FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
October 1996 ◆ Vol 25 ◆ No 1

Change

SMALLER
Army

different missions

INCREASED optempo

Leaner budgets

The challenges of change

Change. The Army's gone through a lot of it in the past 5 years. We've become a new force, a smaller force, a force that not only defends the nation militarily but also takes on new, nontraditional missions. And much of the time, we conduct operations as part of a joint and combined force. We've transitioned from a forward-deployed, forward-defense, major-land-war Army to a CONUS-based, contingency-force-oriented, crisis-response Army that must prepare to react to uncertain threats.

The new reality

All this is now reality. It's not just coming, it's here. The radical changes we're dealing with as well as those we have yet to face require corresponding changes in the way we look at doing our business. Why? Because one thing has not changed: accidents are still a major threat. And, as the Army has shrunk in size even as our missions have grown, every accident has become more expensive not only in terms of manpower and money, but also in terms of readiness.

Today, more than ever before, every mission requires precise evaluation, precise planning, and precise execution. Risk management integration into all three is the key to protecting the force.

We have a simple risk-management process that we can apply to everything we do. All we have to do when we receive a mission is work the hazards and controls in the five-step process:

Step 1. Identify hazards.

Step 2. Assess hazards.

Step 3. Develop controls and make risk decisions.

Step 4. Implement controls.

Step 5. Supervise and evaluate.

Simple, right? So how come we're not all doing it? It has to do with our culture.

Our cultural dilemma

Some aspects of Army culture effectively exclude the risk-management process. After all, risk management leaves no place for—

- The "Hooah Factor," the "We can do any thing, any where, any time, at any cost" attitude that's so much a part of our Army culture.
- The need to "do more with less" mindset.
- Our inbred reluctance to say "No."
- Making decisions based on "the way we've always done it."
- Letting "somebody else" worry about the hazards involved in our missions.
- Doing only what we *have to do* and not giving a thought to what we *ought to do*—such as wearing flak jackets in all live-fire training even when it's not required by regulation. In other words, doing the harder right versus the easier wrong.

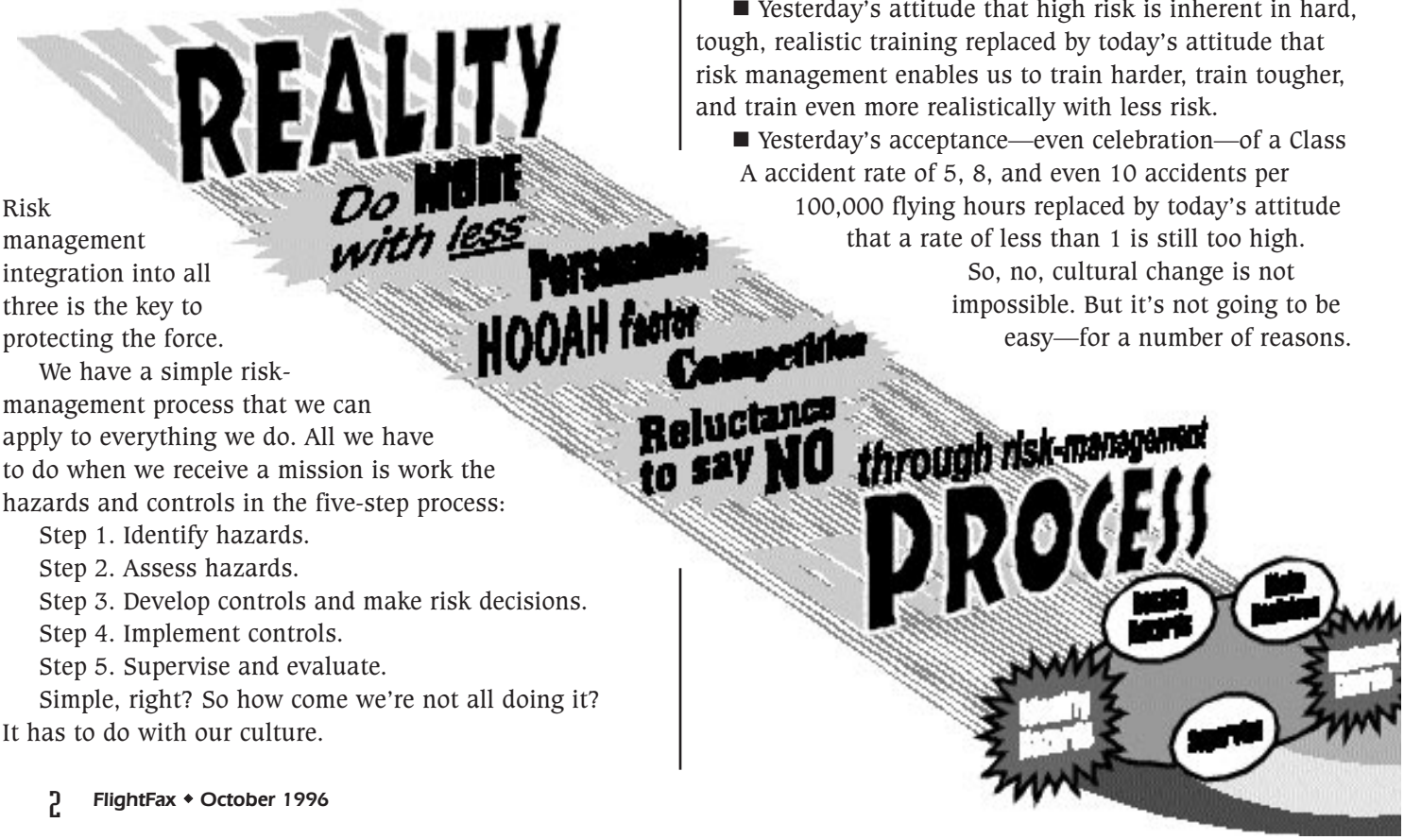
The solution to this cultural dilemma seems to be pretty straightforward: change the culture.

Can we change our culture?

Absolutely we can. And it doesn't have to take forever. We've made some huge changes in our culture during the relatively recent past. We've seen—

- Yesterday's macho image of the hard-drinkin', hell-raisin' soldier replaced by today's image of the responsible, self-disciplined soldier.
- Yesterday's attitude that accidents are simply the cost of doing the Army's business replaced by today's attitude that accidents are neither necessary nor acceptable.
- Yesterday's attitude that high risk is inherent in hard, tough, realistic training replaced by today's attitude that risk management enables us to train harder, train tougher, and train even more realistically with less risk.
- Yesterday's acceptance—even celebration—of a Class A accident rate of 5, 8, and even 10 accidents per 100,000 flying hours replaced by today's attitude that a rate of less than 1 is still too high.

So, no, cultural change is not impossible. But it's not going to be easy—for a number of reasons.



Barriers to cultural change

Certain of today's realities stand in the way of our easily changing the way we do business. For example—

■ **Smaller Army with more missions.** Doing more and more with less and less results in little or no time to learn the lessons of the last mission or to adequately prepare for the next. Leaders and their staffs are so busy that they are off planning the next mission while the troops are executing the current one. There's so much to do, we stay with what we know—*"the way we've always done it."*

■ **Personalities.** We have leaders at all levels whose style it is to say, "I don't want to hear excuses; if you can't do the job, I'll find somebody who can." And there are soldiers of all ranks who simply don't have it in them to tell the boss something he or she doesn't want to hear. And so we are encouraged to stay with what we know—*"the way we've always done it."*

■ **Competition.** It's a hard thing to point out a problem—especially when nobody else is complaining. Doing so could be perceived as whining and give our peers an edge over us. So we go along, staying with what we know—*"the way we've always done it."*

■ **Career aspirations.** Today's Army consists of quality competing with quality. May heaven forbid that leaders become more concerned about their careers than about their troops, but the opportunity exists. We all have career aspirations and, therefore, walk a cautious line. As a result, we tend to stay with what we know—*"the way we've always done it."*

The Army has experienced significant change, creating a cultural dilemma we must overcome.

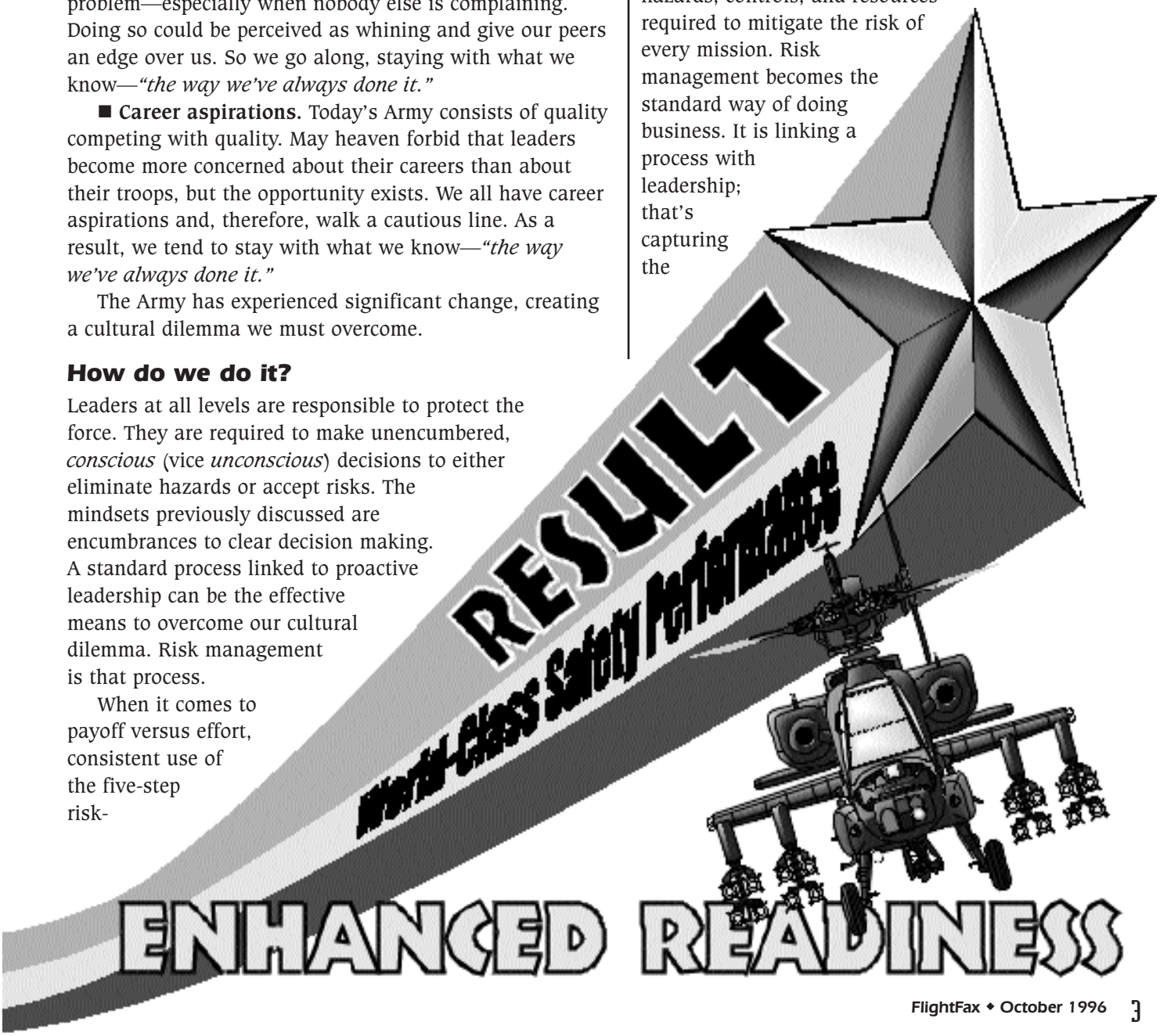
How do we do it?

Leaders at all levels are responsible to protect the force. They are required to make unencumbered, *conscious* (vice *unconscious*) decisions to either eliminate hazards or accept risks. The mindsets previously discussed are encumbrances to clear decision making. A standard process linked to proactive leadership can be the effective means to overcome our cultural dilemma. Risk management is that process.

When it comes to payoff versus effort, consistent use of the five-step risk-management process offers an unparalleled win-win opportunity—a way to get any job done with a clear focus on hazards and controls to mitigate risks. The risk-management process gives us a standard procedure, regardless of mission or force mix or location, to deal with today's realities of uncertainty and high optempo, which demand that—

■ We know and perform to established standards—every time, in every thing. Using our standard five-step risk-management process is a credible way to challenge and eliminate the "That's the way we do it in *this* unit" mentality and get everybody doing things right—to Army standards.

■ We make effective communication the norm up and down the chain of command. A by-product of the risk-management process will be improved communication as we make it not only *acceptable* but *expected* for everyone involved at every level to articulate to the boss the hazards, controls, and resources required to mitigate the risk of every mission. Risk management becomes the standard way of doing business. It is linking a process with leadership; that's capturing the



power of risk management. Consider how it is in the cockpit, where we stress aircrew coordination and cockpit communication. Every crewmember is *expected* to speak up, which eliminates many of the inhibitors to effective communications—rank, age, experience, job, and so forth. Combining this idea with the risk-management process outside the cockpit would improve communications throughout the chain of command.

"As we become smaller, protecting the force becomes even more important. Risk management . . . has resulted in a dramatic reduction of injuries and fatalities."

GEN Dennis J. Reimer
Chief of Staff, Army

"The risk-management process enables leaders at all levels to make conscious decisions to either control the hazards or accept the risks."

BG Thomas J. Konitzer
Director of Army Safety

"Applying the risk-management process in conjunction with troop-leading procedures enables NCOs to make the difference between a mission accomplished safely and a mission failed because soldiers were injured or killed."

SGM Gregory L. McCann
Army Safety Center

■ We make good decisions based on facts, not on fear of being perceived as weak or negative. If we all speak the same language and work the same process of risk management, everybody will understand and no one will mistake the articulation of hazards ("Here's the level of risk for this mission (or task), Boss, and I need your help to bring it down to an acceptable level and still accomplish the mission without any loss") for making excuses ("What's the matter? You can't do it?").

■ We make it not just *acceptable,* but *mandatory,* to tell the boss "No, we can't do that" when risks are too high. If we work the five-step risk-management process at every level, the yes will come—but only after the risks have been controlled to an acceptable level or someone with the proper authority at the proper level makes a *conscious, fully informed* decision to accept that risk.

■ We once and for all destroy the notion that we'll do things differently when the shooting starts, that we'll abandon standards and all that other "training stuff." Risk management is not only an enabler to realistic training, its across-the-board, methodical use will be the best method we have of making sure that the only threat we face in combat is the enemy.

Where do we start?

We start by making risk management—identifying hazards, putting controls in place—the standard way we do business in the Army. So, how do we do that?

We base it on doctrine.

Doctrine is the engine of change in the Army; it drives change not only in training, equipment, and organization but also to a large extent in Army culture—those attitudes and thought processes that make the Army what it is.

This being the case, the catalyst for embedding risk management in our culture is already in our doctrine. FM 100-5: *Operations,* our keystone warfighting text, was significantly updated in 1993 to stress the principles we need to learn and understand to maintain the edge in future theaters of war. A key update was the addition of safety as a component of the protection element of combat power. Safety has also been included in joint-operations doctrine since 1995 (Joint Pub 3-0: *Doctrine for Joint Operations*). That doctrine specifies that protection of the force through the integration of safety into all aspects of planning and execution is crucial to successful operations.

Just as doctrine and policy changes are capturing the top-down approach to risk-management integration, so too TRADOC is working the bottom-up approach through the integration of risk management into officer, NCO, and civilian schools. All that's left is for the field to shoot to the middle and *just do it*, just integrate risk management into all that we do.

Summary

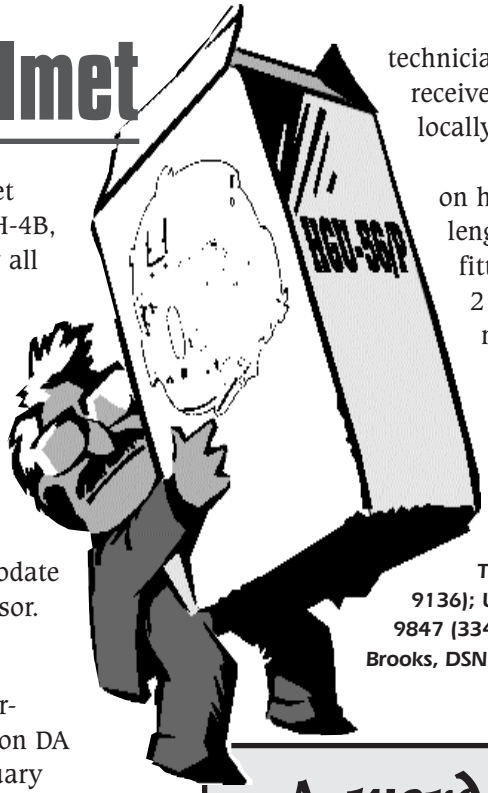
The Army has done remarkably well in reducing accidents, thus saving lives—especially in the past few years even as global responsibilities have increased. A combination of factors has had a direct impact on this success. First and foremost is proactive leadership at all levels. Second is the fact that we have clear and achievable standards for every individual and collective task soldiers are required to perform. Third is teamwork. It is the essence of how we do business. The fourth is the information flow to enhance communications between decision makers. These four elements are institutionalized throughout our Army today. The fifth ingredient that needs to be institutionalized is a process—the risk-management process. Once embedded as a systems approach to business, we can consistently achieve world-class safety performance.

We must embrace risk management as a sound investment in readiness, not as just another "safety requirement" that has nothing to do with our *real* mission. The true cost of our failure to protect the force through risk management will be paid out of lives and equipment—and thus out of readiness.

And that's a price we simply cannot afford to pay.

—BG Thomas J. Konitzer, Director of Army Safety and Commanding General, U.S. Army Safety Center, DSN 558-9360 (334-255-9360), konitzet@rucker-safety.army.mil

New aircrew helmet



The HGU-56/P Aircrew Integrated Helmet System is replacing the SPH-4 and SPH-4B, providing a common helmet for use by all Army rotary-wing aircrewmembers. The new helmet is 20-percent lighter than its predecessors and comes in six sizes for better custom fitting. In addition to better helmet retention, the HGU-56/P offers improved impact and acoustic protection and is compatible with all aviation life support equipment. It also has a dual visor assembly with clear and tinted visors and can accommodate a day (dark amber) and night (green) laser visor.

Fielding

Fielding is being managed by Project Manager-Aircrew Integrated Systems (PM-ACIS) based on DA priority. CONUS fielding, which began in January 1995, is almost complete; OCONUS fielding will begin in the fall. The Reserve Components are not funded by DA at this time.

During the fielding process, PM-ACIS will coordinate with local force-modernization cells. Normally, about 60 days before actual fielding, the PM-ACIS fielding team will brief representatives of the installation central-issue facility, maintenance supervisors, and commanders. The team will discuss the fielding schedule, helmet functions, and the transition process. They will also leave fact sheets, sample publications, and a video on helmet fitting and maintenance. During actual fielding, PM-ACIS representatives will be available to train ALSE technicians, fit helmets, and answer questions.

Sizing and fitting

Proper fit is essential to proper functioning of the HGU-56/P. Fit affects all helmet modules, NVG mounting, and, ultimately, the safety of the user. If optical systems such as ANVIS are used, helmet fit must be checked with that system attached. If M24 or M43 CB masks are used, they should be worn during helmet fitting.

The helmet's thermoplastic liner can be custom-fit through a heat-treating process if necessary to relieve "hot spots" or to allow for physical inconsistencies. Heat-treating will also help stabilize the helmet for ANVIS mounting and will enable users to bring the ANVIS closer to their eyes. (See page 6 for article on ANVIS adjustment.) PM-ACIS is fielding convection ovens to each unit to be used for the heat-treating process. Installations or units requiring additional ovens should contact the PM-ACIS POC.

Fitting and maintenance of the HGU-56/P has been taught in ALSE schools since January 1995. ALSE technicians (Q2 identifier) who have not received this instruction can be trained locally using the video mentioned earlier.

HGU-56/P helmet size is not based on hat size; it's based on "head length." Detailed measuring and fitting instructions are in TM 1-8415-216-12&P, the operators and unit maintenance manual for the HGU-56/P. The manual, in draft form dated 31 January 1995, will be available through the Army publication system sometime during the first half of FY 97.

POCs: PM-ACIS Logistics: Ms. Karen Thompson, DSN 693-9136 (314-263-9136); USASC ALSE: CW5 Dan Medina, DSN 558-9847 (334-255-9847); USASC NVGs: CW5 Bob Brooks, DSN 558-3969 (334-255-3969)

A word to aircrews

Once fielding is complete at your installation, your local central-issue facility (CIF) will issue you the HGU-56/P helmet and helmet bag, both of which will be put on your clothing record. You will also receive a Gentex operator care and use booklet that shows basic maintenance checks and services. It does not, however, include fitting instructions. You will need to see your ALSE technician for that. When you go for your fitting, be sure your hair is the same length and style you wear while flying. If you change your hairstyle, you'll need to have your helmet fit checked as well.

Pilots

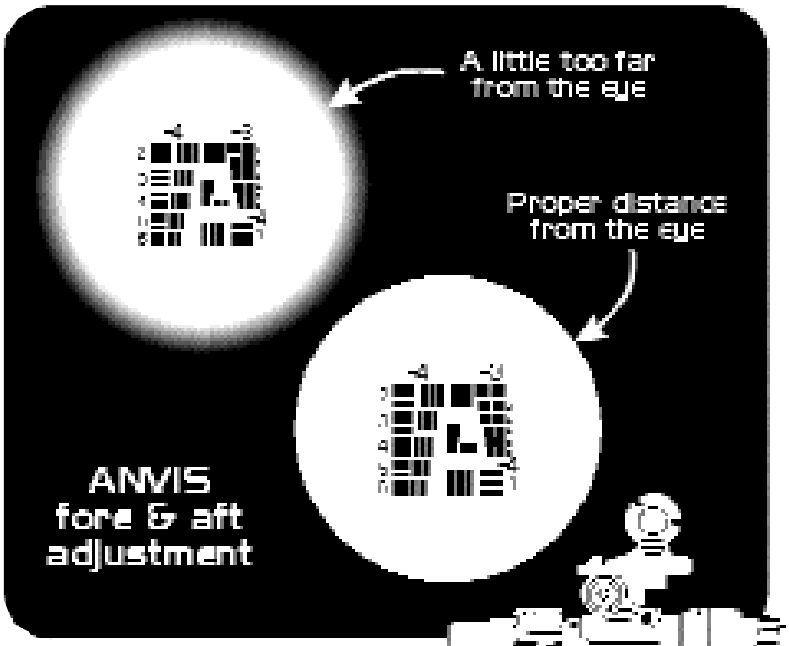
Initially, you will be allowed to keep any previously issued helmet as well as the HGU-56/P. However, you must turn in your HGU-56/P when PCSing until Armywide fielding is completed. If your new installation doesn't have the HGU-56/P, go back to using your SPH-4 or -4B until the new system is fielded at your new location. Once fielding has been completed Armywide, PM-ACIS will instruct local CIFs to collect your SPH-4 and -4B helmets when you leave an installation, and you will take your HGU-56/P to your next assignment.

Enlisted crewmembers

Procedures for you will remain the same as they are now. When you clear, you'll turn in your helmet and bag. When you get to your new location, you'll draw whichever helmet is available there.

HGU-56/P and ANVIS: Adjusting for full FOV

As with previous helmets, some aviators are having problems getting a full field of view (FOV) with the standard eyepiece ANVIS mounted on the HGU-56/P helmet. Interestingly, aviators wearing larger-sized helmets have reported the most incidents. This is probably accounted for by the fact that, as helmet size increases, so does eye-clearance distance. And therein lies the problem.



What IS a full FOV?

Simply stated, you have a full FOV in each tube with ANVIS when you are looking in the center of the circular image and the outer edges of the FOV appear sharp all around the green pattern. When your eyes are on the proper optical axes and the ANVIS is at the maximum eye-relief position while retaining a full FOV, you will notice that when you move your eyes to look in any direction, the edge you fixate on will slightly blur or dim.

How to get a full FOV

For flight, the operators manual recommends that you adjust the fore-aft knob (standard mount) about a half-turn closer to your eyes from the maximum eye-relief position at which you can obtain a full FOV to compensate for goggle shifts that occur during flight. This ANVIS fore-aft position will produce the maximum FOV through the goggles and optimize look-under and -around unaided vision. Moving the eyepieces any closer than a half-turn will unnecessarily reduce your unaided FOV. (NOTE: Earlier NVG adjustment instructions to "move the eyepieces as close to your eyes as possible without the eyelashes touching" referred only to FULL-faceplate AN/PVS-5s, not to cutaways or ANVIS.)

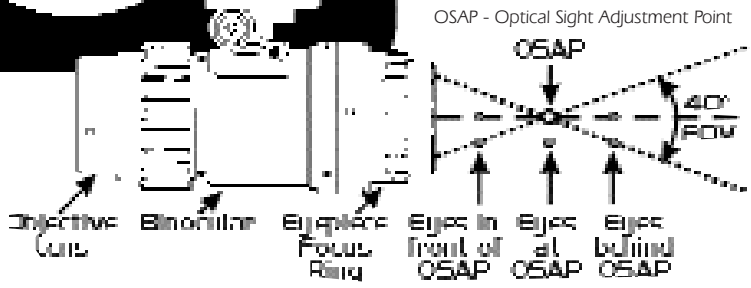
Still having problems?

If you're still having trouble achieving a full FOV after making the above adjustments—

- See your ALSE specialist to verify that your helmet is the right size. If you border between two sizes, try the smaller one. You might also need to have your thermoplastic liner heat-fitted to position your head in a more forward position.
- Make sure your nape strap is snug. This will move your head forward slightly in the helmet. (It'll also improve retention.)

If you do all this and still can't get a full FOV in each tube, you may, as a last resort, try ***slightly*** misadjusting the inter-pupillary distance (IPD) either wider or narrower (no more than ½-turn of the IPD knob) to just clear the outside edges.

If you adjust the ANVIS IPD laterally narrower or wider than your eye IPD, you'll have what's called "partial overlapping FOVs." In this situation, the FOV area seen by each eye separately will be smaller than the total visible horizontal FOV with both eyes open. Objects seen in the right and left tubes will be aligned, but the outline of the right and left FOVs will appear separated laterally. The less-than-total overlap will not compromise safe operation, but it may take some time for you to adapt to this way of seeing. (NOTE: "Partial overlapping FOVs" is the technique planned for use to increase horizontal FOV in the helmet-mounted display for the Comanche.)



The future fix

The larger 25mm ANVIS eyepiece procured with the last ANVIS buy is a giant step toward ensuring every user a full FOV with ANVIS. However, it's going to take some time. A retrofit program for existing systems has not yet been funded, and, while all replacement eyepieces are now the 25mm design, turning in ANVIS with serviceable standard 15mm eyepieces only to change to 25mm eyepieces is not authorized.

POC: Bill McLean, Research Optometrist, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL, DSN 558-6813 (334-255-6813)

What's the deal?

Some publications refer to the standard ANVIS eyepiece as "15mm" and others as "18mm." What's going on?

What's going on is that they're talking about two different things: "eye clearance" and "eye relief." Those of us who use technical terms even though we don't really know what they mean frequently use these two interchangeably. We shouldn't; they're different measurements entirely.

- **Eye clearance** is measured from the eyepiece outer housing closest to the eye to the apex of the cornea of the eye.
- **Eye relief** distance is an optical term computed from the eyepiece lens to the designed exit pupil of a specified size.

Clear enough? Oh, well; when we're talking about ANVIS, most of the time we're talking about "eye clearance," not "eye relief." The more *eye clearance* we achieve with ANVIS, the better our look-under and look-around. The problem is, when we push the NVGs too far away from our eyes, we begin to reduce our optimum field of view.

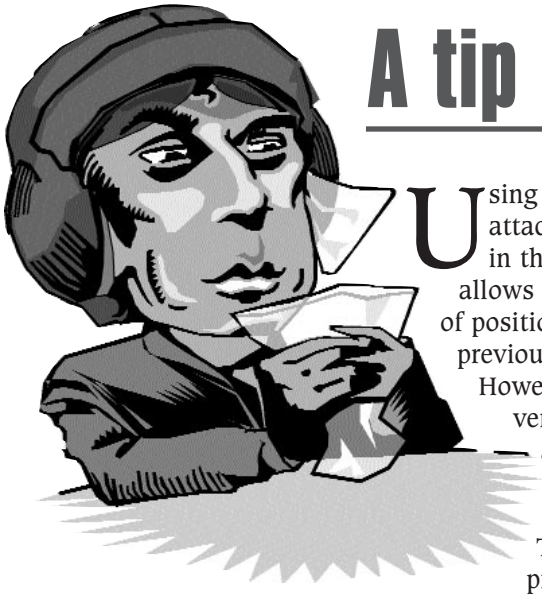
With the standard eyepiece (see next question), users have reported a beginning loss of full FOV at 19mm of eye clearance; others have reported having a full FOV out to 23mm.

With the 25mm eyepiece (see next question again), users have reported a full FOV out to more than 30mm of eye clearance.

The bottom line is, we should have a full FOV with the standard eyepiece with an eye clearance of 20mm or less, and a full FOV with the 25mm eyepiece at 30mm or less.

It's confusing. The diameter of the visible opening for the original "standard ANVIS eyepiece" is slightly more than 19mm, but we call it the "15mm eyepiece." The diameter of the new "25mm eyepiece" is actually about 27mm. What's the deal?

Trust us; you really don't want to know. To explain fully would involve discussing all manner of complicated stuff involving, among other things, distance of the pupil behind the cornea and photopic vision. Let's just agree to call the original ANVIS eyepiece "the standard eyepiece" and the more recent, larger eyepiece "the 25mm eyepiece." That way, we'll have no more confusion; we'll all understand each other.



A tip on positioning the earcups

Using Velcro® to attach the earcups in the HGU-56/P allows a greater range of positioning than previous designs. However, it can be very difficult to adjust the earcups so they fit properly. The usual process is to position the earcups, put on the helmet to see how they feel, take off the helmet, reposition the earcups, put on the helmet to see how they feel, take off the helmet, reposition the earcups, and on and on and on—you know how it goes.

CW3 Sean C. Crothers, the tactical operations officer for the 159th Combat Aviation Group at Fort Bragg, has found a better way. He uses two sandwich-size, relatively heavy-duty plastic bags (the ones that zip closed work great) to position his earcups more quickly and precisely. Here's how he does it:

1. Detach earcups from helmet.
2. Place plastic bags *between* earcups and helmet.
3. While holding earcups and plastic bags in place, put on the helmet. This will require a good bit of dexterity and patience (and, perhaps, a little cussin').
4. Press down on helmet as necessary to make sure it's properly positioned.
5. With plastic bags between earcups and helmet, position earcups (they'll move freely).
6. Once earcups are properly positioned, carefully hold them in place while slowly pulling out plastic bags. The Velcro® will now hold earcups in position.

CW3 Crothers suggests keeping the plastic bags handy in your helmet bag for use wherever you may be.

Our thanks to CW3 Crothers for sharing this tip and giving us the opportunity to encourage you to do the same. And, hey, even if you don't have a tip to share, we still want to hear from you. What you think *can* make a difference. If you have something to say about safety issues in Army aviation, *FlightFax* is the place to say it. You may—

- Fax us: DSN 558-9478/3743 (334-255-9478/3743).
- Call us: DSN 558-2676 (334-255-2676).
- E-mail us: yohns@rucker-safety.army.mil.
- Write us: U.S. Army Safety Center, ATTN: CSSC-RSA (*FlightFax*), Bldg. 4905, 5th Avenue, Fort Rucker, AL 36362-5363.

And, oh yeah, you can reach CW3 Crothers at DSN 236-9917/9660 (910-396-9917/9660).

ASO list server

The Army Safety Center is building a list server for aviation safety officers. So what's a list server? It's a high-speed way to send an e-mail message to lots of specific sites or addresses. What can it do for you? It's a way for ASOs to get the latest information. It's a way to conference across continents and oceans on topics important to you.

Subscription information will soon be published. In the meantime, address your questions to CW5 Barker at DSN 558-2443 or CW4 Helbig at DSN 558-2381, or send a fax to DSN 558-2670 (commercial prefix for all these is 334-255-XXXX). You may also e-mail to barkerm@rucker-safety.army.mil or regular mail to Commander, U.S. Army Safety Center, ATTN: CSSC-RT, Bldg. 4905, 5th Ave., Fort Rucker, AL 36362-5363.

ASO conference

The Army Safety Center will sponsor a conference for aviation brigade (and higher) safety officers 13-17 January 1997 at Fort Rucker. It is scheduled to coincide with the Aviation Brigade Commanders Conference.

More information will come to you via message and coordination with the MACOMs. Plan now to attend, and send your confirmations and agenda items to CW5 Barker or CW4 Helbig at the above addresses and phone numbers.

Accident briefs

Information based on *preliminary* reports of aircraft accidents

Aviation flight accidents

Utility

UH-1 Class E

H series - During cruise flight at 3500 feet MSL and 90 knots, aircraft yawed moderately left, right, left with no EGT fluctuation. Crew chief heard series of moderate banging noises. Aircraft landed at airfield with no further incident. Compressor-stall inspection by maintenance found no damage, and hot-end inspection revealed no adverse indications. Aircraft was grounded pending test flight. This was second suspected compressor stall with no adverse indications during maintenance inspection.

UH-1 Class F

V series - During maintenance runup, pilot noted high EGT. After shutdown, maintenance found engine ingested shop rag into compressor.

UH-60 Class C

A series - During landing to grassy area, left drag beam broke and left strut shifted to 15-degree angle, resulting in broken brake line and left-hand fairing, strut, and disk brake. Unit reports 4 drag beam breakages in the last 6 months, 3 during flight and one noted while aircraft was parked.

K series - Crew reported insufficient power for obstacle avoidance on takeoff. Crew performed No. 2 engine lockout and manually manipulated engine. Gas turbine temperature exceeded TGT limits.

K series - As PC was positioning aircraft tail to face specialized platform to disembark passengers, tip caps of main rotor blades contacted platform.

L series - While hovering in confined area during hoist training, aircraft drifted and main rotor blades contacted trees. All tip caps and two main rotor blades were damaged.

UH-60 Class E

A series - Chalk 3 crew felt vibration from tail wheel during landing at airfield, then vibration dissipated. As aircraft was repositioning to hot refuel, Chalk 4 notified crew of a problem with tail wheel. Crew chief inspected tail wheel and informed crew that tire was flat. Further inspection revealed broken rim. Suspect damage happened during earlier hard landing to unimproved LZ.

L series - During autorotational RPM check required for main rotor balance verification, left-hand fairing cover came partially loose and was caught in wind and torn. Crew chief was on right side of aircraft and didn't notice damage until he began refueling aircraft. Fairing cover was repaired.

Attack

AH-1 Class E

F series - Maintenance inspection revealed ruptured oil line from accessory gearbox to oil debris detection system. Oil line had broken due to contact with forward firewall flange. Maintenance officer ordered fleet inspection and repositioning of clamps to keep oil line away from firewall flange.

F series - Pilot felt collective binding during hover and returned to parking area. During shutdown, he smelled electrical smoke. All segment lights came on whenever master caution switch was touched. After replacing pilot's collective assembly, maintenance could not duplicate problem.

F series - Upon landing after performing OGE power check, crew discovered that logic control assembly panel was missing. Panel was found about 150 meters from landing site.

AH-64 Class E

A series - During OGE hover at 300 feet, utility oil bypass caution light came on. Utility purge valve was clogged, causing large fluctuations in hydraulic pressure.

A series - Engine No. 2 nose gearbox PSI came on during high-speed flight and remained on. Power lever No. 2 was retarded to idle and a roll-on landing was made without incident. No. 2 nose gearbox oil pump was replaced.

A series - During ground taxi for takeoff, master caution and SDC segment lights illuminated and would not extinguish. SDC replaced.

A series - After engine shutdown to APU, vibration was felt throughout airframe, accompanied by unusual noise. Primary hydraulic pressure gauge read between 4000 and 6000 PSI. Hydraulic pump was replaced.

A series - During multi-ship flight, master caution light illuminated in back seat only, followed by oil bypass primary hydraulic segment light. PC assumed controls, exited formation, and returned to airfield without incident. Switch on primary hydraulics manifold that controls light was replaced.

A series - During hot refueling, No. 2 engine was shut down and No. 1 engine was at 100 percent. Refuelers had filled forward tank and were filling aft tank when pilot put crossfeed switch in aft position. Engine No. 1 PSI illuminated and No. 1 engine flamed out about 4 seconds later. Chafed wires going to ECU were replaced.

A series - During before-landing check, oil PSI accessory pump light came on. Crew notified tower and aircraft was cleared to land. Crew then saw SDC caution light illuminate. Neither caution light illuminated the master caution light. Crew elected to land immediately at a shopping mall. Maintenance replaced shaft-driven compressor, took oil samples, and released aircraft for flight back to airfield.

A series - At 50 feet AGL and 20 knots during takeoff from FARP, No. 2 engine-out light came on. CPG was on controls and responded by lowering collective. As aircraft began to descend, CPG increased forward cyclic and collective to gain single-engine airspeed. After uneventful single-engine landing, chafed wires to ECU were replaced.

Cargo

CH-47 Class B

E series - Aircraft was Chalk 2 in aerial refueling flight behind C-130 tanker. Inadvertent disconnect during inflight refueling caused basket to contact main rotor blades, and fuel spattered on windshield. Crew conducted roll-on landing and emergency engine shutdown. Severe rotor vibration caused damage to all main rotor blades and rotor brake. Landing gear was damaged during landing. ECOD pending.

CH-47 Class C

D series - In cruise flight at 1000 feet AGL and 125 knots, upper latch on aft pylon fairing (clamshell doors) failed. Crew was unaware that both doors had come off until they reached destination and landed. Both engine FOD screens were dented, area between aft pylon and No. 1 engine was scraped, and No. 1 engine exhaust tail cone was dented.

CH-47 Class E

D series - During aerial refueling, probe tip contacted refueling drogue. Paradrogue left probe and rose into rotor blades. Refueling drogue was destroyed, and one blade was slightly damaged. Blade damage was dressed out, and aircraft returned to service.

D series - During cruise flight, PC noticed No. 2 engine oil temperature rising. Seconds later, it reached the maximum limit. PC executed emergency engine shutdown procedure, declared an emergency, and terminated with a roll-on landing. Cannon plug on engine deck was found to be loose.

D series - During OGE hover at 50 feet, fire bucket upper support ring snapped, causing bucket to collapse. Crew chief released load, causing center cargo hook to swing and strike bottom of airframe, cracking cylinder cam.

D series - During approach, pilot noticed thrust sticking excessively and N1 and PTIT fluctuations. In addition, loud bangs were heard in No. 1 engine. Caused by bleed-band actuator malfunction.

D series - On climbout during NVG training, IP simulated engine failure by decreasing No. 2 engine emergency trim switch to 70-percent N1. As maneuver continued, emergency power light came on. No. 2 N1 had fallen to 30 percent, and PTIT was at 910°C. Engine control lever was immediately brought to stop, shutting down engine. Roll-on single-engine landing was made without incident. Engine and fuel control were replaced.

D series - No. 1 engine torque split low at 10-foot hover. Both pilot and copilot attempted to adjust with No. 1 engine beep trim but got no response. Engine N2 was controlled by emergency engine trim, and aircraft landed. Maintenance replaced N2 actuator for No. 1 engine.

D series - While conducting Bambi bucket operations, crew heard banging noise from vicinity of combining transmission. Bracket on right-hand clamshell door had broken off, and door was separating. Recovery team replaced door.

D series - During runup, aircraft shuddered from hydraulic surge to boost actuators on aft rotor head with No. 2 AFCS on. No. 2 flight hydraulic pump replaced.

Observation

OH-58 Class C

A series - During minimal power descent, main rotor RPM increased to 112 percent. Upon application of power, RPM decreased to normal operating range. Blade inspection required due to overspeed. Investigation in progress.

C series - Engine failed on takeoff, and aircraft landed hard. Tail boom separated, and main rotor was damaged.

OH-58 Class D

A series - Damage to tail rotor blade was discovered following maintenance test flight and runup. Unknown object caused damage to tail rotor blade. Tail rotor was replaced.

OH-58 Class E

A series - Generator failed during low-level flight. Broken wire to generator was repaired.

C series - After aircraft entered cruise flight, knocking/banging noise was heard. Seatbelt had been left outside door.

C series - At 50 feet and 40 knots with aircraft close to max gross weight in 30-knot winds, aircraft encountered rising terrain. Pilot pulled in 95-percent torque to arrest descent and effect climb. After clearing terrain, aircraft entered high winds

and nose began turning right. Pilot corrected with left pedal, and as normal flight was resumed, torque rose to 110 percent. Pilot immediately reduced power and made precautionary landing.

C series - During engine runup, N2 stabilized at 100 percent. Upon bringing aircraft to hover, N2 dropped to 96 percent and could not be increased with increase/decrease switch. Droop compensator was rerigged.

C series - On short final with PI on controls and torque at 45 percent, IP noticed change in engine noise and took controls. One to two seconds later, low rotor RPM audio and light activated. As IP checked throttle to see if it was full open, underspeed to 95 percent occurred, which activated the warning light and audio. Landing was completed without further incident. Maintenance adjusted throttle friction clamp.

D series - Transmission oil temperature high caution message displayed with one red segment light on MPD for transmission oil temperature (110°-120°C). Aircraft landed in field until cleared for one-time flight back to home base. Problem could not be duplicated during return flight nor could MTP duplicate. Suspect prolonged hover with tailwind caused problem.

D series - Aircraft was landing to FARP when engine chips lower caution message appeared. Inspection found piece of metal on chip detector; aircraft grounded.

D series - Low hydraulic pressure message appeared on final and SCAS kicked off line. Slight feedback was felt in controls. Caused by hydraulics failure.

Training

TH-67 Class D

A series - Aircraft touched down heels first during standard autorotation. Striker plate and isolation mount were damaged.

Fixed wing

C-12 Class C

D series - During descent at night, avionics door separated from right-side nose area and struck right propeller. Right engine cowling and inboard leading edge of propeller were damaged. Investigation continues.

G series - Postflight inspection revealed lightning strike. Maintenance and ECOD substantiate Class C damage.

C-12 Class D

D series - While on takeoff at night, crew saw three deer run in front of aircraft. Crew rotated aircraft but hit one deer. Emergency was declared. After circling airfield while runway was cleared, aircraft landed without further incident. Right-side bottom dipole antenna was torn from aircraft.

C-12 Class E

C series - During flight-control check before takeoff, yoke was noticeably binding at mid travel. Pilot taxied back to ramp and terminated mission. Wire bundle coming from GPS unit had dropped down, interfering with control movements.

F series - Immediately after propeller RPM was reduced during level-off at cruise altitude, No. 1 engine surged and TGT reached 860°C for 3 seconds. Pilot maintained TGT within limits by reducing No. 1 engine power while en route to nearby airfield. Engine continued to surge, with power and TGT fluctuating within normal range. Once in traffic pattern, crew shut down No. 1 engine and made single-engine landing. Visual inspection found no damage or cause of surging. Engine was removed. Surging most likely was caused by failure of high-side engine compressor bleed valve or engine fuel control unit.

N series - Crew couldn't get landing gear to extend normally and observed unsafe gear indications. After initiating emergency procedures, crew was able to get normal extension on the third try and landed without incident. Defective switch assembly in landing gear handle was replaced.

OV-1 Class C

D series - Propeller RPM overspeed occurred during post-phase emergency unfeather procedure. Engine was secured and aircraft landed without incident. Estimated Class C damage to propeller. Investigation continues.

OV-1 Class E

D series - During climbout at about 3000 feet, PC heard popping sound coming from No. 2 engine area. Suspecting compressor stall, PC reduced power (torque) 1 to 2 percent to about 80-percent torque. As power was being reduced, EGT entered red range and No. 2 engine torque dropped to 32 percent. PC immediately reduced No. 2 power to flight idle, shut down No. 2 engine, feathered No. 2 propeller, and made single-engine landing without further incident. Suspect compressor stall, cause of which is unknown. Engine was replaced.

D series - During cruise flight, PC observed partial failure of vertical instrument display system (VIDS) and illumination of auxiliary power light on VIDS panel. He returned to base and landed. Signal data converter fuse had either vibrated loose during flight or otherwise become dislodged. Fuse was replaced.

D series - During propeller governor check as part of engine runup procedure, No. 2 propeller RPM dropped below limit. Propeller control assembly was replaced.

D series - During taxi, fuel gauge needle began to spin. Fuel gauge circuit breaker was reset, but needle rotation continued. Maintenance inspection revealed failure of both fuel quantity indicator and liquid transmitter. Indicator was replaced.

OV-1 Class F

D series - Having reached cruise altitude, crew heard popping noise. Engine instrument indications were normal. Maintenance inspection revealed probable foreign-object damage to compressor blades.

O-5 Class C

B series - During cruise flight at 15,000 feet MSL in icing conditions (OAT -3°), crew saw bright flash and heard loud bang. Navigation systems were temporarily interrupted. Aircraft returned to base. Postflight revealed delaminated mission equipment antenna and other unspecified damage from lightning strike.

O-5 Class D

B series - Significant dent was found on top side of right wing leading edge during preflight. Dent pattern indicates bird strike.

O-5 Class E

B series - During lineup check before takeoff roll, No. 4 engine torque decreased to 880 pounds, NG went to 42 percent, and fuel flow went to 100 PPH (minimum flow). No. 4 engine was shut down, and aircraft was taxied to parking. P3 tube to fuel control unit was replaced.

Flight-related accidents

UH-60 Class C

A series - During MAST mission to retrieve civilian hikers from river gorge area, hoist cable broke with two Army medics and a civilian EMT approximately 10 feet beneath aircraft. They fell 100 feet into shallow river bed. One medic sustained two broken legs, and the EMT sustained broken ribs. Investigation continues.

A series - After aerial recon of proposed static display area, aircraft returned to home base. Crew were informed that an injury complaint had been filed by a civilian who alleged being hit in back by debris from rotor wash.

AH-1 Class C

F series - As AH-1 landed to FARP pad, rotor wash blew over an empty ammo drum, causing the bellmouth guide to separate from the lid. The bellmouth guide blew into the rotor system of an OH-58 on an adjacent pad, striking both main rotor

blades. The OH-58 was shut down without further incident. There was an estimated 10- to 15-knot crosswind blowing from the AH-1 toward the OH-58.

CH-47 Class C

D series - During NVG mission at 180 feet AGL and 60 knots, crewmember monitoring external load (M998 HMMWV) announced that load had released. Pilots noticed simultaneous illumination of master caution, forward, mid, and aft hook-open lights. HMMWV was destroyed on impact. Damaged guard on hoist-control grip exposed hook-release button to inadvertent activation. Suspect crew chief inadvertently activated load-release switch.

E series - During NVG multi-ship training mission, crew chief was raising ramp after departure from LZ. As ramp came up, his foot slipped and got caught between ramp and internally loaded vehicle. He was unable to reach ramp control or ICS switch in time to prevent injury to his foot.

Aviation-ground accident

CH-47 Class C

E series - Flight engineer was performing fireguard duties during shutdown. He was beneath rotating aft rotor system when lightning struck ground nearby. He was knocked to the ground, suffering minor injuries that required hospitalization overnight. Aircraft sustained blade and bonding damage. Local weather advisory was in effect at time of incident.

Safety messages

Safety-of-flight messages

■ Safety-of-flight technical message concerning assigning of service life to UH-1H/V main rotor yoke, P/N 204-011-102-17, NSN 1615-00-757-2905 (UH-1-96-04, 211515 Aug 96) (TB 1-1520-210-20-33). Summary: Currently, UH-1H/V main rotor yoke has no service life assigned; it is on condition and is not time tracked. The purpose of this message is to assign a retirement life of 7200 hours to the main rotor yoke and to initiate tracking of these yokes. The message outlines procedures for doing so. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

Aviation safety action messages

■ Aviation safety action informational message for all UH/EH/MH-60 series aircraft concerning a UH-60A main rotor spindle crack (UH-60-96-ASAM-06, 170215Z Aug 96). Summary: TB 1-1520-237-20-143/UH-60-93-ASAM-12 was issued in April 1993 following discovery of a cracked spindle. The directives provided increased awareness of sudden vibration onset, and possibly subsequent smoothing, as a potential indicator of a main rotor spindle crack. That TB is still in effect. An abnormal vibration occurred recently in a UH-60A during a routine flight and subsequently smoothed. The flight crew recognized it as significant and notified maintenance. A potential association with the spindle was not considered, and the aircraft returned to flight status. When the aircraft entered PMS-2 a short time later, it was discovered that the spindle was completely cracked around the threaded end. The retaining rod was carrying the complete blade load. The purpose of this message is to reiterate to maintenance and operating personnel that TB 1-1520-237-20-143 provides troubleshooting and flight crew awareness information. Contact: Mr. David Scott, DSN 693-2178 (314-263-2178).

■ Aviation safety action maintenance mandatory message concerning replacement of spindle assemblies with certain spindle retaining rods installed in all H-60 aircraft (UH-60-96-ASAM-07, 201419Z Aug 96). Summary: The spindle retention rod, P/N 70102-08102/103, manufactured by the Purdy Corporation has recently completed required engineering testing. Results indicate that its endurance strength is not equivalent to that of an original equipment manufactured component and shall have a reduced retirement life of 1100 hours. Therefore, all subject retention rods manufactured by the Purdy Corporation shall be removed from service immediately if total flight time on the rod is 1100 hours or greater. Spindle assemblies having a suspect retention rod installed that has not reached the 1100-hour retirement life shall be replaced no later than one calendar year from the date of this message regardless of whether or not the rod reaches the reduced retirement life of 1100 hours. By no means shall the 1100-hour retirement life be overflown in this one-year timeframe. The purpose of this message is to list the spindle assemblies affected. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning increase in fatigue life of the Aerex-manufactured tail rotor inboard retention plate on all H-60 aircraft (UH-60-96-ASAM-08, 221645Z Aug 96). Summary: Per TB 1-1520-237-20-173, the retirement life of Aerex-manufactured tail rotor inboard retention plates was reduced to 148 flight hours. Engineering testing has been completed, resulting in increase to the previously published value of 12,000 hours for Aerex-manufactured (cage 5K840) components. The purpose of this message is to annotate the appropriate component records of Aerex-manufactured retention plates to reflect the full life as stated in TM 1-1520-237-23-1. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time and recurring inspections of all UH-1H/V tail rotor blades (UH-1-96-ASAM-03, 231414Z Jul 96). Summary: Bell Helicopter has determined that a number of tail rotor blades may have been manufactured with internal leading edge doublers fabricated from alclad aluminum instead of bare aluminum material. While this material meets design strength requirements, in bonded applications alclad aluminum is not as resistant to corrosion as bare aluminum. The purpose of this message is to require a one-time inspection of the tail rotor blades for corrosion and to add this inspection to current recurring special inspection in the maintenance manual. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning one-time visual inspection for and removal of certain serial numbered 145DS102-3 forward transmission main lubrication pumps on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-96-ASAM-08, 211509Z Aug 96). Summary: Two 145DS102-3 forward transmission main lubrication pump shafts have failed in service. Three additional pump shafts inspected were cracked. All five were from the same manufacturing lot. Five additional lots have been inspected, and no cracks have been found. The suspect lot consists of serial numbers V534 through V598. Based on testing, it is likely that after a main lubrication pump malfunction, the transmission oil pressure master caution warning light will illuminate, followed by illumination of the forward transmission oil hot master caution warning light. Illumination of these warning lights requires compliance with published emergency procedures; i.e., land as soon as practicable. The purpose of this message is to direct a visual inspection of all forward transmission lubrication pump identification plates for suspect serial numbers V534 through V598. If found, these pumps are to be removed from service and returned for rework. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of aileron wing fittings on all

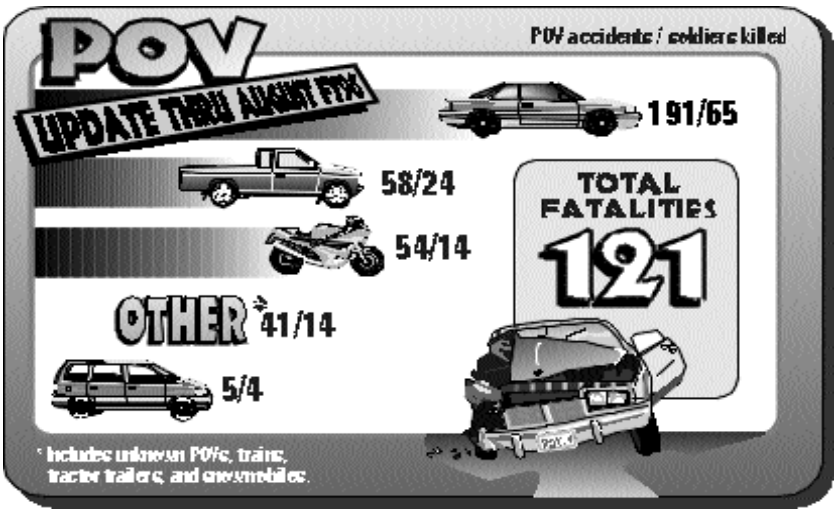
OV/RV-1D aircraft (OV-1-96-ASAM-01, 231426 Jul 96). Summary: There have been five incidents of cracked outboard aileron wing fittings on four different OV-1D aircraft. The purpose of this message is to provide inspection and correction procedures for a one-time inspection of all aileron wing fittings on OV/RV-1D aircraft. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

Maintenance information messages

■ Aviation maintenance information message concerning marking of AH-64 external fuel tank connections (AH-64-MIM-96-005, 261805Z Jul 96). Summary: Several instances have been reported of fuel vapor entering the cockpit from the environmental control unit (ENCU) vents when defog was selected. The major cause of the problem has been cross connecting of the fuel and air lines on the external fuel tanks. A survey indicated that not all lines and fittings on the external fuel tanks were properly marked or identified. This message explains proper identification/marking of external fuel tank lines and couplings. Contact: Mr. Ken Muzzo, DSN 693-5420 (314-263-5420), or Mr. Fred Banks, DSN 693-3243 (314-263-3243).

■ Aviation maintenance information message concerning AH-64 lower scissors arm bearing wear limits (MIM-96-006, 261230Z Jul 96). Summary: The scissors arm is made from an aluminum alloy and wears a little each time the steel bearing is removed and replaced. Accelerated wear has been determined to be caused by failure to fly cut the bearing before removal. This message outlines modified inspection/ maintenance procedures to be inserted into TM 1-1520-238-23-7-1, Task 11.5. Contact: Mr. Darren Baucum, DSN 490-2251 (314-260-2251), or Mr. Larry Powitzky, DSN 693-9869 (314-263-9869).

For more information on selected accident briefs, call DSN 558-3650 (334-255-3650).



Recap of FY96 safety alert messages

The Army Safety Center issued the following Army safety alert messages in FY 96. Contact your installation safety office for copies.

- 161532Z Oct 95, M1A1/M1A2 Abrams Tank
- 161543Z Oct 95, G/VLLD, AN/TVQ-2
- 171558Z Oct 95, M939 Accident Awareness
- 062143Z Dec 95, OH-58D(I) Autorotations
- 151951Z Dec 95, MOUT Training
- 211324Z Dec 95, POV Fatalities
- 301711Z Jan 96, M1A1 Tank Turret Fatalities
- 051503Z Feb 96, Civilian Accident Prevention
- 141814Z Feb 96, Civilian Accident Prevention—Injury Reporting
- 291423Z Feb 96, AH-64 Ground Fire
- 181832Z Mar 96, UH-60 Blade Strike Fatality
- 191910Z Mar 96, Parachute Fatality
- 091312Z May 96, High-Risk Behavior
- 201506Z May 96, Accident-Site Hazardous Materials
- 041835Z Jun 96, Task Overload and Loss of Situational Awareness
- 111935Z Jul 96 (e-mail), Lightning-Strike Awareness
- 061356Z Aug 96, Use of Flak Jackets and Compliance With Minimum Safe Distance Requirements
- 141306Z Aug 96, Entanglement Hazards Associated With Load-Bearing Equipment In Airborne Operations
- 201353Z Aug 96, Military Driver Selection/Training/Incentives
- 111846Z Sep 96, Seatbelt Usage

In this issue:

Class A Accidents through August

		Class A Flight Accidents		Army Military Fatalities	
		95	96	95	96
1ST QTR	October	0	1	0	0
	November	0	0	0	0
	December	1	0	0	0
2D QTR	January	1	1	1	0
	February	0	0	0	0
	March	1	2	0	7
3D QTR	April	1	1	5	3
	May	2	0	2	0
	June	1	1	0	6
4TH QTR	July	0	0	0	0
	August	2	0	5	0
	September	1		0	
	TOTAL	10	6	13	16

U.S. ARMY SAFETY CENTER

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