in the Commander's Accident Prevention Plan, or CAPP. The newest edition of AR 385-95, *Army Accident Prevention*, does not address the commander's duty to prepare a written CAPP. This doesn't mean that the aviation accident prevention program is gone. Instead, commanders must ensure accident prevention, through risk management, is a part of every mission of the unit. Accident prevention is not a stand-alone policy. The duties of commanders are addressed in paragraph 1-6a of AR 385-95. Other requirements for commanders are contained in paragraphs 1-4 (Responsibilities) and 1-5 (Policy).

Flight surgeons are an important part of any accident prevention program. If you don't have a flight surgeon assigned, the local Medical Department Activity Commander or your Command Surgeon are required to coordinate and provide support for the aviation medicine programs at the local level. This includes flight surgeon support for accident prevention programs.

—MAJ Matthew Mattner, US Army Aviation Resource Management Survey Inspector, Fort Rucker, AL, DSN 558-7418 (334) 255-7418, matthew.mattner@se.amedd.army.mil

Shortfax
Keeping you up to date

Are you up on your UH-60 MWOs?

At a recent workshop with AMCOM the subject of MWOs came up. There are currently 12 MWOs active. Seven of these should have been already completed. You say, so what? Well, there are two that are still open on UH-60 aircraft that date back to 1993. The Aviation and Missile Command and the Safety Center continue to track these until they are 100% complied with. Please scrub your aircraft books to ensure that the following MWOs have been completed:

MWO Number	Item Description	Projected Completion date	% Completed (3/00)
55-1520-237-50-44	Anti-Flap Bracket	1/93	99%
55-1520-237-50-49	Mixer Assembly Flight Controls	10/93	99%
1-1520-237-50-59	EME Protection (Phase II)	2/95	99%
1-1520-237-50-64	Engine Cowling Latch	5/97	99%
55-1520-237-50-66	Improved Fire Extinguisher Circuit	4/98	95%
1-1520-237-50-71	Improved Rotor Control System	9/98	99%
1-1520-237-50-70	Improved Center Windshield	7/98	98%

Who is responsible? Unit commanders and maintenance officers are. Let's get 'em fixed and be 100%!

—Bob Giffin, Utility Systems Safety Manager, USASC, DSN 558-3650, (334) 255-3650, giffinr@safetycenter.army.mil

Corrections

Congratulations to all the sharp-eyed readers of April's Flightfax who noticed the incorrect answer to question 4 in the Final Exam on IFR. The correct answer is "c".

And further congratulations to SFC William G. Sikes III. He was recognized as Aviation Soldier of the Year in May's edition. He belongs to D Company, 2/160th SOAR(A). His fellow soldiers, proud of his achievements, pointed out we had placed him in the wrong regiment.

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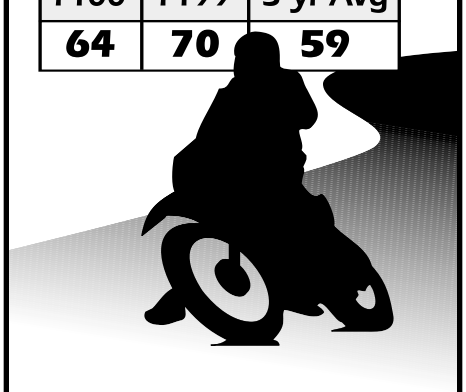
POV Fatalities through 30 Apr

FY00	FY99	3-yr Avg
64	70	59



U.S. ARMY SAFETY CENTER

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Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

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Assistance Visits

Effective Tools for the Commander,

and they are FREE

Assistance Visits: Effective Tools for the Commander, (and they are free)

Today's commander is challenged on every front. He or she must continually find innovative ways to operate efficiently, effectively, and *safely*. Let me emphasize this last point. With all the tasks on the plate, all the upcoming major events, and all the competing interests and concerns, the one thing that will stop a unit dead in its tracks is a training fatality. Everything else becomes suddenly unimportant. All the dedicated work is lost. All planning and execution is wasted.

The time to think about safety is now. The Risk Management Process begins now and continues to evolve through the entire operation. The commander must therefore use every available tool to attack safety concerns. The Safety Center offers such a tool, free of charge. It costs you only a bit of time. This valuable tool is the Assistance Visit, conducted by USASC personnel trained in Risk Management techniques. We offer the commander an outside look and information package to provide the latest and greatest in dealing with command safety issues. This is not an inspection, but an independent look at ways to identify, and mitigate, or eliminate hazards to your soldiers.

What we do

To date, we've conducted eight visits. I make a contract with the commander that everything found in his unit stays with him. The exception is when an issue beyond the commander's control can be resolved at higher levels through our intervention. Again, we do not conduct an inspection. We do look at trends. We provide the commander direct feedback as to how effective his safety program is accomplishing its mission, how to improve the safety environment, and how to integrate Risk Management into all unit operations. This ensures safety is an integral part of planning and execution, not just an afterthought, a checked block, or a paperwork drill.

The old adage "you don't know what you don't know" is true. We are one mechanism to provide you with what "you don't know." Some interesting trends are beginning to emerge from these visits. The following indicate some unhealthy safety trends:

Communications bottlenecks erode unit safety climate. Lower level units in particular, must know and feel the command presence, with emphasis on safe operations. The command safety team sets the safety climate in an organization. If the chain of command doesn't pass information about all operations, in detail, the unit safety climate suffers. Informed soldiers are safer soldiers.

Hazards generally known at lower levels are not communicated up the chain. We talk to soldiers at all levels. We often find that the chain of command is entirely unaware of complaints about many safety issues. We use a tool called the Next Accident survey. We ask the soldiers what will cause the next accident. In one case soldiers identified an over-crowded hangar that would result in damage to an aircraft being ground handled. Within minutes, that very accident occurred. Soldiers often know what isn't right, but they may not know how to resolve the problem. Given an opportunity, soldiers will share their safety concerns.

The unit Safety Officer greatly influences the Command Safety Climate. If your safety officer or NCO is not aggressive, outspoken, and energetic, the unit safety program can become reactive rather than proactive. He must be trained, involved, and active in all operations. He must understand the Risk Management process.

Exceptionally high OPTEMPO may translate into hazard-producing shortcuts. Today's mission load can be taxing. As the plate fills up and the train moves on, time becomes critical and scarce. Soldiers will tell you that there isn't enough time in the day to get everything done. We attack the most imminent threat first, and worry about the next event later. Sometimes we don't give adequate weight to proper planning and Risk Management techniques. The shortcuts begin. "We know this isn't the way we're supposed to do this, but next time we'll do it right." The translation is that we have just set a new standard. Most accidents happen when we ignore the standards.

Unit SOPs are generally not used, understood, or in some cases ignored, due to time constraints. This is an alarming fact. Ask your soldiers what the SOP says about accomplishing a given task. Ask your junior leaders the same question. They may have an understanding of the basic task, but will likely be unaware of what the SOP describes. SOPs are developed from lessons learned the hard way. It is a tragedy to pay with blood for something already known. Take, for example, the Heavy Equipment Mobile Tactical Truck (HEMTT) split rim wheels. Soldiers might or might not be aware of this serious hazard. They likely don't know the proper procedure to inflate a tire using the proper precautions. Two soldiers in the past year paid for this lack of knowledge with their lives. Enforce the SOP. Make certain soldiers know and understand its contents.

We have outstanding soldiers. They will always find a way to get the job done. If they know and understand the standard, they will follow it, given adequate time and resources. It is the command's responsibility to ensure they have the knowledge, time, and resources necessary. Our Assistance Visit is a tool to help you do just that.

The Safety Center Look

The Safety Center analyzes trends from assistance visits. We are the Army Staff agency for safety, providing information to the senior leadership on trends across the Army. Issues affecting like units are addressed at the Army Staff level where decisions are made concerning suitable resources, procedures, equipment, and OPTEMPO.

We typically look at brigade-sized units, offering a menu of events to the command. You pick and choose what you want. You are our customers. We will provide feedback on your safety program, information on recent accidents and trends, Risk Management integration tips and techniques, Driver's Training Program updates, and Privately Owned Vehicle (POV) toolbox training. The Director of Army Safety will personally speak to your senior officers, providing unique insight to accident prevention. All you have to do is ask. For more information check out the Safety Center website at **www.safety.Army.mil**, or call us directly at DSN 558-1253/ 2908, comm. (334) 255-1253/ 2908.

—LTC Mark Robinson, Chief, Risk Management Integration Division, US Army Safety Center, DSN 558-1253 (334)255-1253
robinsom@safetycenter.army.mil

How About Those Junior Officers?

Do you think junior officers and warrant officers need risk management training? A vast majority of critiques from soldiers attending our NCO Professional Development course strongly recommended that their supervisors get some sorely needed Risk Management training. We listened and developed a special program just for the young lieutenant, captain, or warrant officer in a leadership position. The Junior Officer Professional Development (JOPD) course is based on the valuable Risk Management training conducted in the NCOPD course, tailored to the junior officer level of responsibility.

The three-day, 24-hour JOPD course is focused on hazards identification, risk management, and the Army Safety Program and leader responsibilities. The target audience is the young company grade officer or warrant officer technician charged to integrate risk management into both the planning and execution phases of training and operational missions. An additional benefit of this training is that the officers can transfer this knowledge and become better off-duty risk managers.

Units provide up to 30 junior officers for three days of training. The only cost to the unit is the commitment of time and personnel. We pay for everything else! In return, the course produces officers better prepared to identify and control hazards in motor pools, convoys, ranges, wherever high-risk operations may occur.

The course consists of classroom instruction and practical exercises in understanding risk management, risk management integration, and hazard identification. Lessons learned from actual accidents are then integrated into the training. Student officers are provided tools to assist them in managing risks for their soldiers, both on and off duty. Finally, they will have an opportunity to apply what they have learned at an on-site safety visit to an operational facility, typically a motorpool.

Risk Management is the Army process for enhancing combat readiness and reducing losses. Trends show that junior leaders often fail to execute their responsibilities to manage risk and enforce standards, either due to ignorance or time constraints. The JOPD training will make a significant impact by providing risk management training to the "hands on" junior officer leadership of the Army.

Additional information and scheduling may be obtained by contacting USASC, (334) 255-2908, or from the U.S. Army Safety Center homepage at **http://safety.army.mil**.

You've had an accident—now what happens?

ACCIDENT INVESTIGATION BOARD DUTIES AND RESPONSIBILITIES

As we all know, the purpose of accident investigation is accident prevention. We want to protect the force so we can continue to do our mission.

Every now and then a unit will experience an accident that requires a formal accident investigation board be convened (Class A and B aviation and ground accidents and Class C aviation accidents, excluding off-duty fatalities/injuries not involving military operations). These investigations can be conducted by one of two different types of accident investigation boards.

The first type of accident investigation board is headed by personnel from the United States Army Safety Center (USASC) (Centralized Accident Investigation - CAI) and supplemented by personnel from the local command.

The second type of accident investigation board is made up of personnel from the local command (Installation Accident Investigation - IAI). Both types of accident investigation boards are charged with investigating the accident to determine what happened, why it happened, and what can we do to prevent it from happening again ("3W Process"). We are required to follow the instructions in DA PAM 385-40, *Accident Investigating and Reporting,* to conduct the investigation.

SOME PROBLEM AREAS

As I review accident reports, I am finding that some accident investigation boards are not completely following instructions for investigating the accident. This is causing a delay in processing the reports and implementing recommendations to prevent future accidents.

The first error is not following procedures for the submission of DA Form 2028, Recommended Changes to Publications and Blank Forms. Numerous accident reports are forwarded to the USASC with a recommendation that the

USASC submit DA Form 2028 to correct an error in a publication the accident investigation board found during their investigation. It is the accident investigation board's responsibility to complete and submit the DA Form 2028. A completed copy of the DA Form 2028 should be included in the report submitted to the USASC (DA PAM 385-40, paragraph 3-17d(15)(c).

The next error is that accident reports are being submitted with a recommendation that the USASC send a specific part that the board suspects failed to Corpus Christi Army Depot (CCAD) for teardown analysis. Again, this is the accident investigation board's responsibility. DA PAM 385-40, paragraph 2-5, lists the instructions for submitting failed parts to CCAD for teardown analysis.

The last error is writing the findings and recommendations for aviation accident investigation reports. Findings and recommendations for Class A and B aviation accidents are entered on DA Form 2397-2, *TECHNICAL REPORT OF U.S. ARMY AIRCRAFT ACCIDENT*, Part III – Findings and Recommendations. Findings and recommendations for a Class C aviation accident are entered on DA Form 2397-AB-R, *Abbreviated Aviation Accident Report (AAAR).* The instructions in DA PAM 385-40 for completing the form state, "Instructions for writing findings and recommendations are contained in this pamphlet." However, the pamphlet does not tell you where to find these instructions. This is an error on the part of the USASC and will be corrected during the next update of the pamphlet. Write your findings and recommendations using the instructions for completing DA Form 2397-2.The instructions are found on pp 27-30, DA PAM 385-40. Also, follow these instructions when writing findings and recommendations for an accident that requires the submission of DA Form 285-AB-R, *Abbreviated Ground Accident Report (AGAR)*, or DA Form 285, *U.S. ARMY ACCIDENT REPORT.*

Appointing a safety officer to the board as an advisor could eliminate a lot of these errors. If that is not possible, these errors could be corrected when either the Aviation Safety Officer (ASO) reviews the accident report or the Installation Safety Officer reviews the report prior to it being submitted to the USASC.

By following the proper procedures when investigating accidents and writing your findings and recommendations properly, corrective actions can be implemented faster, thus preventing future accidents.

—Gary Braman, Aviation Systems Accident Investigation Division, USASC, 558-2676 (334) 255-2676, bramang@safetycenter.army.mil

Update to AR 385-10

Change 1 to AR 385-10, The Army Safety Program, was published 29 February 2000, in electronic format. Change 1 to AR 385-10 provides risk management policy and definitions and provides authorization for collateral duty personnel to perform Standard Army Safety and Occcupational Health Inspection. Paragraph 2-1, Organizational structure was revised to organize and staff a safety office that includes four core areas and six "as applicable" areas. Pertinent aspects of AR 385-15, Water Safety, (including tactical and recreational water safety) were incorporated into paragraph 2-2n and AR 385-15, Water safety, was rescinded. Relevant aspects of Chapter 6, Personal Clothing and Equipment, were updated and moved into other sections and Chapter 6 was deleted. New Appendix B adds Management Control Evaluation Checklist guidance for the Army Safety Program.

The new AR 385-10 replaces the 23 May 88 edition and is available in electronic format only through the Army Publishing Agency web site. You can download a copy by going to our website **http://safety.army.mil**, then go to Guidance, Safety, Army, AR 385-10.

Editor's note: Please discard any copies of Change 1 to AR 385-10 downloaded prior to 17 May 2000.

—POC: Mr. Truman Taylor, USASC Policy and Programs Branch, DSN 558-2609 (334-255-2609), taylort@safetycenter.army.mil

Bad day at the beach

It was about 4:20 pm on a Saturday in August, and I had been out in the Mediterranean Sea playing around. There were six in our group: my wife, Berin, and I had been swimming together, and her brother, sister, and her sister's two daughters had been playing down at the beach. It was late, and I was tired, too tired, and I was swimming into shore. I didn't think I was this far from the beach when I swam out, but that was about two hours ago, and I had migrated down the beach away from everyone quite a bit.

I don't consider myself a swimmer. I took one swim class when I was 18, twenty years ago, and left that class with the sidestroke and backstroke—I still remember them. But the more I tried to use those strokes, the more tired I became. When I got to where I could put my feet on the sand, I gave up and slowly started to walk in, bobbing my head to stay above the surface. The water was at my knees when I first heard her shout my name.

Why won't anyone help?

When I first turned to look at Berin, I could tell she must have been shouting for a while. I couldn't see her face clearly, but she had "that" tone and volume that told me she was scared. She was shouting in Turkish, except for my name. I immediately turned and started "running", then swimming, out to her.

Berin had a large truck tire tube she had been floating on, but she was now holding onto the side of the tube and trying to swim. When I got to her, she stopped splashing and started shouting in English, "Help them…why won't anyone help them?"

She was now pointing with one hand and holding onto the tube with the other. I turned and saw Berin's sister and niece frantically swinging their arms. Berin's youngest niece was between them holding onto Berin's brother's chin and neck area. All the others blocked Berin's brother from my view. I was so tired I didn't hear them. I was so very tired. I took the tire tube and headed for them. The only thought I remember having was "kick, kick, kick." I probably looked like a child, pushing a tire tube with both my arms outstretched and kicking.

I had seen people all day trying to show others how to swim doing the same thing. But this wasn't like the tube race I was in at the base pool. This was real, and I was scared to death.

I could hear the little girl scream

As I got closer, I could hear the little girl scream. Not words at first, just screams. She always seemed to scream a lot, when playing or when she didn't get her way. Some children are like that. Perhaps other swimmers and those on the beach disregarded her because of it. *I don't know why no one helped.* I could hear Turkish words now, "CABUK, CABUK" ("Hurry, Hurry!").

The youngest girl had one arm around her uncle's head, and the other was waving at me. "Cabuk," she yelled, "cabuk". No one has ever asked me for help like that. When a child needs help, there is a certain universal sound and look that is impossible to misunderstand. I aimed for her. When I looked up again, I saw my brother-in-law was coming up from the water. His eyes had a desperate look, but he wasn't shouting. He went under again

before I reached them.

I was sure there were too many of us to all hold the tire at once. I made sure the little girl grabbed the tube before I let go. Then the others grabbed hold. I was so tired. When I could take hold again, I remember thinking, "Oh, God. Please let it hold us." I was so scared. I started to kick again and splashing with my right arm, like my wife had been maybe four minutes ago. I could see the shore now. The littlest girl was screaming again, so I knew she was still there. I didn't know the word for "Help!" in Turkish, so I just screamed it in English. I hope I never have to yell like that again. I yelled as much as I could and as loud as I could. I was making eye contact with people in the distance now. I could see their heads turn and look. I could see a man with black trunks staring at me. He looked RIGHT at me, but no one came…no one shouted back…no one helped.

I could hear water splashing now from behind me. I wanted to stop, but I was too tired to see if anyone else had started kicking. Suddenly there was a man standing next to me pushing the tube. I could tell I wasn't moving the tire now. I stopped kicking. A second later, a woman was standing in front of the tube taking the still-screaming little girl in her arms. My wife and others were helping my brother-in-law, his sister and her older daughter. Someone was helping me now. I collapsed on the beach. I tried to vomit some of the water I had swallowed, but felt too tired to even do that. I couldn't move. I just stayed there, on all fours, until I could walk.

The aftermath

We all sat silently in shock for a while. Everyone else on the beach was still going about his or her business, as if nothing had happened.

My hope is that someone—anyone—will learn from my nearly catastrophic experience:

1. Never, never go past your limit. Remember, swimming back is not the same as swimming out. Go back to shore *before* you're tired. They recommend stopping for 10-15 minutes for every hour you drive. Do that when swimming also. GET OUT OF THE WATER AND TAKE A BREAK. You may want to turn off the "military thing" for the weekend, but SAFETY can't take a break. Stay vigilant.

2. Keep control of your group. According to Turkish customs, family comes before all else. Many Americans feel the same way. This applies to all social strata and income levels. When it comes to decision-making, I now secretly appoint a soft spot in the team and use them as a monitoring point. If they can't do it, then the team can't. We all stick together.

3. In Turkey, America, or Timbuktu, many places don't have lifeguards or security to help. Regardless, when faced with an emergency, having the presence of mind to act, to actually respond appropriately, is a rare strength for anyone, even emergency responders. We would like to think that as members of the military, we will do this or that during a crisis. No one knows the future, but I promise you, whatever you choose to do (or not do), you'll remember it for a long time.

4. Plan for contingencies with your family. Maybe get a little silly and play a game of "what if." For me, that means making sure everyone takes another swim class before we hit the water again. For you, it might mean carrying a telephone card in your wallet, or a flashlight in your car. For others, it may mean to do more than just be in the right place at the right time. The best thing you can do is try to identify, mitigate, and plan for the risks involved in your activities BEFORE you begin to participate. It's always best to stay out of trouble rather than jump blindly into it.

After it was all over, we spent many hours going over what we did. It doesn't take a psych major to know that talking helps, and the ability to do so is a strength, not a weakness. I think the adults were more frightened than the kids were, but we all learned. With the proper planning, risk management, and maybe just a touch of luck, I intend to do all I can to make sure nothing like this ever happens in my family again.

—Reprinted with permission from Torch, US Air Force

Use your Kiowa's data transfer modules

Digital source collectors have proven themselves over and over to be valuable maintenance and safety tools. The OH-58D (R) Kiowa Warrior's digital source collector is the data transfer module (DTM). Data recovered from the DTM has been used for engine salvage and replacement decisions. Data recovered from the DTM has also been used to investigate numerous Class E through A accidents. The DTM, however, is useless if not installed on the aircraft.

The Army has experienced several occasions in which the opportunity to record valuable maintenance and safety data was lost because the flight crew did not install the DTM before flight.

Therefore, flight crews should never fly without a DTM installed on their aircraft. Further, if a flight crew experiences an in-flight mishap, accident or system malfunction, the crew should remove the DTM as soon as possible to avoid overwriting the event data.

Maintaining the DTM.

Maintenance personnel should follow the following maintenance procedures:

a. Always store the DTM in a dry, well-ventilated place free of dust and other contaminants.

b. Avoid dropping, denting or banging the DTM. Severe impacts may damage the memory chips inside the module.

c. Avoid contact with the pin receptacles in the back of the cartridge. Damage to the pin receptacles may interfere with the transfer of data from the cartridge and/or the storage of data on the module.

Performing Operational Checks of the DTC.

Before use, flight crews should perform the following operational checks:

a. Visually inspect the DTM for cracks or dents that could indicate damage to the recording capability of the DTM.

b. Load mission data, even if the data is not to be used in the mission. This allows flight crews to ensure that mission data can be transferred to the aircraft. This check also ensures the cartridge is functioning properly and will perform as a flight data recorder.

Remember, the DTM can't help us if it's not installed.

—Joseph Creekmore, RAM, Inc. DSN 558-2259, (334) 255-2259,

NCO Corner:

THE UNSUNG HEROES

We have heard the expression, "Where have all the heroes gone?" In the Army Aviation community, the emphasis is primarily placed on the Operator (pilot) and crew. When a pilot has avoided a potential catastrophe, he or she gets a Broken Wing award (deservedly so). Awards are given and the stories get told.

Let's take a moment to look at the big picture. How many maintenance types does it take, and how much time does it take, to make that airframe airworthy? Quite a few MOS's, Crew Chiefs, shops personnel, and mechanics are required to perform the task. Of these MOS's, they too have their "Glory times".

Consider this for a moment. Pilot and crew are given a mission to fly the following day. It's wintertime and the weather's cold with blowing winds. The crew takes the proper time to do a thorough preflight while braving the elements. The crew takes the time to start the aircraft, ignite the engines, and perform the checks. Time to get some heat into the aircraft. When the cabin gets warm, everything works as advertised.

Consider how frustrating it would be if the battery failed to start the aircraft. Here enters one of many unsung heroes.

We take for granted that every time the battery switch is activated, we will have DC power. Do you realize what tasks are involved? The battery technician is usually isolated in a shop away from the other work places, because of the toxic fumes and explosive gases that are generated when charging takes place. It's a tedious job that requires the utmost attention. Day in and day out, the same task is performed. That task, if done incorrectly could possibly severely injure or kill the technician.

Let's take it one step further, after the battery switch is turned on and everything works. That's IF you have fuel in your aircraft.

How about those POL folks? First on the job and usually the last to leave. Pumping fuel, making sure it's clean and without contaminants, testing and recirculating fuel, doing PMCS on their vehicles, etc. Not to mention the hazards involved. How far would we get without those folks? They are out there, day in and out, warm and cold, day and night, pumping fuel. These are just a few of the unsung heroes.

Next time you're on your way to preflight, to a meeting, or just passing through the hangar, take the time to say thanks to our people "behind the scenes".

Our Army is getting smaller and the expression Teamwork becomes more paramount than ever. It's time we make time to acknowledge the unsung heroes a simple "I appreciate what you're doing" will suffice.

They're out there everyday doing what they're trained to do. We, as operators, supervisors, and leaders need to acknowledge these unsung heroes in their "House" and take the time to say thanks for what they do. You'll be pleasantly surprised at what happens when you turn that switch on.

—CW3 Henry Dubiel (Maintenance Officer), Det 2, Co D, 245th AVIM BN, Silverbell AHP, Marana, AZ 85653, DSN 853-5975

New ASO Director

There's a new director of the Aviation Safety Officer Course. CW5 Butch Wootten has turned the reins over to CW4 Don Wright, formerly Officer in Charge of NCO professional development for the Safety Center's Mobile Training Team. Mr. Wootten joins the Safety Center's Aviation Investigation Division. Thanks, Butch, for a job well done.

The Army goes to sea –

Recent history has demonstrated the necessity for shipboard/helicopter interoperability, that is, the ability for Army, Air Force, and Marine aircraft to operate effectively from Navy ships.

Out of that necessity was born J-SHIP – the Joint Shipboard Helicopter Integration Process. J-SHIP was chartered in July 1998 by the Office of the Secretary of Defense as an official four-year Joint Test and Evaluation program.

Recent history has shown us a marked increase in shipboard operations by non-US Navy/US Marine Corps helicopters aboard US Navy, Military Sealift Command, and US Coast Guard ships.

Various service commands and agencies representing the operational, acquisition, and testing communities within the Department of Defense have provided enormous support to the program and its goals.

The Navy is the lead service with Army and Air Force participation in test resources and personnel within the joint test force.

The J-SHIP team is composed of military, government, and contractor personnel. Computer Sciences Corporation and DCS are the prime contractor team with

strong support.

Recently, Bob Giffin of the US Army Safety Center has been aboard both the Essex and the Constellation in support of J-SHIPs. Here are some lessons learned to date.

Going to Sea?

You say it can't happen to you. That's what the 4/2 ACR, 10th Mountain Division, and 159th Aviation Regiment said before they found themselves on a Navy ship heading to Haiti. For those who have never experienced shipboard helicopter operations, it's a rude awakening. Not only will seasickness complicate your mission accomplishment, shipboard operations pose many hazards foreign to Army Aviation.

You can mitigate the risk to most of these hazards through proper planning, training and just being aware of those hazards. If your unit has an over water task list, make FM 1-564 part of your training. J-SHIP is helping to enhance the information in FM 1-564 through a series of 12 Dedicated At Sea Tests (DAST) of various ship/helicopter combinations over the next few years. The results will be located on a web site and a CD that will be one-stop shopping to find everything you need to know to deploy, and operate successfully aboard a ship.

Water Survival Training is a must, and it isn't a cakewalk. Just ask some of the Army crewmembers who recently failed to pass their swim test training for J-Ship's 3rd DAST on the aircraft carrier USS Constellation. Not only will you need to be trained; your unit will need to procure water wings and HEEDS (Helicopter Emergency Egress Deployment System) bottles for underwater emergency egress.

There is no more intensive electromagnetic environment than on a ship, called Electro Magnetic Interference or EMI. The high power emitters are less than 100 meters from your maintenance and staging areas. Each of these emitters has differing effects on your helicopter's ordnance, communications and electronics—some effecting safety-of-flight systems such as hydraulic controls, AFCS or radar altimeter.

Just one rocket or missile that is accidentally exploded by a ship's high power emitter or is overheated can ruin your whole day—That's what happened on the USS Forrestal that burned for 3 days and claimed 132 lives from just one loose missile. The Navy now has the HERO program (Hazards of Electromagnetic Radiation to Ordnance) to mitigate the radiation risk. J-SHIP plans to provide all known EMI/HERO hazards on their web site so you won't have to dig them out of old test reports, and then try to interpret engineering reports on how field strengths of certain frequencies affect your various electronic systems and ordnance.

These are just a few of the considerations that your unit might want to think about when the word comes down that your next mission is to go aboard a US Navy ship.

Have any interesting safety-related experiences on a Navy ship? Send your "Sea Stories" to garybc@navair.navy.mil

List of things to consider:

(Soon available at www.jship.org)

- FM 1-564, Helicopter Shipboard Operations
- Joint Pub 3-04.1, Joint Shipboard Helicopter Operations JTTP)
- Army/Air Force Deck Landing Operations (Joint MOU)
- Helicopter Emergency Egress "Dunker" Training
- Navy Water Survival Training
- HEEDS Training
- Corrosion Control—fresh water washing for engines and aircraft

Submitted by:

CDR Bret Gary, USN, Deputy Test Director, J-SHIP (301) 342-4936, x 219, garybc@navair.navy.mil and

Mr. Bob Giffin, CW4, Ret., USASC, Safety Systems Manager (UH), DSN 558-3650 (334) 255-3650, giffinr@safetycenter.army.mil

True Faith

In the evening earlier this spring, a military aircraft crashed near my home. This crash resulted in the deaths of 19 U.S. Marines. Although crashes of military aircraft and deaths do occasionally happen, this crash reminds us of the saying about history being doomed to repeat itself. Although this involved a new aircraft, this type of mishap scenario has happened before, with other aircraft. While all of us who fly are prepared to risk our lives for our country, we are never truly prepared to handle the tragedy of a mishap.

The previous afternoon I had been browsing Internet links through the Vietnam Helicopter Pilots' Association (VHPA) web site, looking at names of aviators and crewmembers I served with, who died in Southeast Asia. When we think back on significant events that have influenced our lives and careers, we are reminded of those events that not only impressed us in their vividness, but also frightened us out of our wits. Those of us who have actually witnessed aircraft mishaps will never forget seeing the crash and the resultant heartbreaking outcome.

Each day we are bombarded with stimuli from every imaginable source. What sets us apart from each other is how we filter and interpret this information. Our backgrounds, education, training, and experiences influence this process. Each of us in aviation has a fairly similar common 'core of experience' due to the standardization of training. It is because of this core of experience that we seem to react and are affected the same way when a mishap occurs, especially one that results in loss of life. Much has been written about the 'bond' of camaraderie among soldiers, but aviators and crewmembers share this bond or affinity for each other even more strongly. That's why we are all so intimately affected by a mishap and death – "there but for the grace of God, go I". When that mishap literally occurs near home, the reality of the events is made even clearer and more personal.

We as Instructor Pilots (IP) and Aviation Safety Officers (ASO) have a regulatory responsibility to ensure we provide the commander with our very best. Not only is it our sworn duty to our country, but also it's a moral duty to our fellow soldiers, sailors, airmen, and Marines. While we all swore to "support and defend" and "to bear true faith and allegiance" to the Constitution, we must always remember that the oath also applies to the people we are sworn to protect.

When we look at the results of an aircraft mishap, we as IPs and ASOs must honestly ask ourselves how we might have positively influenced that mission and helped prevent the mishap. Did it occur due to a quirk of fate, an engineering flaw, a maintenance error? Or could an IP, ASO, or even another soldier have removed a weak link in the mishap chain?

When we think back, we are reminded of events we experienced where various people have had profound influences in our lives. If we are lucky, we remember those people who actually saved us from becoming a mishap statistic. If we are honest with ourselves, we'll even admit and admire those people who saved us (and consequently other people) from ourselves.

While it is very commendable to excel in non-aviation activities, it is the unforgiving profession called military aviation that demands our attention. There is no room in military aviation for personnel not contributing 100% to the unit mission. Aviation is a deadly serious business that requires each of us to devote all of our attention. It is our duty as IPs and ASOs, to assist our fellow aviators and crewmembers in learning and maintaining their skills through qualification and refresher training programs. We must ensure they understand the purpose of aviation methods, procedures, and techniques, and why these influence combat readiness. We must also be brave enough to honestly advise the commander about his or her unit's *true* state of combat readiness.

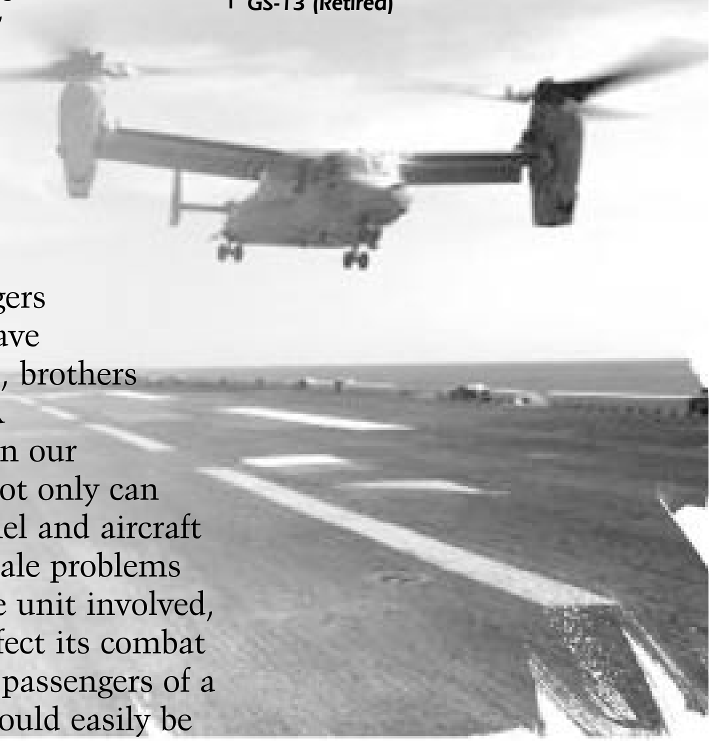
Although these are our assigned duties, we as IPs and ASOs have an even higher duty to perform. We have a truly sacred obligation to ensure the aviators, crewmembers, and their leaders are prepared, through the very best of our ability, to perform their own assigned duties. When an aircraft mishap occurs, we cannot help but wonder if we failed those involved in some way. Did we teach them everything we could? Were they listening in class? Did we teach them to employ all the elements of aircrew coordination? Could they perform their Aircrew Training Manual (ATM) tasks to standard? You can second-guess yourself forever and never resolve these questions. We hope we did our best and must continue to strive to provide the best instruction and advice, and ensure it is received and understood.

The IPs and ASOs are the commander's professional advisors, and it has been said - his conscience. In this capacity, they can have positive influence upon a unit, if the commander and the unit are astute enough and willing to heed their advice. It is our job as professionals to 'sell' our specialized advice or product. It is here where the IP and ASO must be totally professional and above reproach. If that instructor or safety officer is not diligent all the time, his credibility will suffer and may have a negative impact on the unit. This is the most difficult and challenging part of our job. While the various regulations, manuals, SOPs, etc provide the authoritarian basis for instruction and safety, the outcome of the IP's and ASO's influence can sometimes be difficult to measure. Although measurements likes the ARMS do gauge success, they may not be able to judge the successful influence that the IP and ASO have on their unit. Mission accomplishment and positive safety records do enable instructors and safety officers to be justifiably proud of their unit and its individual accomplishments. Personal satisfaction comes from knowing you did the job right, the first time.

Each of us must continue to strive to "to be all that we can be" in aviation. The mishap I mentioned above resulted in 19 deaths, 15 of which were passengers. We must always keep in mind not only are aviators and their crewmembers involved in aircraft mishaps, so are their innocent passengers. A mishap resulting in casualties also creates devastation in the service members' families, and it affects us all. To put it in an even more important prospective, the crew and passengers involved could have been our spouses, brothers & sisters, sons & daughters, or even our grandchildren. Not only can losses in personnel and aircraft cause severe morale problems and devastate the unit involved, it can actually affect its combat capabilities. The passengers of a mishap aircraft could easily be a division commander or other personnel who could decisively influence the outcome of combat operations.

It is the instructor pilots' and aviation safety officers' job to impart their skills and knowledge, and help their unit increase its warfighting capabilities, which help preserve soldiers' lives. We must keep in mind that professionalism is truly a Combat Multiplier. As we IPs and ASOs perform our sworn duties, we must keep in mind – that we indeed, have a moral obligation to "bear true faith and allegiance" to our fellow soldiers, sailors, airmen, and Marines. We can accomplish this by having the integrity to be totally professional and living up to our oath. To quote a line from the movie Gettysburg, "what we're fighting for, in the end, we're fighting for each other".

Llewellyn Buck
MAJ, USAR (Retired)
GS-13 (Retired)



Apache pilots view the world differently

Apache aviators have a unique way of viewing the world during flight. They use a monocular (right eye only) helmet mounted display (HMD) called Integrated Helmet and Display Sighting System (IHADSS). Forward looking infrared (FLIR) imagery and flight symbology are first reproduced on a miniature cathode ray tube, and then delivered to the eye by relay optics.

When first developed, the IHADSS one-eyed design gave us smaller packaging, reduced head-supported weight, and lower costs. The success of the IHADSS in the Apache is due to IHADSS designers, and the skill of the aviators who use it.

However, monocular HMDs impose a unique visual situation which is unnatural to our normal vision process. This can cause a conflict in what is perceived by the pilot. Some concerns include:

Limited Field of View (FOV)— The field of view with IHADSS is reduced over normal vision, causing the need for increased head movement.

Small exit pupil— The exit pupil is circular, and 10 mm in diameter. It must be placed very close to the eye, and remain stable, or FOV will be further reduced.

Binocular rivalry potential— When using the IHADSS, each eye receives different information. This causes viewing conflicts between the pilot's aided eye (viewing the IHADSS imagery) and the pilot's unaided eye (viewing the outside world.) Aviators may have trouble switching attention between the two scenes.

Eye dominance — The IHADSS is viewed only by the right eye. Most individuals have a preference to use one eye over the other to perform specific visual tasks.

All of the above can result in increased visual workload. This can show up as visual discomfort, headache, blurred or double vision, or afterimages.

There are other equipment items that can have an impact on visual performance. These include the M-43 chemical mask, and the KG-3/5 laser protective modified spectacles. Either ofthese can force the IHADSS combiner away from the eye, which will further reduce field of view, and increase your visual workload.

If you have flown the AH-64 within the last six months, please visit this special USAARL web page: http://www.usaarl.army.mil/AH64

Data on visual performance

In 1990 the US Army Aeromedical Research Laboratory (USAARL) conducted a three-part study following anecdotal reports of problems and concerns over

potential long-term effects of flying with the IHADSS. The study, while verifying a number of complaints, found no evidence of any significant changes in vision.

There are also physiological issues which may affect aviator performance. The eye constantly changes as we age. One of these changes in accommodation—the eye's ability to "auto-focus". Past the age of forty, we lose some of our ability to focus on near objects.

In a continuing effort to investigate helmet mounted display visual issues, USAARL is building a database of aviator visual performance with the IHADSS. You can have input to this database by signing on to a special USAARL web page and filling out the IHADSS Vision Questionnaire. All information is collected anonymously and will be used for research purposes only.

—Clarence E. Rash, research physicist, USAARL, DSN 588-6876, (334) 255-6876, Clarence.rash@se.amedd.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class C

A series

■ Loud report, shudder, and grinding of tail rotor controls emanated from aircraft during engine run-up in idle position. Emergency shut down was performed and MTP egressed aircraft without further incident. No. 4 drive shaft appeared twisted/severed 18 inches forward of the No.1 anti-flail assembly.

■ While at a sustained hover in steep sloping mountainous valley terrain, aircraft inadvertently drifted to the rear and made contact with trees on steep slope, causing damage to aircraft. Aircraft was flown to field site where maintenance was notified and the aircraft was repaired the following day.

■ During roll-on landing, tail wheel struck curb and was broken off.

Class E

A series

■ During takeoff the Backup Control System (BUCS) Fail warning light illuminated. The pilot aborted the takeoff without further incident. Maintenance exhausted all trouble-shooting per the appropriate technical manuals without finding any faults. The maintenance operational check was okay and the aircraft returned to service.

D series

■ During cruise flight, tail rotor VIB gearbox light illuminated. Crew made a precautionary landing at airport. Maintenance officer, who was a crewmember in the flight, found grease level of the gearbox to be low. Maintenance replaced grease.

■ Aft deck fire was enunciated to crew. Aircraft was landed without incident. Post flight revealed smoke and strange smell from transmission area. It was noticed that a 28 vdc wire coming from the #2 trv was chaffed by and melted the fire detection wire.

C12

Class E

F series

■ During climbout, passing through 7500 AGL, PC noticed the left engine oil pressure gauge fluctuating between 70 PSI AND 80 PSI. PC reduced power on the left engine to 1000 LBS TQ and returned to airfield without further incident. Cannon plug to oil pressure transducer was cleaned. The aircraft was released for flight.

CH47

Class C

D series

■ During No. 2 engine HIT check, engine experienced a suspected materiel malfunction that resulted in rotor overspeed of 117%. Aircraft was immediately shut down.

Class D

D series

■ After hot refueling, the No. 2 engine beep failed to respond to normal inputs. The No. 2 emergency beep auto/manual switch was placed in the manual position to control the engine manually. The No. 2 N2 control box was replaced and the cannon plug was cleaned. No further incidents occurred.

E series

■ Main cabin escape hatch panel departed aircraft during flight while door was being lowered into the closed position. Despite extensive search, it could not be found.

OH58

Class C

A series

■ During power recovery from simulated engine failure, rotor RPM exceeded allowable limits. Tail rotor blades were replaced.

Class E

A series

■ In straight and level flight, PC made a collective increase. The low RPM audio came on with a visual drop in N1 and N2. PC entered power off autorotation to the ground with emergency shutdown. No damage to airframe. Initial inspection after shutdown revealed leaks in the PC/PYfuel control lines. Lines replaced.

UH60

Class C

A series

■ During NOE flight, aircraft's main rotor contacted trees. Damage to all 4 main rotor blade tip caps was found on postflight inspection.

■ During postflight checks, crew noticed three main rotor blade tip caps had been damaged during prior night's training flight.

Class D

L series

■ Aircrew was performing multiple Fast rope and Infl/Exfil approach training. During approach to landing zone a bird impacted the aircraft main rotor system. The inspection revealed one damaged main rotor tip cap. The tip cap was replaced.

Class E

A series

■ During NVG flight approx eight minutes after take-off the main transmission oil press caution light illuminated. After completing the emergency procedure and cross checking transmission temperature and oil pressure, the aircraft was returned to airfield for a precautionary landing. The maintenance officer determined light was due to moisture from earlier aircraft wash.

■ Following 10 ft hover check on parking ramp, aircraft transitioned forward for take off and immediately encountered brownout conditions. PIC on the controls turned right to avoid known obstacles and maneuvered to land on a known surface ramp. Tail wheel struck the ground and stabilator struck a metal pole. Further inspection revealed L/H side tail wheel landing gear gouge and sheet metal damage to stabilator.

L series

■ At a ten-foot hover, the stabilator failed in the auto mode. When the IP pushed the auto control to reset, the stabilator failed to return to the auto mode. The crew terminated the mission and returned to parking. Stabilator amplifier was replaced.

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.

Aviation messages

Recently issued by AMCOM

SAFETY OF FLIGHT MESSAGE

March 2000

UH-1-00-07: Inspect Tail Boom Vertical Fin Assy

April 2000

AH-1-64-07: Loss—Aircraft Electrical Power

May 2000

CH-47-00-05 Inspect Pitch Housings
CH-47-00-06: APU Containment Device
AH-64-00-08: Loss—Aircraft Electrical Power

June 2000

AH-1-00-07: Imperial Main Rotor Grout
UH-1-00-08: Inspect 42 Degree Gearbox
UH-1-00-09: Inspect Mast Assembly

AVIATION SAFETY ACTION MESSAGES

March 2000

C-23-00-ASAM-01: Paradrop Restriction Removed

April 2000

AH-1-00-ASAM-07: Inspect for Relay, Solid State
CH-47-00-ASAM-01: Fuel Pods
OH-58-00-ASAM-02: Magnetic Chip Detectors

May 2000

AH-1-00-ASAM-08: Tail Rotor Driveshaft Coupling
CH-47-00-ASAM-02 Hinge Pin Shoulder Bolts
CH-47-00-ASAM-03 Hydraulic Fuel Sampling
OH-58-00-ASAM-03 False Engine Out Warnings
OH-58-00-ASAM-04 Directional Control Tube Chafing
UH-1-00-ASAM-04 Tail Rotor Driveshaft Coupling
UH-60-00-ASAM-05 Fire Extinguisher Wiring

June 2000

AH-1-00-ASAM-09: Restrict Firing Tow Missiles
OH-58-00-ASAM-05 Hydraulic Fluid Sampling
UH-60-00-ASAM-04: Inspect Tail Landing Gear/Shock Strut

POV Fatalities through 31 May

FY00	FY99	3-yr Avg
69	86	74

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U.S. ARMY SAFETY CENTER

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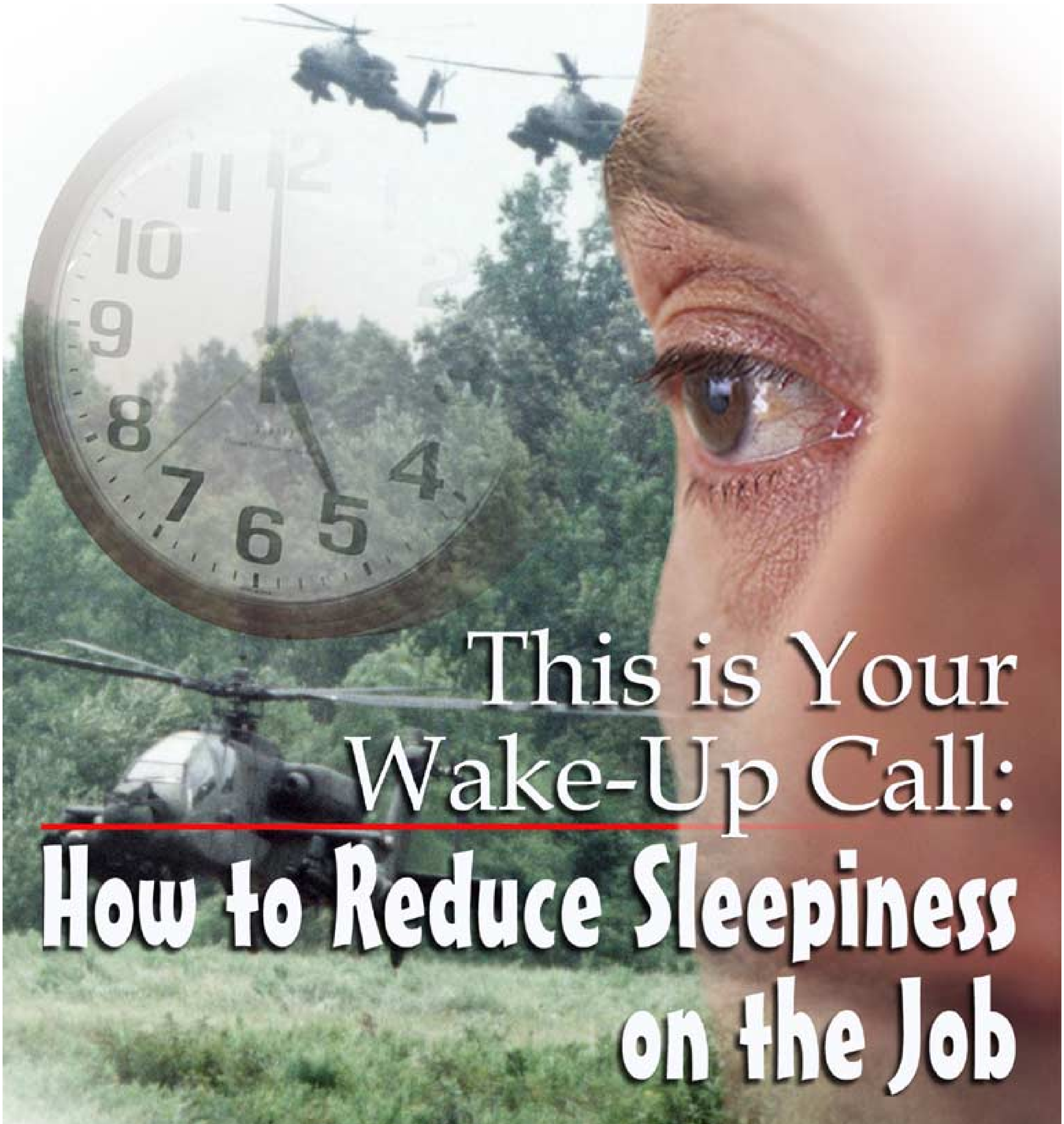
Gene M. LaCoste
Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

September 2000 ♦ VOL 28 ♦ NO 9

http://safety.army.mil



This is Your Wake-Up Call:
How to Reduce Sleepiness on the Job

Aviator fatigue is getting a lot of attention these days, largely because of the high-profile media coverage of recent accidents in the commercial sector. When 11 people, including the captain, died in the 1999 crash of American Airlines flight 1420, fatigue was one of the first possibilities that came to mind, in an effort to explain why an experienced pilot would try to land his MD-80 in Class Six thunderstorms. Although final determinations have yet to be made, pilot fatigue/sleepiness remains a primary candidate because both the pilot and copilot had been on duty for 13 straight hours prior to the mishap. This, combined with the other routine day-to-day stressors, may have impaired the judgment and reaction time of the crew so that safety was compromised.

Fatigue also has been identified as a factor in the 1997 crash of Korean Air flight 801 in Guam. In this case, the National Transportation Safety Board ruled that fatigue was a major contributor to the general confusion and impaired reactions of the pilot and crew which ultimately resulted in the deaths of 228 people. In fact, in the last few minutes of conversation on the recovered cockpit voice recorder, the captain himself said that he was "really . . . sleepy." In light of these types of reports, it is clear that fatigue can be very dangerous, at least in some situations. But, generally speaking, how big of a problem is it?

How can you tell?

Unfortunately, it is difficult to know exactly how many mishaps are the direct result of impaired alertness because there is no Breathalyzer for fatigue; however, there is mounting evidence that tiredness in the cockpit has reached alarming levels in the aviation sector.[1] A former NASA scientist recently indicated that as many as 70 percent of the commercial pilots he surveyed reported they had nodded off in the cockpit at some point.

This is a pretty scary thought, but it's not too hard to believe in light of the results from a recent survey of Army aviators conducted here at the U.S. Army Aeromedical Research Laboratory (USAARL.) Among the pilots who were asked, 44 percent answered Yes to the question: "In all the time you have been flying, have you ever dozed off while flying in the cockpit?" Furthermore, 82 percent said they believed that fatigue or lack of rest was a contributing factor to the increase in aviation accidents.

These results might lead us to question why pilots in particular are so tired, but the truth is that it's not just the pilots, but also a lot of other people in the U.S. In fact, a National Sleep Foundation survey of Americans revealed that 37 percent of adults felt they were so sleepy during the day that it interfered with their routine activities.[2] Almost 20 percent said they occasionally or frequently made errors at work due to sleepiness.

Disturbingly, this type of fatigue is not limited to the office, but affects the everyday commute between home and work as well. Estimates from the U.S. National Highway Traffic Safety Administration indicate that approximately 100,000 crashes and 1,500 fatalities each year involve driver drowsiness/fatigue[3], a finding which coincides with the National Sleep Foundation's discovery that 27 percent of drivers admit to have fallen asleep behind the wheel. The National Transportation Safety Board furthermore reports that fatigue is a probable cause in 57 percent of fatal-to-the-driver truck accidents.[4]

[1] Flying tired? Dateline NBC, www.msnbc.com/news/367099.asp, February, 2000.
[2] 1998 Omnibus Sleep In America Poll, National Sleep Foundation, March 1998.
[3] Don't drive drowsy: Fatigue can be just as lethal as drunk driving, Traffic Safety, July/August, pp 12-15, 1996.
[4] From laboratory to flightdeck: Promoting operational alertness, In Fatigue and duty limitations: An international review, The Royal Aeronautical Society, pp 7.1-7.14, 1997.

In view of these facts, it's no surprise that the fast pace of everyday life is producing serious sleepiness and fatigue that is creeping into everyone's leisure and work time. Fortunately, not everyone has to make the sorts of moment-to-moment critical decisions that are required of aviators. So, while fatigue is problematic throughout society, it can be catastrophic in aviation. The question is, what can we do to reduce the amount of on-the-job sleepiness among aviators on a daily basis?

What can we do about it?

The first thing is to determine whether or not sleepiness/fatigue is affecting your individual alertness and well-being. This may sound like a simple task, but it may take some serious effort to come up with an accurate answer. Ask yourself the following questions:

- On most days, do you have much difficulty waking up without the aid of an alarm clock?
- Do you repeatedly press the snooze button to catch a few extra minutes of sleep?
- Do you have to fight the temptation to take a nap during the day?
- Do you have trouble staying awake during meetings, while riding in a car, or while watching TV?
- Are you so sleepy at night that you're out within 5 minutes of your head hitting the pillow?
- Do you really look forward to the weekends just so you can catch up on sleep?
- When you have a day off, do you usually sleep more than 2 hours longer than normal?

If you answered Yes to the majority of these questions, it is pretty clear that you are suffering from sleep deprivation. So, what can you do about it?

There are many reasons that people don't sleep enough every night. Some of them are related to medical disorders, such as sleep apnea, which require a doctor's intervention. However, a great percentage of us don't get enough sleep—either because we deliberately shorten the sleep period for the sake of work, recreation, or family;[5] or because of a range of other problems including poor sleep habits.[6]

Inadequate sleep leads to poor and sometimes dangerous performance, especially in jobs like aviation.

You might belong to the first category (deliberate short sleepers) if you often set aside less than 8 hours for sleeping each night. If this is the case, you unfortunately have a lot of company since the average amount of sleep in the U.S. is only about 7 hours per night, and 3 out of every 10 Americans sleep less than 6.5 hours. Chronic sleep deprivation is difficult to avoid in a society that glorifies a strong work ethic to the extent that going without sleep is seen as a reflection of a real go-getter who is willing to sacrifice whatever it takes to get the job done.

However, in the long run, inadequate sleep leads to poor and sometimes dangerous performance, especially in jobs like aviation where small mistakes can lead to big problems. So, if you are one of these self-sleep-deprived people, cut it out! You need at least 8 hours to be your best. Plan your days accordingly, and remember there is no way to train yourself to get by on less sleep.

If you are sleepy on the job, but it's because you have trouble going to sleep or staying asleep even though you really try to get enough sack time every night, you are probably suffering from bad sleep habits. It is estimated that a high percentage of insomnia cases occur simply because people engage in behaviors that are contrary to sleep. So, if you are someone who tries to sleep but just can't, try the following:

- Establish a regular bedtime and waking time schedule, and stick to it, even on days off.
- Make sure your room is cool, dark, quiet, and comfortable.
- Do not engage in heavy exercise within 4 hours of bedtime.
- Avoid heavy meals within 3 hours of bedtime.
- Use the bedroom only

[5] 2000 Omnibus sleep in America poll, National Sleep Foundation, March, 1998.
[6] Relief from situational insomnia, Postgrad Medicine, volume 92, pp 157-170, 1992.

for sleep, and avoid working, watching TV, etc. in bed.

■ If you tend to worry, set aside an earlier time to list problems and actions to be dealt with the next day.

■ Try using simple relaxation techniques to reduce stress right before bedtime.

■ Place the alarm clock where you can't seek out the time every time you wake up.

■ Avoid caffeinated foods and drinks, and remember that some medications contain caffeine.

■ Avoid heavy alcohol consumption-it breaks up sleep in the second half of the night.

If you follow all of these recommendations, but find you're still having problems being as sharp as you should be, it's possible you may have an undetected sleep disorder. Such problems can be diagnosed by a sleep specialist who is trained to recognize and treat a wide range of sleeping difficulties. It's important to note that many sleep disorders are highly treatable, and the positive results can change your life. Not only will your energy levels improve, but also the change in your mood and performance will be amazing.

In summary, the key point is that adequate daily sleep is a physiological necessity like food and water, and there is no substitute. Eight solid hours of nightly sleep is the amount needed by the average person to be as alert as possible. Less than that leads to generalized fatigue which slows reaction time, decreases attention span, impairs crew coordination, and interferes with the ability of aviation and support personnel to get the job done. In fact, inadequate nightly sleep can produce micro lapses during which the brain of a fatigued person literally falls asleep for 4-5 seconds at a time without their knowledge. Just think, on the highway driving at 55 miles per hour, that's long enough to travel the length of a football field. That's quite a distance relative to how close your car is to telephone poles, bridge railings, and oncoming traffic. Imagine how that translates to the flight environment at 120 knots or more!

The Army has consistently emphasized training personnel on how to manage fatigue, and the AR 95-1 crew endurance guide is a clear effort to control fatigue risks both in peacetime and combat settings. However, fatigue management must be an individual as well as an institutional priority. It's going to take a team effort to eliminate this problem. Recognizing the dangers of sleepiness in the aircraft, flightline, hangar, and the maintenance bay, and taking the appropriate preventive and corrective actions will go a long way toward ensuring that aircrew safety is our first priority and Army aviation remains Above the Best. ✧

—John A. Caldwell, Ph.D., Director, Sustained Operations Research, U.S. Army Aeromedical Research Laboratory, 334-255-xxxx, DSN 558-6864, john.Caldwell@se.amedd.army.mil

Final Exam on Fatigue

Q. *What is the difference between fatigue and sleepiness?*

A. Fatigue and sleepiness are often considered to be the same. It is the state of tiredness due to prolonged work or insufficient sleep.

Q. *Why are the effects of fatigue underestimated?*

A. The effects of fatigue can be underestimated because, unlike alcohol, there is no breath analyzer for fatigue. Sleepy pilots are reluctant to admit they fell asleep on the job, especially if an accident resulted.

Q. *How big a problem is fatigue?*

A. Approximately 63 million Americans suffer from moderate or severe daytime sleepiness.

This adversely affects on-the-job concentration, decision-making, problem solving, and performance. Forty percent of adults say their sleep is inadequate. Many of the over 25 million shift workers in the US (including Army personnel) find it impossible to stay alert during their night jobs because of inadequate sleep during the day.

Q. *When is the worst time for fatigue?*

A. Alertness is greater during the day. Our biological rhythms are set to 24-hour cycles by exposure to daylight, knowledge of clock time, meal intervals, and activity schedules. Because of this, we feel sleepier at night, and don't perform as well as we do in the daytime.

Q. *What does fatigue cost?*

A. Fatigue costs 18 billion dollars in US industrial production every year. Fifty percent of aviation mishaps are caused by human error, and fatigue is thought to be directly responsible for many of these.

Q. *Can I train myself to need less sleep?*

A. No. Simple tasks can be made resistant to sleep loss by practicing them until they become automatic; but this will not work with tasks that require vigilance, thought, and/or judgment. Sleep deprived individuals perform poorly, but often are unaware of their level of impairment.

Q. *How can I improve my alertness on night flights?*

A. Avoiding fatigue during night flights is difficult. If there is no flexibility in establishing when a flight will take place, try the following strategies:

- Get plenty of sleep before the flight.
- If the flight is late in the day, or at night, take a 45-minute nap before takeoff.
- Avoid alcohol consumption within 24 hours prior to night flights.
- During the flight, swap tasks between pilot and co-pilot to minimize boredom.
- Consume caffeine immediately before and during the flight.
- Avoid hot refueling in favor of shutting down and walking around for a few minutes.
- Note that increasing radio volume and exposure to cold air do not fight off sleep.
- Remember that after being awake for a long time, you may involuntarily fall asleep, despite your best efforts.

Q. *What are some fatigue warning signals?*

A. When there is no choice but to fly when tired, be aware of these indicators that you are at serious risk for falling asleep:

- Eyes go in and out of focus.
- Head bobs involuntarily.
- Cannot stop yawning.
- Thoughts become wandering and disconnected.
- Cannot remember things you did.
- Navigation checkpoints are missed.
- Routine procedures are not performed.
- Control accuracy degrades

If you experience even one of these symptoms, the safest course of action is to end the flight as soon as possible and get some sleep.

ATTENTION AH-64 DRIVERS

Reminder—this ASAM—AH-64-97-ASAM-04— is still in effect

Aviation Safety Action Message, Maintenance Mandatory, All AH-64 Aircraft, inspection of number 2L stringer for AH-64 aircraft having accumulated 1750 or more flight hours.

SUMMARY OF PROBLEM

AH-64 aircraft having flown 1750 or more flight hours are susceptible to cracking of the number 2L stringer. Previous fatigue tests conducted in a laboratory on an AH-64A tailboom revealed cracking of the 2L stringer at the equivalent 1750 flight hours.

Unless a doubler reinforcement is applied or the slot area has been closed the aircraft must be inspected for cracks before each flight.

INSPECTION PROCEDURES

Inspect skin surface over the number 2L stringer area of the slot on the upper left side of the tailboom from fuselage station (FS) 409 – 476 before each flight. Concentrate on the skin surface over the number 2L stringer. Inspect for working rivets or skin cracking.

If skin cracking is found during the inspection inspect the number 2L stringer inside the fuselage.

■ Inspect the area of the stringer directly in line with the skin crack and the area 3 rivet rows forward and aft of the crack.

■ Perform a fluorescent penetrant inspection and use a 10X magnifier.

If stringer is cracked, aircraft is non-operational until stringer is replaced.

If no crack is found, proceed to step 3.

■ Perform AMCOM approved eddy current inspection.

If working rivets are found, inspect the corresponding hole area in the number 2L stringer inside the tailboom and check three adjacent fastener holes forward and aft.

■ Determine if the fastener can be moved by hand.

■ Use 10X magnifier to inspect for number 2L cracks.

If crack is found, aircraft is non-operational until stringer is replaced.

If no crack is found, continue inspection.

Contact Technical POC before removing and replacing loose fasteners and inspecting for cracks using eddy current probe. ✧

—CW5 Bill Ramsey, Aviation Investigation Division, USASC, DSN 588-2785 (334) 255-2785, ramseyw@safetycenter.army.mil

NCO Corner

2000 ALSE User's Conference set

The Aviation Life Support Equipment User's conference is scheduled for 19-21 September 2000 at the Rocket Auditorium, Redstone Arsenal, Huntsville AL. Commanders, ALSE officers and technicians, unit safety officers, and other interested personnel are invited to attend. There is no conference fee this year.

Duty uniform or Class B is the dress for the conference. Civilian attire is acceptable for the last day of the conference.

A block of rooms has been reserved at the Huntsville Hilton at Huntsville's per diem rate. Call (256) 533-1400 to make a room reservation, mentioning the conference to obtain the per diem rate.

For information on presentations or other conference items, contact Melanie Barksdale (256) 313-4269, Melanie.barksdale @ peoavn.redstone.army.mil or John Jolly (256) 313-4262, john.jolly@peoavn.redstone.army.mil.

CW2 Michael H. LaMee

During a routine medical evacuation from the Air Force Academy to University Hospital, Denver, CO, the UH-60 medical evacuation helicopter experienced decreasing rotor RPM. The aircraft was in straight and level flight at approximately 100 KIAS.

The co-pilot was on the controls when the event occurred. He immediately reduced collective to regain rotor RPM while CW2 LaMee, the pilot-in-command, focused his attention inside the aircraft to determine what was happening. CW2 LaMee noted that both engines were running and indicating “in the 500s” on TGT. This was a normal indication for TGTs at that current low power setting.

CW2 LaMee told the co-pilot that the engines appeared to be functioning normally. The co-pilot applied collective to arrest the descent, and the low rotor audio and light were again immediately activated. Simultaneously, the co-pilot entered an autorotation, while CW2 LaMee looked for a forced landing area. Continued flight was not possible because of decreasing rotor RPM.

CW2 LaMee chose the only unlit, uninhabited area, which was to their front left. When the landing light was used to illuminate the selected area, it was discovered to be a river filled with large boulders and other obstacles, both natural and man-made.

At this point, CW2 LaMee elected to land on the nearest road, which was an interstate carrying a large volume of vehicular traffic. Electing to cross over oncoming traffic to avoid landing head-on into interstate traffic, he brought the nose of the aircraft up to trade off airspeed for altitude, and collective was applied in an attempt to clear this traffic. The aircraft did not have sufficient altitude to clear the median between the northbound and southbound lanes. The tail wheel was torn from the aircraft as it crossed the interstate’s concrete barrier. Once across the median, as the aircraft was turned to the north to land with the flow of traffic, an enormous set of power lines loomed directly in the flight path. The nose was brought down and collective bottomed out to get under these wires.

The aircraft impacted the ground and skidded down the interstate. Full left pedal was applied to enable the crew to guide the damaged aircraft out of traffic and bring it to rest in the breakdown lane of the interstate. The accident investigation determined that the cause of the accident was Dual Engine Rollback.

The crew performed emergency shutdown, and egressed the aircraft after the blades stopped turning. Crewmembers then directed vehicle traffic around the aircraft, and the patient on board was transfered from the aircraft to an ambulance and transported to a nearby hospital.

Immediate decisions and actions by CW2 LaMee and the crew saved not only the lives of the crew and patient, but also the lives of untold numbers of civilians on the ground, both on the interstate and in the surrounding community.

CPT Kevin McGrath

During cruise flight over a remote training area in northern Wisconsin, the OH-58 crew experienced an engine malfunction. Initial indications of the malfunction were a change in engine noise, followed almost immediately by the Engine low RPM audio and light.

The IP immediately took the controls, lowering the collective to preserve rotor RPM. He then slowed the aircraft to 60 KIAS as it entered autorotation. The engine did not fail, but the N1 would not increase above 65 to 68%. The aircraft would not maintain level flight.

CPT McGrath then announced he had an engine underspeed and was making a forced landing on company FM. While on descent, he observed his chosen landing area was heavily wooded, very uneven terrain. At 100 feet AGL, he turned left to a level, flat area, covered with thick brush. Upon landing in the brushy area, smoke and fumes were observed and emergency shutdown was performed. The crew then egressed the aircraft. The aircraft settled upright and level on three mossy clumps in a rugged and remote swampy area of Northern Wisconsin. CPT McGrath's immediate and instinctive actions in response to this emergency situation over a densely forested, remote training area, ensured the safety of the crew without visible damage to the aircraft.✧

The Maintenance Test Pilot course

Do you have what it takes...?

Is the Maintenance Test Pilot Course in your future? Do you hope to attend the Instructor Pilot Course? Did you know there are requirements you must meet before you can attend these courses? Do you know what they are?

AR 95-1, available online at the U.S. Army Publishing Agency's Home page; www.usapa.army.mil, and the Army Training Requirements and Resources System (ATRRS); online at www.atrrs.army.mil, will let you know if you meet the prerequisites to attend the Maintenance Test Pilot Course or the Instructor Pilot Course. The prerequisites are:

Maintenance Test Pilot Course

■ 500 hours of pilot time in aircraft category.

■ 250 hours in the course aircraft type/design.

■ 50 hours as PC in the course aircraft type/design.

■ Current class II flight physical that will not expire during the course.

Instructor Pilot Course/Methods of Instruction

■ A letter of recommendation from your unit commander.

■ 500 hours of pilot time in aircraft category.

■ 250 hours in the course aircraft type/design.

■ 50 hours as PC in the course aircraft type/design.

■ 48 hours pilot time in the course aircraft type/design in the last six months.

■ 25 hours NVS in the last six months. (AH-64 only)

■ Performed pilot duties in the course aircraft in the last 180 days.

NVD qualified.
Assigned to, or on orders to, a unit with the course aircraft.
Current class II flight physical that will not expire during the course.

Getting a Waiver

Do you find yourself a bit short on the requirements? Don't worry. Some of the prerequisites may be waived. First, let's look at the ones that cannot be waived. For IPC/MOI the letter of recommendation is a must.

The same goes for the 500 hours in category. That requirement cannot be waived for IPC/MOI. The rest may be waived, depending on the aviator's total experience.

Having as many of the prerequisites as possible, however, would help your request for waiver. For instance, a 40-hour PC in the course aircraft has a better chance for favorable action on a waiver than an aviator with 20 hours PC time in the course aircraft.

Give yourself the best chance to start and finish the course. Get that time before requesting a waiver. Remember, these are not refresher courses.

If you are going to attend one of these courses in the future and need a waiver request for the course prerequisites, don't wait until you arrive at the school. You can contact the Aviation Training Brigade Standardization Office by e-mail. Just send a note to conversej@rucker.army.mil and ask for a waiver form. We'll send you one by e-mail that you can print and fax back to us. Then we'll process the paperwork, and let you know if you have what it takes before you arrive at Fort Rucker. ✧

—CW4 John H. Converse, Standardization Office, Aviation Training Brigade, DSN 558-3259 (334) 255-3259, conversej@rucker.army.mil

Motorcycle Safety

Roadmap to a Good Ride

There's a lot to be said for motorcycles. Motorcycles provide an economical means of transportation to and from work, and provide off-duty transportation and recreation as well.

When controlled by careless or inexperienced drivers, however, motorcycles can be lethal. In fact, the Army experienced 79 recordable motorcycle accidents involving soldiers in FY99. Of these 79 accidents, 21 Army personnel lost their lives.

These accidents and deaths should provide the impetus for leaders to stop and ask themselves three important questions:

■ Am I providing enough training for my soldiers? To answer this question, it is first necessary to reiterate the regulatory requirements for motorcycle riders. Paragraph 3-2a(2) of AR 385-55,[1] Prevention of Motor Vehicle Accidents, states the following: "Each driver of a military or privately owned motorcycle or moped who is authorized to operate on an Army installation will be required to complete an Army-approved motorcycle safety course. The course will consist of classroom instruction, hands-on training, and successful completion of a written evaluation." Many installations experience problems regarding training simply because they are unsure what constitutes "Army-approved." According to the U.S. Army Safety Center (USASC), the best motorcycle safety training program available today has been developed by the Motorcycle Safety Foundation (MSF), which is a nationally recognized organization and is Army-approved.

In fact, 31 state licensing agencies use one of four different MSF skill tests, 41 states use the MSF motorcycle operator's manual, and 29 states incorporate the supporting knowledge test. For more information on the Motorcycle Safety Foundation, check out their web site: http://msf-usa.org/pages/MAIN1.html or for the nearest rider course location, call (800) 446-9227.

■ Am I relaying POV accident data to my soldiers? As all of us within the safety community know, the primary purpose of accident investigation and reporting is to develop countermeasures to prevent similar accidents from occurring. Besides ensuring that soldiers understand and adhere to regulatory guidance regarding motorcycle safety requirements, leaders must also make every effort to share both Armywide and local POV accident experience with their soldiers. This can be done through safety council meetings, stand down days,

[1] In accordance with message DTG 131922ZJUN00, subject: Implementation Guidance for AR 385-55: Prevention of Motor Vehicle Accidents, section E 3.2 replaces section B-3 (Motorcycle Safety) of 385-55. The new section applies to anyone operating a motorcycle on any DOD installation. If you are stationed somewhere that does not have a helmet law you are still required to use PPE. Section E 3.2.9 states that failure to wear personal protective equipment or comply with licensing or operator training requirements may be considered in making line-of-duty determinations if the injury is from nonuse of PPE or noncompliance. The HSPG can be viewed or copied from our website http://safety.army.mil/.

safety alerts, unit formations, long holiday weekend briefings, and articles published in the installation newspaper. Armywide POV accident data can be obtained from the USASC web site at http://safety.army.mil. Local accident data is available to leaders from their installation safety office.

■ Am I enforcing AR 385-55 and local SOPs? Providing education to soldiers regarding proper equipment and safe riding techniques is extremely important; however, enforcement of the regulatory requirements may be the most critical element in reducing motorcycle accidents. Many installations ensure these requirements are met by integrating them into the local motor vehicle operator regulations that are enforced by the installation provost marshal. Enforcement of these requirements by installation military police and chain of command sends a clear message to soldiers that leadership will not tolerate violations and is concerned about the well-being of their soldiers.

In addition to the training requirements we have discussed, Appendix B of AR 385-55 specifies additional requirements for motorcyclists. These consist of the following:

■ Operators must be currently licensed to operate a motorcycle.

■ Motorcycles and mopeds must have headlights turned on at all times except where prohibited.

■ Soldiers must wear properly fastened DOT-approved helmets when operating a motorcycle or riding as a passenger.

■ Soldiers will wear eye protection (clear goggles/face shield).

■ Soldiers will wear appropriate clothing including long-sleeved shirt or jacket, long trousers, full-fingered gloves, leather boots or over-the-ankle shoes, and high-visibility garments (bright colored for day and retro reflective for night). ✧

—POC: Frank L. McClanahan, Senior Safety and Occupational Health Specialist, Aviation Branch Safety Office, Fort Rucker, AL, DSN 558-1027 (334-255-1027), mcclanahanf@rucker.army.mil

(Reprinted from Countermeasure.)

BLACK HAWK USERS, WE NEED YOUR HELP!!!

AMCOM is looking for input from Black Hawk users.

The following (pages 11 & 12) is a survey being conducted by AMCOM Engineering for the purpose of evaluating the H-60 usage spectrum. This spectrum is an important part of the safety of the aircraft.

The usage spectrum is a large part of the equation which calculates the retirement time of aircraft components. In general, over the years the operations of an aircraft change. This survey is being conducted to ensure that the current usage spectrum is still valid. This survey will also be used as a building block for future H-60 systems such as the UH-60L+ and UH-60X. Please have the Unit Commander or Operations Officer fill out this survey and return it to:

Commander
US Army AMCOM
AMSAM-RD-AE-F (Usage Spectrum Evaluation)
Redstone Arsenal, AL 35898
Or FAX to
Brad Huhlein (Usage Spectrum Evaluation) at DSN 897-4923 or Commercial (256) 313-4923

Each mission identified (A-H) in part 1 will require a separate part 2 sheet. Copy as necessary.

Please call Brad Huhlein with any question or comments at (203) 386-4975, e-mail bradley.huhlein@redstone.army.mil. Thank you for your help.

YOUR INPUT WILL MAKE A DIFFERENCE.

UH-60A/L USAGE SPECTRUM SURVEY
UNIT LEVEL DATA COLLECTION SHEET
Part I

Unit Designation: ______________________________

Location: ______________________________

Field Altitude: ______________________________
Alt. (ft. above Sea Level)

Number of Aircraft: ______________________________

Unit Flying Rate: ______________________________
Avg. Hours per Month

Date of Survey: ______________________________

Identify the missions flown by the Unit and distribute the total Unit flight hours into those missions. ATM Training/Practice shall be considered as a mission. For each mission you identify below please complete a Part II form.

MISSION	% of Flight Hours
A. ______________________________	________ %
B. ______________________________	________ %
C. ______________________________	________ %
D. ______________________________	________ %
E. ______________________________	________ %
F. ______________________________	________ %
G. ______________________________	________ %
H. ______________________________	________ %
Must Total to 100% **TOTAL**	________ **%**

UH-60A/L USAGE SPECTRUM SURVEY
UNIT LEVEL DATA COLLECTION SHEET
Part II

Mission: ____ (Letter)   Mission Duration: ______________

Takeoff Gross Weight: __________ lbs

Takeoff C.G.: __________ inches

Takeoff Configuration – Check the applicable item(s):

❑ Slick
❑ Volcano
❑ External Sling Load
❑ Wings – ESSS
❑ Robertson Internal Fuel Tank
❑ Internal Rescue Hoist
❑ Aeromedical Kit

If Wings (ESSS) box is checked, complete the following configuration options:

Outboard Pylon

❑ Nothing
❑ 230 Gallon Tank

Inboard Pylon

❑ Nothing
❑ 230 Gallon Tank
❑ 450 Gallon Tank

VFR Flight Plan Closure

The FAA has identified a growing trend of military aviators failing to properly close out VFR flight plans. This oversight applies to all branches of the Armed Forces. However, the highest percentage of VFR flight plans not being closed come from Army and Marine aviators since they file most of the VFR flight plans. Let's do our part as Army Aviators to ensure we are not part of the problem.

AR 95-1, paragraph 5-2d, is our mandate to file flight plans (or be on an operator's log for local flights) for all flights. We do a good job of filing and opening the flight plan, but remember, the process in not complete until the flight plan is closed. AR 95-1, paragraph 5-5e, addresses this by placing the onus on the pilot-in-command to "ensure the flight plan is closed as shown in the DOD flip." For those of you who like references, read paragraph 5-31 of the GP. This paragraph cites three examples to ensure your flight plan is properly closed. The Aeronautical Information Manual (AIM) is another good reference to put out at your next Pilot's Call. Paragraph 5-1-4 in the AIM defines VFR flight plans and how they benefit the user. Pay particular attention to 5-1-4g. Using VFR position reports will more clearly define the search area in the event a Search and Rescue (SAR) mission is required. (If you're flying from A to C and your last VFR position report was made at B, the search area can now be focused from B to C.) This may be beneficial during a long cross-country flight. AR 95-1 no longer requires us to make hourly position reports during VFR flights, but it is still good practice.

So why do we still have the problem of VFR flight plans not being closed?

■ Military pilots are not in the habit of personally opening and closing VFR flight plans when departing or arriving at military airfields. This service is automatically provided by Base Operations. This becomes a negative habit transfer problem when we depart to or from a civilian airfield. Remember, this automatic service does not exist when departing/arriving at a civilian airfield or when military base operations are closed.

■ Tail numbers are not provided with tactical call signs of flight plans. This is generally not an Army issue. However, if you are using tactical call signs on a flight plan, remember to provide the tail number(s) of the aircraft. All Army aircraft tend to look alike during a ramp search without a tail number to distinguish them!

■ Incorrect identifiers are used for the departure and/or destination airport. This will cause incorrect routing of the flight plan. Attention to detail!

■ Multi-aircraft flights are not properly re-filing after breaking into individual flights. The former chalk 2 closes the flight plan under their tail number. This leaves the original flight plan unanswered.

■ Flight routes are changed without updates to the originally filed flight plan. The aircraft does not arrive at the expected airfield and SAR procedures are initiated.

■ Military Base Operations are not properly closing flight plans with the FSS. This is not the aviator's fault, but do yourself a favor and get the operations specialist's initials when landing at a military field. Do not do this as a "blame line", but rather to identify and fix a problem within base operation's procedures.

This list illustrates some of the common reasons for a flight plan not getting closed out. It is not posted as an excuse for the aviator. It is a reminder of some common problems happening within our own operations. Make sure your flight does not fall victim to one of these areas. It's your responsibility as a pilot to close out your flight.

What are the consequences of failing to close out a VFR flight plan?

A VFR flight plan is protection. There is no FAA requirement to file a VFR flight plan. The FAA views a flight plan's primary purpose as a means to initiate a SAR operation should it become necessary. In addition to a SAR tool, the military uses a flight plan as an announcement of your arrival at another military base. This allows landing rights, departure rights and helps avoid any embarrassing or uneasy moments at a military airfield. All this happens automatically without our having to open or close the flight plan. But remember what AR 95-1 says: It is the Pilot-in-Command's responsibility to ensure the flight plan is closed.

If we forget to close a flight plan, the FSS assumes it is overdue and begins the SAR process 30 minutes after ETA and communications or location cannot be established. A communications search alone could involve up to 20 to 40 airfields in the area. If these airfields are closed, the search may fall on local and/or county law enforcement agencies.

This is a large amount of manpower being diverted for an unnecessary operation or being displaced should an actual SAR be needed elsewhere. The FAA will always ensure that potential downed aircraft are found in a timely and efficient manner through the use of established SAR procedures.

We don't need to dilute the urgency of these operations through an ongoing "boy who cried wolf" syndrome. (To better understand SAR procedures, read section 6-2-7 of the AIM. Pay particular attention to sections f and g.) Flight Service Stations are not immune to mistakes either. If you feel that you followed the correct procedures and the failure was at the FSS, contact your Department of the Army Regional Representative (DARR). Your DARR should be used to maintain a productive and open line of communication between the unit and the FSS or FAA. The DARR can help resolve conflict. Your DARR is a great source of information regarding interaction between the military and the FAA.

They can help you coordinate with FSS managers for tours or discussion and provide FAA support to base operations regarding training, procedures, discussion, etc… The bottom line is that we need to be professional and thorough in all aspects of our operations.

Military and civilian aircraft are sharing the same airspace and both must do their part to make the system work smoothly. The next time you're closing out the logbook ask yourself if you closed the flight plan too. Use the crew level AAR as a tool to ensure the mission is complete. As the old saying goes, "the job's not finished till the paperwork is done". ✧

—CW3 Steven W. Woodfint, Utility Division, Directorate of Evaluation and Standardization, DSN 558-1748, (334) 255-1748, e-mail woodfints@rucker.army.mil

Army Safety Conference set

The Army Safety and Occupational health Conference and training seminars will be held at the Opryland hotel, Nashville TN, September 25-29, 2000. This year's theme is "You make a difference". The intent of the meeting is to inform, train, and motivate personnel responsible for implementing the Army Safety Program, to include Commanders, operating personnel, and military and civilian safety professionals.

Details are available on the website of the conference manager http://www.ncsievents.com. Conference attendees must make their own lodging arrangements. Information is available on the website.

—James Gibson, Office of the Director of Army Safety, DSN 329-2409 (703) 601-2409

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64

Class C

A series

■ During pre-flight inspection, damage was found to one tail rotor blade and the stabilator. Damage resulted from a Camloc fastener retainer off the 90 degree gearbox fairing. Suspect retainer separated during flight, hit tail rotor blade and was deflected into the stabilator.

■ While in cruise flight at 200′ AGL, a bird flew into aircraft's main rotor system. Aircraft landed without further incident.

■ During engine run-up, #4 drive shaft twisted, severing forward of the #1 anti-flail assembly.

■ While aircraft was making a shallow approach to roll-on landing, tail wheel struck a concrete bunker and broke off.

D series

■ Bird struck right engine nacelle during flight. Aircraft landed without further incident.

Class E

A series

■ While at a hover, crew noted a strong fuel odor in the cockpit. Crew landed the aircraft and shut down the engines. Postflight inspection found fuel dripping from No.2 engine nacelle and down the side of the aircraft. Further inspection found fuel pooled in the catwalk area and both engine nacelles. Maintenance personnel replaced the APU fuel control, solenoid, fuel line and fitting.

■ During blade track and balance (ground run-up only) MP heard unusual noise from the transmission area. Aircraft was shut down with no further incident. Inspection revealed that the forward tail rotor hanger bearing was damaged beyond repair and did not have any grease in it. Maintenance replaced the tail rotor hanger bearing.

■ Aircraft was in cruise configuration on a night PNVS mission when a TADS Electronic Unit failure was experienced. Aircraft returned to field site and landed without further incident. The power to the TADS was recycled and unit operated normally.

■ Aircraft was in hot refuel when POL personnel ceased the refueling operation due to a clogged fuel hose. Refuel hose was clogged with a fibrous foreign material. Aircraft was shutdown, defueled and fuel filters changed with no evidence of contamination.

D series

■ During APU operations, the aircraft's main rotor blades started to spin and accelerate. Crew immediately shutdown the APU. After the blades stopped spinning, crew attempted another APU start with the same results. Suspected internal transmission clutch failure.

CH47

Class C

D series

■ During landing, aircraft rolled back and struck a boulder, resulting in sheet metal and antenna damage.

■ A rotor overspeed of 117% occurred during No. 2 engine HIT check.

■ Left aft landing gear drag brace snapped during landing, resulting in sheet metal damage to lower ramp.

■ During water bucket training, the "Bambi" water bucket was damaged when it was inadvertently dropped from 50′ AGL.

Class D

D series

■ During run-up (APU Start) a loud noise was heard from the APU area and a shudder was felt throughout the aircraft. Three attempts were made to start the APU with the same results each time. Maintenance was notified and a new APU hydraulic motor/pump was installed.

■ Prior to engine runup, crew heard loud bang from APU. APU then could not be started.

OH58

Class C

A series

■ During landing to a tactical field site, aircraft sustained damage to tail rotor blades and tail rotor assembly.

■ During simulated engine failure at altitude, the throttle was advanced to the full open position and aircraft was decelerated at 50′ AGL. The N2 and NR needles split and the NR oversped to 115% for approximately one second.

C series

■ While on the ground, engines running, transmission oil light illuminated. Aircraft was shutdown without further incident. Replaced transmission oil pressure switch.

UH60

Class C

A series

■ During post flight inspection, two main rotor blade tip caps were found to be damaged. Tree strike was suspected. Blade tip caps were replaced.

Class D

L series

■ During the fourth of six class V sling loads, cargo net separated from the sling leg, which remained attached to the cargo hook. The load impacted in an unoccupied wooded area. There was no damage to the aircraft. Inspection of the sling leg indicated no damage to the grabhook assembly other than the keeper was missing. Link failure was ruled out. Improper rigging by inverting the grabhook is suspected.

Class E

A series

■ During run-up, stabilator auto mode failed during hydraulic leak test. Aircraft was shut down without further incident. Hydraulic back-up pump replaced.

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.

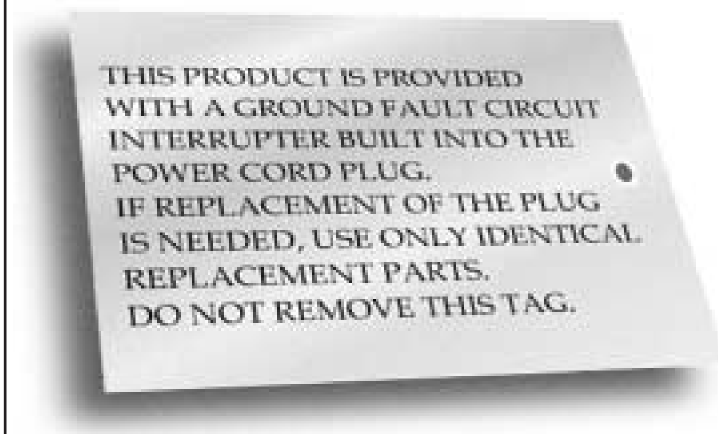
Steam cleaners need GFCI

URGENT: Death, serious injury, or damage to Army equipment will occur if actions specified in this message are not implemented.

If you have a combination pressure washer and steam-cleaner around the hangar, you could be risking serious injury. These machines are electrically operated, and burn diesel fuel to obtain the high temperatures and pressures required for cleaning. Many of these machines lack ground fault circuit interrupter (GFCI) protection features. Because of the wet conditions surrounding the items being cleaned and the lack of GFCI protection, electrical shock and possible electrocution of the operator could result.

The Tank Automotive command has issued an urgent safety-of-use message (SOUM TACOM-00-016) mandating the use of a ground fault circuit interrupter with all pressure washers rated 250 volts AC and less.

The GFCI fix can be accomplished by either connecting the steam cleaner power plug into a power supply outlet with a GFCI protection system certified by a licensed electrician, or by connecting the steam cleaner to an electric supply cord with a built-in GFCI. Attach a tag plainly and permanently marked:



Contact your TACOM Logistics Assistance Representative with any questions about this message. ✧

—SOUM TACOM-00-016

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POV Fatalities

through 31 July

FY00	87
FY99	106
3-yr Avg	93

U.S. ARMY SAFETY CENTER

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Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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http://safety.army.mil

CH-47 Spotlight: A look at current and future issues

CH-47: A look at current issues

Control stiffness binding during flight-control check

The CH-47 fleet at Fort Rucker was administratively grounded for 3 weeks this past year due to control stiffness/binding that was experienced during maintenance test flight checks prior to engine start. The test pilot was conducting the flight controls check, in accordance with the maintenance test flight manual, when the stiffness and binding was encountered. The flight controls checks were repeated on different aircraft, and the stiffness/binding could be replicated on those aircraft. After an exhaustive investigation by the Safety Center, Boeing, and the Program Manager's office, it was determined that the stiffness/binding was a design characteristic of the actuator and that the aircraft were safe to fly. The Fort Rucker fleet was returned to service, and revisions to the maintenance manuals are being developed.

Uncommanded flight-control inputs: This is an ongoing issue within the community that has yet to be resolved. Investigations have been conducted, but none have turned up conclusive evidence of the cause of any of the reported incidents. ASAM CH-47-97-ASAM-01 (151327Z Oct 97) and CH-47-99-ASAM-02 (161228Z Feb 99) have been issued to address suspected causes, and to ensure the proper operation of the aircraft systems. Units should comply with the published messages, and conduct all maintenance procedures by the book. If any flight control anomalies are experienced they should be documented thoroughly and reported through unit safety and maintenance channels.

Hydraulic System purification: Historically the CH-47 flight control systems have never been serviced or the filters changed unless there was a maintenance problem requiring action. The fact that the systems were never serviced was highlighted during the investigations that tried to determine the cause of the uncommanded flight-control inputs reported from the field. CH-47-99-ASAM-02 (161228Z Feb 99) requires the purification of all aircraft flight and utility systems, and CH-47-00-ASAM-03 (012043Z Jun 00) details the sampling and reporting procedures. This purification and reporting is designed to: remove contaminantes (water, particulates, air, solvents), improve system performance, extend fluid life, and establish a baseline for future investigations.

In-flight operations with the cargo-loading ramp down: The CH-47 cargo loading ramp is an integral part of the fuselage structure, and consequently should be in the full up position during flight. Mission profiles requiring the ramp to be in other than the full up position during flight are acceptable, but those times are the exception rather than the rule. When the ramp is down, it should be for the accomplishment of a specific task or mission, and then the ramp should be returned to full up position upon completion of the task. Possible mission profiles include but are not limited to: paradrops, SOF insertion/extraction techniques, internal load operations, emergencies, and safety considerations. Maintaining the ramp in the full up position during flight will improve the structural integrity of the aircraft and reduce the possibility of ramp/fuselage damage during an emergency landing sequence. ✧

—*CW5 Noel C. Seale, Chief, Cargo Branch, Directorate of Evaluation and Testing. DSN 558-3475,(334) 255-3475*

A look at the numbers

FY 99 was a good year for the Chinook community. Even though we had one Class A accident, we had no fatalities for the third year in a row. The CH-47 fleet had one Class B, ten Class C, six Class D, and 177 Class E mishaps. Damage cost totaled $4,303,134.

Table 1. CH-47 Accident Incident Experience

FY	A	B	C	D	E	Fatalities	Total Cost
95	2	0	7	8	218	6	18,968,929
96	2	0	15	9	192	5	36,149,831
97	1	3	11	3	181	0	13,936,699
98	0	2	17	3	121	0	1,790,405
99	1	1	10	6	177	0	4,303,134
Total	6	6	60	29	889	11	75,148,998

Chinook publications update

TC 1-210 (TC 1-200)	Commanders Guide	Currently under revision
TC 1-216 (TC 1-240)	Aircrew Training Manual	Currently under revision
TM 55-1520-240-10	Operators manual	Current with change 14
TM 55-1520-240-CL	Operator/Crewmember Checklist	Current with change 11
TM 55-1520-240-PMD	Preventative Maintenance Daily	Current with change 14
TM 55-1520-240-MTF	Maintenance Test flight manual	Current with change 25
TM 55-1520-240-PM	Phased Maintenance Checklist	Current with change 17
TM 55-1520-240-23-1	Maintenance manual	Current with change 71
TM 55-1520-240-23-2	Maintenance manual	Current with change 26
TM 55-1520-240-23-3	Maintenance manual	Current with change 19
TM 55-1520-240-23-4	Maintenance manual	Current with change 40
TM 55-1520-240-23-5	Maintenance manual	Current with change 33
TM 55-1520-240-23-6	Maintenance manual	Current with change 25
TM 55-1520-240-23-7	Maintenance manual	Current with change 22
TM 55-1520-240-23-8	Maintenance manual	Current with change 17
TM 55-1520-240-23-9	Maintenance manual	Current with change 25
TM 55-1520-240-23-10	Maintenance manual	Current with change 21
TM 55-1520-240-23P-1	Parts manual	Current with change 14
TM 55-1520-240-23P-2	Parts manual	Current with change 16
TM 55-1520-240-23P-3	Parts manual	Current with change 12
TM 55-1520-240-23P-4	Parts manual	Current with change 06

DES observations

General

During recent DES unit assessments most units performed well overall, but training and administrative weaknesses were noted as detailed below. OPTEMPO and PERSTEMPO were up across the board, but the units were motivated and generally the commands were supportive of the crewmembers and the rigors of the mission load.

Aircrew Coordination Training (ACT)

TC 1-210 requires all crewmembers to have ACT completed prior to progression to RL 1, and for the training to be documented on the DA Form 759 and the DA Form 7122. If the training was documented prior to the initiation of the new ATP forms, a red informational entry can be made on the DA Form 7122 indicating the training with no entries for flight time and no remarks. IERW Class 95-07 and subsequent ones are ACT qualified during IERW training and should have the entry "ACT qualified" on their DA Form 759. If the training was completed after the initiation of the new ATP forms then all entries per the TC 1-210 are required. Crewmembers that conducted the training should have documentation on the DA Form 759 or DA Form 7122 indicating that they are ACT trainers. Units also need to develop and implement a written ACT sustainment-training program through the ATP.

Evaluation versus Training

If the mission is an evaluation and it was incomplete, unsatisfactory, or satisfactory then it should be documented as such. Some missions start out as evaluations, but if the crewmembers performance is not up to standard then the mission becomes training. This practice degrades the standardization program in the unit, and reinforces the lack of everyday preparedness of the crewmembers. If additional training is required, then propose a training strategy, complete a DA Form 4507 to document the training and administer a re-evaluation after the training is completed.

Evaluator documentation

TC 1-210 requires the documentation of all evaluations on the DA Form 7122, but allows the recorder to be someone other than the evaluator. Units are recording evaluations but the person making the entry does not have the qualifications to conduct the evaluation and there are no remarks listing the evaluator. DES recommends that if the person making the entry was not the evaluator then a remark should be made indicating the evaluator's last name, first initial, rank, and qualifications.

Rated Crewmembers (RCM)

Instruments: Aviators are not confident/ proficient in instrument flying, and inadvertent IMC training is not a hands-on event. Most units are so mission-focused that instrument training is not a priority, and as a result of this focus, aviators are losing their proficiency in instrument tasks. Flying instruments in the national airspace system is the only way to gain and maintain true instrument proficiency—simulator training is beneficial but it is no substitute. Instrument flying should be included in the no-notice program.

Equipment: Based on the mission, aviators are not utilizing all of the systems on board the aircraft for every flight. For missions in the local area, the Aircraft Survivability Equipment (ASE) is rarely used, and at times the navigation equipment is not powered up. Aircrews should power up and check all aircraft equipment during the run-up, and then disable or turn off the equipment that is not needed. Although the equipment is not needed for the accomplishment of the mission, its routine use will ensure proper system operation and improve operator proficiency.

SFTS Instrument Evaluations; AR 95-1 requires the annual Instrument Flight Evaluation to be conducted in the aircraft. With the commander's approval, and if certain conditions exist, the evaluation may be conducted in a compatible simulator. DA Form 7122 entries indicate that instrument evaluations are being conducted in the simulator, but there is no record of the commander's approval. DES recommends a remark on the DA Form 7122 stating the commander's approval to conduct the evaluation in the simulator.

Heads Up Display (HUD): The majority of units visited have the aircraft modified for HUD, and they also have the Display Units (DU) available. The aviators that fly with the system are in the minority, and for the most part no more than 4 qualified pilots have been verified in any unit. Unless a training program is developed and implemented, the current trainers will PCS leaving a unit with equipment and no way to qualify aviators in its use. Units should develop an SOP and training program for implementation during NVG RL 2 training. Once aircrews become comfortable with the system, its operation and use will become routine.

Simulator training: Units are utilizing the simulator, but not utilizing the device to its full potential. The simulator training should be designed to complement the ATP, and not just be seen as a requirement. Console operators should instill the mentality that flying the simulator is just like flying the aircraft from mission briefing to mission de-brief. Aviators should understand that the simulator is where they internalize proper reactions to emergencies, and where they learn to react to threats using aircraft survivability equipment and terrain flight techniques. The simulator is where the trainers can observe crew coordination of unit aircrews.

Non-rated crewmembers (NCM)

Academic training: Units are not scheduling or conducting aviation specific NCM academic training. CTT is regularly scheduled, but generally there is no emphasis on the improvement and sustainment of aviation skills and knowledge. NCMs should be scheduled for aviation-specific classes on a weekly basis, and the training should be attended by the NCO chain of command. If the RCMs are receiving academic training required by the NCMs, then the NCMs should be included in that training. When the RCM training is not applicable to the NCM, then training should be scheduled concentrating on NCM task.

Fundamentals of Instruction (FOI): Flight Engineers (FE) conduct most of the training in Chinook units and receive no training in the fundamentals of instruction. Flight Instructors (FI) and Standardization Instructors (SI) received initial training but no sustainment FOI training. The NCM academic schedule should include training on FOI conducted by a unit Instructor Pilot for unit FEs, FIs, and SIs. ✧

The future of the Chinook

Extended Range Fuel System II (ERFS II)

The ERFS II upgrade uses the Guardian fuel system manufactured by Robertson. The tanks are crashworthy, self-sealing, ballistically tolerant and provide a 25-inch aisle for ease of movement. Each tank has a capacity of 800 gallons and the aircraft can be equipped with up to 3 tanks and Forward Area Refueling Equipment (FARE). An improved fuel control panel allows single point pressure refueling of the tanks simultaneously with the aircraft main tanks, and provides a quantity gauge that can monitor each tank individually or all tanks.

The system provides the capability of

dispensing 2,400 gallons of fuel within a 150 NM radius of action or a self-deployment range of 1,100 NM. Fielding of the system is currently underway.

T55-GA-714A: The 714A engine upgrade program is designed to buy-back the performance lost due to aircraft weight growth. The engine produces 21% more hot-day shaft horsepower, has specific fuel consumption reduced by 5%, and has improved engine corrosion protection. The engine incorporates a Full Authority Digital Electronic Control (FADEC) that automatically prevents the engine from exceeding any of its operating limits. Reliability improvements include improved: torque meter, compressor, combustor, starter drive bearing, oil pump, and oil filter. Fielding is currently underway and scheduled to be completed in FY 07.

CH-47F

The CH-47F is a service life extension program designed to enable the CH-47 aircraft to bridge the gap to the Joint Transport Rotorcraft (JTR). The service life extension is achieved by a complete airframe rebuild, which restores the airframe as near as possible to its original life expectancy.

This airframe rebuild also includes improved vibration reduction technology, improved corrosion protection, and a low maintenance rotor head. These improvements will lead to reduced operating and support cost as well as increased fleet readiness. Enhances to air transportability reduced the man hours/total hours required for disassembly/reassembly from the 115.6 MH/15.15HR on the CH-47D to 47.8MH/5.2HR on the CH-47F. Additional improvements include: Extended Range Fuel system II (ERFS II), T55-GA-714A engine, and a digital cockpit that makes the aircraft force XXI compatible. The first delivery is scheduled for May 2003. ✧

—*CW5 Noel Seale, Chief, Cargo Branch, DES*

Paving a path to the future

With the recent release of the new Army Aviation Modernization Plan, we, the material developers, have a clear understanding of our customers' future needs. This plan is consistent with the vision provided by our Program Executive Officer, Aviation, Major General James R. Snider, directing our design and sustainment efforts on the four aviation platforms—Comanche, Apache, Black Hawk, and Chinook—while laying the ground work for the eventual development and fielding of the Future Transport Rotorcraft (FTR).

Within the Cargo Helicopters Project Office we have created a product-oriented organization, as opposed to the traditional functional organizations. We seek to sustain the current fleet, extend the service life of the aging aircraft, and apply needed upgrades to ensure maintainability and battlefield compatibility.

Modernization Programs

The office is evolving a philosophy of managing cargo helicopters as a "system-level" team, re-engineering the way we accomplish life-cycle management.

The first step in this process is to establish an aircraft system baseline for the fielded fleet that captures and defines what the true costs and cost drivers are to operate the CH-47 worldwide. Once the baseline is established, we must have a data-management system that will feed our newly formed customer service and fleet-management cells, enabling us to provide soldiers all the needed logistical elements based on the ever-changing operational tempo (OPTEMPO).

As we continue our efforts to baseline and manage the fleet, we have also embarked on a path to upgrade the fielded fleet through minor modification programs, culminating in the CH-47F Improved Cargo Helicopter Service Life Extension Program (SLEP). One of our larger modification efforts is the procurement of the T55-GA-714A engine, which affords a 27 percent increase in power, with a reduced specific fuel consumption of 5 percent. This much needed upgrade will be applied to all CH-47s and will begin fielding this year.

In addition, the development and procurement of the Extended Range Fuel System (ERFS) finally gives our soldiers a crashworthy internal fuel system that either extends their range or enables them to conduct FAT COW (refueling) operations for other aircraft or forward-deployed ground systems.

Beginning this year, all CH-47s will be modified to accept ERFS, with two complete systems fielded per platoon.

And in our continuing effort to reduce the operations and support costs of the aircraft, the Low Maintenance Rotor Head program seeks to replace the oil-lubricated hubs with an improved hub using "dry-film" bearings. This effort is a combined initiative with our partners from the United Kingdom. The program kicked off last year, and is well on the way to a 60 percent reduction in parts and a six-fold decrease in material costs.

Bridging the Gap

The CH-47 Improved Cargo Helicopter is the aircraft that will bridge the gap to the Future Transport Rotorcraft (FTR). Three hundred CH-47Ds were earmarked for the upgrade to extend their service lives until the FTR is available. The Army recognized that to extend the Chinook's service life an additional 20 years would require a detailed re-manufacturing program, additional improvements to reduce operations and support costs, and a digital cockpit upgrade to ensure compatibility with the Army's digitization initiatives. The program was formulated based on the success of the CH-47D upgrade, the planned application of demonstrated new technologies, and incorporation and improvement of existing cockpit modifications from our special operations aircraft.

The remanufacturing effort is designed to restore the CH-47 airframe as near as possible to the original life expectancy of 20 years. There is a significant difference between an overhaul that returns an aircraft to service and a re-manufacture program that actually extends the aircraft's service life. Having the airframe re-manufactured is a prime opportunity to apply cost-effective improvements to enhance performance or reduce the maintenance burden.

Attacking problems

Corrosion continues to be a problem in the floors of our Chinooks. The Army-Boeing team has selected a new bilge paint that is flexible enough to accommodate the flexing of the airframe. Additionally, while reviewing the design, the team sought to reduce the time it takes to dismantle the aircraft for shipment aboard Air Force aircraft. To make a long story short, the team developed a kit—which will be applied to all CH-47Fs—that will enjoy a 58 percent man-hour reduction and a 65 percent time reduction to disassemble and assemble the aircraft. This kit was applied to Bearcat 3, our test aircraft at the Aviation Technical Test Center (ATTC), and these times were demonstrated.

One of the key cost-reduction initiatives on the CH-47F is to improve subsystem reliability and reduce airframe cracking through airframe tuning. Airframe tuning involves changing the natural frequencies of the airframe, reducing vibration and reducing responses to rotor forces. To demonstrate the potential benefit, the Army and Boeing entered into a cooperative research-and-development agreement, applying the modification to Bearcat 3. The aircraft demonstrated significant vibration reduction throughout, approaching an 80 percent reduction in one area.

Cockpit Digitization

The Chinook cockpit-digitization effort is designed to provide the crew with improved situational awareness and enhance their survivability. The newly designed cockpit will incorporate a 1553 data bus with a modular, open architecture that ensures growth potential. The cockpit incorporates the Harris digital map into the Rockwell-Collins electronic flight instrument system coupled with smart multi function displays. Since we are using existing equipment in the cockpit, the challenge here is software. There are software integration labs operating at both Rockwell and Boeing. Software drops one and two were delivered by Rockwell-Collins on time. Thus far, no major software trouble reports have been generated. Cockpit development is on schedule.

The Workhorse of the Army

As you can see, the future of cargo helicopters is bright. We have a team that is focused on providing a combat multiplier that is interoperable, versatile, deployable, survivable and sustainable.

From Vietnam to Kosovo, the CH-47 has been the Army's workhorse. It brings to every Army contingency a unique capability that is inherently flexible to meet the soldier's requirements.

However, if the system is not sustainable, it becomes a burden. We believe that our initiatives and programs to assist our soldiers with the maintenance, sustainment and upgrade of this aircraft will ensure that this true battlefield enabler will be there to ensure full spectrum dominance. ✧

—James Caudle, Project Manager, Cargo Helicopters, Aviation and Missile Command, Redstone Arsenal, AL 35898, DSN 897-3397 (256) 313-3397, james.caudle@ peoavn.redstone.army.mil

(Adapted courtesy of Army Aviation Magazine)

Website resources for Cargo aircraft

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

DES Official Cargo website
http://www-rucker.army.mil/des/cargo.htm

Cargo helicopter project management office
http://www.Chinook.redstone.army.mil

AMCOM Aviation safety messages
http://www.redstone.army.mil/sof

US Army Night Vision Goggle (NVG) Branch
http://www-rucker.army.mil/atb/nvd/nvdb.htm

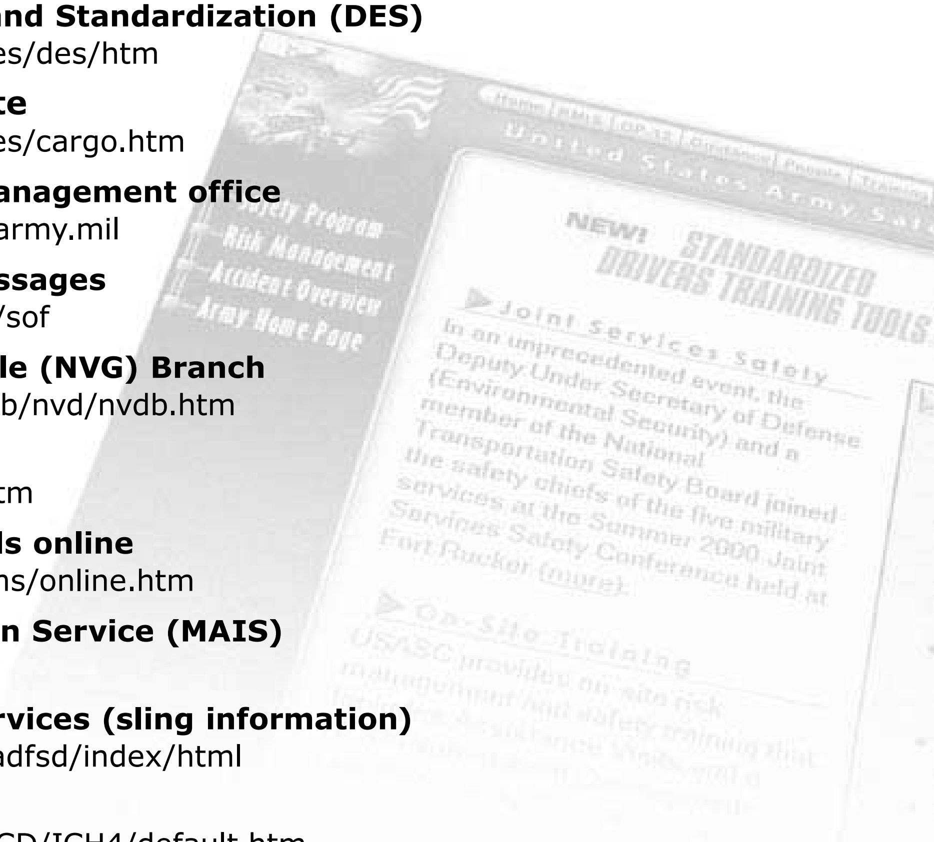
US Army Safety Center
http://safety.army.mil/home.htm

Electronic technical manuals online
http://www.logsa.army.mil/etms/online.htm

Military Aircrew Information Service (MAIS)
www.mail.afwa.af.mil

Aerial delivery and field services (sling information)
www.quartermaster.army.mil/adfsd/index/html

CH-47 user home page
http://www-rucker.army.mil/DCD/ICH4/default.htm



Corpus Christi Army Depot Bearings Shop keeps helicopter fleets flying

"If we had not been here, the Chinooks and Apaches would not be flying today," said CCAD Bearing Shop supervisor, Manuel Torres, during a tour of his unique facility. He was talking about the grounding of both the CH-47 Chinook and AH-64 Apache Attack Helicopter fleets in the past year due to flawed transmissions.

Part of that work was the replacement, inspection, and repair of the CH-47 first & second stage planetary gear bearing assemblies, and the AH-64 transmission bearings, sprag-clutches, and hanger bearings.

Hundreds of forward and aft transmissions from the big twin engine Chinook, and hundreds more transmissions and hanger bearing assemblies from the Apaches, have had to be checked and, when necessary, fixed at the Army Depot, since Fall 99.

The Bearing Section processed and restored to serviceable status over 3,300 first and second stage planetary gear bearing assemblies for the CH-47 Safety of Flight (SOF) program. This was quite an accomplishment as the shop normally processes only 100 each of the first and second stage planetary gear bearing assemblies on an annual basis. The bulk of these gear bearing assemblies were turned around within one work shift. "My folks did a terrific job; but we also had super support from Tom Long's and Frank Munoz's Non Destructive Testing (NDT) shops. They performed the 200 percent NDT inspection requirement on the gears," Torres said. The section also processed over 700 sprag-clutches and reclaimed over 2,500 critical transmission and hanger bearings for the AH-64 SOF programs during this same period.

The Bearing Section is the only facility of its kind in the US Army. It is also only one of three within the Department of Defense that are authorized to perform complete overhaul and repair on aviation bearings. The Navy facility is located in North Island, San Diego and the Air Force facility is at Tinker AFB. In fact, "Tinker used the Corpus Christi Army Depot shop to benchmark theirs," said Torres, "so it is almost exactly like ours," he said.

The section currently processes over 4,000 different vendor part numbered bearings, gear assemblies, and sprag-clutches ranging from 28 inches to a quarter-inch in diameter that are vital in helicopter systems—engines, transmissions, and other systems. For example, an Apache transmission has 48 bearings, four sprag clutches and six planetary gear bearing assemblies. The Chinook's aft and forward transmissions have 41 bearings and 20 planetary gears. Bearings are tough; some have 30,000 hours. Torres has seen some of the bearings he worked on years ago come through again and again. "You get so you can recognize your own work," he said. "It's like a signature. It has to be good, because a record is kept for 15 years on the names of the mechanics who did the bearing work".

Bearing work is hard work. Since last fall his crew has been working six days a week for a 60-hour week. It's also tiring work. The gears and bearings weigh up to 30 pounds each, and there is constant standing and lifting to be done.

Torres rotates his shop personnel frequently so they can become familiar with the individual bearing characteristics and end-item applications. The bearings, gears, and clutches are inducted and precision-cleaned, buffed and polished, and NDT'd before undergoing a detailed visual examination. Those that pass the visual exam are then processed thru a Class 100 Clean room (in which workers wear white suits and head covers) where they undergo a detailed dimensional inspection to blue-print specification; and then lubricated, preserved, and packaged for delivery to the customer.

In all the years that Torres has been there "We have never had a crash traced to one of our bearings," he said proudly. "The AIB (accident investigation branch) folks come see us a lot when a crash occurs, just in case." ✧

—Ralph Yoder, Public Affairs Office, Corpus Christi Army Depot, CC, TX 78419 (361) 961 3627, Ryoder@ccad.army.mil

STACOM 173 ✦ August 2000

Emergency procedure training

Recent evaluations by the Directorate of Evaluation and Standardization have revealed some confusion concerning the interpretation of AR95-1, paragraph 4-8, Emergency Procedures Training, and the requirements of 4-8, b (2) as it relates to multi-engine helicopters. Paragraph 4-8, b(1) applied to single-engine helicopter touchdown emergency procedures, and does NOT apply to multi-engine helicopters.

Paragraph 4-8,b (1) states: *"hydraulics-off, auto-rotations (except from a hover) and anti-torque touchdown emergency procedures training in single engine helicopters…"*

The rationale for this interpretation is based upon the following:

a. Multi-engine helicopters cannot be operated with the flight control hydraulics disabled.

b. Practice touchdown auto-rotations are prohibited in Army multi-engine helicopters.

c. There are no Aircrew Training Manual procedures for loss of directional control in Army multi-engine helicopters.

d. Roll-on landings are normal operating procedures and AR 95-1 does not require air-to-ground communications or crash and rescue equipment on site to practice them.

As always, local commanders may establish more restrictive training requirements if they feel they are necessary. However, don't let paragraph 4-8 of AR 95-1 restrict you from conducting realistic training in Army multi-engine helicopters.

—STACOM 173, COL Richard M. Johnson, Director of Evaluation and Standardization, Fort Rucker, AL; DSN 558-9029, (334) 255-9029, cameronc@rucker.army.mil

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Unauthorized oil substitution

Be alert for possible unauthorized substitution of hydraulic oil Mil-H-46170b in the place of Mil-H-83282 for aviation applications. There has been a reported incident of an aviation unit receiving hydraulic oil Mil-H-46170b (NSN 9150-01-131-3323) in the place of Mil-H-83282. The reported case involved personnel accidentally pulling the wrong oil from the storage facility. Hydraulic oil Mil-H-46170b has not been approved for use in Army aircraft or Army aviation support equipment.

DLA (the Defense Logistics Activity) is award that substitution is not authorized. Aviation units should inform their local supply source that Mil-H-46170b hydraulic oil should not be issued to aviation units in place of Mil-H-83282.

Container of Mil-H-46170b are clearly marked ***NOT TO BE USED FOR AIR APPLICATION.*** This includes all army aircraft and aviation support equipment.

If an aircraft or piece of aviation support equipment has been serviced with Mil-H-46170b, maintenance personnel should flush and re-service the aircraft or equipment with the proper hydraulic oil prior to operation.

Current NSNs for Mil-H-83282 are:

9150-00-149-7431 – 1 quart
9150-00-149-7432 – 1 gallon
9150-00-009-7709 – 10 gallon

—the Black Hawk newsletter

The tie-down and mooring story

When a big wind brews, make sure your birds are safely anchored to the ground and won't fly away on their own.

Typical blade tie-down instructions and aircraft mooring procedures for your aircraft are in its –23 TM.

But you should also check out *TM 1-1520-250-23, Aviation Unit and Aviation Intermediate Maintenance for General Tie-Down and Mooring on all Series Army Models AH-64, UH-60, CH-47, UH-1, AH-1, and OH-58 Helicopters.* It's the bible for aircraft tie-down and mooring info. It was written after a major windstorm devastated Fort Hood in 1989, and gives procedures and hardware to keep birds anchored in heavy winds.

This information is also being added to individual aircraft pubs as they are updated. If there are conflicts between an aircraft's pub and the tie-down manual, the tie-down TM takes precedence.

For more info on tie-down or mooring for your aircraft, contact Lee Bumbicka at the Aviation and Missile Command, DSN 897-4925, (256) 313-4925, lee.bumbicka @redstone.army.mil ✧

—**PS Magazine**

Retirement looms for older systems

Three types of Army helicopters will be retired in the next four years, and aviation battalions will be reorganized as part of the Army's 2000 Aviation Task Force. AH-1 Cobras will be divested by October 2001, said BG Craig Hackett, director of requirements in the Office of the Assistant Deputy Chief of Staff for Operations and Plans—Force Development. UH-1 Iroquois and A and C model OH-58 Kiowas will be retired by 2004.

According to the plan, the UH-1s will be replaced by UH-60 Black Hawks. The Cobras and Kiowas will be replaced by AH-64D Apaches and eventually by RAH-66 Comanches, the new reconnaissance and attack helicopter scheduled to begin joining the Army in 2008. Later-model Kiowas are scheduled for retirement in fiscal year 2013, according to the plan.

The modernization plan also affects the model D and F CH-47 Chinook cargo helicopters. The CH-47 Ds will be modified to become CH-47Fs, and existing F models will be upgraded with digital technology, Army officials said.

—***Army News Service***

BASEOPS, the future is now!

In today's world, the aviation industry, Federal Aviation Administration, and other assorted businesses are embracing the so-called technological wave. They are using the web to do business.

One has to question, why US Army airfields around the

world are not following the lead or example of businesses around the world? Also, why are some airfield operations (BASEOPS) still so dead set on continuing to produce a blizzard of paper? I cannot answer these questions for other military airfields, but I can tell you what we do at Ansbach AHP BASEOPS in Germany.

The US Army pilot (fixed or rotary wing) has to cope with a myriad of tasks prior to his flight: weather briefs, NOTAMS, wire hazards updates, filing flight plans and pre-flight. The list goes on and on. There are several ways to "skin the cat"— faxing, telephone briefs, and so on. But Ansbach AHP BASEOPS has taken a technological step forward to going "paperless" in flight planning and filing.

It's the first US Army airfield/heliport to fully embrace the Internet/Intranet technologies and e-mail to better serve our customers, the Army's aviators.

At Ansbach AHP, we are using e-mail and a website to furnish the pilots with access to, NOTAMS, weather briefs, weather satellite pictures, Army Aviation regulations, FAA regulations, helicopter safety and standards information, Local Flying Standard Operating Procedures for virtually all airfields in Germany and much, much more. A pilot can get all this and file his flight plan to Ansbach BASEOPS from a personal computer or Macintosh at home or work.

Why does Ansbach AHP BASEOPS do this? Call it common sense! It saves pilots and unit operations personnel time from walking (or driving) up and down flight lines bringing flight plans or picking up flight information. It places all the information at the pilot's fingertips. It also brings BASEOPS in line with the Secretary of Defense's policy on offices going "paperless" and getting a head start on the Federal Act of 2003 that requires all government offices where possible to reduce the paperwork.

Since the website's inception in May 1999, the website has been "hit" or accessed 6,600 times! Also, we started accepting flight plans during January 2000 after receiving test approval from US Army Aeronautical Detachment Europe, V Corps Aviation and Standardization and Army Flight Operations Detachment.

It started slowly, with approximately 40 electronic flight plans filed during January. In June 2000 we received over 130 electronic flight plans. The number of flight plans we have received is amazing. Why? Because, most of the Ansbach AHP's aviation assets were deployed to Kosovo during KFOR operations. As of July 2000 (and the return of our flying assets), we have had a significant jump in website hits and electronic filings. During January our electronic flight plans filings only consisted of 10% of our flight plans received. By June it was up to 60-70% of flight plans received.

With little investment, using off the shelf technology, we are now doing Army aviation "business" at the speed of light! We have and are continuing to provide our pilots with the best service possible and plan to continue.

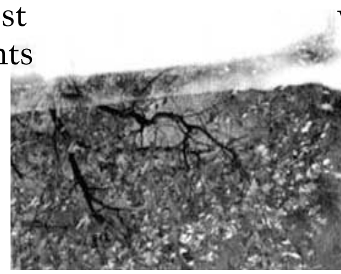
Why aren't other US Army airfields around the world attempting to save pilots time, money and The Black Forest in paper usage? I don't know. But I can say, come to Ansbach AHP, Germany***, and we will show you the future of Army airfield operations. Now***! ✧

—Bill "Big Jake" Jacobs
Air Traffic Asst (Ansbach, Germany) web designer, webmaster for a US Army airfield's first web based flight-planning system,
jacobsb@cmtymail.98asg.army.mil
DSN 467-2872/2047

Fire safety begins in your office

When I was a unit safety representative for a logistics support squadron, my duties were largely administrative. When I performed inspections in offices, I was often told, "You won't find much in here; all we do is office work."

Most of the time I found very little, but if I did find something, it was usually a fire hazard. Some of the hazards most often identified in office environments include, but are not limited to, the following. They should be fixed promptly.



Power strips plugged into power strips. With the increase in number of desktop computers in our work areas, some older buildings experience an acute shortage of available power outlets. This provides only a temporary solution. It becomes a hazard when one power strip is plugged into another. By doing so, the user is drawing power for two strips through a cord that is only rated for one.

Extension cords used in lieu of permanent wiring. Another short-term solution for limited outlets is the use of extension cords. Extension cords are ideal for short-term use. Extension cords can become a hazard when they are used for long periods of time. An extension cord used to power your personal computer is not an appropriate use. Often, extension cords are required to pull greater loads, and for longer periods of time, than they were required to handle. In addition to this, they are often used across existing walkways where they can become frayed.

The wrong type or inadequate numbers of fire extinguishers. A work center may have been originally equipped with class A extinguisher, (for trash, paper, and wood combustibles) which was adequate for the work performed. With the addition of multiple desktop computers, a class ABC extinguisher is required. Something else to consider is the number of extinguishers. Are there enough in the building to provide quick and easy access in the event of a fire? Do you know where they are?

Materials stacked too close to light fixtures or fire detection suppression devices. Offices are often in short supply of storage space. Work materials can end up on top of refrigerators, filing cabinets and shelves. Make sure these items are at least 18 inches away from overhead lights or fire detection/suppression devices.

Most of us would readily admit that refueling aircraft is an obviously dangerous operation with easily identifiable fire hazards. In contrast, very few of us would acknowledge that an office environment can and often does present some significant, though often overlooked, fire hazards. It's better to find them now than to have the fire chief explain them to you amidst the smoldering ruins of your workstation. ✧

Download firefighting manuals

Tri-Max fire suppression systems recently completed an update of the operations, training, and maintenance manual and training video for the Tri-Max 3 and Tri-Max 30 fire suppression systems. The manuals can also be downloaded from the Tri-Max website **www.tri-maxkoldcaf.com**

Changes, along with maintenance advisories, will be posted on the website. The Tri-Max website also has a comment page to submit recommended changes to the manuals and other appropriate comments on Tri-Max products. Any organization that did not receive the new manual or video can request a copy by providing a POC and mailing address via e-mail to the Military Marketing Manager, COL (retired) Mike Smith, E-Mail: smithmasa@aol.com. ✧

Rank in the cockpit – NCO Corner

Through the course of my career, I have met some top-notch individuals, pilots and enlisted crewmembers. As a flight engineer riding in the back of helicopters, I literally put my life in the hands of the pilots on the controls.

Back in the late 1980's and early 1990's, the US military realized that human error accidents, left unchecked, would consume irreplaceable lives and valuable airframes. Hence, the *Aircrew Coordination program* was instituted throughout Army aviation.

One of the goals of the program was to take junior crewmembers/aviators who were timid or shy, and teach them how to interact as a team during all stages of a mission. The other part of the goal was to take senior pilots or ranking individuals, and teach them how to receive input and assistance from all members of the crew without undermining authority or creating an atmosphere of hard feelings. Terms like "direct assistance" and the "two challenge rule" were introduced. These concepts apply to ***all*** members of a crew. Thorough briefings before and after a flight are essential to positive crew performance and successful missions.

Many times after a mission has been completed, I've been approached by crewmembers who reported that they were unhappy with how the mission went. Sometimes they were unhappy enough to request they not be scheduled with that particular aviator again. When I ask them if they expressed their concerns during the debriefing, the answer is invariably "no". The reasons usually are expressed as "Well, he outranks me" or "he has more experience than me" or "he is just an overbearing individual, I just can't get a word in without getting verbally beat up."

We need to do a better job teaching junior aviators and crewmembers to speak their minds freely in the aircraft.

There have been times during my flight experiences when I asked an aviator to stop doing something I didn't like, and rank had nothing to do with it. **My life had everything to do with it.** Some of these experiences include missed radio calls from ATC, flying unsafe maneuvers, and paradrop operations in a high-density air traffic environment.

After some of these flights, I've had pilots come to me and say they were glad that I let them know when I was uncomfortable with what was going on during a flight. There were no reprisals or badgering, just a handshake and a thank-you. They may not remember, but I do.

Pass it on

I try to remember to continue to pass my knowledge on when teaching new crewmembers aircrew coordination. We need to do a better job teaching junior aviators and crewmembers to speak their minds freely in the aircraft.

From some things I've seen recently, I'm not so sure we are doing a good job teaching that. It may be that some don't know when they should speak up.

In my office, I have a case study of a B-52 accident. The pilot in command was the Wing Standardization Instructor Pilot. He had a three-year history of performing unauthorized maneuvers in aircraft. Leadership at all levels, including the flight surgeon, had failed to take corrective action. The results were tragic.

At our facility, we have a wide variety of safety magazines from other branches of the service, as well as the Army's *Flightfax.* When I read about accidents involving very experienced crewmembers, I wonder why. How could things have gotten so bad that a mishap like that occurred? We must be vigilant. Treating each crewmember with respect and valuing their opinions are elements of a successful flight. Taking appropriate direction from the PC is also essential for a safe flight. ✧

—SFC Steven Robertson, CH-47 Standardization Flight Engineer and Platoon Sergeant, Co H, 140th Aviation Regiment, California Army National Guard, DSN 466-5322, Steven.Robertson@ca-arng.ngb.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH1

Class C

F series

■ During performance of shallow approach, aircraft experienced engine trouble and made a hard forced landing. After landing, crew extinguished small engine area fire. Landing damage to skids and lower fuselage, with some fire damage to engine area components.

AH64

Class A

A series

■ Aircraft impacted the ground during aerial gunnery training. Postcrash fire ensued. Two fatalities.

Class C

A series

■ During cruise flight, PNVS shroud came off and struck the elevator mirror. Aircraft landed without further incident.

Class E

D series

■ During contour flight, No. 2 generator failed. Aircraft landed without further incident. Generator control unit was replaced.

C12

Class C

H series

■ Aircraft struck by lightning as it entered a thin layer of clouds. (Nearest reported thunderstorm was 50NM to the north). Aircraft landed without further incident. Damage was found to No.2 propeller and elevator.

CH47

Class C

D series

■ Slingload separated as aircraft was on final approach for drop off. Load consisted of two M-998 HMMWVs. A loud report (clunking sound) and illumination of master caution and hook-caution lights at 50 feet AGL alerted the crew, who confirmed separation and landed the aircraft without further incident. Both vehicles sustained significant damage.

Class E

D series

■ While on climbout during a limited test flight for main rotor tracking, the No.2 engine fire light illuminated. The crew executed a precautionary landing, with crash rescue responding. There was no fire. The cause is believed to be due to a faulty indication within the fire warning system.

D series

During search and rescue operation, aircraft landed on extremely rocky area with many very sharp rocks. Crew cleared area under ramp prior to lowering, but did not see rock due to blowing snow. Rock punctured small hole in ramp when it was lowered.

OH58

Class C

C series

■ During simulated auto with turn that was going to overshoot the landing area, IP attempted to terminate maneuver with power. N1 and N2 did not respond and aircraft bounced, then landed hard. Damage to vertical fin, both cross tubes and lower fuselage.

D (I) series

■ Aircraft was making final turn for landing when birdstrike occurred. Horizontal stabilizer was damaged.

■ Engine NP reading climbed to 122% when the Engine Supervisory Control (ESC) was disengaged while engine RPM was at 100%. Aircraft had been undergoing maintenance following an inflight "32" failure code on the ESC. Engine replacement required.

■ A range building was inadvertently destroyed by a Hellfire missile during gunnery training. Building was used to house a rail-mounted moving target. No injuries were incurred.

Class E

C series

■ Aircraft's fuel boost pump light illuminated while on the ground, engines running. Aircraft was shutdown without further incident. Replaced fuel boost pump cartridge.

UH1

Class E

H series

■ Hydraulic caution light illuminated while aircraft was at OGE hover. Pilot performed a precautionary landing without further incident. Maintenance determined that the hydraulic pressure switch had failed.

UH60

Class C

A series

■ During practice of tailwheel landings, tailwheel strut failed. Damage to tailwheel and possible tailboom damage.

Class D

A series

■ Aircraft was found with the co-pilot's cockpit door missing. It is suspected that when an adjacent aircraft took off, the rotorwash caused the door to fly open and thereby be torn from the aircraft.

Class E

A series

■ On post flight, PC found red tail rotor tip cap damage, a few scratches, and some chlorophyll on the tail boom. Tree strike suspected. Maintenance inspections revealed damage to the yellow tail rotor paddle tip cap and the lower anti-collision light support panel. Both the tip cap and support panel were replaced and the aircraft was released from maintenance.

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.

GSE conference at Fort Rucker

The Directorate of Combat Developments-Aviation, Materiel and Logistics Systems Division at Fort Rucker, AL will host the 2nd Annual Aviation Ground Support Equipment (AGSE) Users Conference on 5 and 6 December 2000 at Ft. Rucker, AL., Officer's Club, Building 113, Novosel Street.

The theme for this year's conference is "Focus on the Future." Equipment in the development process will be on display. The proposed aviation logistics vision and supporting AGSE will be reviewed and priorities set for future development and acquisition of Army AGSE. Attendance is intended for Brigade, Battalion and Company-level Maintenance Officers and NCOs. These personnel provide valuable input from the user's perspective on AGSE requirements and priorities. This input is extremely important in accomplishing our mission as the user's representative. User participation gives the field commander the opportunity to provide input to future systems requirements.

Attendees wishing to depart with an electronic copy of the presentations are encouraged to bring one CD-R compact disc. Fort Rucker billeting reservations can be made by calling (334) 255-2626 or DSN 558-2626. Attendees are requested to RSVP NLT 10 November 2000. ✧

—CPT Rob Wegner, DSN 558-1580 or (334) 255-1580, fax ext-9191, email: WegnerR@rucker.army.mil.

No in-flight meals, please

Don't allow anyone on an aircraft to use flameless ration heaters (FRH) to prepare MREs (Meals Ready to Eat) during flight. An activated FRH produces a vapor that contains hydrogen, a flammable gas. Air Force Joint Manual 24-204. para 3.6.3, prohibits the handling, opening, and use of FRF inside an aircraft. The Army equivalent regulation is TM 38-250. This restriction applies on any mission, including contract passenger aircraft. ✧

—Del Hamilton, HQ Air Mobility Command (USAF), DSN 576-3967 (618) 256-3967, Delbert.Hamilton@scott.af.mil

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POV Fatalities

through 31 August

FY00	100
FY99	115
3-yr Avg	101

U.S. ARMY SAFETY CENTER

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Commanding

Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

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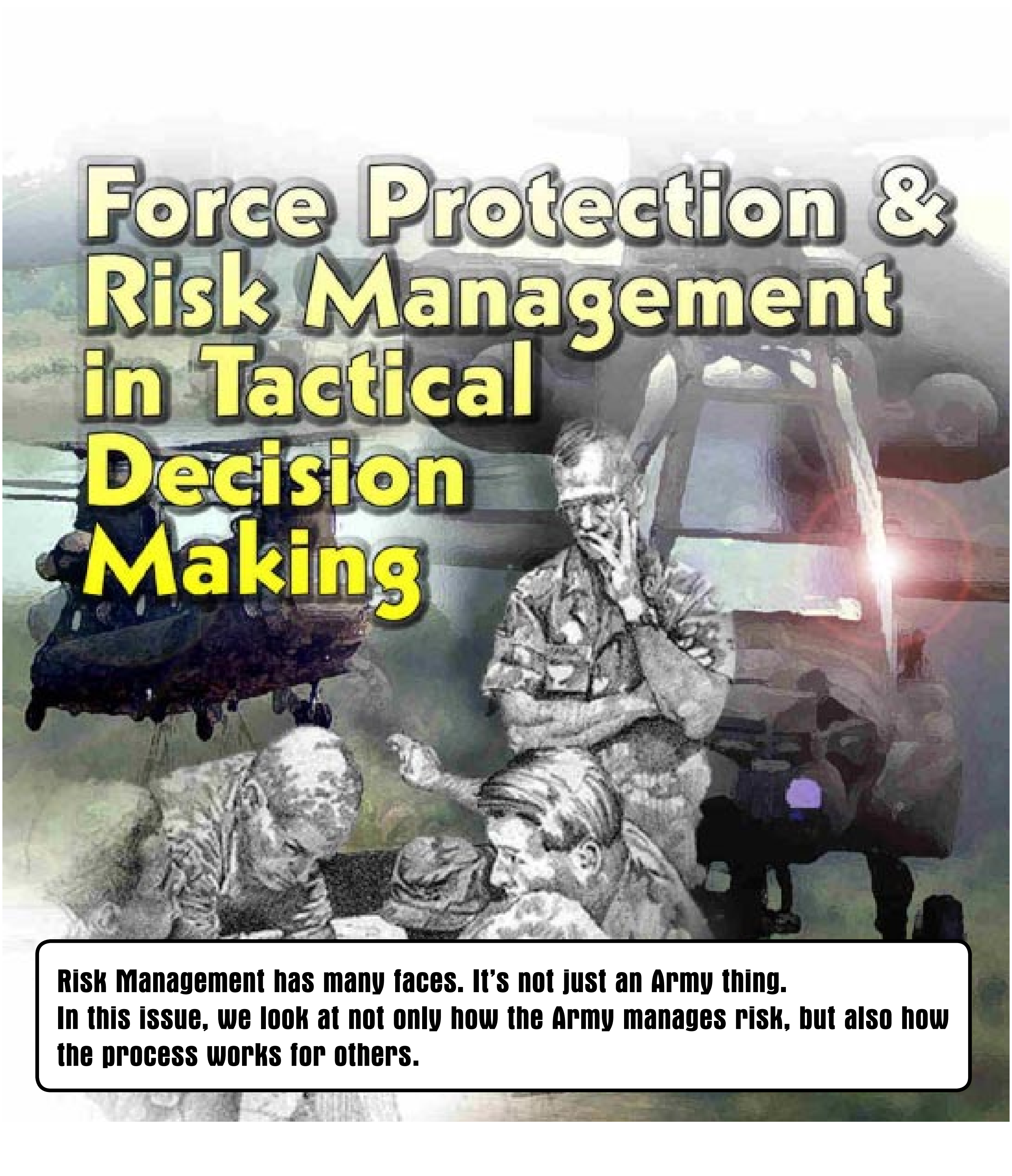

Risk Management has many faces. It's not just an Army thing.
In this issue, we look at not only how the Army manages risk, but also how the process works for others.

RISK MANAGEMENT IN TACTICAL DECISION MAKING

"Risk management is not an add-on feature to the decision making process but rather a fully integrated element of planning and executing operations…Risk management helps us preserve combat power and retain the flexibility for bold and decisive action. Proper risk management is a combat multiplier that we can ill afford to squander."
General Reimer, Chief of Staff, U.S. Army, 1995

"Step up to the plate. It's a long way from the front office to the cab of a vehicle. Our challenge is to get the Safety Program to the soldier behind the wheel."
General Shinseki, Chief of Staff, U.S. Army, 1999

We operate in an inherently dangerous business, in an inherently dangerous environment, under inherently dangerous conditions. The art of war and preparation to fight and win our nation's wars are both complicated and risky.

The Army's process to identify, assess, and control risks is called Risk Management. Risk management provides a formalized, systematic tool to help commanders identify hazards and controls necessary to reduce or eliminate risks during operations planning and execution.

CONTROLLING HAZARDS PROTECTS THE FORCE FROM UNNECESSARY RISKS.

Eliminating unnecessary risks opens the way for audacity in execution, thus preserving combat power.

Risk management is a five step process and is explained in detail in FM 100-14, Risk Management:

STEP 1: Identify hazards: (The first step is conducted during the first four steps of the military decision making process (MDMP)- mission receipt, mission analysis, course of action (COA) development, and COA analysis.) A hazard is an actual or potential condition that can result in injury, illness, death, damage or loss of equipment or property and mission degradation. Focus on those hazards most likely to be encountered for the operational mission and environment.

STEP 2: Assess Hazards: (The second step is done during three steps of the MDMP - mission analysis, COA development, and COA analysis.) Examine each hazard in terms of probability and severity to determine the risk level of one or more hazards that can result from exposure to the hazard. The end result is an estimate of risk from each hazard and an estimate of the overall risk to the mission that cannot be eliminated. *Steps 1 and 2 together comprise the risk assessment. The risk assessment provides for enhanced situational awareness.

STEP 3: Develop Controls and Make Risk Decisions: Accomplished in two sub-steps: develop controls and make risk decisions. (This step is done during the COA development, COA analysis, COA comparison, and COA approval of the MDMP.) After assessing each hazard, develop one or more controls to either eliminate the hazard or reduce the risk (probability and/or severity) of a hazard. Then compare and balance the residual risk against mission expectations. A key element of the risk decision is determining if the risk is justified. The individual with the appropriate level of responsibility must decide if the controls are sufficient and acceptable and whether to accept the resulting residual risk. If the risk level is determined to be too high, he must develop additional controls or alternate controls, or modify, change or reject the course of action.

STEP 4: Implement Controls: Controls are integrated into standing operating procedures, written and verbal orders, mission briefings, and staff estimates. The critical check for this step, with oversight, is to ensure that controls are converted into clear, simple execution orders understood at all levels. This step is done during the orders production, rehearsal and execution and assessment of the MDMP.

STEP 5: Supervise and Evaluate: Supervise mission rehearsal and execution to ensure standards and controls are enforced. Techniques may include spot-checks, inspections, situation reports, brief-backs, buddy checks, and close supervision. Continuously monitor controls to ensure they remain effective, and modify controls as necessary. Anticipate, identify, and assess new hazards to implement controls.

Continuously assess variable hazards such as fatigue, equipment serviceability, and the environment. Modify controls to keep risks at an acceptable level. This step is done during rehearsal and execution and assessment of the MDMP.

After a mission, evaluate how well the risk management process was executed.

■ Determine how to ensure that successes are continued.

■ Capture and disseminate lessons learned.

■ Consider the effectiveness of the risk assessment.

■ Determine whether the residual risk was accurately estimated.

■ Evaluate whether the controls were effectively communicated, implemented, and enforced.

There are no new accidents! We continue to kill and maim soldiers in the same ways. We still have POV accidents, AMV accidents, aircraft accidents, and range accidents. We continue to make the same mistakes. It is a tragedy that we must pay for the same mistakes in blood, again and again. The Risk Management process provides a commander with a mechanism to capitalize on lessons learned, identify and assess hazards, and put control measures in place to prevent predictable mistakes and failures. ✧

—MSG Pete Markow, Risk Management Integration Division,
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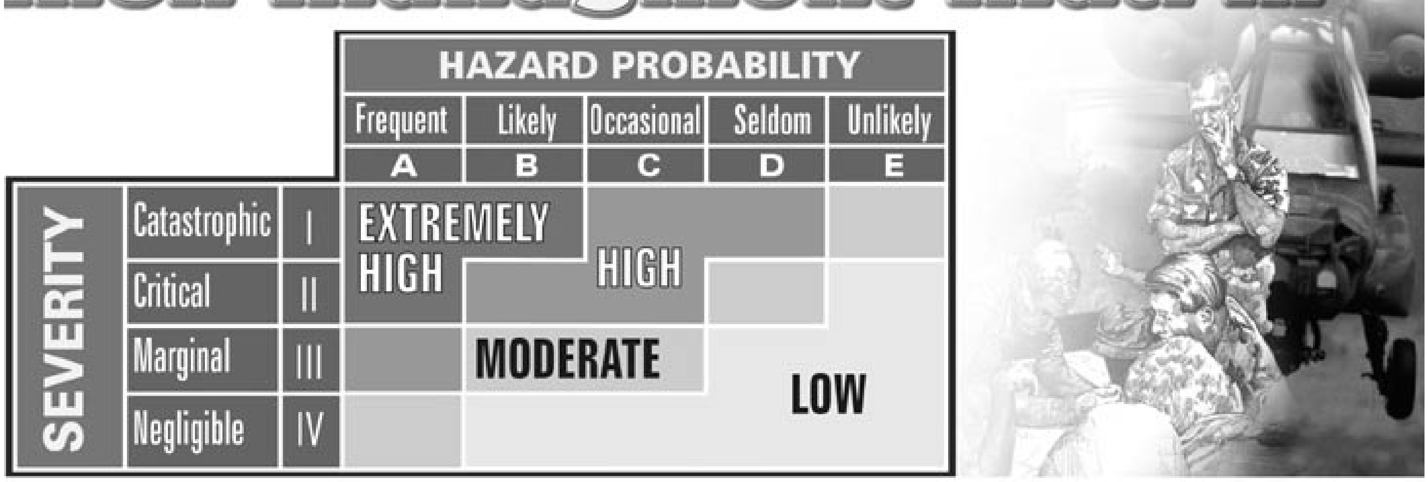
Risk Managment Matrix



Risk Management — Mom's way

Operational Risk Management is a six-step process.* A lesson from Mom helps hammer home the point.

The first step is to identify the hazard. But, before we identify a hazard, we have to have a mission or an objective. Let me recount an experience I had in my early youth.

The objective is for you and me to cross the street to play with our friend who lives across the road. We'll do this without Mom's supervision.

The hazard in this case is obvious, cars on the street whiz by at 25 mph. While an impact between us and the car might not hurt the car very much, Mom tells us that we could definitely be maimed or killed by a car striking our fragile and precious bodies.

But we don't want to be noted as neighborhood wimps. So we set out to see if Mom is really in touch with reality. At this point we are certain that we don't want to be maimed or killed or be the focus of Mom's wrath if we even come close. So we sit on the porch and watch the flow of traffic. We live near the corner, where there is a crosswalk and a "Walk/Don't Walk" signal, and we notice that there are other folks crossing the street at this location. We are now stepping up to the plate at step two of the process—we are assessing the risk.

While sitting by the curb we notice that nobody gets killed or maimed, or even has to dodge traffic, if they cross on the "Walk" light. But Mom notices that some cars push the light, and she isn't comfortable with us crossing because there is an added risk of some of the drivers ignoring the risk and barreling through a red light. Ah, we counter, if we look all ways to ensure all the drivers are stopping and that there are no turners who may not see us, then we can safely cross the street and she needn't be anxious for our safety.

She is impressed that she hasn't raised dummies but her maternal instincts still cause her stomach to churn with a considerable amount of concern, because what if…

Mom thinks about this for awhile, and engages into step three of the process we have already started. She is analyzing our risk control measures. Mom, realizing that we have to grow up sometime and accept responsibility for our behavior, reluctantly says, "OK, but you must tell me when you go and when you are coming back."

We are thrilled because that means that we can cross the street without Mom holding our hand.

She has just made control decisions that will affect how we achieve our objective.

We tell her that we are leaving and that we will follow all the rules and be disciplined in our street crossing behavior. We will look and only cross on the "Walk" light. We promise to be cautious and arrive safely on the other side of the street. We are executing our mission and employing risk control implementation. We are following the rules; Mom knows when we are going and coming; and we have significantly managed the risk to keep Mom happy and ourselves safe.

Notice that the risk isn't eliminated, only managed.

We have a great time at our friend's house, and the time passes quickly—too quickly. Not only are we likely to get home late, but traffic is denser.

Mom knows this—that's why she's the Mom and we're the kids. She's anxious again and watches through the living room window for our return.

Not wanting to incur Mom's wrath by being late for supper, we, of course, dart across the street between cars and buses. Now we expect that Mom is going to be proud of us because we arrived safely home and just in the nick of time. We come running up the steps to the front porch expecting to leap into the arms of our proud mother.

But nooooooooo!

We find Mom furious with us. Notice that we have failed to manage the risk and have exposed ourselves to increased risk in a misguided effort to follow a rule (to be home on time).

She just completed the last step of ORM. She has supervised and reviewed our behavior. Mom started the process over. She made some adjustments to our lack of understanding of the hazard, our incomplete analysis of the risk, our faulty analysis, and our failure to adhere to risk control measures or apply risk control implementation on the way home.

So she did what every good Mom should (and every good leader should too). She corrected our behavior and gave us another chance. ✧

ORM, the Air Force's Operational Risk Management, is a six step process.

Reprinted with permission from TORCH

Cold Weather—Are You Prepared?

The good news is that all the satellite and weather balloon measurements of temperature agree that the surface temperature measurements are all lower than the models and that global warming isn't really happening. The bad news is this means winter will be cold as usual. Cold weather brings cold injuries, at least for those who are not prepared. This has been true from Hannibal crossing the Alps, to the soldier wearing jungle boots on guard duty in Bosnia in January.

How do you prepare? The first thing in any battle is to know the threat.

■ **Dehydration:** In the cold, dehydration is a problem because it is unexpected. Most of us think that dehydration is only found with heat injuries—this isn't true. In the heat, you sweat, and it's easy to think of drinking water to replace the sweat. Working in the cold, you still sweat; but because you are not hot, you might not think you need fluids. Symptoms of dehydration include dizziness, weakness, headaches, and nausea. A good rule of thumb is that if your urine is dark yellow, you're not drinking enough water. (Note: Diarrhea and vomiting can also promote dehydration or make it worse.)

✚ **First Aid:** DRINK WATER! Have the soldier replace lost fluids. Water is best; however, sports drinks are also acceptable if available. Fluids should be sipped, not gulped. Sodas, coffee, tea, or other caffeine drinks won't help. If the soldier isn't improving quickly with fluids and rest (preferably in a warm location), seek medical help.

■ **Immersion Foot:** This is also called trench foot after the first descriptions of the condition when it occurred in World War I soldiers. The cause is continued exposure to wet, cold conditions. The surprising factor is that it doesn't have to be freezing cold, trench foot can occur at temperatures up to 60 degrees Fahrenheit if the exposure is around 12 hours. Of course, if the temperature is lower, it can occur sooner. Symptoms include cold, numb feet that may have shooting pains, as well as redness, swelling, and bleeding particularly involving the toes.

✚ First Aid: The most important step is to re-warm and dry the feet. Expose the feet to warm air and/or gently wrap in dry blankets or towels. Do NOT massage, rub, or use salves or ointments on the feet. Do not expose the feet to extreme heat; if the feet are numb, the victim may get burned and not realize it. If you suspect trench foot, get medical help immediately.

■ **Chilblain:** This is a condition caused by exposure of bare skin to continued temperatures

ranging from 20-60 degrees, depending on an individual's acclimatization. Symptoms of chilblain include tender, hot-feeling, red and itching skin, mainly on exposed areas like the cheeks, ears, and fingers. Feet, however, may be affected also.

✚ First Aid: Warm the soldier's affected body part with direct body heat, or move the soldier to a warm area. Do NOT massage the area, rub with snow or ice, or apply salves or ointments. Do NOT expose the area to any intense heat. If the soldier does not improve, seek medical help.

■ Frostbite: This is a very common and potentially dangerous injury. The body is mainly water and water freezes at 32 degrees. Frostbite occurs when the body cannot maintain sufficient internal heat in certain parts, and the water in cells freezes. Areas that are most often affected are those areas exposed, or where blood flow can be decreased, such as fingers, toes, ears, and other facial parts. Exposure to bare skin on metal, extremely cool petroleum, oils, and lubricants (POL), wind chill, and tight clothing, particularly boots, can make the problem worse. Symptoms include numbness or tingling in the affected part; blisters, swelling, or tenderness; body parts that feel dull or wooden; and pale, yellowish or waxy looking skin—gray in dark-skinned soldiers..

✚ First Aid: Frostbite is a medical emergency; the victim should be evacuated as soon as possible. If not treated properly, frostbite can lead to gangrene and amputation. Prior to evacuation, the soldier should be moved to a warm area and warm the part affected with direct body heat or warm air. Do NOT warm with hot water, expose the part to any intense heat, rub or massage the area, rub with snow or ice, or use salves and ointments. Do not allow the part to thaw and then refreeze.

nHypothermia: This is a serious medical emergency. Hypothermia is caused by severe body heat loss due to prolonged cold exposure. Immersion in water can make hypothermia worse or come on more quickly because the water increases heat loss. Symptoms include lack of shivering and what has been described as "the Umbles"—stumbles, mumbles, fumbles, and grumbles—all of which are signs of mental slowing and lack of coordination. Hypothermia can progress to unconsciousness, irregular breathing and heartbeat, and eventually death.

✚ First Aid: If you find a soldier in the earlier stages of hypothermia—still conscious—start to warm the soldier immediately. If the clothes are wet, remove them. Loosen any restrictive clothes. Wrap the victim in dry blankets or a sleeping bag. Another person can get into the sleeping bag as an additional heat source. Get medical help immediately.

If the soldier is unconscious, cold to the touch, and appears to have no pulse or breathing, DO NOT assume that the soldier is dead! Normal body temperature is 98.6 degrees. When it gets down to 90 degrees, the body tries to save energy and heat by trying to "hibernate." Blood flow to the arms and legs is decreased, and pulse and breathing become shallow. A soldier may appear dead, but his heart rate and breathing might be so low that untrained personnel miss it. People with temperatures as low as 82 degrees have been resuscitated. Get the soldier to a medical facility as soon as possible!

Cold Injury Prevention:

The most important thing is planning for the cold. Planning factors include: making sure you have accurate weather information for the area and time of the mission, being particularly aware of rain, snow, and winds; ensuring soldiers have appropriate cold weather clothing; if the tactical situation permits, use covered vehicles for troop transport, and have warming tents or areas available. If possible, have warm food and drinks available. Wet conditions and windchill greatly increase chance of injury. Pay particular attention to soldiers manning FARPS - not only are they exposed to cold, but also wet conditions (either from rain, snow, or possibly POL) and also increased windchill from rotorwash. In addition, they are handling cold metal objects, and there can be a real chance that skin can freeze to them. Aircrew are not immune to the same hazards, and need to be cautious if flying with either doors, ramps, or windows open, or exposed to rotorwash.

The most important individual preventive measure is the proper wear of cold weather clothing; soldiers frequently get cold injuries simply by improper wear of clothing. Jungle boots are not appropriate for snow, the Gore-Tex™ parka is designed to keep you dry, it is not intended to be the main overgarment in extreme cold, and definitely not approved for use while flying - the shell is nylon and burns or melts easily. Wearing every article of cold weather clothing issued can be bad, because it may cause overheating, or restricted circulation. All cold weather clothing should be worn loose, and in layers. This allows for insulation by air trapped between the layers. Socks should be changed frequently, and boots rotated. Proper wear of boots is important. If you have intermediate cold weather boots (Gore-Tex™ lined, like Matterhorn™ boots) you might think you are safe from trench foot - not so. Many soldiers wear them both indoors and out, some year round. The problem here is that the Gore-Tex™ lining is designed to keep water out, but it can also keep water in. So, soldiers may wear them indoors (or when it is warm out) where the feet may sweat freely, then go out into a cool environment. Because the feet are wet from the sweat, they have set themselves up for the conditions that can lead to trench foot. Also, if the boots are off at night, for example, and not allowed to dry by a heat source, the sweat can freeze. What has happened is that soldiers have gotten injuries by putting their feet into ice (frozen sweat) the next morning. It is important to keep clothing clean and dry. Dirt, POL, or water can increase the rate of heat loss by reducing the insulation ability of the clothes, and through evaporation. It is also important to keep the clothing repaired - a broken zipper cannot keep the cold out. Headgear is extremely important, the body can lose large amounts of heat through the head. It is important to protect the hands and fingers by wearing proper gloves. Aviators - your Nomex™ gloves are designed to protect you from fires, they are not designed for extreme cold, and will do little to protect your hands when wet. Long underwear for flight crew should be wool or cotton - polypro can burn or melt. Use of Air Force cold weather flight suits with the nylon liner is also prohibited, aviators have been injured in fires when the lining has melted into the skin.

Other factors influencing cold injuries:

- **Previous cold injuries.** Soldiers with previous cold injuries are more susceptible to having another. It is extremely important to identify these soldiers, and for first-line supervisors to monitor them closely.
- **Tobacco.** Nicotine, regardless if it comes from a cigarette, snuff, pipe, cigar, or patch causes blood vessels to constrict. This is particularly dangerous in the hands and feet, and can lead to, or worsen a cold injury.
- **Alcohol & caffeine.** These can lead to increased urination and dehydration.
- **Meals.** If you skip meals, the first thing the body does is to slow the metabolism. Slower metabolism means less heat production and more chance of cold injury.
- **Activity.** Huddling up and not moving is the wrong thing to do. The more you move, the more heat you produce. Decreased activity decreases the time it takes to get an injury.
- **Buddy system.** The buddy system is a great way to help prevent injuries if soldiers are trained to know what to look for.
- **Self-checks.** A simple self-check is to pinch the fingernails and watch how fast they return to red. The slower the return, the higher the potential for an injury to the fingers or toes.

More information on cold injuries can be found in FM 21-10 and FM 21-11, GTA 5-8-12 (this is a good pocket guide for soldiers), and Technical Note No. 92-2, Sustaining Health and Performance in the Cold: Environmental Medicine Guidance for Cold-Weather Operations, published by the U.S. Army Research Institute of Environmental Medicine.

Conclusion

All cold weather injuries are preventable! Prevention is the responsibility of leaders at all levels, as well as the individual soldier. Battling the cold is like battling any other enemy—mission success happens only through planning and training.

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

We Are All Safety Officers... Or Are We?

Providing a Facelift for the Army Safety Profession

As we enter the 21st century we are experiencing great advances with the integration of risk management in Army operations. As the processes which afford us safer training evolve, we as safety professionals should be careful to nurture our profession as well as its public image.

It is apparent the Army is taking "safety" and all its integers (risk management, POV safety, OSHA compliance, *et al*) quite seriously. At the Army level we see the initiation of Risk Management Chain Teaching. At the unit level, we find command teams and staffs integrating risk management into operations from inception to execution. We no longer find "safety" added as an afterthought annex to operation orders. We find units routinely meeting or exceeding OSHA requirements for workplace safety, not just before an external inspection as we may have seen years ago.

With all these great advances taking place in our field why is it that we still hear grumbling in formation prior to a long weekend safety brief? Why is it that safety officers are viewed as individuals who would rather cease training or eliminate an activity rather than mitigate the risk and train as safely as possible?

While the safety aspect of operations is moving forward, the view of the safety professional seems to be caught in a slump. This may seem unimportant; why worry about public opinion when statistics show we are performing effectively? Imagine how much more effective we could be if commanders sincerely sought the insight of the safety officer in planning rather than checking the block by filling out the risk management worksheet. How could we better affect operations if personnel felt at ease in approaching us with situations and potential problems, knowing that we will try to find a solution rather than finding fault or shutting down operations?

> ***Imagine how much more effective we could be if commanders sincerely sought the insight of the safety officer in planning rather than checking the block by filling out the risk management worksheet.***

PERCEPTION IS REALITY

Perception is reality and the perception in many units is that "we are all safety officers." While this age-old saying is alive and well at a range near you, it does nothing for the credibility of you or I as an ASO or Safety NCO. If Lt./Pvt. Snuffy is brought up to believe "we are all safety officers," then he or she sees little need for a safety professional. LT or PVT Snuffy's opinion may not seem important in the overall scheme of maneuver, but this is the kind of baseline shift that we need to have occur in our units.

As of last July every soldier in the United States Army is now formally trained in risk management as mandated by the Army Chief of Staff. Let's train soldiers and leaders alike that we are all risk managers—we are. Let's save the title of Safety Officer for those properly trained in the profession.

Please don't think I'm so naïve as to believe a name change will shift the face of Army safety; it will take much more than that. We as safety professionals need to relook one of the first lessons taught at the Safety School:

CREDIBILITY, CREDIBILITY, CREDIBILITY!

Why is it that the safety field is viewed by many to be the job of choice for underachievers and those too weak in their profession to perform in another field? Too many individuals before us have done the minimum needed to ensure compliance. If

necessary and mandatory file clerk, but not the integrated subject matter expert that we should be. Rather than checking the block for our commanders by merely ensuring compliance we need to be proactive in every aspect of our units operation. Sure, that's a huge undertaking, but that should be what we signed up for. We need to be out on the hangar floor, interacting with the crew chiefs. We need to be at the convoy SP ensuring PCI's are complete and licenses are current. We need to be in the S-3 shop assisting in planning and ensuring the commander isn't going to be blindsided by an unforeseen risk. Sure, that's a lot of work, but there are many out there currently doing it and doing it well. We as safety professionals must take it upon ourselves to raise the bar, raise the standards of our unit's safety programs.

we are performing our jobs at the level that should be expected and to which we are trained, there is no reason our profession should not be held in the esteem presently reserved for IP's and MTP's. While these professions are admirable, they are singularly focused. What other career field in the Army, other than that of a unit commander, is so diversified as ours?

Not only do we operate as productive pilots and crew members but also as *the* subject matter expert in areas ranging from accident investigation to respiratory protection.

RESPECT

If we do not earn and maintain the respect of those we work with and for, we are relegated to the job of a file clerk, a

THE FUTURE

Some say "That sounds great, but other career tracks are provided follow-on training and career progression." Until now the only training an ASO or SNCO could hope for after the initial school was mentoring from those already in the field and possibly a two-week refresher at Fort Rucker. This is all about to change.

As the Army has seen a need to transition from a compliance based safety program to that of an integrated system, it has also seen a need for further training of its safety professionals. The USASC is currently developing a program that will provide industry-based follow on training to safety professionals. According to CW5 Wootten, former Director of the Army Safety Officer Course, the training will be rank and position based, ensuring we are provided the training necessary to be effective advisors in progressively challenging assignments.

We in the safety business find ourselves in a blossoming occupation. The Army as a whole is placing more and more emphasis on the product that is the end result of our efforts, safer, effective operations. We can stand by, content with the status quo or we can lead the movement through heightened standards and proactive efforts, transforming the outdated Safety Geek into the modern Safety Professional. ✧

—CW2 Chance, ASO, C Troop 3-4 Cav, WAAF, HI DSN 456-1355 (808) 656-1355, AvnSafetyGuy@aol.com

CORRECTION:

The website address for TRI-MAX is incorrect (the hyphen is omitted) as it appeared in the October issue. The correct address, which allows military users to download manuals, is www.tri-maxkoldcaf.com

Wartime Safety–Risk Management in World War II

(Editor's note: This article appeared in 1986, and it was not new then. These principles have stood the test of time.)

Unquestionably safety has become an integral part of the flying mission—at least in peacetime. But what about in time of war? In the crucible of battle do we really have the luxury of safety programs—and does it really make any difference anyway?

A World War II general gives us an excellent example of how a vigorous safety program actually did work in a combat theatre, and how safety made a difference in the success of the mission. In his lively memoir, *Over the Hump,* republished by the Office of Air Force history in support of Project Warrior, General William H. Tunner recalls his stint as commander of the crucial India-China airlift during the last year of World War II.

In the 1940s, the very concept of military airlift was in its infancy. In fact, the India-China airlift had only been reluctantly called into existence by a ground-oriented command because a deadly combination of Japanese and geography made the better-known Burma Road somewhat less than efficient.

The purpose of the airlift: To carry enough supplies into Western China to keep the Chinese in the war. A Chinese military presence tied down approximately two million Japanese troops—troops that otherwise could be used against US forces in the Pacific.

When General Tunner arrived in India in the summer of 1944, the airlift had been in operation about two years. Its performance was barely adequate in terms of tonnage transported, but the major problem was safety. General Tunner described the situation:

"Here, in a strange land far from home, on the fringes of a mysterious backward civilization, were all the conditions that bring hazardous flight: Fog, heavy rain, thunderstorms, dust storms, high mountains, a necessity for oxygen, heavy loads, sluggish planes, faulty or no radio aids, hostile natives, jungles, and one-way airfields set in mountainous terrain at high altitude."

As tonnage had gradually increased during the airlift's operation, so did the mishap rate. In January 1944, the accident rate was 1.97 —per 1,000 flying hours!! Every 200 trips over the hump cost one airplane; for every 100 tons flown into China, three Americans died. As General Tunner put it:

"Not only was the accident rate alarming, but most of the accidents were washouts—total losses, with planes either flying into mountain peaks, or going down in the jungle. In many of the cases in which there was reason to believe that some or all crew members had been able to parachute from their planes, the men were never seen again. The jungle had simply swallowed them up. The combination of a high accident rate with the hopelessness of bailing out was not conducive to high morale in the flying crews."

Certainly an understatement.

General Tunner soon identified a major problem. All efforts up to that point had concentrated on increasing tonnage, the prime indication of mission success. But all consideration for safety had been ignored.

Night flying had been introduced on the Hump, although radio communication and navigational facilities were nonexistent except at the

terminals. Weather conditions were virtually ignored; the common saying was "there is no weather on the Hump." Many planes flew in violation of standard Air Corps specifications. As one report indicated: "If Air Corps technical orders were now in force, I doubt that there would be an airplane in the air."

General Tunner's challenge became immediately clear: Increase tonnage **and** lower the accident rate, seemingly contradictory actions in a wartime environment. Yet the record shows the two were not at odds at all. By instituting a safety program that seems obvious to us today, it became possible to change the whole tenor of the airlift.

What was the program? Nothing more than the basics distilled into four main points:

(1) Analysis of existing flight and maintenance procedures and practices,

(2) statistical investigation and analysis of the accidents,

(3) recommendations for the correction of faults revealed in the foregoing analysis,

(4) prompt action and follow-up on that action.

In particular, General Tunner and his staff carefully investigated the training of the pilots and made up for any gaps before sending them over the Hump. They began to take weather and communications seriously (there **was** weather on the Hump) attacking such conditions as icing and turbulence and becoming more familiar with navigational equipment and how best to deal with its absence.

Another major area was one we hear much more about today, particularly in the area of human factors—pilot discipline. General Tunner was very specific about the use and importance of the checklist, an aid which told the pilot "the exact procedure he must follow from the time prior to starting the engine to that following his cutting it off at his destination. We found planes without checklists and pilots who didn't bother." Both situations had to be corrected.

Briefing and debriefing, according to General Tunner, lay at the heart of the program:

"Briefing and debriefing proved to be of the greatest importance. Briefing involved not only a thorough preparation of the pilot for the route he was to take, but a check to make certain that the crew was competent to make the proposed flight safely. Debriefing would show up incompetent flight procedures, indicating the need for corrective action and additional training. Debriefing also provided our best weather reports."

Did all of this work? In August 1944, (just before General Tunner's arrival) they airlifted 23,000 tons to China with an accident rate hovering around 2.0 per 1,000 flying hours. In January 1945 with close to 40,000 tons airlifted, the accident rate dropped to .301. By July 1945, total tonnage jumped to 71,042 with an accident rate of .239. During August, the final big month of the airlift, 20 planes were lost during 136,000 flying hours, bringing the accident rate down to .154 per 1,000 flying hours. General Tunner makes the statistics come to life by looking at them another way:

"If the accident rate in 1943 and early 1944 had continued, along with the great increase in tonnage delivered and hours flown, American would have lost not 20 planes that month, but 292, with a loss of life that would have shocked the world."

Serious military airlift was born in this distant theater on the almost forgotten edge of the twentieth century's greatest war. Along with it, however, came safety. Especially the realization that safety was a necessary part of a wartime mission. ✧

—reprinted with permission

NCO Corner

All those messages...

Messages, messages, you get lots of messages. They are all important, but some are more important than others. Here's a rundown.

1. Safety of Flight Messages

SOF messages are defined as electrically transmitted messages pertaining to any defect or hazardous condition, actual or potential, that can cause personal injury, death, or damage to aircraft, components or repair parts where a medium to high risk safety condition has been determined per AR 385-16. These messages may also authorize the immediate use of technical changes to publications announced in the message pending receipt of the DA authenticated change. The types of SOF messages are as follows:

a. Emergency: An emergency message immediately grounds a fleet of aircraft or a designated portion of a fleet of aircraft. This occurs when a hazardous condition exists that has the potential to cause a catastrophic accident resulting in injury or death of personnel, damage, or destruction of aircraft. (These messages are for grounding purposes only. Emergency messages will always be followed by operational or technical messages.)

b. Operational : An operational message may ground an aircraft for operational reasons, other than emergency, to correct hazardous conditions pertaining to aircraft operation. These may include flight procedures, operating limitations, or operational policy.

c. Technical: A technical message may be issued to effect grounding for material or maintenance conditions. This message can be an independent or a follow-up to an emergency SOF message. Required corrective action must be completed within the time frame or frequency established by the initial message or published in subsequent SOF messages or publications. Technical messages may include the following:

(1) Corrective action not involving a configuration change.

(2) Aircraft, component, or repair parts modification to be accomplished by an urgent Modification Work Order.

(3) One-time inspection requirements for aircraft, components, or repair parts to be accomplished by an urgent Technical Bulletin (TB).

(4) Replacement of safety related items that require continuous monitoring.

2. Aviation Safety Action Messages :

Aviation Safety Action messages are defined as electrically transmitted messages which convey maintenance, technical or general interest information where a low-to-medium risk safety condition has been determined per AR 385-16. ASAMs are of a lower priority than SOF messages. ASAMs may direct, modify and clarify maintenance actions, update technical publications pending receipt of DA authenticated changes, or provide information to include aviation related equipment (for example, NVG, ALSE...). A maintenance mandatory ASAM will not ground aircraft but may require accomplishment of a task and require report of completion of findings. The types of ASAMs are as follows:

a. Maintenance mandatory: A maintenance mandatory ASAM directs maintenance actions and/or updates technical manuals and may also require compliance reporting and task/inspection reporting.

b. Informational: An informational ASAM will provide status and information of a maintenance, technical, or general nature.

c. Operational: An operational ASAM pertains to aircraft operation, flight procedures, limitations or operational policy.

3. Maintenace informational Messages:

Maintenace informational messages (MIMs) are a lower priority than ASAMs. MIMs are informational messages that apply to aviation maintenance personnel. Normally, MIMs do not require any entries on forms and records.

4. Safety of Use messages:

SOU messages are developed, prepared, and electronically sent by the Aviation and Missile Command (AMCOM) to all users of Army nonaircraft equipment. AR 750-10 covers procedures for issue, compliance, and management of SOU messages, urgent MWOs, and TBs. SOU messages are different from SOF messages and ASAMs; the different types of SOU messages are listed below.

(1) Operational: This type of message changes operating procedures or places limits on equipment usage.

(2) Technical: This message deadlines aviation associated equipment, used in support of aircraft and other aviation associated equipment, because of materiel or maintenance deficiencies. This type of message calls for modification of the equipment or its components, modules or parts. The information will be published later as an urgent MWO.

(3) One-Time Inspection: This type of message immediately deadlines equipment and directs inspection procedures before its next use. Equipment found to be deficient will remain deadlined until the deficiency is corrected. This type of message will not direct or prescribe a configuration change. SOU one-time inspection messages that are superseded by SOU technical messages will be published later as emergency TBs.

(4) Advisory or Technical Maintenance or Operational: This type of message contains new operational or technical maintenance information vital for equipment operators or maintenance activities. Advisory messages will not deadline equipment or direct accomplishment of a task or maintenance function.

The point of contact for SOF/ASAM message distribution, compliance reporting, and administrative matters is the AMCOM Safety Office. Technical or logistical questions should be addressed to the points of contact indicated in the messages. AMCOM Safety Office representatives can be reached at: Commercial (256) 842-8620 or 313-2097; DSN 788-8620 or 897-2097; and EMAIL safeadm@redstone.army.mil. Lost a message, or need to check and see if any new ones are out ? http://www.redstone.army.mil/sof

5. Safety –Alert Notifications :

SANs are issued by the U.S. Army Safety Center to notify users of existing and potential hazardous conditions identified during the course of an accident investigation. These are posted on the Safety Center's website at : http://safety.army.mil

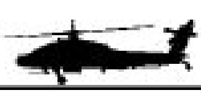
The point of contact for Safety Alert notifications distribution is Ed Heffernan, DSN: 558-2660, Com (334) 255-2660, or e-mail him at heffern@safetycenter.army.mil

—SFC Ralph McDonald, Aviation Division, US Army Safety Center, DSN 558-3754 (334) 255-3754, mcdonalr@safetycenter.army.mil

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH64



Class C

A series

■ During NOE flight, main rotor blade contacted power line, resulting damage to tip cap.

Class D

D series

■ During postflight inspection, aircraft drive shaft cover was found open. Preliminary inspection revealed scarring to No.5 tail rotor drive shaft, and structural damage to tail rotor drive shaft cover.

Class E

A series

■ After completion of tactical refuel, crew began transition from day to night-aided flight. During runup for NVS flight, pilot's Night Vision Sensor picture was found to be unstable. PIC aborted mission, returned to home airfield unaided, completed landing and taxied to parking without further incident. Maintenance troubleshooting revealed faulty Pilot Night Vision System. System was replaced, and aircraft was released for flight.

■ While on the ground, engines running, aircraft's HARS/Doppler was found to be inoperable. Aircraft was shutdown without further incident. Doppler signal data converter was replaced.

D series

■ During landing, No.2 generator failed. Aircraft was shutdown without further incident. Replaced spline adapter.

■ During approach, utility hydraulic level caution message was announced. Aircraft landed without further incident. Replaced utility hydraulic shutoff valve.

C12

Class C

N series

■ While taxiing, aircraft's left wing pod contacted a parked fuel truck. Damage occurred to left wing instrument pod, wing tip and NAV light. Aircraft was flown under one-time flight authorization back to home station.

T series

■ Crew observed No.2 engine over-temp reading shortly into flight. Crew continued flight to home station. Postflight maintenance inspection revealed engine TGT reading of 813°C for 28 seconds. Engine replacement pending.

Class E

F series

■ A report believed to be thunder was heard during flight, but no flash of light was noted. As the FMS 800 had malfunctioned during an earlier flight, no change of operation was noted. Damage to the antenna was discovered on the post flight inspection.

CH47

Class C

D series

■ While aircraft was at a 15-ft hover, two slingloaded HMMWVs separated. Both vehicles sustained extensive damage.

Class E

D series

■ During ramp and cabin check, flight engineer noticed hydraulic fluid seeping from the No.1 AFCS Roll ILCA, upper pressure tube. No cockpit caution capsules illuminated. Maintenance panel indicated minor loss of hydraulic fluid. Crew terminated training and returned to home station without further incident.

OH58

Class A

C series

■ Aircraft reportedly descended while circling at terrain flight altitude, and impacted the ground. Crew sustained treatable injuries. Aircraft destroyed.

D (I) series

■ Aircraft was Chalk 2 in a multi-ship contour flight when it contacted wires. Aircraft landed under its own power; damage was sustained to one main rotor blade.

■ RSP experienced uncommanded engine acceleration during engine run-up procedures. Engine monitor display revealed that engine had exceeded allowable NP limits (128% for 2 seconds).

Class C

D series

■ During termination phase of low-level autorotation, main rotor blades struck the tail rotor driveshaft cover. Aircraft was shutdown without further incident. Damage to 2 main rotor blades, tail rotor driveshaft and cover, and embedded global positioning system/inertial navigational system antenna.

Class E

A series

■ As the aircraft transitioned from low level to contour flight entering the training area, the pilot on the flight controls noted medium and high frequency vibrations in the pedals. As power and airspeed were stabilized, vibrations decreased to slight high frequency. When power and air speed were reduced again vibrations increased. Medium frequency was especially noticeable at airspeed less than 40 Kias. A Precautionary Landing was performed. Maintenance personnel determined the tail rotor was out of balance.

TH67

C series

■ Engine would not start. Aircraft was shutdown without further incident. Replaced key switch.

UH60

Class E

A Series

■ Aircraft experienced total electrical failure during hover, landed without further incident. Replaced starter generator.

Class C

A series

■ Crew noticed chip detector illumination upon nearing their intended landing point and immediately initiated their descent to land. Crew then experienced drooping of the main rotor blades just prior to touchdown. Crew executed a normal landing and aircraft-shutdown. Postflight inspection confirmed non-flyable status. Subsequent maintenance inspection revealed that all 4 MRB had made contact w/the ALQ 144.

Class D

A series

■ After hot refueling and taxi to pickup point, aircraft shutdown to await passengers. During the shutdown, APU running, engines at idle, master caution boost, SAS and No.2 Res low light illuminated. Crew chief observed hydraulic fluid cascading down right side of aircraft. Shutdown without further incident.

Class E

A series

■ During approach after NVG training flight, crew attempted to use the landing light without success. After landing, the landing light bulb was found to be hanging from its wires. Maintenance personnel determined that the light's retaining ring failed, allowing the bulb to become loose and dangle from its wires, thus becoming jammed. The light assembly was replaced and the aircraft was released for flight without further incident.

■ While on the ground, engines running, No.2 engine failed. Aircraft was shutdown without further incident. Replaced Hydro mechanical unit. MOC test flown OK.

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.

Vehicle Safety Quiz

1. Speed, fatigue, alcohol and non-use of seatbelts are most likely to kill soldiers.

❑ ***True*** ❑ ***False***

2. A soldier is required by Army regulation to use seat belts at all times, on and off the installation, while riding in a POV (privately owned vehicle).

❑ ***True*** ❑ ***False***

3. Seatbelts are not necessary if your vehicle is equipped with air bags.

❑ ***True*** ❑ ***False***

4. Most fatal POV accidents in which the Army driver is at fault occur in which time period:

❑ **a. 0600-0900**
❑ **b. 0900-1500**
❑ **c. 1600-2000**
❑ **d. 2100-0500**

5. If you are driving and feel sleepy, you should:

❑ **a. Roll down the windows so the fresh air will wake you up**
❑ **b. Turn the radio volume up to keep you alert**
❑ **c. Turn the air conditioner to a higher setting; the cool air will wake you up**
❑ **d. Stop and get some sleep**
❑ **e. Any of the above**

6. One beer or less in an hour can affect judgment and loosen inhibitions in the average 160-180 pound individual.

❑ **True** ❑ **False**

7. Which of the following factors determine safe driving speed? (Choose all that apply.)

❑ **a. Posted speed limit**
❑ **b. Road and weather conditions**
❑ **c. Time of day**
❑ **d. Amount and type of traffic**
❑ **e. a and b**
❑ **f. a through d**

8. Most fatal POV accidents in which the Army driver is at fault occur on:

❑ **a. Monday and Friday**
❑ **b. Wednesday, Thursday, and Friday**
❑ **c. Friday, Saturday, and Sunday**
❑ **d. Sunday and Monday**

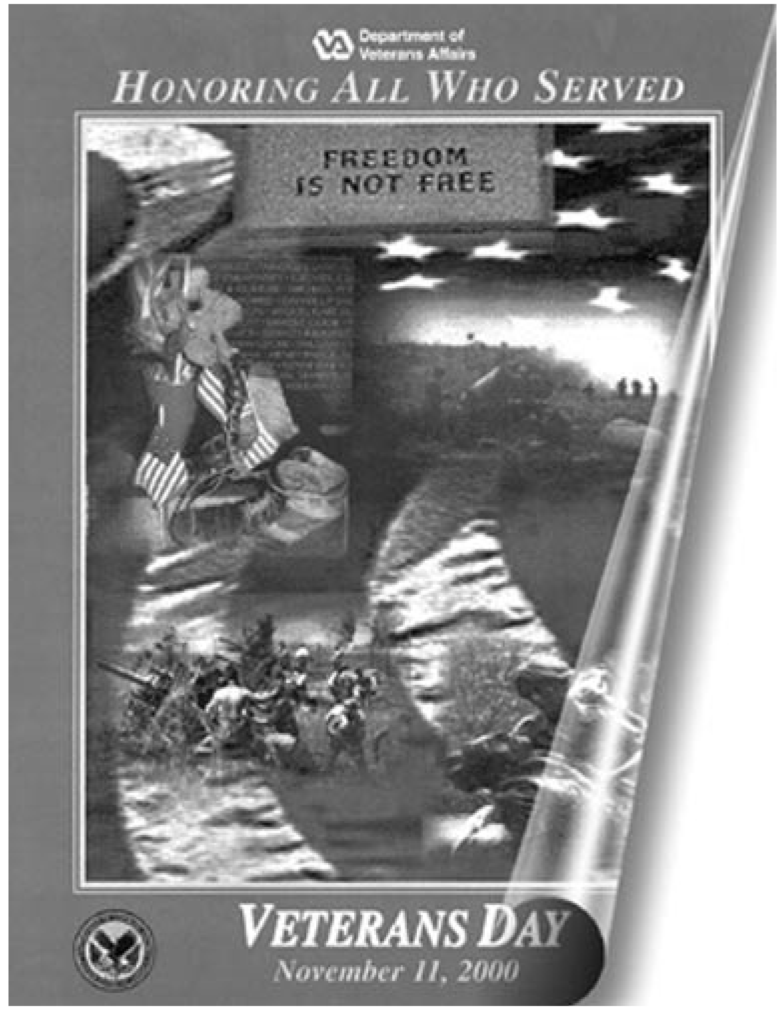
Answers: 1. True 2. True 3. False 4. D. 5. D. 6. True 7. F. 8. C.

Cold weather publications

Your aircraft –10 TMs often refer you to FM 1-202, *Environmental Flight*, for additional info on cold weather operations.

Forget that! FM 1-201, *Fundamentals of Flight*, has replaced the old FM 1-202. The new pub has updated cold weather information, and includes the info from FM 1-203, *Fundamentals of Flight*; TC 1-201, *Tactical Flight Procedures*; and TC 1-204, *Night Flight Techniques and Procedures.*

—PS Magazine



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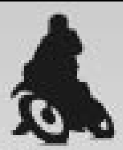

POV Fatalities

through 30 Sep

FY00	115
FY99	124
3-yr Avg	111

U.S. ARMY SAFETY CENTER

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Gene M. LaCoste
Brigadier General, USA
Commanding

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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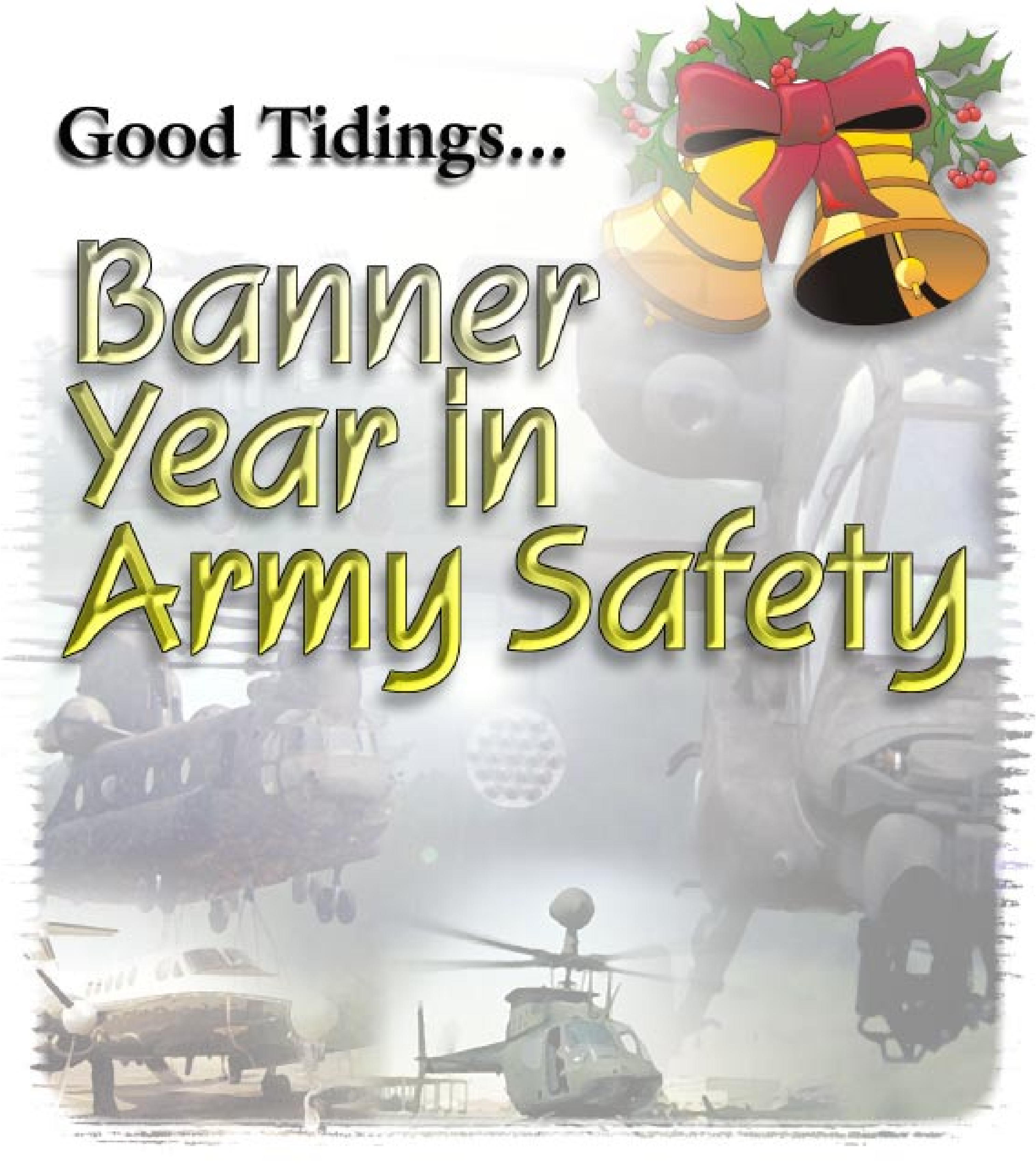
http://safety.army.mil

Good Tidings...

Banner Year in Army Safety



UNITED STATES ARMY HAS BANNER YEAR IN SAFETY

The U. S. Army just completed one of its safest years in history. Army aviation accidents and fatalities are at an unprecedented low, and ground and vehicle accidents and fatalities have also been reduced from previous years. The largest reductions were in Army aviation. Aviation flight fatalities have dropped from 22 in Fiscal Year 1999 to four in FY 2000, an 82-percent reduction. Class A and B flight accident rates for FY00 show a 70-percent reduction from FY99.

Not only did fatality rates decline in the aviation community, but the Army also closed out FY00 with its second-lowest year ever of ground and privately owned vehicle (POV) fatalities. POV accidents, notoriously the number-one killer of soldiers, claimed the lives of 114 soldiers in FY00, compared to 124 in FY99. On-duty ground fatalities dropped from 32 in FY99 to 27 in FY00, a 15-percent reduction.

Brigadier General Gene M. LaCoste, Director of Army Safety and Commander of the U.S. Army Safety Center, said this year's safety successes were possible because the Army—soldiers, civilians and family members—all worked together to manage risk effectively both on and off duty.

According to LaCoste, the FY00 safety success can be attributed to four factors:

- Leadership involvement, which equates to command emphasis on safety programs.
- Improved ability of soldiers to identify hazards, assess risks those hazards impose, and implement controls to mitigate the risks.
- Enforcement and adherence to standards by leaders and soldiers.
- Improved self-discipline.

"The Army's emphasis on the basics of leadership, standards and discipline is evident in the lives we saved and in the degree to which we enhanced our combat readiness by preserving both our people and our materiel resources," says LaCoste.

While the Army enjoyed a record-breaking year in safety, there's still work to do. "We can never rest on our laurels. The numbers and rates aren't low enough. The numbers and rates will never be low enough if we lose even one soldier or civilian."

"Safety success is fragile," said LaCoste as he cautioned that we must stay focused on the missions and prioritize requirements. "To ensure that we continue to set soldiers up for success, we owe it to them to intensify our efforts to fully integrate risk management into our training, leader development, and materiel systems designs." By doing these things, LaCoste said, the Army can continue to achieve significant gains in safety.

LESSONS LEARNED: PAYBACK TIME

The phone rang three times before I realized it was the one on my nightstand and not the one in my dreams. When I looked over at the clock, the digital read out showed 0100. Who in the world would be calling me at this hour, probably a wrong number, and then I remembered I was first up as a board recorder. You see I work at the Safety Center as an accident investigator.

The voice on the other end of the phone said: *we have had a Class "A" aircraft accident in Colorado; no fatalities but there were several injuries. A UH-60 aircraft has hit wires and crashed.*

I asked, what time do we depart? The voice, on the other end of the phone, replied: *0800 hours, via military air. Oh, by the way, the accident site is located in Colorado at the 12,000-foot elevation mark and there is plenty of snow on the ground, so pack accordingly.*

Great, I thought. All I had was a pair of cold weather-boots and a heavy flight jacket, and it was the middle of February.

At 0730 I met up with the board president at the airfield and we boarded our flight to Colorado. By late morning we were in Colorado, making arrangements to get a ride up to the accident site with the accident unit.

COLD WEATHER CLOTHING

When the supporting unit inventoried our cold weather clothing, they informed us that it would not be adequate. We were taken over to a Special Forces unit, where we were issued appropriate cold weather clothing. They provided us with all the cold weather gear we would need. You would have thought we were going to Alaska with all the stuff we were issued.

After arriving in Leadville, we checked into our hotel and linked up with the Special Forces commander for an update and briefing. The Special Forces unit was providing site security for the downed UH-60 aircraft.

The briefing went something like this: *after arriving at the lake by ground vehicle you will ride on the back of snowmobiles along a four mile stretch of road and then travel a mile cross country to get to the crash site*. No problem—I thought, they had it planned very well except for one thing. You see, I am from Charleston, South Carolina, and you know they do not get very much snow. So what's the point? Well, the point is, I was to ride for five miles on the back of a snowmobile. I have never seen a snowmobile much less ridden on one. Snowshoes, what are snowshoes?

So for the next hour I went through a very thorough class on the Do' s and Don'ts of riding on a snowmobile and how to wear and walk on snowshoes.

THE RIDE OF MY LIFE

The next morning, the accident board team members met out in front of the hotel, counted heads, and then loaded into vehicles to drive out to the pick-up site. There we would link up with our snowmobile driver's. We made it to the pick-up site with little difficulty. After a few handshakes and formalities we were assigned snowmobiles with drivers. The snowmobile drivers were all senior Special Forces NCOs. They conducted a quick informal class on how to ride on a snowmobile. They covered such things as where to hold on, leaning into turns, and no talking to the drivers. We were about to load onto the snowmobiles when one of the NCOs asked an out-of-the-blue question: "Are you all pilots?" We said, "yes" in unison, wondering why in the world he would ask us such a question. Well, one of them said that they did a lot of riding in the back of helicopters. I thought to myself, so?

As I climbed onto the back of my snowmobile, I tapped my driver on the helmet to ask him a question. Before I could get my question out he asked me if I saw the logo emblem on the back of his helmet. I told him that I did. He then instructed me to focus my eyes only on the logo and nothing else. "Do not lean to the left or right; just sit straight up and do not move around." I told him, sure, no problem. He asked me if I had any questions and I told him I had one. "OK, What is it, sir?" I inquired about the earlier question, asking us if we were pilots. As we started down the road at a brisk pace I heard these words: "**PAYBACK TIME!**"

For the next four miles, I hung on for dear life, thinking at any moment I was going to be hurled off this rocket into oblivion, never to been seen again in one piece. After what seemed an eternity, we slowed down and stopped. We had come to the end of the road and were going into the woods for the last mile. With my stomach up around my neck, I felt I had done very well to stay on this thing and proud to say that I never let that logo out of my sight.

We proceeded into the woods at a much slower speed. We had only been in the woods a short time, when I lost sight of the logo. I was wondering to myself, what happened to the logo? It just disappeared. It did not take long to figure out where it went, especially after a tree limb almost took my head off. You see, the driver was driving in, around, and under trees. Somehow he had forgotten to tell me the part about driving under tree limbs. By now you probably have figured out what happened to the logo. As the driver went under a tree he ducked without telling me. It only took one time; the next time the logo disappeared, I ducked. We made it to the accident site without another incident.

PAYBACK

Upon arriving at the crash site, I dismounted from the snowmobile, took my helmet and gloves off, and reached over to shake the driver's hand and thank him for that wonderful experience. As we shook hands, not a word was spoken from either one of us, just a large grin covered the driver's face. I had been paid back in full, plus some, for all the helicopter rides he had ever been on.

I guess the point to this story is to remind pilots out there that you never know when and where you will encounter one of your passengers. They always seem to remember the rides they were given, especially the rides where the pilots tried to make them sick. So the next time you try to thrill your passengers with your flying skills, remember those two words: **"PAYBACK TIME".** You may never know when or where you will hear those words.

—CW5 Bill Ramsey, Accident Investigator, US Army Safety Center, DSN 558-2785, (334) 255-2785, ramseyw@safetycenter.army.mil

Safety goes hand in glove with mission

Safety is not an entity in and of itself. Commanders need to develop a healthy perspective as to safety, not think of it as an obstacle to mission accomplishment, but a *means* to mission accomplishment.

In this article I want to highlight the links among management, standardization, training and safety. These items go hand in glove with mission accomplishment and cannot be separated.

AR 5-1, *Army Management Philosophy,* provides a definition of management: *"The process of acquiring, assigning priorities, allocating and using resources (people, money, materiel, facilities, information and time)* in an effective and efficient manner."

DOD-MIL-STD-8823, provides a definition of safety: *"The conservation of human life and its effectiveness, and the prevention of damage to items consistent with mission requirements."*

Note how these two statements follow the same theme as AR 385-95, Para 1-5 b (1), *Commander's Duties*, which calls for establishing requirements as necessary for the safety and conservation of aviation resources under their control. *"This will conserve manpower and materiel by reducing losses due to* *accidents*."

The basic gist here is to accomplish the mission while conserving resources. We do this and prepare for this with training and standardization, or standardized training. Let's look at some statements and definitions in training and standardization, and note the ties with management and safety.

AR 34-4, Army Standardization, defines standardization this way: *"The management principle which fosters the development and sustainment of a high state of proficiency and readiness among soldiers and units throughout an organization. Standardization is accomplished through the universal application of uniform practice and procedures*."

Management, standardization, training and safety go hand in glove with mission accomplishment and cannot be separated.

You may ask where or at what level this standardization, or development of uniform practices, is developed. AR 350-41, Training in Units, provides some insight in this area, in paragraph 5-4, Training Standardization:

"Executing training using approved Army publications (field manuals, mission training plans, drills, soldier's manuals, MQS manuals, training circulars, training manuals, and technical manuals) provides the basis for standardization."

This looks very much like a statement in AR 385-95, Army Aviation Accident Prevention. Paragraph 1-5 b. (2) states:

"Safety is a by-product of professionalism, and professionalism means complying with all set standards (Army regulations, aircrew training manuals, technical manuals, field manuals, SOPs and so forth.) By the book, disciplined operations are mandatory."

AR 385-10, paragraph 2-2 b. states: *"Ensure that the risk management process is incorporated in regulations, directives, SOPs, special orders, training plans; and operational plans; and SOPs are developed for all operations entailing risk of death, serious injury or property loss."*

Furthermore, AR 385-10, paragraph 1-5e says " *Appropriate action will be taken to expeditiously correct non-conformities with mandated standards, work place deficiencies, hazards, and accident causes.*

AR 350-41, Training in Units, paragraph 3-3-2 f. notes the responsibilities of the commanders: *"Set the standard for safety, provide guidance for risk acceptance decisions and conduct training risk assessments."*

It can be deduced that safety is a result or product of proper management, training and standardization. Also, the purpose of standardization of training, along with standardization and training is to allow accomplishment of the mission while conserving the resources.

A common thread runs through all of the terms—management, standardization, training, and safety. FM 100-5, Operations, lists safety as one of the four parts of protection, which is one of the four primary elements of combat power. It provides a fitting conclusion:

"Safety is a part of all combat operations and operations other than war. Commanders at all levels should embrace safety as a principal element in all they do. Safe procedures represent a skill—a product of enforced standard and training. Safety in training planning and operations is crucial to successful combat operations and preservation of combat power."

ACCOMPLISH THE MISSION-CONSERVE THE RESOURCES

—Major Keith M. Cianfrani, US Army Reserve Liaison Officer, USASC, DSN 558-9864, (334) 255-9864, cianfrank@safetycenter.army.mil

Product Quality Deficiency Reports

During an accident investigation, materiel factors are always investigated. The materiel factors investigation is conducted to establish the equipment's condition at the time of the accident, to describe the damage that occurred during the accident sequence, to determine any materiel failures or malfunctions that caused or contributed to the accident, and to identify the system inadequacies (root causes) for the materiel failure or malfunction.

One source of information that is reviewed during the materiel factors portion of the investigation is product quality deficiency reports (PQDR). The PQDR will alert the investigator to suspect parts that should be examined for failure or malfunction during the investigation. But the primary reason for submitting a PQDR is not to assist an accident investigator but to prevent the accident from ever happening.

DA Pam 738-751: *Functional User's Manual for the Army Maintenance Management System–Aviation (TAMMS-A)*, Chapter 3, specifically addresses PQDRs. And it's important to remember that Army Regulation 750-1: *Army Materiel Maintenance Policy and Retail Maintenance Operations*, paragraph 4.42, makes the requirements of DA Pam 738-751 **mandatory**.

Purpose

According to paragraph 3-2a, the primary purpose of a PQDR is to "suggest corrections and improvements to aircraft and aviation-associated equipment, including mission-related equipment, and to alert AMCOM to problems encountered by the user due to receipt of defective equipment."

Types

Two categories of PQDRs, categories I and II, are addressed in paragraph 3-2b. Category I PQDRs are submitted to describe an unsafe condition, operational or maintenance procedure for aircraft, mission-related equipment, component or module, or repair part whose use is critical to airworthiness, and failure that could be expected to cause loss of aircraft and/or serious injuries to the air crew or ground personnel.

Additionally, Category I PQDRs are used to report the reason for failure, identified or suspected, when it does not provide enough warning for the aircrew to complete a safe landing, and it is reasonable to assume that the problem could be present in other aircraft of the same mission, design, and series (MDS) or to report incorrect or missing data in technical publications that may cause a hazardous operational or maintenance problem.

Category II PQDRs are submitted for items that do not meet the definition of a Category I item, but may adversely affect serviceability, durability, maintainability and/or reliability of an aircraft system, subsystem, repair part, component or module, and/or mission-related equipment.

Conditions for submission

One of three conditions described in paragraph 3-2d must be met for submitting a PQDR:

- The material failure or fault would cause a hazard to personnel, equipment, or safe completion of the mission;
- The equipment does not work properly because of bad design and/or material, or low-quality workmanship during manufacture, modification, conversion, repair, overhaul, or rebuild;
- Environmental conditions cause aircraft, aviation-associated equipment, including mission equipment, components or modules, repair parts, systems and/or subsystems to fail.

Special conditions requiring submission of a PQDR

There are certain special conditions described in paragraph 3-2e that require the submission of a PQDR. A Category I PQDR will be submitted when any condition involving personnel safety or safety of flight (SOF), as

defined in AR 95-1: (Flight Regulations), is discovered. Additionally, a PQDR must be submitted to AMCOM when suspected or confirmed materiel failure is the cause of a Class A, B, C, D, or E accident/incident. A copy of the PDQR must also be submitted with the accident report in accordance with AR 385-40: *Accident Reporting and Records*. When the PQDR is submitted on a failed part that caused an accident and/or incident, the unit will not be charged with the mishap. The mishap will be charged to a special DA account in accordance with AR 385-40, paragraph 1-6b(1).
(NOTE: There is no specific block on DA Form 2397-AB-R (AAAAR) to enter the PDQR number. It is recommended that the PDQR number be annotated in block 15, SUMMARY, of the AAAR.)

Submission of PQDRs

PQDRs should be submitted to AMCOM using SF 368 and forwarded to the addresses listed in Table 3-4 of DA Pam 738-751. Remember, Category I PQDRs must be submitted telephonically within 24 hours and followed up with an electronic message, fax, or e-mail. Category II PQDRs must be submitted within 5 working days after discovering the fault or failure.

The PQDR is a very effective accident prevention tool—if everyone takes the few minutes required to complete and submit the report when it is required. Let us help you prevent accidents by informing us of the problems you are having.

—Gary Braman, Fixed-Wing/Cargo Aircraft Systems Safety Manager, USASC Aviation Systems and Accident Investigation Division, (334) 255-2676, DSN 558-2676, bramang@safetycenter.army.mil

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

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

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

AMCOM
E-mail: cfo@redstone.army.mil
FAX: DSN 746-4904/Commercial 256-876-4904
Phone DSN 788-6665/Commercial 256-876-6665

CECOM
E-mail: cfo@cecom2.monmouth.army.mil
FAX: DSN 992-1413/Commercial 732-532-1413
Phone: DSN 992-3808/Commercial 732-532-3808

SSCOM
E-mail: hormsbee@Natick-amedd2.army.mil
FAX: DSN 256-5286/Commercial 508-233-5286
Phone: DSN 256-5043/Commercial 508-233-5043

TACOM-ACALA
E-mail:qawqdrs@ria-emh2.army.mil
FAX: DSN 793-6653/Commercial 309-782-6653
Phone: DSN 793-6764/Commercial 309-782-6764

TACOM-Warren
E-mail: tacomdrs@octagon.tacom.army.mil
FAX: DSN 786-6637/Commercial 810-574-6637
Phone: DSN 786-5422/Commercial 810-574-5422

DA Form 2028
The DA Form 2028 can go several ways:
Snail Mail:
Commander, AMCOM (US Army Aviation and Missile Command)
AMSAM-MMC-LS-LP, B-5301, Room 1128
Redstone Arsenal, AL 35898-5230
E-Mail: ls-lp@redstone.army.mil
FAX: DSN 788-6546/Commercial 256-842-6546
Web Access: www.uhpo.redstone.army.mil

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

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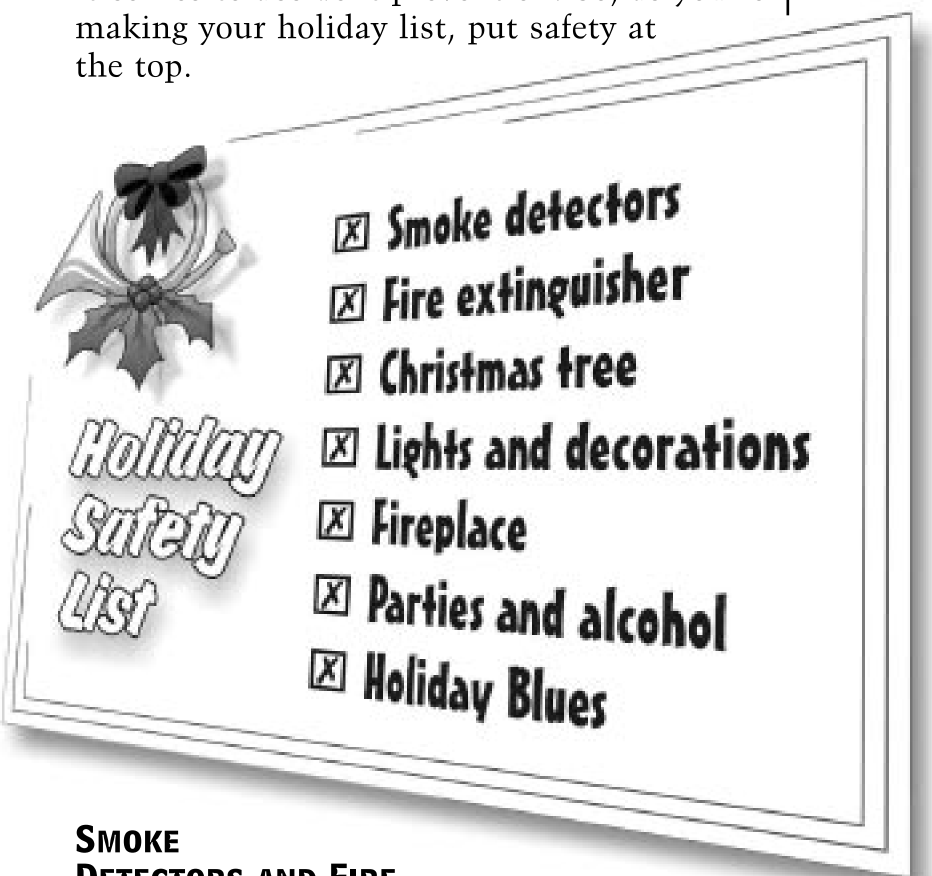
Put Safety at the Top of Your Holiday List

The holidays are a joyful time of the year as we gather with our families and friends. Often, our lives become very hectic as the season approaches, and it's easy to overlook common safety precautions. Just as there are safety rules and precautions to help you on duty, there are also safety guidelines to help you through the holidays while off duty. As joyous as the season is, we must remember to keep our guard up when it comes to accident prevention. So, as you're making your holiday list, put safety at the top.



Smoke Detectors and Fire Extinguishers

If you don't have these essential lifesaving devices, put them at the top of your shopping list. Smoke detectors should be installed on each floor of your home and outside each bedroom. Avoid placing smoke detectors in the kitchen, where false alarms are common. Test your smoke detectors at least once a month, and replace their batteries once a year. Make sure every member of your household knows what the smoke detector alarm sounds like and what to do if there is a fire. Also, buy a fire extinguisher for your home and make a habit of inspecting it on a regular basis.

Christmas Trees

Christmas trees are one of the most popular traditions of the season—-and one of the most dangerous. Whether you choose a live tree or an artificial one, there are certain precautions that must be followed.

Freshness is the most important safety factor. The higher the moisture content, the less likely the tree is to dry out and become a fire hazard. The best way to ensure a tree is fresh is to cut it yourself; however, sometimes that can't be done. Pre-cut trees can be just as good if you use these tests to help judge a tree's freshness:

- Lift the tree and tap the trunk on the ground. Only a few needles should fall, and the trunk should be sticky with sap.
- Make sure the needles are attached firmly to the twigs and that the needles can be bent without breaking.

Once you get the tree home, take these precautions to keep it fresh:

- Immerse the tree trunk in a bucket of water until ready to decorate.
- When you're ready to put up the tree, cut a one- or two-inch diagonal slice off the bottom of the trunk. The new cut helps the tree absorb water and will preserve freshness.
- Put the tree in a sturdy stand with widespread legs and keep the stand filled with water the entire time the tree is indoors.
- Keep the tree at least three feet away from heat sources such as fireplaces and space heaters.

When the holidays are over, take the tree outside as soon as possible. Recycle or discard it according to your local city or county regulations.

If you are considering using an artificial tree this year, look for the label "Fire Resistant" when purchasing. Be aware that even fire-resistant artificial trees can catch fire—especially if they have years of dust buildup on them. Wash the artificial tree each year and store the parts in plastic bags. When decorating, be sure lights are designed for artificial tree use.

Important: To keep your tree from being knocked over, set it up where it is out of the way of traffic and does not block entrances or exits.

Lights

Mixing and matching lights can create a fire hazard, so keep outside lights outside and inside lights inside. Examine lights before you hang them. Check to see that each strand has a United Laboratory (UL) label, indicating it has been safety tested. Inspect the light strings and cords for fraying, bare wire, loose connections and broken sockets. After replacing missing or broken parts, check each set by setting it on a nonflammable surface and plugging it in for 10-15 minutes to see that the lights don't melt or smoke.

Now that you have examined the lights, you're ready to hang them. Be sure to take the following precautions:

■ Position the bulbs so they are not in direct contact with needles or ornaments. Also keep lights away from curtains or flammable materials.

■ Don't overload electrical outlets. Don't connect more than three sets of lights to an extension cord.

■ Keep cords and plugs away from the water under the tree.

■ Don't run a cord under a rug or carpet, since wires may overheat and surrounding materials could catch on fire.

■ Be cautious when placing cords behind furniture—if pinched, cords may fray.

Remember: Unplug all decorations inside and outside the home before leaving the house or going to bed.

Fireplaces

The holidays bring to mind images of relaxing in front of a cozy fire. But before you get too comfortable, review these safety rules for using fireplaces:

■ Ensure a professional cleans your chimney every year.

■ Don't use a fireplace to burn wrapping materials or newspapers. It can create toxic fumes and even a flash fire.

■ Use kindling and wooden matches to light fires, not flammable liquids.

■ Always use a fire screen.

■ Don't wear loose or flowing clothes when tending fires.

■ Don't close the chimney flue until you ensure the fire is completely out.

■ Ensure the fire is out before leaving the house or going to bed.

Important: Dispose of ashes in a metal container. Never store them in or near the house.

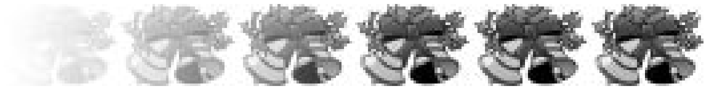
Holiday Parties and Alcohol

It's great to get together with coworkers and friends to celebrate the season. Let common sense be your guide. Please don't drink and drive. Use a designated driver or take a taxi home. Better yet, don't overdo it. If you're hosting a party, serve plenty of food along with the drink.

Holiday Blues

Finally, the holiday season--a joyous season for most people--is just the opposite for many soldiers away from home, perhaps for the first time. Being alone for the holidays can have a depressing effect. Don't let someone you know spend the holidays alone. The true meaning of the season is that of giving and opening our hearts to others.

—Reprinted from Countermeasure



Can I wear sneaker boots?

The Army Safety Center has received inquires asking if the all-leather sneaker boot can be worn by Aviation crewmembers. It meets the description of "boots, black, leather" in AR 670-1 and AR 95-1, so why not?

We contacted the U.S. Army Aeromedical Research Laboratory, Directorate of Combat Development, DCSPER, and Natick Laboratory, and the answer is still no. Here's why: In AR 670-1, chapter 2, there is a paragraph that reads, "Manufacturers and suppliers of uniform clothing items will (1) Obtain certification required under the UQCP from the U.S. Army Uniforms Branch, U.S. Natick Research Development, before manufacturing any items for sale. (2) Affix the following label certifying the uniform items were manufactured in accordance with the UQCS prior to offering the items for sale: *"This garment is warranted to meet or exceed the standards of specification number ___ and was produced under specification number ___ from basic material warranted by the manufacturer as having been produced in accordance with the sample under current certification."* (3) Familiarize themselves with Army specifications, purchase descriptions, shade standards, and other pertinent information and submit required samples and information to the Uniforms Branch for approval. Fact of the matter is that your favorite sneaker boot company has not submitted any samples for testing that meets the U.S. Army basic requirements or standards for footgear.

Authorized manufacturers such as Cochran and H&H have the specification number stamped on the boot, which specifies they have met all the said requirements. In addition both the Air Force and Navy Safety Centers confirm that they do not authorize sneaker boots for their aircrews. Not just any boot, leather, black, meets the requirement for aviation use.

—MSG Terry Briggs, Aviation Investigations, US Army Safety Center, DSN 558-3703, (334) 255-3703.

NCO Corner

NO RESPECT

Recently I was reading through a Navy magazine called "MECH" April-June 1999 issue. I came across an article written by Joe Castro of the Navy Safety Center. The article was titled, "Are you part of the Solution or the Problem?"

In reading this article I thought, "This could be about our Facility!", albeit some of the equipment was different. I discovered that we, on the Army side, realize many of the same types of problems. Having visited a few other facilities in my career , Active and National Guard, I found the same problems. Problems not only with the equipment, but also problems with attitude, application and education.

Attitude in the sense of how the equipment is used, treated and cared for. Most often the attitude is that the equipment is "Not Critical",as in, "It isn't important because it doesn't fly" or "I work on Aircraft not Ground Equipment". These attitudes and others like them often lead to the abuse and the poor condition of our Ground Support Equipment. *It Gets No Respect!*

Application in how the equipment is used. How many facilities can say, "We never have used our tug as a taxi"? How many aircraft mechanics can say they have never used a piece of equipment improperly? I should add here, "Knowingly" used a piece of equipment improperly. Which will take us to the next point.

Education is knowing the basic PMCS, BEFORE, DURING AND AFTER USE checks. Most equipment users will say, "I know how to use that piece of equipment", when in reality they know how to get it to do what they need it to. Far too often they won't know where to find the dip stick, if it is so equipped. Therein lies the problem, the lack of education about the equipment.

The following are sample incidents where all three stated problems came into play:

A Test Pilot and Ground Crew were going to power up an OH-58A to do some ground runs and MOC's. They required the use of the 10KW

Generator (Ground Power Unit). Though it is normally stowed on the flight line, the Ground Crew found it in the GSE storage yard. They rolled it out to the aircraft and immediately plugged it in. Upon doing so sparks and smoke began to come from the Generator. They quickly unplugged it and rolled it away from the helicopter. When they finally opened the access panel on the generator they found a red tag and the fact that the battery had been removed in the course of other maintenance being performed.

When they plugged it in, the helicopter battery current back charged the system, and shorted out the cables against the frame of the Generator. The logbook DD 5988 had been annotated with the maintenance ongoing. Yes, a tag could have been placed on the outside of the piece of equipment. However, a "before use" check would have prevented the resulting damage.

An aircraft mechanic was in a rush to service the tires on an AH-64A. He drove a tug to the GSE Storage yard and hooked up the nitrogen cart trailer. In his rush to get out to the aircraft, he cut the corner too tight. The left tire of the trailer came in contact with a B-4 work stand parked next to the trailer and punctured the tire. This caused the unnecessary expenditure of approximately $ 60.00 for a new tire. The irony is that the aircraft had to wait even longer for the tire to be changed than if the mechanic had taken a little more care.

Numerous incidents like these and incidents that result in injury, even death, occur throughout the Army system. The vast majority of which can be prevented through changing attitudes, application(use) and educating personnel. Even though we are only talking about lowly Ground Support Equipment, it deserves respect too!

The first step in rectifying the problem is awareness. Then by surveying your own particular situation, developing a training plan that fits your needs and schedule. It all comes down to Supervision. Supervisors have to insure the training is being used and followed. They must regularly re-emphasize the criticality of Ground Support Equipment and how it is treated and cared for. Remember the key word is support; without it something usually falls, fails or just comes up short.

It is your program, your equipment, Show it some *RESPECT!*

1SG CALVIN L. MONROE
ALLIED SHOPS SUPERVISOR
ARIZONA ARMY NATIONAL GUARD
ARMY AVIATION SUPPORT FACILITY #2 SILVER BELL ARMY HELIPORT
MARANA, ARIZONA 85653-9598
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Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH1

Class C

F series

■ Main rotor tiedown was left on during start up and became entangled with tail rotor assembly.

Class E

F series

■ During engine run up, aircraft's engine fuel pump caution light illuminated and remained on. The mission was canceled. Maintenance found water in the wire lead boot for the fuel pump, connections were corroded. Connections cleaned and boot sealed.

AH64

Class C

A series

■ During NOE flight, main rotor blade contacted a power line. Main rotor blade tip cap was damaged.

Class E

A series

■ Aircraft was in cruise flight at 3500 feet and 120 knots when the No.2 nose gearbox chip light illuminated. Crew completed the emergency procedures for this fault, when the No.2 nose gearbox PSI segment light also illuminated. Crew then shutdown the No.2 engine and completed a rolling landing. Maintenance discovered that the output seal was blown, and that only 20% of the oil remained in the gearbox. Chip detector was pulled and found to have small flakes of metal on the plug. Maintenance replaced the #2 engine nose gearbox.

■ During run-up, TADS registration check was out of tolerance. Aircraft was shutdown without further incident. Mission aborted. Replaced data entry keyboard.

■ During cruise flight, TADS was excessively grainy. Aircraft landed without further incident. Replaced night sensor assembly

■ During cruise flight, HARS went into free inertia and doppler was inoperable. Aircraft landed without further incident. Replaced doppler.

■ After takeoff, on crosswind, the OIL PSI Accessory Pump caution warning light illuminated. Aircraft made a precautionary landing and shutdown without further incident. Maintenance replaced the accessory oil pressure switch. Maintenance checks were good. Aircraft was returned to service.

D series

At 300′ AGL and 60 KIAS No.1 generator fail was displayed via up front display message. Both pilots' stations lost their multifunction display and helmet display unit video for 20-30 seconds. Their function returned as inverse video after an additional 30-40 seconds. The aircraft was landed without further incident. Maintenance replaced the failed generator. Maintenance operational check was performed and aircraft was released.

C12

Class E

J series

■ During takeoff climb, the right propeller RPM dropped below 1300 RPM. Normal range is 1400-1700. Instructor pilot reduced the right power lever to idle and feathered the right propeller. A single engine landing was made without further incident. Maintenance found that the wire rope on the propeller reversing push/pull control assembly had been stretched.

N series

■ While in flight, aircraft's Mission Power Fault Light illuminated and the scent of melting plastic was noticed. A descent to 10,000 MSL with oxygen mask on was initiated while performing the emergency procedure. During the descent the R/Bleed Air Fail Light illuminated and the R/Bleed Air was turned off. The scent of melting plastic stopped and the aircraft was landed without further incident. Maintenance replaced failed poly tubing.

CH47

Class E

D series

■ During ground taxi the crew smelled smoke in the aircraft. The aircraft was stopped and the crew performed emergency shutdown. The flight engineer found the left aft landing gear on fire. The brake had engaged during taxi. Maintenance replaced the brake assembly.

■ While aircraft was on the ground, overhead console sparked and crew noticed the smell of burning wires. Aircraft was shutdown without further incident. Replaced stick positioner rheostat.

■ During run-up, the aircraft's N2 Beep Trim failed. Emergency Engine Trim functioned normally. Aircraft was returned to home with No.2 emergency trim in manual position without further incident.

■ Following landing, the aircraft's combining transmission cooling fan shaft containment shield was found to be loose. The four retaining studs which attach the assembly to the combining transmission had worked loose.

OH58

Class E

C series

■ During run-up, crew heard sputtering and backfire noises. Aircraft was shutdown without further incident. Replaced fuel control and bleed valve. MOC and test flown.

■ Engine failed during run-up. Aircraft was shutdown without further incident. Flame out inspection was conducted. Fuel nozzle was replaced. MOC and test flown.

DI series

■ Engine was found to be leaking oil during hover. Aircraft landed without further incident. Replaced generator garlock seal.

DR series

■ While in formation flight, the pilot on the controls reduced power while in a turn. The aircraft warning system indicated a false ENGINE OUT message along with audio tones. The crew verified the engine was still operating and announced the condition to the formation. The formation was over trees and the FARP was less than 1 Km away. The crew flew to the FARP, landed and shut the aircraft down without further incident.

TH67

Class E

A series

■ Aircraft's main generator failed during hover. Aircraft landed without further incident. Replaced starter generator.

UH60

Class B

L series

■ Crew experienced insufficient power during approach. Aircraft landed 50 feet short of the LZ.

Class C

A series

■ During approach to a hospital helipad, a wheelbarrow was blown into two parked civilian vehicles.

■ During level flight at 2500 MSL at constant cruise speed 145 KIAS, a loud bang from rear of aircraft was heard. Aircraft yawed approximately 10 Degrees left and ENGINE OUT audio and light came on. Collective reduced to regain rotor RPM. Aircraft was decelerated to approximately 90 KIAS to maintain level flight. PI noted No.2 engine TGT climbing rapidly into the red and engine speed passing below 40%. After engine failure was confirmed and level flight was sustained, aircraft was flown approx 5 miles to nearest airport. Crew completed a roll-on landing and normal shutdown of No.1 engine. Suspected failure of the cold section of No.2 engine.

■ While performing multiship operations as a flight of three, crew of Chalk 2 noticed a loud exploding sound in the area of the No.2 engine. Engine turbine gas temperature exceeded 950 degrees Celsius. The aircraft was landed to a nearby area. After passengers evacuated the aircraft, smoke was noted coming from No.2 engine compartment. The main and reserve fire bottles were discharged, and the engine was shutdown without further incident. An inspection of the No.2 engine revealed that a blade from the first stage axial compressor had broken off during flight, resulting in a partial engine failure. Materiel failure suspected, engine replaced and aircraft returned to service.

■ On short final for landing, aircraft's main rotor blades contacted the

ALQ-144. All four rotor blades were damaged.

■ During a flight capability test, load was inadvertently jettisoned from aircraft. The controller's finger guard was reportedly bent.

■ Aircraft's tail gear strut failed during a practice run-on landing. Tail gear and tail boom damaged.

L Series

■ During post phase inspection run-up, right hand folding stabilator folded up and made contact with the tail rotor blades, damaging the tip caps. Aircraft was shut down without further incident. Right hand folding stabilator locking pin was not installed.

Class D

A series

■ Upon landing at patient pickup location, medic discovered that front window of the aircraft's left cargo door was missing. Upon discussion, crewmembers recall feeling an unusual "blast of wind" just before takeoff, concluding that the window was lost about that time. PC decided that since there were no unusual noises or vibrations at that time, to continue the medevac mission. Patient was taken from point of injury to hospital. Aircraft was shutdown and surveyed with no damage found. Returned to home base with no further incident.

Class E

A series

■ While on the ground, engines running, aircraft's No.1 fire warning light illuminated. Aircraft was shutdown without further incident. No.1 engine upper flame detector was replaced, MOC OK.

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.

Black Hawk Droop Stop

The UH-60 main rotor is equipped with droop stops and flap restrainers to prevent extremely high or low blade flapping at low rpm. As rotor speed is increased to approximately 70 to 75 percent rpm, the droop stops rotate from their "static" to their "dynamic" position. The audible knocking of droop stops during engagement or shutdown, as they are rotating between the static and dynamic position, is a good indicator to the pilot of droop stop pounding (DSP).

To avoid DSP during rotor runup or shutdown, the cyclic must be centered or displaced very slightly into the prevailing wind. The collective should be raised no more than one inch, above full down and pedals centered. If possible, shutdown should be avoided until adjacent helicopters are at flat pitch.

DSP can also occur with the droop stops in their dynamic position, usually with excessive aft cyclic, low collective, and with all wheels on the ground. Although DSP can occur during rearward taxi (prohibited by the operators manual) and downslope landings, the maneuver that is most likely to produce DSP is the roll-on landing. Aerodynamic braking with cyclic is permissible while the tail wheel is on the ground before main gear contact. Once the main wheels contact the ground, the cyclic must be centered, collective lowered (center cyclic before lowering the collective), and brakes applied as required. (A complete description of the maneuver is given in task 1029 of TC 1-212.) Initiate all cyclic control input on the ground with sufficient collective input to maximize the effect of cyclic input, thereby minimizing cyclic displacement.

If a pilot attempts to slow the aircraft after main wheel contact by using extreme aft cyclic as he lowers collective, he will hear an audible 4/Rev knocking. This is the first indication of DSP. With more rear cyclic, severe DSP and contact with the ALQ-144 may result. Severe DSP can cause dynamic components to be stressed beyond design limits.

To avoid droop stop pounding during a roll-on landing:

1. Keep speed in accordance with TC 1-212 (60 knots or below) before touchdown. Effect termination by making the tail wheel touchdown above effective translational lift (ETL) but below 60 knots ground speed.

2. Be aware of the tip path plane–excessive aft cyclic will place the tip path unusually high in your field of view.

3. After landing, neutralize (center) the cyclic before lowering the collective.

Excessive forward cyclic during taxiing can lead to DSP. Aviators are reminded to comply with Chapter 8, paragraph 8.26 and the Caution Note with regard to DSP.

—Jay P. Merkel, AMSAM-RD-AE-I-D-U Comm 256-313-4806 DSN 897-4806

Boeing Agrees to Pay Up to $54 Million for CH-47D Gear Problems

In the late 80's and early 90's, the Army suffered the loss of five service members and several CH-47Ds due to faulty gears Boeing installed during the re-manufacturing of CH-47A-Cs into the CH-47D model Chinooks. As a result of these losses, suits were filed against Boeing and its subcontractors, Litton and Speco. These suits were recently settled with Boeing for up to $54,000,000. Of that, $10.5 million was paid to the person, the "Relator," that identified the problem in Speco's processes and sued the companies on behalf of the Army.[1] An additional $7.5 million was paid to the Relator's attorneys.

"This case demonstrates the tragic consequences that can occur when faulty parts are sold to the Defense Department. The lives of our service members, not only dollars, are at stake. This lawsuit sends a message that the United States will not stand by if contractors provide our military with substandard and dangerous equipment" commented David Ogden, Assistant Attorney General of the Justice Department's Civil Division.

If you know of a similar problem with a contractor, please contact your nearest JAG office and speak with the Procurement Fraud Advisor.

—LTC Cindy Gleisberg, Judge Advocate General, US Army Safety Center, DSN 558-2924 (334) 255-2924, gleisberc@safetycenter.army.mil

[1] Certain people can bring suit against a contractor on behalf of the government and then ask the government to join in the suit. In this case, Brett Roby, a former Speco quality engineer, filed the claim pursuant to 31 U.S.C. § 3730(b) on behalf of himself and the US Government. This law encourages workers to help protect public funds by giving them an incentive to alert the government to false or fraudulent claims.

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POV Fatalities

through 31 Oct

FY01	FY00	3-yr Avg
8	7	11

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