Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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Our Army at War

Protecting Our Combat Readiness

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
COL Christopher Gallavan – Publishing Supervisor
Paula Allman – Managing Editor
Danny Clemmons – Graphics
Julie Shelley – Staff Editor
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

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

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

Blowing the Dust Off Brownout Initiatives

Last fiscal year brought some sobering statistics for Army Aviation: 35 crewmembers (including 1 Department of the Army Civilian) died in aviation mishaps. That number doubled from the aviation-related fatalities in FY02 (17), and more than tripled the number from FY01 (11). We are going in the wrong direction and getting there fast!

From my experience in Afghanistan and Iraq, I know commanders and aviators are doing everything in their power to mitigate risk. However, the high cost of training, combined with the harsh environments we expect our aviators to operate in daily, equals high risk. Some level of risk simply must be accepted in order to accomplish missions, but the risk must be acknowledged and accepted at the right level.

We at the Safety Center recognize this challenge and are committed to helping commanders mitigate risk at all levels to preserve combat power. Specifically, we are applying modern technology to attack brownouts. Brownouts caused 39.1 percent (11) of the Army's Class A aviation accidents last year. In Operation Iraqi Freedom (OIF), 75 percent of Class A accidents were attributed to brownout situations, resulting in one fatality. Since we can't change the environment, we must change our crews' ability to handle the environment. These are three of the Army's initiatives on the forefront.

FY03 Class A Aviation Trends OIF AOR

Events**

Brownout	**9 (75%)**
Collision w/Ground	1 (8.3%)
Wire Strike	1 (8.3%)
Material Failure	1 (8.3%)

Causes*

Individual failure	8 (88.9%)
- Crew coordination	6 (66.7%)
- Overconfidence	3 (33.3%)
Environment	**8 (88.9%)**
Support failure	2 (22.2%)
Leader failure	4 (44.4%)
Training failure	3 (33.3%)
Standards	2 (22.2%)
Risk Management	1 (11.1%)

Profile*

Night	**58.3%**
IP	**25%**
Single ship	**41.7%**
IP (total/type)	1271/unknown
PC (total/type)	1166/993
PI (total/type)	602/431

Type

(ClassA/Fatal)

AH-64	5/0
MH/CH-47	1/0
OH-58D	2/0
MH/UH-60	5/8

*Three accidents still under investigation/Non-materiel failures

As of 21 Oct 03

Numbers do not add up to 100 percent due to more than one possible cause per accident.

Advanced simulators

Most units lack the resources to take their aircraft into desert environments on a regular basis; therefore, the effectiveness of our simulators is an extremely important factor. Our current simulators lack the proper feel and visual cues to build muscle memory and improve our aviators' confidence and control. The next generation of simulators have the capability to provide excellent training. I recently visited an advanced simulator complex that can develop a country database in 30 hours. The terrain replicates visual cues, such as grass moving while at a hover and the building of brownout at slow airspeeds. I see future simulators allowing units to fly collective missions at home station, preparing them for any possible area of responsibility (AOR).

Attacking Brownout

Tactile Situation Awareness System (TSAS)

The Navy has developed a vest with a series of quarter-sized vibrotactile stimulators, known as tactors, embedded in strategic locations. The tactors will add light pressure to the pilot in the direction of movement (e.g., starting a roll will put pressure on the pilot's right or left side, allowing for a natural correction in the opposite direction). During testing, the vest allowed Navy helicopter pilots to land with their eyes closed, using only the tactors' pressure as cues. The 160th Special Operations Aviation Regiment (SOAR) is currently exploring the TSAS for their aviation life support equipment (ALSE) suit. We are strongly supporting the program so we can expedite the concept into a fielded reality.

Aircrew coordination training

No one doubts the importance of crew coordination; 66 percent of the Class A accidents in OIF had "lack of crew coordination" as a contributing factor. Recognizing the need for training to help compensate for the reduced flight hours of today's crews, Army Aviation's leadership has re-energized the program. The new program provides computer simulation training at home station, developing positive habits prior to deploying to theater. The next generation of crew coordination training will be integrated into the Centralized Aviation Flight Record System (CAFRS), currently beginning an 18-month development fielding process.

Until technology becomes fielded in equipment and programs, I encourage you to use innovation and flight discipline to lower your environmental risk. Just because you don't have the resources to train in the desert doesn't prevent you from training. To mitigate your risk, consciously limit your power while flying at home station and develop good habits in the simulator. Furthermore, by complementing a well-planned reception, staging, onward movement, and integration (RSOI) training program, good units can and are overcoming these challenges.

Operating in limited-visibility conditions, whether those conditions are caused by the weather or blowing dust or snow, can be challenging, risky, and potentially destructive. But it can be done safely and without the loss of life or equipment. There isn't a single golden nugget to significantly reduce brownouts, and nothing is going to take the place of safe, well-executed desert training. However the Army Safety Center, in conjunction with Army Materiel Command, Assistant Secretary of the Army for Acquisition and Logistics Technology, and the Army Aviation Center, is aggressively pushing tools through the acquisition process to provide the future Army aviator with a safer way to fly and win our Nation's wars. FY04 can be the best year ever in aviation safety. It's up to all of us to make it happen through reinforcing the basics each and every day!

Keep your leader lights on!

Joe Smith

GEN Schoomaker Sends...
Protecting Our Combat Readiness

GEN Peter J. Schoomaker
Chief of Staff, Army

We are an Army at war. The challenge of the Global War on Terrorism demands the highest level of leadership and Soldier proficiency. We cannot be risk-averse; our Soldiers are our most valuable combat asset. Therefore, reducing preventable accidents throughout our formations is fundamental to protecting our combat readiness.

Last year the Army experienced the highest accident rate in 10 years. The current trend, if not abated, will exceed last year's losses. Leaders must understand the impact of inexperience on their formations and where it will require education, training, direct leadership, and enforcement of standards to overcome. I hold myself and leaders at all levels accountable for meeting this challenge.

Since World War II, over half of our combat losses were caused by accidents. Risk management integration has proven to be effective in reducing accidental losses. In Operation Iraqi Freedom (OIF), our accident rate remained at 38 percent, a tribute to the performance of combat leaders' effective use of risk management. However, in order to win the Global War on Terrorism and protect the force, we must aggressively attack adverse trends in three key areas.

I expect senior leaders to focus aviation training on potential operational environments and aircrew coordination. Brownouts attributed to 75 percent of aviation Class A accidents in OIF. Aircrew coordination was a factor in half of those accidents.

Almost half of ground combat losses occurred during vehicle rollovers. The primary cause was speed, aggravated by the failure to wear seatbelts. In addition, far too many of our Soldiers have been killed in theater by negligent discharges. I challenge our Noncommissioned Officer Corps to train Soldiers to standard, enforce those standards, and supervise.

During the last 10 years, over half of our accidental fatalities happened in POVs. This year is no exception. Our programs are not effective. To make an impact we must change our culture. Risk management is a 24-hour leader responsibility, and Soldiers must be held accountable for their actions. I have provided you with tools, accessible through the Army Knowledge Online Web site, to drive our culture change and reduce risk. We will win the Global War on Terrorism, but we must not accept any unnecessary risks that place our Soldiers in jeopardy. ♦

—Adapted from CSA's message dated 11 December 2003

LTC R.M. Beckinger
4th Squadron, 2d ACR
Operation Iraqi Freedom

One of our goals in *Flightfax* is to encourage aviation units to share ways they have solved problems. In the November 2003 issue, LTC Daniel L. Ball presented his unit's approach to safer brownout operating techniques while serving in Operation Iraqi Freedom (OIF). Here is another unit's success story of training effectively at the Joint Readiness Training Center (JRTC), Fort Polk, LA, and how this training brought success in the Iraqi desert.

The 4th Squadron, 2nd Armored Cavalry Regiment (ACR) Sabre Squadron's mission in OIF was to conduct limited combat operations, reconnaissance, security, and air movement. In addition, we also conducted force protection at Red Catcher Base to help provide a safer environment for the Iraqi people.

Starting point

Our journey to Baghdad really finds its origins in our unit's rotation to the JRTC in August 2002. During that deployment, our aviation task force (TF) was task organized as a 500-man, 42-ship TF in support of the 5,000-man 2d Regimental Combat Team (RCT). The combined arms "full spectrum" operations at JRTC laid the foundation for the unit's training program, which prepared us for success in Iraq. The after action reviews allowed us to assess measures needed to not only sustain strengths, but also correct weaknesses in warfighting skills from the individual up to collective level. Specifically, we were able to validate our mission essential task list (METL) collective troop-level battle tasks (i.e., reconnaissance, security, air movement, logistics, command and control [C2], and force protection).

As warfighters, we were able to focus on air-ground integration (AGI) during 24-hour combined arms operations down to the ground platoon leader level. We also refined our procedures

From JRTC

concerning fighter management of crews and battle staff, to include fratricide prevention; aviation operations; tactics, techniques, and procedures for urban environments; maintenance and sustainment logistical procedures; ground convoy training; and force protection measures.

JRTC was the backdrop for not only our "road to war," it also influenced our ease in expediting our reception, staging, onward movement, and integration in Kuwait. It encompassed the approach, march, and mission assumption in Iraq; the doctrinal crosswalk of task to purpose for daily operations; and, finally, our activities for day-to-day air maintenance and force protection. The training program we developed over a period of months leading to our successful deployment in April by air, ground, and ship was shaped by our JRTC experience.

The road to war

After completing recovery from JRTC, our first training focus was on small arms and aerial gunnery proficiency. In September, the squadron focused primarily on individual and crew small arms proficiency training and followed this training up by completing crew tables III through VIII (UH and OH) aerial gunnery in October.

In November, the squadron blocked a 3-week period focused on combined arms lanes training in support of all regimental ground cavalry troops (GCTs). During this training, the ground cavalry squadrons (GCSs) conducted live fire exercises (LFXs), which helped to refine the lessons learned at JRTC for AGI. Conducting this training served to enhance our squadron's capability beyond the habitual association of the air cavalry troops (ACTs) to more flexible interchangeable teams, to include integrating table VIII qualified staff crews as liaison officers in support of the GCTs.

Our training focus in December was on refining individual training proficiency via common task testing; nuclear, biological, chemical (NBC) lanes training; combat lifesaver training; drivers' training (individual and collective); and advanced individual marksmanship ranges. At the end of the first quarter, Sabre Squadron was ready for collective level refinement and final preparation for deployment in support of the looming war in Iraq.

Sabre Squadron started out the new year scheduled to conduct one field training exercise and two LFXs. Our emphasis was on refining, augmenting, and validating lessons learned from JRTC and the first quarter training plan. The squadron deployed in January for the FTX, which included an attachment of GCTs, the regimental Military Intelligence company, and the air defense artillery (ADA) battery for force-on-force training. During the FTX we conducted 24/7 operations and focused on assembly area (AA) operations, AGI, ground convoy operations (which included main supply route reconnaissance), and force protection (with emphasis on perimeter security integration of the air and ground quick reaction forces [QRFs] with Kiowa Warriors [KWs] and using a refined reconnaissance and surveillance plan for likely ADA, mortar, and squad-size attacks on the TF assembly area). In addition to the training emphasis, we were capable of refining aircrew and staff battle rhythms, as well as augmenting and validating first quarter training by conducting NBC individual and collective lanes training.

In February we incorporated collective LFXs, to include ground convoys (III/V and logistics package) with KW teams and 3 weeks of ACT AGI live fires with every GCS.

With the arrival of the warning order in March, the squadron completed a regimental STAFFEX (JANUS) and made final deployment preparations, to include validation of load plans, final certification of combat lifesavers, completion of theater-specific

to Baghdad

individual readiness training, soldier readiness processing, and the third evolution of small arms ranges in 6 months.

We completed the road to war in April with aerial gunnery tables III through VIII and a table X with a joint air attack team LFX. Ultimately, it was JRTC Rotation 02-09 that allowed the regimental commander to set the conditions over two training quarters for our success for operations in Iraq.

Lessons learned

The squadron is conducting full-spectrum operations, which is evolving into steady state stability and support operations. The key to our success so far has been our aircrews' understanding of commanders' intent, the unit's METL, and the doctrinal crosswalk to the type of mission we conduct daily in Iraq.

Our flying OPTEMPO is twice the rate of home station. The III/V platoon is the hardest-working platoon in the squadron and has been a linchpin of our success to date. Reconnaissance (route, zone, and area), security, air movement, and C2 missions have been in support of not only the regiment, but also conventional combined arms members.

Ultimately, it was JRTC Rotation 02-09 that allowed the regimental commander to set the conditions over two training quarters for our success for operations in Iraq.

Our fighter management program supports this OPTEMPO and was validated during our JRTC rotation. We maintain a 24-hour steady state and surge capability (with table VIII qualified staff crews, a total of six) tied directly to the enemy's battle rhythm. The three ACTs rotate from Day (0500-1700) to Night 1 (1200-2400) to Night 2 (2200-0600) every 30 days, while the lift troop splits its crews between two 12-hour shifts. We also maintain a 30-minute KW team and a UH QRF capability.

The tactical operations centers operate on three overlapping, 9-hour shifts, conducting current operations and planning future ones. Flight operations are collocated with the TOC to sustain our 24-hour capability. We maintain the marathon pace required on a long deployment, ensuring every trooper has one day out of seven off. Life support and morale upgrades have been constant.

Embedded in our mission success has been a tremendous team maintenance effort on the part of our troop commanders and first sergeants, NCOs, crew chiefs, support squadron, and contractors. We could not maintain our current OPTEMPO without their commitment to mission accomplishment. Tracking the Class IX parts flown from the United States or Germany into Kuwait or Baghdad International Airport is difficult at best, as well as tracking the corps and division support area by ground or air. To supplement a developing Class IX air system, personnel have been placed at the key resupply nodes to assist in tracking the Class IX flowing into theater.

A lack of spare parts has led to frequent partial mission capable conditions on the mast-mounted sight (MMS) and aircraft survivability equipment (primarily the ALQ144). To help alleviate and expedite the turnaround process, we have taken two courses of action. First, we conduct bi-monthly UH-60 shuttle flights to the forward repair activity in Arifijan, Kuwait, to deliver priority non-operational MMS components for testing and to secure repair parts. This has helped us to maintain better reliability rates on the MMSs. Secondly, we now do UH-60 phases at the aviation intermediate maintenance (AVIM) level. Our first external phase took 10 weeks, and our second in-house phase took 3 weeks (averaging one UH-60 going into phase every 6 weeks). We believe this dramatic difference can be attributed to ownership and better responsiveness to unit needs. We have found AVIM provides better visibility on controlled substitution and allows more timely requisition on previously unforecasted parts.

A final lesson learned concerning maintenance in this environment is that aviation assets should work from a hard stand (ours is on two paved parade fields) when possible. It reduces the stress on and untimely replacement of engines, auxiliary power units, and rotor blades, not to mention the enhanced safety for aircrews not forced to operate from a desert field-like environment.

Force protection was noted as a weakness during our JRTC rotation. The squadron command sergeant major oversees the guard force while the squadron executive officer (SXO) administers overall base security because of his knowledge of force protection projects needed, planned, and completed. Additionally, the SXO maintains a close relationship with the other tenet units and is well-versed in their unique security capabilities

and needs.

Externally, we have identified likely threats and targeted our countermeasures accordingly. We use KWs for area reconnaissance of named areas of interest for all regimental base camps with the purpose of locating and destroying possible enemy mortars, rocket-propelled grenades, ADAs, car bombs, and small arms threats posed by small groups of terrorists or paramilitary forces. A threat in an urban environment poses some unique challenges but has some similarities to the one posed at JRTC in a heavily vegetated terrain. Specifically, the ability to attack and fade into the surrounding environment can only be prevented by measures designed to locate and defeat the attack before it occurs.

We merged with other units and learned that our different capabilities complement the strengths inherent in substantial numbers sharing security needs. We share a proportional portion for defense of a 360-degree perimeter and an integrated base defense plan, to include an air and ground QRF and C2 under one unit for base defense needs under the base defense operations cell. Manpower requirements for force protection represent 15 percent of our TF (we surge to 30 percent guard and QRF based on elevated threat levels while still conducting flight operations). It includes a robust, well-trained, and responsive ground QRF under the control of the headquarters troop XO. The QRF conducts active patrols both inside and outside the perimeter, apprehension and detention of hostile individuals, and seizure of weapons and vehicles, as well as participating in ride-along patrols with infantry, armor, and ground cavalry units outside the AA.

The guard force is responsible for roving patrols (random check points) and manning a mix of fixed towers with crew-served weapons and checkpoints. To date, we have used a graduated response on several occasions, to include the use of deadly force to maintain base camp security. Additional internal measures include placing military-owned demountable containers in front of the aircraft and emplacing concertina wire around all key locations on Red Catcher Field. Finally, all of these assets are under the regimental support squadron C2, which retains overall responsibility for incorporating all units into the force protection plan.

Force protection extends not only to the fixed base and soldiers at dismounted points, but also to daily ground convoy operations. We established "TF Hammer" for convoy operations in response to the increased paramilitary and improvised explosive device threat. It is an NCO-led, 30-person, 10-vehicle, mission-specific, task-organized force rehearsed and trained to be responsible for daily convoys that must leave Sabre Base for sustainment and coordination needs. Ground convoy operations are requested, planned, and tracked by the S3 shop in Iraq. Missions are given to TF Hammer 48 hours in advance for detailed route planning and rehearsals to defeat the known threat and train for likely contingencies with the appropriate upgraded force protection measures.

Summary

JRTC provided us with the road to war that successfully prepared us for daily ground and air combat in Iraq. Our current operations are best described by flexibility—as only a cavalry organization could respond—to an ever-changing threat in an unforgiving environment. We have been privileged to work under and support the Marne Division (3ID) and now the Iron Division (1AD), as part of the Dragoon Battle Group. The long-term outlook in Iraq is positive. We make daily improvements in access to basic services for every citizen (water, sewage, electricity, housing, food, and gas or propane access). Coalition forces are providing a safe and secure environment for the Iraqi people, and we are marching inevitably to not only the defeat of former regime elements and terrorists, but also the establishment of a democratic, representative government in the coming months. ♦

Editor's note: *This article was written in Oct 03, we have since received an update from LTC Beckinger. Updated stats follow for the past 9 months: 4/2 ACR has flown over 12,000 combat hours, pumped over 750K gallons of jet fuel, and supported every maneuver battalion in 1AD as part of the Dragoon Battle Group. They have assisted TF 1AD (35K strong) in the capture of countless violent former regime loyalists and terrorists, as well as the seizure of hundreds of weapons and thousands of tons of ammunition. They have performed all this safely since arriving in Iraq.* ♦

—LTC R.M. Beckinger is the Squadron Command Officer of the 4th Squadron, 2d ACR, OIF. He is a master Army aviator (2,800 hours) and has a Masters in National Security/Strategic Studies from the Naval Staff College. LTC Beckinger has 28 years in service. He can be reached at DSN 587-4912/10 or e-mail richard.beckinger@us.army.mil.

Tactical Risk Manage

LTC Thomas McDermott
U.S. Army Safety Center

Risk management is a layered tool used from commanders down through every subordinate. The process of identifying, assessing, and controlling hazards arising from operational factors and then making decisions that balance the risk costs with mission benefits is the definition of risk management. So, from where do we get "tactical risk management?" Is there a field manual in the Army system that we can go to and read the doctrine for tactical risk management? The answer is no.

Tactical risk management is a lot like morale. You can't reach out and touch morale, and you can't order somebody to be satisfied and happy, but you can create a climate where soldiers are happy and satisfied to perform their duties. Risk management and tactical risk management are performed in the same manner by the soldier as he performs whatever mission or task he is assigned.

How is this done? Tactical risk management is the result of four key elements. These four elements are not that different from the principles of risk management. The first of these elements is that risk management must be integrated into planning. Second, you must not accept any unnecessary risk. "Unnecessary" is the key word! This does not say, "…accept any risk." Third, you must make the risk decisions at the proper level. The fourth and final element

ment: It's for Real!

is that you must accept the risks if the benefits outweigh the costs, and only if those costs cannot be mitigated. Whether it is the commander planning a mission or crew chiefs ground-handling an aircraft to the flight line, the hazards associated with task accomplishment must be weighed.

To put this into perspective, during World War II, 43 percent of battlefield casualties were due to enemy fire, compared to 56 percent of casualties caused by accidents. More recently, during Operation Desert Storm, 20 percent of the battlefield casualties were due to enemy fire, compared to the accident casualty rate of 75 percent. Is tactical risk management a key factor on the battlefield, or is plain old risk management of missions and everyday tasks adequate in the tactical environment?

This brings us to where the "rubber meets the road." Can we tell the difference between a gambler and a risk manager? The Army tries to foster bold and aggressive leaders who will take calculated risks to accomplish the mission. The problem with this leadership trait is that when the gambler is successful, he is hard to separate from the calculated risk taker. Eventually, the gambler will always lose. The reason the gambler always loses is that he will perform an operation without regard to the risk. A good risk manager, whether the mission is tactical or training, evaluates the risk versus the benefits. Control measures will be placed on the risks, and all soldiers involved in the operation will be made aware of them.

During World War II, 43 percent of battlefield casualties were due to enemy fire, compared to 56 percent of casualties caused by accidents. During Operation Desert Storm, 20 percent of the battlefield casualties were due to enemy fire, compared to the accident casualty rate of 75 percent.

While performing your troop leading procedures, whether it is receiving the mission, issuing a warning order, or making tentative plans, do not forget to IDENTIFY THE HAZARDS. Once the hazards are identified and assessed, place control measures against those hazards and re-evaluate the level of risk. The two biggest factors in tactical risk management will be the time available to make the decision and the time available to implement the control measures. Soldiers must understand and then apply those control measures, execute the controls, perform to standard, and crosscheck each other.

So who benefits from the results of tactical risk management? None less than the individual soldier who has to make the correct decision at the correct moment in the fluid flow of battle. Just as the aura of morale can't be touched with a finger, a soldier's safe operation through situational awareness and employment of good common sense will keep us alive on the battlefield at the day's end. ♦

—LTC Thomas McDermott, Aviation Accident Investigator, U.S. Army Safety Center, DSN 558-3644 (334-255-3644),

Risk Management During Deployment

Whether deploying for mission training—such as rotations to the National Training Center or Joint Readiness Training Center—or deploying for combat or humanitarian relief missions, effective risk management is critical in the planning and execution phases. From planning for takeoff at home station to tiedown at the destination, strict adherence to the risk management process and rules is the best way to ensure a safe deployment.

Diligently applying the risk management process and rules enhances a unit's ability to safely deploy crews and equipment. But application of the risk management process and rules is not a one-time, before-deployment step. Once the initial planning is completed and units are en route, crewmembers must continue to carefully manage the risks and apply the risk management rules to handle the unexpected events that frequently occur.

For example, crews sometimes get "weathered in" while en route to their destination. Weather forecasting is not an exact science! It is just a forecast—a best guess on the information available. While en route, many places don't have weather reporting points available to make a good forecast. And sometimes, the weather just isn't what was predicted. Other times, the weather can change so rapidly that crews are forced to delay until conditions improve.

If the weather deteriorates while en route, crews should quickly identify the hazards, assess the risks, and make a decision to proceed or land. If the benefits of continuing don't outweigh the risks, land and just wait it out—even if it means overnight stays in unplanned places. Don't allow yourself to be pressured into pressing on if the risks are too high.

Chip lights, pressure lights, and other warning systems let us know when there is a problem with the aircraft. These devices are designed to warn of impending failure of some system, and crewmembers don't hesitate to use that information to make a decision to get an aircraft on the ground promptly. Likewise, deteriorating weather should warn crews of hazards that are likely to be encountered. Do not hesitate to land or to keep an aircraft on the ground if the weather is bad.

Don't allow the desire to save a few of the unit's dollars sway you into ignoring the hazards and making a poor risk decision during deployment.

Although crew endurance or limitations should be considered carefully while planning the deployment, the fatigue of a long deployment affects each crewmember differently. Sometimes, it's hard for an aviator to admit fatigue when among peers. However, it is obvious that fatigue is a hazard and imposes an unnecessary risk. Let the unit pilots know that it is okay to say they are tired and need to stop for the night.

In peacetime, it's prudent to be conservative. The crewmembers and aircraft lost in training will not be available for the next combat, support, or humanitarian relief mission. Even well-planned deployments sometimes require unplanned stops. When unexpected events such as deteriorating weather and fatigue are encountered, start the risk management cycle over: identify and assess the hazards, and then make a risk decision.

Everyone knows that in these times of constrained resources, it's important to use dollar resources wisely. But don't allow the desire to save a few of the unit's dollars sway you into ignoring the hazards and making a poor risk decision during deployment. ♦

Aviation
Port Operations Safety

CW4 Scott Dillon Fort Carson, CO

In the first part of 2003, we saw an enormous deployment in preparation for and in support of Operation Iraqi Freedom. As we prepare for the return of these forces and deployment of future forces, we should review the risks and controls associated with port operations.

Port operations offer many challenges. Split-base operations and unfamiliar operations and locations are just a few. But prior planning and risk management can offset these challenges.

Planning

During the planning process, the leadership must develop a robust maintenance support package. Aircraft might have been in transit for over a month and will require scheduled and unscheduled maintenance, as well as the necessary personnel to prepare the aircraft for flight. The flow of aircraft to or from the port must be managed to prevent overcrowding at the dock. In addition, ships can be late and equipment slow to be offloaded, adding to the frustration and friction of port operations.

Port operations

Once port support teams are identified and in place, it is important to familiarize them with the hazards at the port. The best people to conduct these briefings are the port representatives, who should brief the dangers of being at the dock's edge or near the railings of ships. Leaders should identify these areas as off limits to soldiers and mark them, if possible. Every work shift should begin with a safety brief on the hazards present. All soldiers working in the port are required to wear head protection when unloading operations are underway. An American National Standards Institute (ANSI) helmet is preferred, but the Kevlar helmet will suffice. Also, soldiers need the appropriate clothing and hydration for the type of climate they will be working in.

Aircraft maintenance

Space at ports is at a premium. Prior planning will be needed to sequence aircraft into port for the space available. Aviation units need to identify an area for conducting aircraft maintenance. The area should be marked to prevent unauthorized vehicles from traveling through the area. By-the-book maintenance is a must, and maintainers must be aware of antennas under the aircraft that can be damaged when being loaded on ships. Also, use proper vehicles for towing and ensure only licensed personnel operate them.

Test flights

Ensure fuel samples are taken prior to the first flight of aircraft coming off the ship. Condensation could build up in fuel tanks during shipment. A test flight area should be coordinated and used. A local pre-accident plan should be implemented and tested prior to conducting flights.

Once all your aircraft are off the ship and ready, it is time for the flight home. Ensure the proper DOD flight information publication (FLIP) is available for the route of flight and that you have coordinated for fuel at en-route stops. Remember, weather along the coast is sometimes worse than forecast; have a plan if you encounter bad weather en route. Also, when receiving your aircraft, monitor crew aircraft currency status and ensure all crews are current and qualified for the mission. Another consideration is to have a flight medical team at the port. Offloading and preparation for movement can take up to a week or more, and flight personnel could become ill or be injured and require clearance from a flight surgeon.

Port operations can be complex and frustrating. Being prepared for contingencies can reduce the frustration, and by using risk management you can prevent the loss of time or equipment and move smoothly back to your home station. ♦

—CW4 Scott M. Dillon, Installation Aviation Safety Officer, Fort Carson, CO, DSN 691-3672 (719-526-3672), e-mail scott.dillon@carson.army.mil

Flying in the Snow

Bob Brooks
U.S. Army Safety Center

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 fall. 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 Field Manual (FM) 1-202, *Environmental Flight*, as well as all the local standing operating procedures (SOPs). Also ask questions—lots of questions—of local safety folks and instructors.

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 instructor pilot (IP) was fairly confident in his abilities. He had more than 2,200 hours of helicopter flying time, with more than 1,200 hours in the OH-58.

The crew was conducting a night vision goggle (NVG) blowing snow checkout. The pilot (PI) had completed three hover down approaches and five constant angle approaches into the training area. The crew departed that training area in order to continue training in a more restrictive landing zone (LZ). The PI successfully executed three approaches into the LZ and was attempting his fourth approach as a constant angle approach. As the aircraft proceeded inbound at an altitude of 8 to 10 feet, the IP announced that a snow cloud was at the rocket pods. The PI acknowledged this and proceeded forward and down. The snow cloud engulfed the aircraft as it approached the terrain. The PI lost his visual references, and the aircraft began to drift to the right. The IP announced they were drifting to the right, but the PI did not acknowledge the drift.

The aircraft continued to advance forward and drift right until the main rotor blades made initial contact with several small trees. The drift continued until the main rotor blades struck and severed an 11-inch diameter pine tree, upon which the fuselage began a rotation to the right. The rotational momentum continued as the main rotor blades disintegrated and the severed pine tree fell toward the aircraft. The aircraft came to rest among the trees in a level, upright position. The two crewmembers received minor injuries.

Lessons learned: No matter how many of these approaches you do, anticipate and prepare to go around at any time during the approach. IPs, be prepared to take the controls regardless of who you are flying with.

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 Three. 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 to 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. Fortunately there were no fatalities in this accident.

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 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.

The aircraft continued to advance forward and drfit right until the main rotor blades made initial contact with several trees.

Lessons learned: Approach and go-around planning are essential for any formation flight; however, 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 the 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 might 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 by ground control, remember to keep a good scan going to keep from inadvertently descending.

Summary

Many aviators have their own ideas about how to mitigate risks associated with blowing snow. As part of the winter academic program, it might 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. ♦

Editor's note: *We are continuing to learn valuable lessons involving dust landings, and units are developing the tactics, techniques, and procedures (TTPs) for coping with some of those treacherous operating environments. We request that you forward those TTPs to our Flightfax office. We'll consolidate and staff them, and then publish them in a future Flightfax article as lessons learned.*

—Bob Brooks, Operations Division, DSN 558-9860 (334-255-9860), robert.brooks@safetycenter.army.mil

Broken Wing AWARDS

The Broken Wing Award recognizes aircrew members who demonstrate a high degree of professional skill while recovering from an in-flight failure or malfunction requiring an emergency landing. Requirements for the award are listed in Army Regulation (AR) 672-74, Army Accident Prevention Awards. The Army Review Board met recently and approved the following awards.

WO1 Andrew F. Smith and WO1 Jamie T. Naquin

B Co., 1/223 Aviation Regiment
Fort Rucker, AL

While on a cross-country visual flight rules (VFR) training mission, an instructor pilot (IP) and two Initial Entry Rotary Wing (IERW) students, WO1 Andrew F. Smith and WO1 Jamie T. Naquin, spotted three large birds in their flight path about a half-mile ahead. The IP, who was at the controls in the left seat, gestured with a "thumbs up," shook his head, and continued with his radio call. Both student pilots were on flight training Day 29. W01 Smith, in the right seat, had a total flight time of 32.9 hours. WO1 Naquin, in the right rear seat, had a total of 32.7 flight hours.

The TH-67 was cruising at approximately 1,400 feet mean sea level (MSL) and 93 knots indicated airspeed (KIAS) when a fourth large bird, a 15-pound black vulture, suddenly appeared in front of the aircraft and struck the left front windscreen. The bird exploded through the windscreen and struck the IP full in the face and neck area, immediately rendering him unconscious. The IP fell forward onto the cyclic and slumped to the right, pushing WO1 Smith's collective down. The bird flailed inside the cockpit, knocking WO1 Smith's radio pin switches down, and eventually came to rest on the right side of the console.

The aircraft pitched down violently in an estimated 60- to 70-degree nose-low attitude while rolling right 30 to 40 degrees. WO1 Naquin yelled to WO1 Smith: "Get it, Get it." WO1 Smith immediately grabbed the controls and attempted to regain control of the aircraft, but was initially unable to move the cyclic or collective due to the weight of the unconscious IP on the controls. WO1 Naquin quickly assessed the situation, unbuckled his lap belt, grabbed the IP, and pulled

him away from the controls. Seconds later WO1 Smith announced, "I think I got it, I got it." The aircraft was level but still losing altitude. The loud noise of the impact and the wind noise had caused WO1 Smith initially to think they had had an engine failure. WO1 Naquin called out to check the gauges. WO1 Smith checked the gas turbine speed (N_1) and turbine outlet temperature (TOT) gauges and saw they were stable, and the torque gauge was indicating 10 percent. As he pulled up on the collective, the rate of descent began to decrease. WO1 Smith finally regained control of the aircraft at 900 feet MSL.

Looking ahead, WO1 Smith saw the runway of a local airport and placed his radio pin switches back to the up position. He made a "Mayday" call while starting an approach to the airport. Both WO1 Smith and WO1 Naquin began searching for traffic while landing at the airport. WO1 Smith looked over at the IP and shouted, "Sir, are you OK?" The IP did not talk, but did raise his hand off his leg. He continued to drift in and out of consciousness.

WO1 Smith landed the aircraft on the runway, and he and WO1 Naquin completed the aircraft shutdown procedures by the checklist, with WO1 Naquin reading the checklist so they would not miss any steps. They then began administering first aid to the IP and made sure he was breathing. The IP was still in and out of consciousness and showing signs of shock, but he did give a "thumbs up" to WO1 Smith and WO1 Naquin when they asked if he could breathe. The IP was MEDEVACed shortly after landing and taken to a local hospital, where he was diagnosed with a broken palate, broken nose, and fractured jaw. The IP's injuries could have been much worse had his visor not been in the down position.

WO1 Smith and WO1 Naquin's superior airmanship (in spite of their lack of experience), remarkable crew coordination, and risk management in response to the emergency thrust upon them is reflected in their pivotal decisions and actions. The outstanding manner in which they worked as a team during this emergency is displayed in the successful outcome of this event, especially for student pilots of their experience and hour level. The presence of mind and quick actions WO1 Naquin displayed to unfasten his seatbelt and pull the IP off the controls helped save the lives of all aboard the TH-67. WO1 Smith took the controls and continued to fly the aircraft until he had regained control of a potentially deadly situation. Both student pilots displayed remarkable poise and composure above their experience level in a very serious situation that easily could have become a catastrophic event. ♦

Mr. Billie Loucks
Advanced Division
Lear Siegler Services, Inc.
Fort Rucker, AL

During instrument flight training at 3,000 feet MSL, Mr. Billie Loucks, an IP, and two IERW students experienced a complete engine failure on their aircraft. Mr. Loucks assumed control of the aircraft and autorotated in instrument meteorological conditions (IMC) while declaring an emergency with Air Traffic Control (ATC).

With insufficient altitude to attempt a restart, Mr. Loucks continued the autorotative IMC descent. The aircraft entered visual meteorological conditions (VMC) at 400 feet above ground level (AGL).

Mr. Loucks selected a landing area and banked the powerless trainer into a 90-degree turn for a final approach. Noticing the flight path was obstructed by power lines, he S-turned to lose altitude and successfully avoided the obstruction. Mr. Loucks safely completed an autorotational landing without injury to the crew or damage to the aircraft. ♦

Mr. Robert C. Smith

Primary Division
Lear Siegler Services Inc.
Fort Rucker, AL

While at 1,000 feet MSL, Mr. Robert C. Smith, an IP, and two IERW students heard a loud grinding noise, which was followed by a severe airframe vibration and aircraft yaw. Mr. Smith took control of the aircraft, initiated a "Mayday" call, and began a descent. He quickly recognized the aircraft had lost tail rotor thrust and, owing to the loud banging noise, suspected some aft airframe components might have ripped free.

Although powered flight was possible, all indications were that a catastrophic loss of the tail boom was about to take place. Deciding to land immediately, Mr. Smith approached the selected landing area with the aircraft approximately 50 feet above the trees and at 60 KIAS. As he slowed the crippled aircraft, it began to yaw. Mr. Smith maintained heading control with throttle, collective, and airspeed management until no longer possible. Mr. Smith completed the emergency approach, just skimming the treetops circling the selected landing site. Mr. Smith safely completed an autorotational landing without injury to the crew or damage to the aircraft. ♦

CPT Tim Dickinson

Camp Robinson
North Little Rock, AR

Following a reconnaissance mission, CPT Dickinson dropped off a law enforcement officer at a local airport and resumed the flight to his home airfield. The OH-58 RAID aircraft was at approximately 1,200 feet AGL and had been in the air about 5 minutes when it began yawing violently to the left and then to the right, finally remaining in a left yaw. The N_1 gauge was noted as decreasing at a rapid rate, along with the engine tachometer. The LOW ROTOR RPM audio sounded, and rotor RPM was observed at approximately 92 percent. CPT Dickinson immediately lowered the collective and began an autorotation. During this time, he also made a "Mayday" call, which was transmitted and heard by the local flight operations.

CPT Dickinson noted the only acceptable landing site was 150 degrees to the right rear of the aircraft and contained several large hay bales, trees, and a large ditch. He immediately initiated a hard right turn in order to make the landing area. The obstacles in the landing area made a "no run auto" necessary. The autorotation to the ground lasted about 43 seconds based on altitude and the descent rate of about 1,800 feet per minute. The

autorotational descent and landing were accomplished successfully, with no damage to the aircraft or injury to personnel. Once on the ground, CPT Dickinson saw the engine was not running and completed an emergency engine shutdown. He then called the local flight operations on his cellular telephone and informed them of the aircraft's and crew's status. ♦

—Comments regarding this article may be directed to Ms. Julie Shelley, U.S. Army Safety Center, DSN 558-1218 (334-255-1218), e-mail julie.shelley@safetycenter.army.mil.

New Look, Same Great Message!

The U.S. Army Safety Center is proud to announce improvements to the Broken Wing Award. Submission requirements have been streamlined, and the award has received a long-needed and deserved facelift.

A newly designed certificate and plaque honors Broken Wing awardees for their extraordinary skill in preventing or reducing personnel injury or aircraft damage. The upscale certificate is printed on deluxe parchment paper with an embossed Army seal. It is signed and framed along with a Director of Army Safety coin. The stylish "Aviation Blue" plaque features the awardee's name and the coveted Broken Wing emblem.

Director of Army Safety Message dated 1 October 2003 streamlines the nomination process: "Nominations will be forwarded through command channels to the first O-6 level commander, then to the USASC, ATTN: CSSC-PT (Broken Wing Award), Fort Rucker, AL 36362-5363."

The changes to the Broken Wing highlight our initiatives to renovate the Army Accident Prevention Awards Program. Look for more improvements to the safety awards program in future articles of *Flightfax* and *Countermeasure*. ♦

ASMIS-1
Clearing the Road Ahead

Julie Shelley
Staff Editor

You're finally coming home from that long deployment in the "sandbox." Family and friends are anxiously awaiting your return, and you can't wait to get back home and celebrate. Once you return stateside, you begin thinking about the quickest way home. Should you fly, or maybe drive? After all, your car has been in storage all these months and these are real roads. Why not take the scenic route home and enjoy the view?

The thousands of Soldiers redeploying home in the first few months of this year will finally be away from the dangers of combat. However, these Soldiers might not think about the risks on American roadways. Privately owned vehicle (POV) accidents are the leading cause of accidental death in the Army: In Fiscal Year (FY) 2003 alone, 109 Soldiers died in POV accidents.

In response to this and other emerging trends, the U.S. Army Safety Center (USASC) has developed a tool to mitigate on- and off-duty risks. The Army Safety Management Information System-1, or ASMIS-1, is an automated, centralized tool that features a question-and-answer session designed to assess the potential risks of a Soldier's planned activities. The system features three modules—POV, ground, and aviation. The POV module is currently available in a beta version, and the aviation module is scheduled to be released early this year.

The thousands of Soldiers redeploying home in the first few months of this year will finally be away from the dangers of combat. However, these Soldiers might not think about the risks on American roadways.

The POV module is designed to be completed by all Soldiers on leave or pass (including those returning from deployment) for all planned trips outside the immediate local area. The tool helps the individual Soldier plan every aspect of the trip before departure. Questions about travel and factors such as the type of vehicle, seatbelt use, sleep, rest stops, and time of departure are asked in drop-down, multiple-choice fashion. When a Soldier completes the questionnaire, the system builds a profile based on the information collected and displays actual accident cases

In Fiscal Year (FY) 2003 alone, 109 Soldiers died in POV accidents.

found in the USASC database that match the profile. The Soldier then gets to see real accidents involving other Soldiers just like them. From there, the Soldier is routed to a "Hazard Assessment" page, where a score of 1 (lowest risk) to 10 (highest risk) is assigned based on the Soldier's responses. Also featured on the page are a risk management matrix card and links to Mapquest and The Weather Channel. This assessment will then be forwarded to the Soldier's supervisor for his or her review, risk mitigation, and approval.

A new feature in the POV module is a page that lists check-the-box controls in response to the personal and travel factors selected in the questionnaire. The information includes statistics on seatbelt use and drunk driving, along with other dangers such as fatigue. Here the Soldier can lower his or her risk by checking the appropriate control measures. The system then navigates the user to the final hazard assessment page, where the final score and risk level are figured based on combined responses from the questionnaire and controls pages. The Soldier should print the last page of the assessment to keep for their personal use.

Soldiers and their supervisors should work hand-in-hand when using this system. When completed, the supervisor listed in the Soldier's profile will receive an e-mail listing the results of the assessment. It's important to note the results are confidential and non-retributional; ASMIS-1 was developed to help, not punish. The use of this tool by the Soldier and his or her supervisor allows for the exchange of information regarding the Soldier's travel plans and the associated risks. The hardest thing for young Soldiers to understand is that they don't know what they don't know. This tool will show Soldiers what has gone wrong for other Soldiers with similar travel plans and what the consequences were.

Begin the planning process by going to **https://safety.army.mil/asmis1**. First-time users should click the "Register" button and create an account. (Leaders have a separate login link just above the FY03 fatality chart.) Once login is complete, step-by-step directions will follow on every page. The entire process is complete in just a few easy steps and takes only a few minutes to finish. Take the extra time and try it out. You were victorious in Iraq. Now help us win the War on Accidents! ♦

—Julie Shelley, U.S. Army Safety Center, DSN 558-1218 (334-255-1218), e-mail julie.shelley@safetycenter.army.mil

NEWS & notes

UAVs Are Now Aviation

Effective 1 October 2003, unplanned damage involving unmanned aerial vehicles (UAVs), drones, or other remotely piloted vehicles will be investigated and reported as aviation accidents. Mishaps of this nature should be reported on "Technical Report of Army Accident," DA Form 2397 series, or "Abbreviated Aviation Accident Report," DA Form 2397-AB-R. ♦

—Bob Giffin, Systems Safety Manager, U.S. Army Safety Center, DSN 558-3650 (334-255-3650), e-mail robert.giffin@safetycenter.army.mil

CH-47 Cargo Hook Release Switch and Accidental Jettison of Loads

Aviation Safety Action Message (ASAM) CH47-97 ASAM 02 was released on 30 December 1996. This ASAM was introduced to help prevent crewmembers from accidentally releasing the cargo they were sling-loading using the cargo hook system on their CH-47 aircraft. This ASAM directs maintainers to visually inspect the aircraft for installation of the Winch/Hoist Operator's Control Grip Assembly 145ES017-1, NSN 1680-01-123-7645, or the Cargo Hook Release Switch Guard EGD-1001, shown in Technical Manual (TM) 55-1520-240-23-10. Task E-311 of the Winch/Hoist Operator's Control Grip Assembly P/N 114ES250-2, NSN 1680-00-963-1051, directs maintainers to visually and functionally check the cargo hook release button to ensure it is recessed and cannot be opened prematurely by accidental bumping or dropping.

Since this ASAM has been out to the field, incidents of accidental releases of external loads have dropped greatly. This ASAM has helped tremendously, and the Aviation Division of the Army Safety Center would like to keep this awareness alive. The crewmember (either the flight engineer or crew chief) that has the responsibility for "calling the load" must always be aware of the location of the pistol grip. Keep the crewmember "calling the load" rather than calling the supported unit because of a dropped load. ♦

—MSG Shane Curtis, Aviation Systems Safety Manager, U.S. Army Safety Center, DSN 558-9859 (334-255-9859), e-mail shane.curtis@safetycenter.army.mil

We Want to Hear From You

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

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

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

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

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

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

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

That's pretty much it. You can mail your story to: Commander, U.S. Army Safety Center, ATTN: *Flightfax*, Bldg. 4905, 5th Ave., Fort Rucker, AL 36362. You may also fax your story to DSN 558-3003 (334-255-3003), or e-mail flightfax@safetycenter.army.mil.

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

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

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class A:** During flight the aircrew received an APU FIRE warning light. The crew attempted to fly the aircraft back to a safe area. The crew landed the aircraft and egressed without injury; however, the aircraft burned and was considered a total loss.

■ **Class A:** On final approach to landing during emergency procedures training, the aircrew heard a grinding noise. The noise was followed by illumination of the APU FIRE and ENG 2 FIRE buttons. The crew immediately landed the aircraft and armed and discharged the fire bottles. They egressed the aircraft without injury. Crash rescue personnel extinguished the fire. The aircraft suffered extensive fire damage from the main transmission to the tail boom.

CH-47

D Model

■ **Class C:** The aircraft was flying at 3,500 feet mean sea level (MSL) and at 140 knots during a post-phase maintenance test flight when the co-pilot's door separated from the aircraft. The aircraft landed normally, and no other damage was noted during the post-flight inspection.

EH-60

A Model

■ **Class C:** During engine start-up the #2 engine accelerated to 150 percent engine torque and 1,000 degrees turbine gas temperature (TGT), resulting in Class C damage.

OH-58

D(I) Model

■ **Class B:** Aircraft experienced a bird strike, resulting in Class B damage. No further details were reported.

■ **Class D:** The instructor pilot (IP) failed to recover the throttle to full open during a simulated engine failure (SEF). The IP discovered the error at approximately 50 feet above ground level (AGL) and touched down to an improved surface with the throttle at idle. The aircraft experienced a hard landing. Visible damage to the vertical fin was noted.

D(R) Model

■ **Class C:** The aircraft was at an out-of-ground effect (OGE) hover at an observation point during a close air support (CAS) tactical mission under night vision goggles (NVGs) when the pilot on the controls felt a bump from the aircraft's tail. All other aircraft indications were normal. The aircrew continued the mission until relieved and returned to the field site. Damage to the tail rotor system was noted during the post-flight inspection. A tree strike is suspected.

UH-60

A Model

■ **Class C:** During the post-flight walk-around following a training flight, the pilot in command (PC) noted a 3-inch by 1-inch tear in the right-hand upper surface of the stabilator. The aircraft was flown on a one-time flight to another base, where a subsequent investigation revealed separation of the trailing edge of one tail rotor blade paddle. An intact composite paddle bearing retaining bracket also was found trapped within the damaged stabilator. Destructive inspection (DI) of the tail rotor blade further revealed a second composite bracket free within the blade.

■ **Class C:** While ground taxiing to the takeoff pad, the #1 engine oil pressure dropped below 35 psi at 93 percent engine gas generator speed (N_G). At 90 percent N_G the oil pressure dropped to 20 psi, and the LOW OIL PRESSURE light illuminated. Oil pressure remained at 20 psi while ground taxiing back to the parking pad. At the parking pad, the #1 power control level (PCL) was retarded to idle. The oil pressure suddenly dropped to zero, so an emergency shutdown was completed. Post-flight inspection revealed the #1 oil cap was not secure. More than 3.5 quarts of oil were needed to refill the engine.

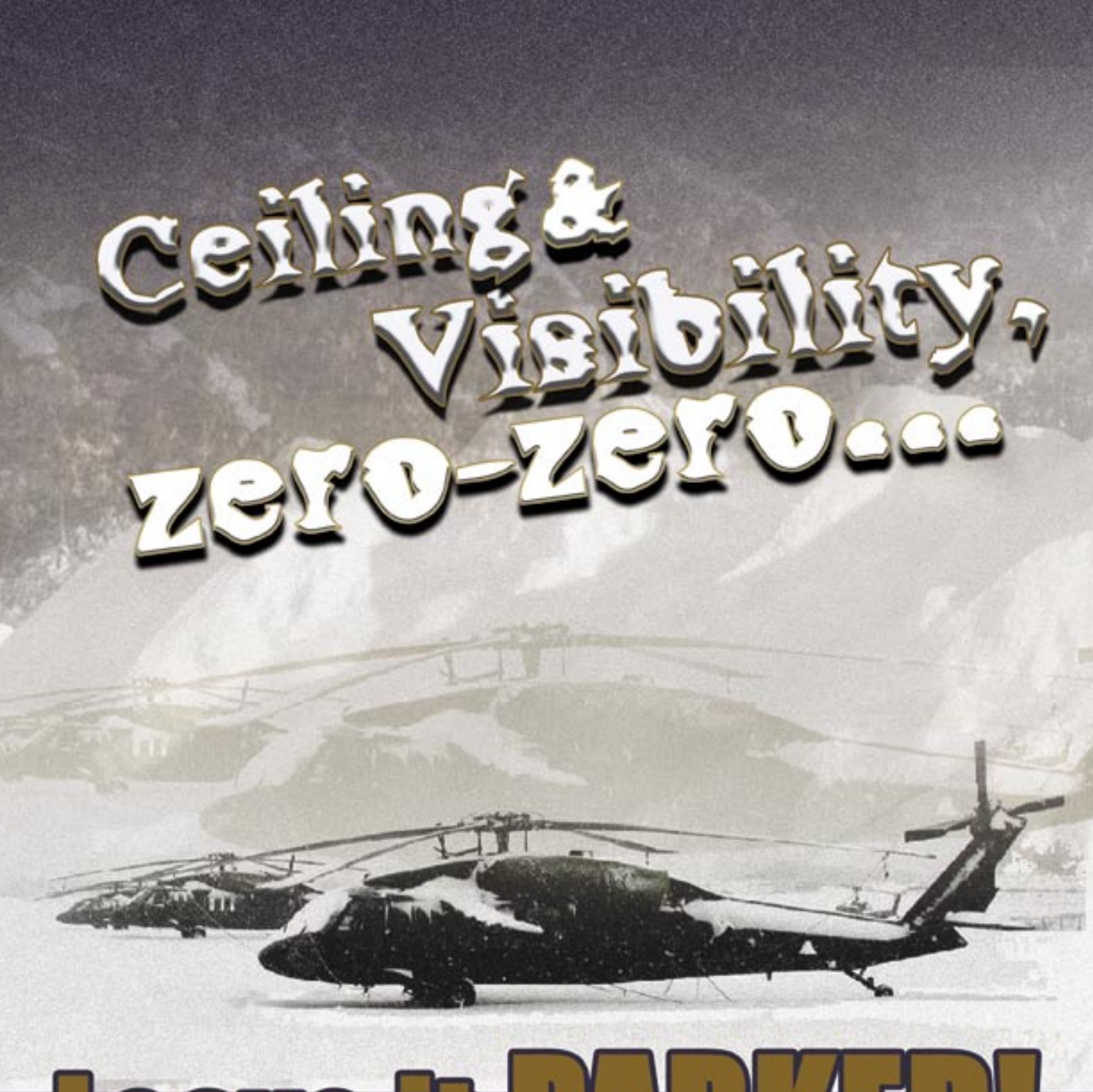
L Model

■ **Class A:** One Soldier was killed and another Soldier suffered a permanent total disability (PTD) when a tire of the parked aircraft they were servicing exploded. The Soldiers were servicing the tire with a nitrogen cart when the rim separated, causing the tire to explode. The aircraft suffered structural damage due to the explosion.

■ **Class D:** During straight and level cruise flight at 800 feet AGL and 140 knots indicated airspeed (KIAS), Chalk 2 of a flight of two banked right to avoid an oncoming bird. The bird dove to avoid the aircraft, passed through the rotor system, and struck the horizontal stabilator. The pilots analyzed the aircraft's flight characteristics after the impact and determined flight to the nearest airport was possible. The aircraft landed safely back at home station with no further problems.

***Editor's note*: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).**

Ceiling & Visibility, zero-zero...

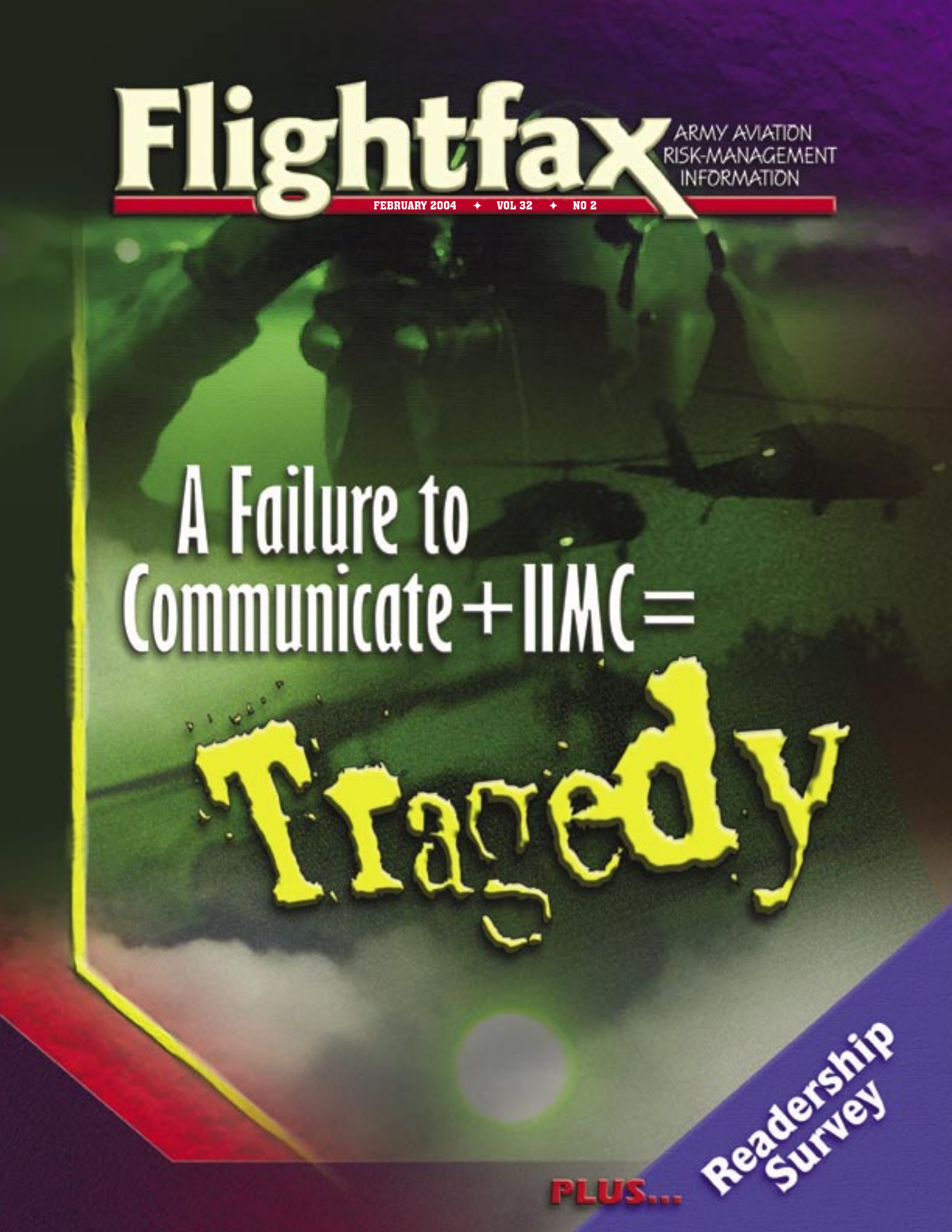


Leave it PARKED!

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

FEBRUARY 2004 ✦ VOL 32 ✦ NO 2



A Failure to Communicate + IIMC = Tragedy

PLUS... Readership Survey

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
COL Christopher Gallavan – Publishing Supervisor
Paula Allman – Managing Editor
Danny Clemmons – Graphics
Julie Shelley – Staff Editor
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

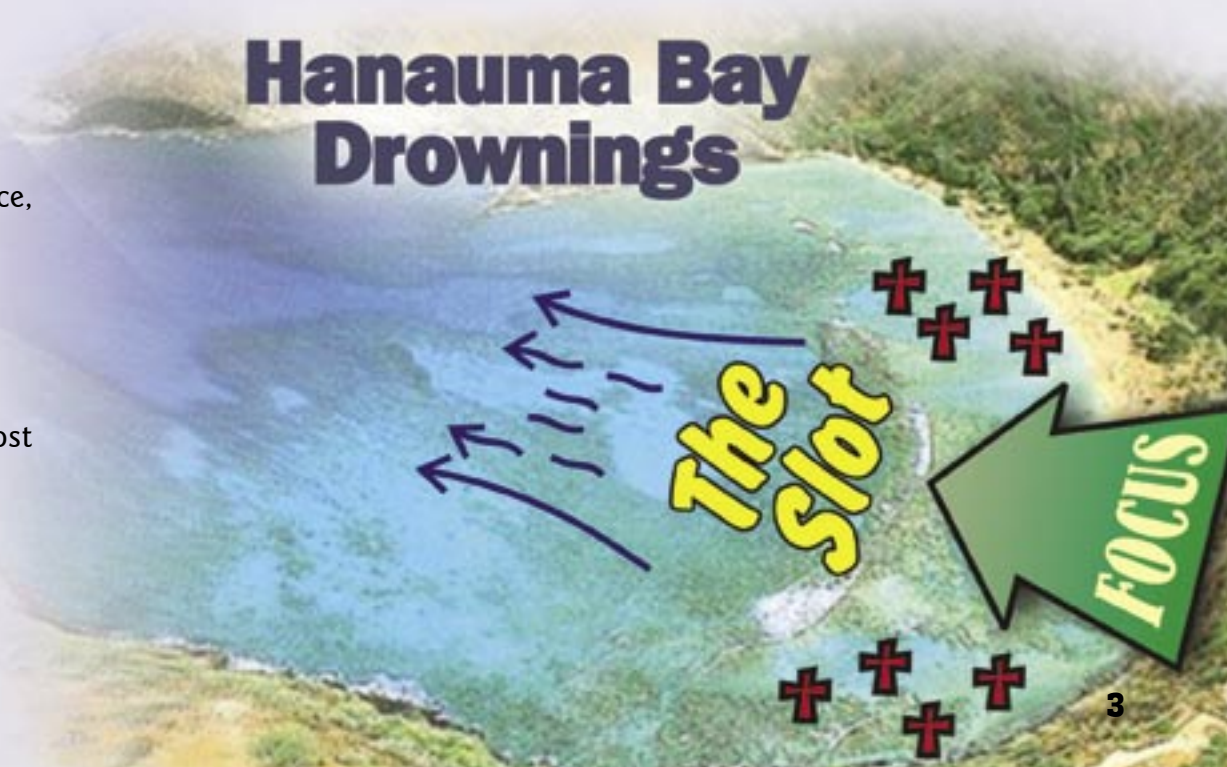
Think Outside the Slot— Expand Your Peripheral Vision

The common perception I hear as I travel around the Army is that risk management isn't "sexy." Junior leaders—the people who really make the difference—often see risk management as a hindrance rather than a combat multiplier. To these leaders, risk management exists only in the Army and is just one more layer of bureaucracy to overcome.

This misconception could not be further from the truth. Risk management is a major growth industry worldwide. As industry leaders realize the benefits a safe work environment can have on morale and productivity, people who specialize in risk mitigation have become in high demand. In fact, the Army's 5-Step Risk Management Model has been implemented by many organizations. One of those organizations is the Hanauma Bay Ocean Safety and Rescue Team.

Hanauma Bay is one of the world's most spectacular vacation locations and sits at the southern end of Oahu, 30 minutes from downtown Honolulu. The bay is a mecca for tourists and hosts thousands each day from around the globe. The snorkeling in the bay is second to none; however, for many swimmers it is their first experience with a powerful ocean tide, and that presents significant hazards. Those hazards became painfully obvious during 2002, when 12 swimmers drowned in the bay. This sparked a wave of public and political pressure for drastic changes. Hanauma Bay's Ocean Safety and Rescue Team's answer was to implement the Army's risk management process.

With support from U.S. Army Pacific Command safety professionals, the team began taking a hard look at the hazards. Identifying the hazards proved easy, but the assessment process was harder. The team painstakingly researched the accidents, looking at a host of factors including age, sex, swimming experience, and medical pre-conditions. However, none of these provided any consistent trends. The drownings almost always occurred in chest-deep water, but were evenly



distributed throughout the bay. The breakthrough came when the team went beyond analyzing the accidents and started looking at the near misses. As they looked at the locations where swimmers were rescued from drowning, they saw a pattern. The "slot"—a snorkeling area with a strong undertow—had the greatest number of rescues, but no fatalities. The team members highlighted the slot as their highest risk area and were doing several things to protect swimmers there. However, because the lifeguards were so fixated on watching swimmers in the slot, they were missing distressed swimmers in other areas of the bay.

By analyzing the near-miss data, the team realized it had a model for success that could be learned from and built upon. The team presented its data on fatalities and near misses to public officials. As a result, the team gained funding for an additional guard tower to focus on the dangerous areas east of the slot. Additional control measures included a safety briefing for all swimmers on the bay's danger spots, and better communication between lifeguards and rescue crews. Lastly, a supervisor was hired to implement the controls and supervise the bay's safety team.

The changes in the Hanauma Bay safety program produced immediate results. During 2003, there were 2 fatalities, a huge drop from the previous year's 12. The team attributed its success to the Army's risk management program. As it turns out, risk management is pretty sexy when it saves lives—and not just at Hanauma Bay.

Hanauma Bay's safety team was taking care of the slot, their area of highest risk, but not paying attention to lower risk areas. I believe many units approach risk management the same way. Let's use collective missions vs. single-ship training as an example.

Army Aviation does an outstanding job at identifying and mitigating risk for collective missions. We brief, rehearse, and ensure senior leaders understand and accept the risk. However, what happens during single-ship missions? Is the same level of detail given to route planning, fighter management, and crew selection? Does the appropriate level of leadership approve the mission brief? Does the mission briefer receive a full back brief, or does he check the block and just sign his name without reviewing the plan in depth because "it's a simple mission?" Does the briefer review the plan in person, or brief over the phone?

These perceived simple missions are proving to be as equally dangerous. In FY03, 43.5 percent of Class A accidents were single-ship missions. Although we have correctly identified single-ship missions as our highest risk, we often fail to implement the same successful control measures we used during collective missions. Great leaders identify all areas of risk, not just their highest risk, and implement appropriate control measures for all missions.

As an Army, we must begin to look hard at our near misses if we are to get our arms around all risk sources. In military schools, we are taught to prepare for the next war, not the last one. Studying near misses allows us to identify and prevent accidents before they occur. Look closely at your formations and other units like yours for near misses. Share your near-miss stories with us by sending them to ***warstories@safetycenter.army.mil*** so we can all learn from them. If it saves just one life, it will be the most valuable 5 minutes you ever spent.

Thank you for what you do every day to keep our soldiers safe.

Keep your leader lights on!

Joe Smith

A Failure to Communicate + IIMC = Tragedy

MAJ Ron Jackson
U.S. Army Safety Center

Inadvertent instrument meteorological conditions (IIMC) break-up procedures are often one of the most overlooked aspects of air mission planning and rehearsals. Whether a unit is conducting a mission or continuation training, IIMC break-up procedures seldom receive the emphasis necessary to ensure the safe and successful return of flight crews.

The mission was to conduct night extraction training of four six-man teams from a long-range surveillance (LRS) unit preparation. The concept of the operation was for two UH-60As, under night vision goggles (NVGs), to conduct a link-up with a two-man LRS control team. After the link-up and final coordination, the aircraft would depart with the two-man control team en route to a notional landing zone (LZ). After completing the insertion, the aircrew would loiter at a predetermined location until it was time to extract the

teams. The unit that assigned the mission was a command aviation group company, with the primary mission of command and control, VIP support, and personnel recovery.

The crew received the weather forecast from a weather briefing flimsy approximately 4 hours prior to the flight. The forecast called for minimum ceilings at 3,000 feet, minimum visibility 2 miles, and winds 120 degrees at 20 knots, gusting to 22 knots, with blowing dust and isolated thunderstorms for the planned area of operation. However, unknown to the crew, their weather flimsy had been replaced but wasn't on file in the tactical operations center. The flimsy forecast of minimum ceilings and visibility remained largely unchanged, with the exception that light rain showers and thunderstorms were added as a visibility restriction. In addition, the incidence of thunderstorms was changed from isolated to few.

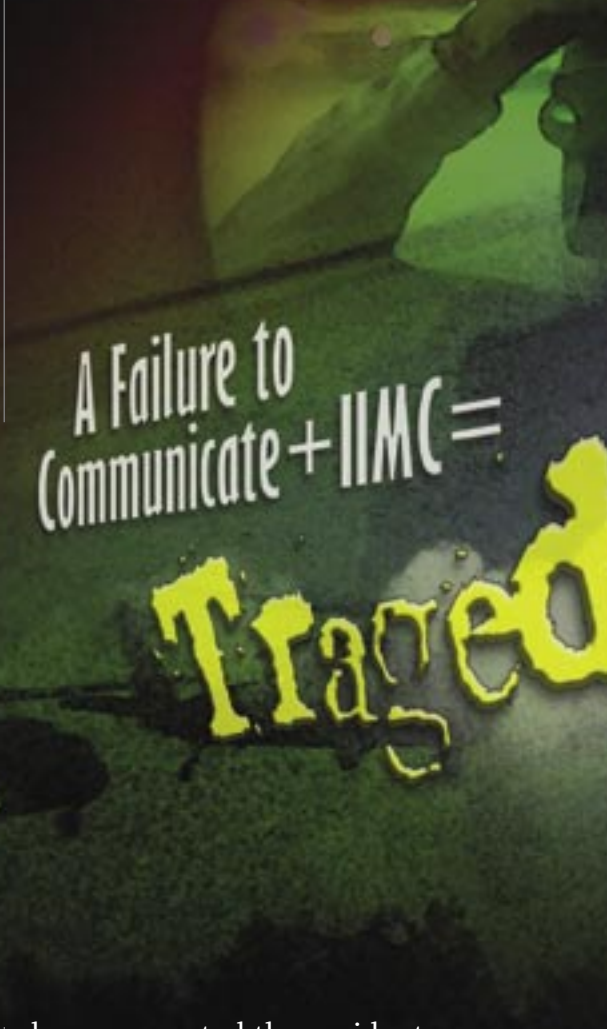
Prior to departing for the mission, the airfield's tactical tower received a pilot weather report (PIREP) from a CH-47 flight that informed them they had encountered IIMC and declared an emergency. After landing, the pilot in command (PC) of the lead CH-47 submitted a PIREP to their weather detachment at 2315 of ceilings reported at 400 feet above ground level (AGL). The PIREP was recorded by weather personnel, but was not disseminated to the Joint Army/Air Force Weather Information Network or to the accident aircraft's weather detachment. Additionally, a returning AH-64D transmitted a PIREP to the tactical tower indicating that instrument flight rules (IFR) conditions existed in the local area.

While the UH-60 flight was taxiing to the runway, they heard the AH-64D crew relay the PIREP and were notified by tower that the field was operating under IFR. The lead UH-60 requested a special visual flight rules (SVFR) departure to the south.

At 0010, the flight of two UH-60As departed the airfield. Approximately 10 minutes into the flight with an en route altitude of 100 feet AGL, Chalk 1 began to enter decreased visibility and announced to his aircrew that he was initiating IIMC procedures. The lead aircraft began a climbing left turn; however, Chalk 2, unaware of what Chalk 1 was doing, continued along the route of flight. Shortly after Chalk 1 initiated IIMC break-up, Chalk 2 impacted the ground. The aircraft was destroyed, and all personnel were fatally injured.

Lessons learned

The preliminary investigation revealed support, training, leader, and environment as contributory factors to this accident; planning and communications were critical to the outcome. Although all factors contributed, one might have prevented the accident—briefing and rehearsing IIMC break-up procedures.



■ **Support**. The weather distribution process must be linked for all operational units, regardless of boundaries. In this case, two separate aviation brigades had weather reporting assets; however, weather information from one

aviation brigade weather team was not being disseminated to other weather detachments. As such, critical PIREPs were not relayed to the flight crew.

In areas with remote weather reporting capability, it is incumbent upon aircrews to provide the necessary observations to assist weather personnel in updating weather conditions. However, the chain does not stop there. Aviation flight operations elements must ensure that all weather data is received from all sources of information, and this information must be available to the aircrews.

■ **Training**. Continuation training that incorporates IIMC procedures is critical in building the confidence of aviators who could encounter this situation. Too often, IIMC can be viewed negatively; a common remark when discussing IIMC procedures is, "Don't go IIMC!" Unfortunately, it is not that easy. Single- and multi-ship IIMC procedures should be incorporated into all training plans and missions. In this accident, the unit was accustomed to operating single-ship missions; consequently, the aircrews were not proficient in multi-ship operations, let alone IIMC break-up procedures.

■ **Leader**. Leaders at all levels must be part of the planning process through mission execution. Without this involvement, leaders are unable to make informed risk decisions that can affect the outcome of the mission. In this case, company and battalion leaders were not involved in the air mission brief. They both received an overview of the mission, but were more than likely unaware that IIMC break-up procedures were not planned or briefed.

■ **Planning**. As with any mission, planning and performing rehearsals are a crucial element to facilitate the successful outcome of the mission. The key element that was lacking in this mission was the IIMC break-up plan.

■ **Communication**. In three separate incidents, two single factors—vague instruction and a lack of communication—contributed to the outcome of this mission. In the first incident, the lead CH-47 PC informed the tactical tower of the weather conditions and submitted a PIREP to their weather detachment. Although the PIREP was recorded by weather personnel, a vital communication breakdown occurred when the PIREP was not passed on to the accident aircraft's weather detachment or the Joint Army/Air Force Weather Information Network.

In areas with remote weather reporting capability, it is incumbent upon aircrews to provide the necessary observations to assist weather personnel in updating weather conditions. Aviation flight operations elements must ensure that all weather data is received from all sources of information, and this information must be available to the aircrews.

Shortly afterward, the AH-64D crew submitted a PIREP to the tactical tower and assumed the weather information would be relayed to the following flights. However, tower operators misunderstood this request and never relayed the weather situation to the UH-60 crew.

The last communication breakdown occurred when the UH-60 flight lead announced his intentions to initiate IIMC procedures to his aircrew only. At no time was the execution of IIMC break-up ever relayed to Chalk 2. ♦

—MAJ Ron Jackson, Aviation Systems and Accident Investigation Division, U.S. Army Safety Center, DSN 558-3754 (334-255-3754), ronald.jackson@safetycenter.army.mil

Aviation Weather Support Transformed

LTC John D. Murphy

Delivering the highest quality, mission-tailored weather and space environment information, products, and services to our Nation's combat forces—anytime, anyplace, and from the mud to the sun—is the Air Force Weather (AFW) mission. The USAF has provided meteorological services to the Army (except for artillery) since it first became a separate service. This obligation traces itself back to the initial implementation agreements of the National Security Act of 1947. Since that time, AFW has focused on improving support to USAF and Army warfighters, operators, and trainers; reducing workload; and working smarter.

The world has changed a lot since 1947. Environmental data requirements are changing at an ever-increasing pace. The fundamental differences in threats we face today require us to be more strategically responsive than in the past. Re-engineering AFW was both a USAF and Army effort to improve the timeliness, accuracy, and precision for decision-makers and aviators at every echelon.

The need for change

In 1996 the Chief of Staff, Air Force (CSAF), recognized the need for change by stating, "In a time of increased operations and reduced budgets, the USAF must change the way it does business." Since then, AFW completely re-engineered the way it provides weather support to both the Army and USAF. The four main areas driving AFW's need to re-engineer its primary weather support function (i.e., support to aviation) included:

■ **Customer requirements changed**. Operators require more focused, tailored, responsive, fine-scale, highly accurate, and relevant weather support. Demands are ever increasing, and personnel and operations tempo drives nearly continuous deployments while garrison workload remains constant.

■ **Resources changed**. AFW is a smaller, less-experienced force operating with reduced budgets. Outsourcing and privatization (O&P) will produce a greater portion of the force that is non-military, changing the environment in which AFW builds and sustains readiness.

■ **Acquisition changed**. Changes in acquisition are characterized by more rapid prototyping, more open architectures, and an increase in competition of commercial and government off-the-shelf equipment and software.

■ **Technology changed**. The information age, with increased emphasis on system interoperability and

readily available product visualization, is changing future operational concepts.

Before AFW re-engineered, you could find these forces at work in your local weather unit. Budgetary and operational impacts resulted in reduced manpower authorizations and grade structures of the combat weather team (CWT), high personnel and operations tempo, continuous on-the-job training (OJT) of school graduates at field units, low re-enlistment rates, and low forecaster manning levels. Combined, these changes and impacts resulted in an environment where AFW could no longer effectively mentor or train its new people to deliver quality support. There was a compelling case for reorganization and improvement.

In 1997, in response to the growing need for change, AFW began re-engineering its Total Force from top to bottom. The transformation was a functional initiative crossing all weather functions supporting the Army and USAF. It was intended to improve support to warfighters and operators to enable them to "choose the weather for battle." Warfighters and operators must be able to anticipate and exploit the weather, rather than coping with and avoiding it.

The plan

The AFW re-engineering strategy called for an improved mission focus. AFW reorganized its forecasting process and established a new career path, with weather technicians replacing forecasters and observers. Weather technicians assigned to your CWT would be qualified fully to provide support. AFW established eight operational weather squadrons (OWS) to provide common products and train new technicians, give improved support capabilities AFW-wide, and achieve economies and efficiencies in manning and operations. The six primary improvement areas addressed by AFW's strategy were:

- Focus weather support on the operator by optimizing forecasting processes, structure, and career path.
- Expand space and terrestrial weather observing capabilities and exploit science and technology to enhance support.
- Implement end-to-end processes, organization, and systems to provide a seamless transition of operations from peace to war.
- Revolutionize training and create a continuous, efficient, and effective training process.
- Implement end-to-end communications and software capabilities to provide fast, responsive, reliable, and relevant weather information to the operator.
- Implement an operator-focused metrics program.

Each of the above improvement areas aimed at providing high-quality weather information needed to "own the weather."

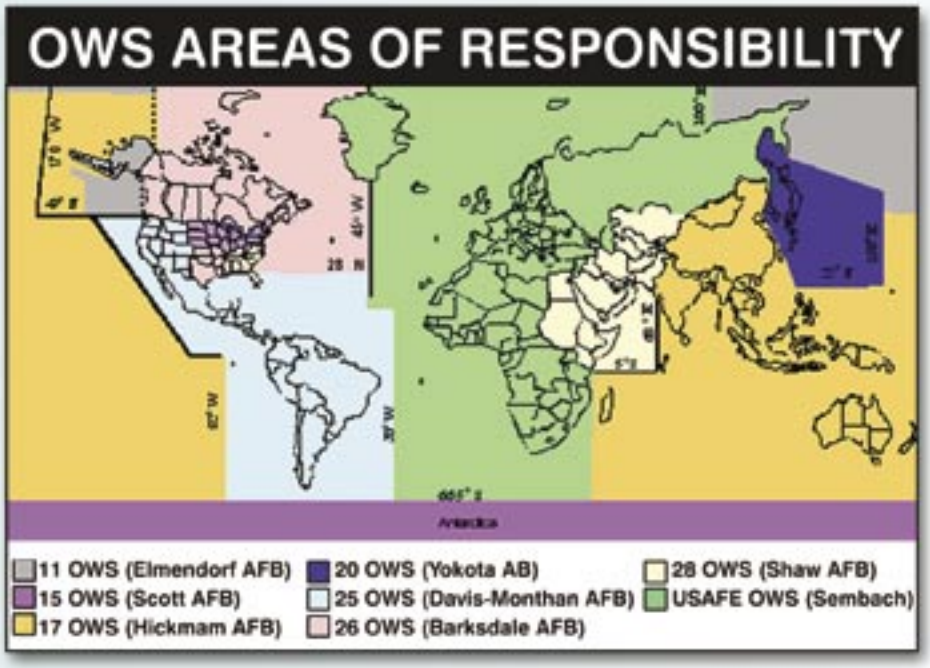


Figure 1: Worldwide AFW OWS Areas of Responsibility

What's the impact to an Army aviator?

The primary difference is appearance. For transient aviators, the weather counter is now more "virtual" than wood or pegboard. Your smaller, local CWT still supports your installation (in garrison and deployed) operations but is no longer sized to support transient aviators.

Most USAF bases or Army posts have transient aircrew work areas located near the weather station (usually in the post or base operations area or flight planning room). To help you get a remote flight weather briefing (FWB), work areas usually have a computer terminal capable of electronically filing your FWB request with the appropriate OWS (see figure 1). If a computer is not available, you always can call your requested information in directly to the OWS (preferably 2 hours in advance).

OWS contact information is located in the Flight Information Handbook and Flight Information Publication (FLIP). If these resources are not available, the local CWT usually can help you contact the appropriate OWS for transient information.

Once you contact the appropriate OWS, your information is transmitted directly to their FWB briefing cell to be worked. OWSs are staffed and organized to provide 24-hour transient aircrew support. Your completed briefing, tailored to your specifications, will be returned to you via computer, designated fax machine, or telephone.

Technology has not replaced weather forecasters completely. You still will hear a human voice when you contact the OWS by phone. OWS forecasters can

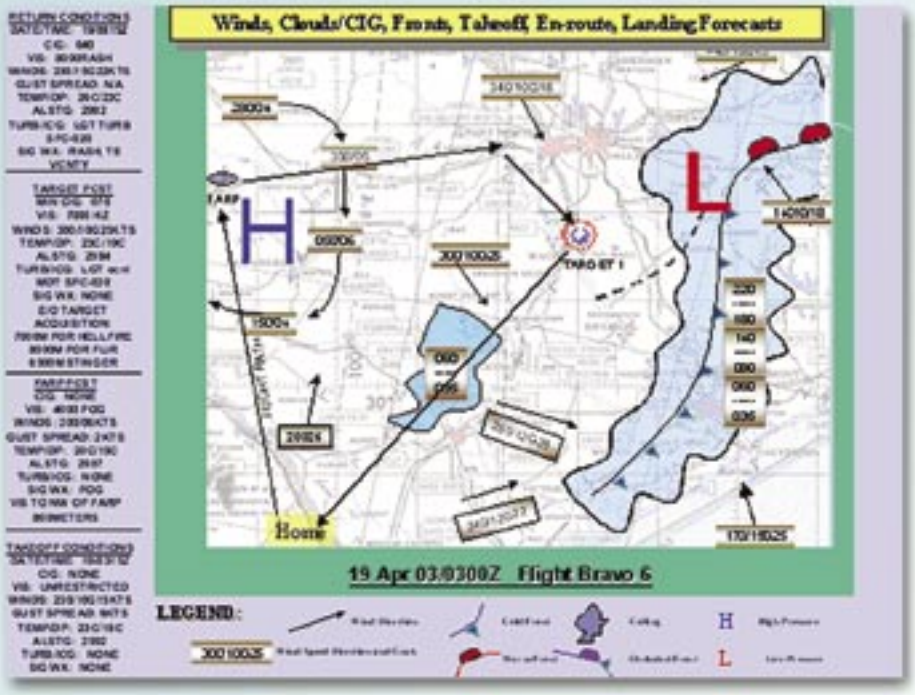


Figure 2: Flight route winds, clouds and ceilings, fronts, and landing forecast.

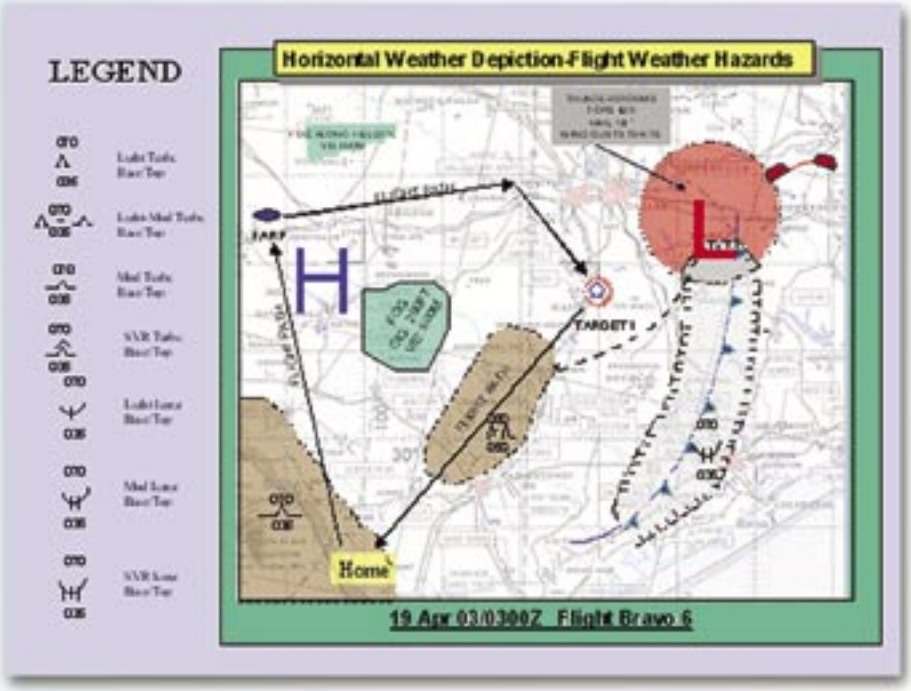


Figure 3: Flight route horizontal weather depiction and flight weather hazard forecast.

answer your questions, clarify information, elaborate on expected weather conditions, and provide the official "brief time" and "initials" you require. However, you no longer have to stand in line at a traditional weather station counter to receive your briefing. As a matter of fact, you can really help yourself, and others, by submitting your request in advance. Ideally, your request should be filed the evening prior to the next day's takeoff so your briefing will be ready when you arrive for preflight planning. Some OWSs are logging over 3,000 weather briefs per month, with most requests filed during peak flying hours. Early submissions help everyone but, most importantly, your briefing will be ready when you call and you won't have to wait.

What's next?

AFW continues to look for ways to improve support to Army aviators. An Army Aviation Center staff weather officer (SWO) was assigned recently at Fort Rucker, AL, to assist in the training of Army aviators. In addition, AFW initiated steps to standardize flight weather graphical attachments (see figures 2 through 5). Once technology is available to produce the products automatically, forecasters will be able to easily provide you with detailed, low-level flight weather briefings that truly are tailored to your missions. ♦

Editor's note: AFW is aiming for "environmental understanding," not just situational awareness. By understanding first, you'll be able to "act first and finish decisively!"

—LTC John D. Murphy wrote this article when he was stationed at HQDA, DCS G-2 (DAMI-POB), 1000 Army Pentagon, Washington, DC 20310-1000.

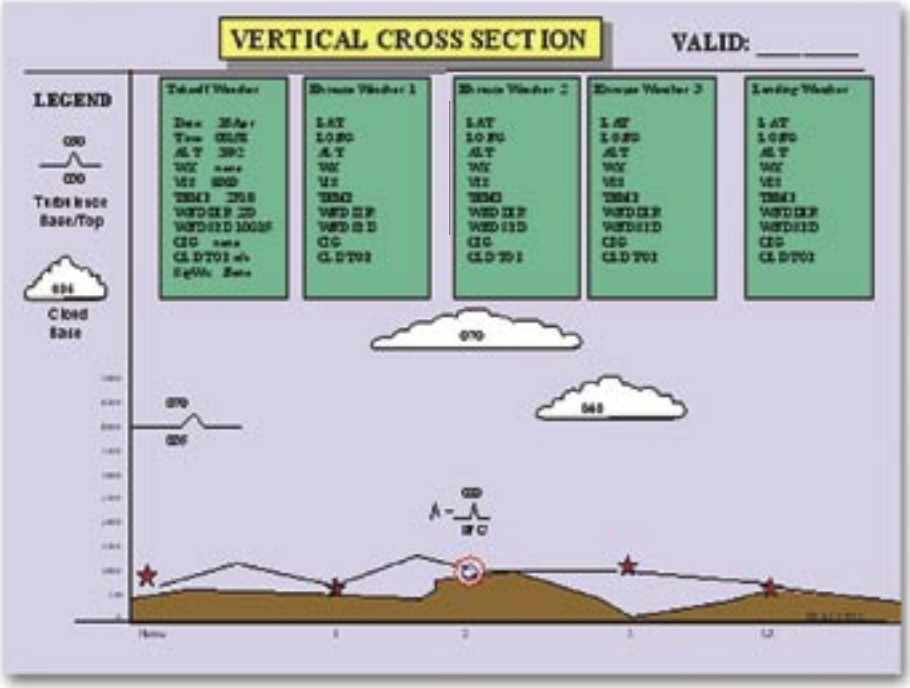


Figure 4: Flight route vertical cross-section forecast.

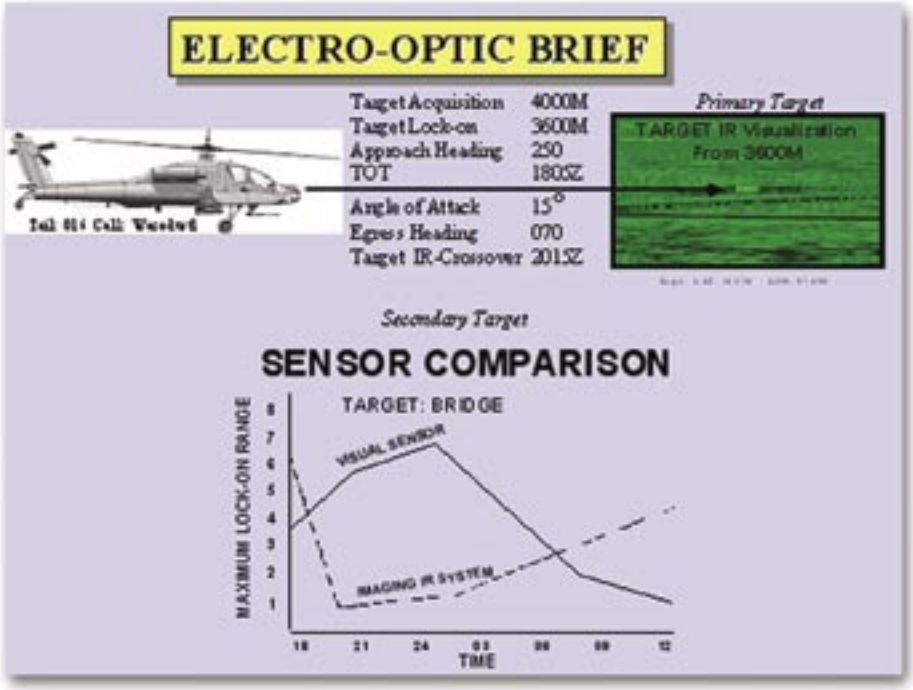


Figure 5: Special mission forecast (i.e., electro-optic brief).

WAR Stories

There I Was, IIMC and Nowhere to Go!

We all have our "war stories." Aviators can get into some precarious situations in only a matter of seconds. One of the most frightening scenarios for even the most seasoned aviator is suddenly not being able to see the ground anymore—just white around the aircraft. In other words, you've just gone inadvertent instrument meteorological conditions (IIMC)! This phenomenon is not uncommon, but can be very dangerous if the proper procedures aren't effected immediately. The aviators below found themselves IIMC and lived to tell about it. Can you relate to any of these situations?

I was a junior CW2 flying Black Hawks and had just been assigned to a new unit. One of the unit's missions was to fly fire bucket support on the local range to help protect endangered snails. The range sat on the ocean shore and consisted of a U-shaped valley ringed by mountains of up to 4,000 feet. This particular fire bucket mission was my first under night vision goggles (NVGs), and I was flying with a relatively junior instructor pilot (IP), also a CW2.

As you can imagine, there was always at least some cloud cover over the mountains. When we were mission complete, we always flew down the coast to a pass that was about 900 feet in elevation. It was around midnight when we were released by range control. As luck would have it, the clouds were only covering the peaks of the mountains. The IP asked me if I had ever flown directly back to the airfield, and I said I hadn't.

There was a small pass, more of a gap really, at the end of the valley. The IP proposed that we fly through it. Based on the cloud cover, it appeared we would just barely have the 500-foot basic cloud clearance. (By now you must be thinking, "Uh oh!") Because we were so close, I chose to keep my airspeed back at about 60 knots as I climbed to the end of the valley.

Everything was going smoothly until we started through the gap, when a band of clouds blew across the opening. I lost all visual references. I calmly stated (ok, maybe I wasn't calm!) that I was IMC and began applying full collective to gain altitude. The IP said he had the controls and started a 180-degree turn back to the valley. I thought he could still see the valley, but when I looked out his side window all I saw was the red position light reflecting off the clouds. I have to admit that I was nowhere near calm as I imagined slamming into the side of the mountain. I yelled, "What are you doing?" He replied, "Don't worry. I know where I am."

I reached down to make sure he still had the collective in the full-up position, still thinking about an untimely meeting with that mountain. As he executed the turn, I noted that our airspeed had dropped off to zero, and our pitch and roll were oscillating up to 20 degrees in every direction while the aircraft was climbing straight up at a couple thousand feet per minute.

I defaulted to basic instruments and started repeating, "Get some airspeed, wings level, in trim, keep climbing." As the IP increased the airspeed our attitude stabilized, and I saw the altimeter passing 4,000 feet on the way to our minimum safe altitude. I breathed a sigh of relief. Now that it appeared we would live, it was a simple matter of calling Approach Control, declaring an emergency, and doing an instrument landing system (ILS) approach.

As the IP started flying toward the approach airfield, which wasn't our home airfield, I started digging out the approach plate to get frequencies and such. I was tuning up the radio and about 1 to 2 minutes had passed when the IP said he had the ground in sight through a gap in the clouds. Even though I joked about it being a "sucker hole," neither one of us wanted to declare an emergency and disrupt the Class B airspace. He began a dive through the opening.

No, we didn't punch back into the clouds, but we did pop out right in the middle of a set of 1,500-foot antennas. Fortunately we still had on our NVGs as we carefully picked our way through the guy wires. I swore I'd never let myself get into such a stupid situation again. That night I learned a whole bunch of lessons the hard way. I only hope that after you quit laughing, you remember our mistakes and avoid getting into a similar situation. ♦

—CW4 Marc V. Elig, ASO, 2-25th Aviation Safety, Schofield Barracks, HI, DSN 315-456-2562 (808-656-2562), e-mail eligmv@schofield.army.mil

Here's another one...

This one time I was performing a topping check (TEAC) in a UH-1 with another maintenance test pilot (MTP) in the left seat, screaming through 8,000 feet mean sea level (MSL). Inside the cockpit, both of us were recording the numbers when we popped into a cloud deck and went full IMC. Could this be contributed to overconfidence? Yes, but situational awareness, no. Did the principles of maintaining level attitude and constant heading, along with minimal control inputs and an accurate assessment of where and what just happened, pay off? You bet! But in this case, I descended without any further problems because the conditions didn't necessitate vertical helicopter IFR recovery procedures (VHIRP). Did I report it? No—not back then, anyway. I was a young aviator not willing to admit I had made a mistake. ♦

—LTC Jeffrey S. Radke, ASO, Delaware Army National Guard, 302-326-7208, e-mail jeffrey.radke@de.ngb.army.mil

And another...

In Germany years ago, one of our command and control (C2) pilots was flying an OH-58A or C (I can't remember which) and had a frightening IIMC experience. He was coming back from the north and had an artillery captain with him. They were at about 500 feet, trying to follow the autobahn and stay visual meteorological conditions (VMC). The pilot momentarily looked inside to check his map, but when he looked back out all he saw was the inside of a cloud. I'll never forget his "testimonial" at the next safety and standards meeting when I, as the IP and instrument flight examiner (IFE), asked him to share his experience with the group. When I asked him what he did, he blurted, "I immediately turned 180 degrees." I asked if he transitioned to instruments, to which he replied, "Hell no! I just turned it around!" So much for classroom training! This guy was known in the unit for being a hardhead.

As a long-time Huey pilot, IP, and IFE, I always preached "real world" instruments. We tried to plan an IMC flight every chance we could. All the classroom training in the world can't beat actually going into the clouds. There is no way to inspire the panic that sets in when you suddenly find yourself IIMC. I believe that only with hours of instrument training and experience can a pilot remain relatively composed when this happens. I have yet to find a commander who considers instrument training a waste of time, especially if there's a simulator around. ♦

—CW5 Sargent B. Means, Andrews Air Force Base, sargent.means@andrews.af.mil

Editor's note: If you have an IIMC story, or any war story you'd like to share, please e-mail flightfax@safetycenter.army.mil.

Mail Call

I just finished reading your war story "The Need to Know" in the December 2003 Flightfax. Just wanted you to know you are not alone.

I had an almost identical experience as an ROTC cadet in the flight program at the University of Houston in February 1972. I had about 14 hours at the time. I was at 3,000 feet over the Houston Ship Channel in a CESSNA 150 when I attempted to enter and recover from a stall. I was at a high power setting and out of trim. The nose dropped and the aircraft entered a flat spin which became increasingly steep. I fought the controls but nothing worked.

Then, I remembered my flight instructor's advice and demonstration from an earlier flight. He demonstrated (along with a lot of other non-standard maneuvers) the aircraft's capability to fly "hands off" and advised me that if I ever got in trouble to simply pull off the power and take my hands and feet off the controls.

Since nothing else was working, I did just that. I pulled off the power. The hardest part was taking my hands and feet off the controls. When I did, the aircraft gave a lurch and a little dip, and flew right out of it. I recovered about 1,000 feet above a refinery. I then calmly flew back to Hobby airport. After I landed, I had a real case of the shakes and couldn't stop thinking about what had just happened.

In retrospect I was saved because of--

■ The inherent characteristics of a fine aircraft.

■ My flight instructor taught me a maneuver a lot sooner than I needed it.

■ A LOT OF LUCK.

I flew for 24 years after that. I have had other close calls, but that one always sticks in my mind.

So thanks for a good story, with a good point. ♦

—LTC Chris Southard, chris.southard@us.army.mil

ARAS—Accident Rep Made Easy

Julie Shelley
Staff Editor

When an accident happens, the last thing anyone wants to think about is paperwork—you know, those pages-long accident reports that seem to go on and on. But that paperwork is vital in the fight to prevent future accidents in our Army. To answer that need, the U.S. Army Safety Center (USASC) is in the process of developing an automated, user-friendly reporting system available at the touch of a button—the Accident Reporting Automation System, or ARAS.

The first of several ARAS phases to be released over the next 2 years was deployed in early January 2004 and provides a much-needed alternative to the cumbersome paper reports used in the past. Through ARAS, the Abbreviated Ground Accident Report (AGAR) and Abbreviated Aviation Accident Report (AAAR) can now be completed online through the USASC's Web site. These forms are available anytime you need them, and they also come with built-in help! A few features include:

■ Built-in logic making the forms intuitive, which will help guide you through the accident reporting process—NO MORE CODE BOOKS! The drop-down menus

found throughout the system allow you to select needed information, reducing the amount of time spent filling out unnecessary sections.

■ An error-checking code to help you input accident data and reduce erroneous or incomplete data submissions. The electronic forms help with dates, times, and cost information, thereby saving time from needless corrections.

■ A complete Help menu system for technical and accident reporting questions and concerns.

■ An overview tutorial to assist you in navigating the appropriate Web pages.

■ Army Knowledge Online (AKO) authentication, which means you won't have to remember another user name and password. After initial registration, the system remembers your name and even what page you worked on last in a particular report. Also, each of your active reports is displayed every time you log on, making file management of multiple reports much easier.

■ Total electronic staffing of accident reports, so there's no need to print, fax, or mail paper copies. Once you submit the completed report, your supervisor will be notified via e-mail and asked to review the information.

Since this is a first-phase version, the system currently is available only for Class C and D on-duty ground accidents, and Class D, E, and F on-duty aviation accidents. However, forms for all accident classifications should be released in the near future. The ARAS forms can be accessed directly at **http://safety.army.mil/aras_public/intro_aras.html** or from the USASC home page, **http://safety.army.mil/home.html**.

Remember that ARAS is an official Department of Defense automation system developed to capture legitimate Army accident data. Practice sessions are not permitted—all data submitted on the site should involve actual Army accident cases. A developmental test site is available, however, to allow you the opportunity to become familiar with the automated forms and test the approval process. The test site can be found at **http://safety.army.mil/araswebforms/index.asp**.

The USASC team is excited to bring you this new technology. It's now easier than ever to report this vital data. Get on the test site and try ARAS out. We think you'll like it! ♦

—Ms. Julie Shelley, U.S. Army Safety Center, 334-255-1218 (DSN 558-1218), shelleyj@safteycenter.army.mil

Dust Landings—Lessons Learned Over 27 Years

CW5 Dennis McIntire
NVD Branch, Fort Rucker, AL

Dust landings will challenge the best of aviators. In heavy dust, the brownout is not a question of "if" but, "when." The "if" is a given, while the "when" is a factor we have little control over.

It's important to understand that the dust generated during the landing phase doesn't cause a true brownout until the vortices bring the heaviest dust through the rotor system. That said, if you can be in a touchdown position prior to that point, your landing will be easier and that much safer.

Additionally, you must understand the direct correlation between the aircraft angle of approach and the rate of descent as it applies to the ground roll/run following touchdown. It is best explained this way. At one extreme we can use a shallow approach angle. In that case our airspeed is higher (with a touchdown at or slightly above ETL), our rate of descent is very low, and our ground roll/run is long. That approach is relatively easy to master and has its place when landing to flat, unobstructed areas. For illustrative purposes ONLY, let's say the other extreme is a 90-degree vertical approach angle. This theoretical approach would use zero airspeed, a very high rate of descent, and would result in little or no ground run. It would also be extremely difficult to perform. Again, this example is only provided to illustrate the extreme end of the spectrum. I am not advocating that type of an approach. What I am saying is that you can execute a safe and controlled dust landing with minimum ground roll/run to most areas using factors in between these two extremes.

Over the years I have executed thousands of dust approaches while training others. During that time I have learned that dust landings using a steep side of a normal approach work best when landing to the toughest and dustiest landing zones. This type of approach is tough to perform, but I believe that every aviator needs to master it.

Approaches using the steeper approach angle must be flown in concert with a higher rate of descent than that of a normal approach. By a "higher rate of descent" I am not implying that the aircraft has to literally "fall out of the sky." Hardly so. The rate of descent is just slightly higher than that of a normal approach. While the brownout condition occurs without warning using the steeper approach, it reduces the opportunity for the dust

to cycle through your rotor system prematurely. That decreases the likelihood of a brownout before you are landing-assured. In addition, these approaches require greater skill due to the timing factor involved with adjusting the controls for touchdown. The benefits, however, become readily apparent when landing to unimproved dusty landing zones. This approach reduces the ground roll/run while allowing the pilot to see the landing area for virtually the whole approach.

The confidence to perform a dust landing with this type approach comes only through repetition with the benefit of a more experienced pilot or instructor pilot on the other set of controls. Most of this training can take place in a non-dusty area to reduce wear and tear on the aircraft. The "final exam," however, must be in true brownout conditions. Only then can the aviator know that their skills are up to the task.

Surprisingly, I've noticed that many aviators, especially those flying more powerful aircraft, tend to ignore the wind when determining their landing direction. Forgive me for stating the obvious but this can't be overemphasized—landing with a tailwind forces you to land with a higher ground speed to avoid browning-out prematurely. With that in mind, remember that "wind calm" does not always mean there is no wind. Just a few knots of wind can make all the difference in the world when it comes to your dust landing. Try it yourself. Experiment with a tailwind and headwind dust landing under identical light wind conditions. You can use a quartering headwind/tailwind if you like. Regardless, you'll be amazed by the results.

Knowing the surface wind is so important to me that in times where trusted indicators of surface wind were absent (trees, dust, smoke or water), I went through the effort of generating my own dust with a low approach to an area away from my final landing area. I performed that maneuver at a distance from my final landing area to avoid obscuring it prematurely for my later approach. This technique allowed me to accurately determine the wind direction and then consider it, along with other factors, in deciding my final approach method.

Formation landings add a measure of risk due to the increased chance of collision during the landing or go-around phase. Collective training is a must to ensure that individual crews work as one during their formation landing. While the landing techniques for formation aircraft are the same as for single-ship operations, all aircraft in the formation must be using the same approach angles, speeds, and braking. In addition, formation landings in dust require the formation to be "stacked down" so that the trail aircraft touches down first. All other chalks land in succession with the lead aircraft touching down last, thereby enabling all the aircraft to land in relatively "clean" air.

Ironically, though dust landings are not new to Army Aviation, recent events have forced us to look more closely at how we perform them. Until a device comes out that allows aviators to see "virtual VFR" in all conditions (trust me, we're looking), the individual pilot's skills will largely determine the landing outcome. **Fly safely!** ♦

Editor's note: This article delves only into the mechanics of a dust landing. Keep in mind that crew coordination, go-around procedures, and a plethora of other considerations need to be applied during the execution of these maneuvers.

—CW5 McIntire is Chief of the Night Vision Devices Branch, Fort Rucker, AL. He has been an IP since 1984 and has flown more than 5,500 hours with over 3,000 hours as a UH-1 & UH-60 IP/IFE. He can be reached at DSN 558-9515 (334-255-9515) or e-mail mcintire@rucker.army.mil.

Maintenance Evacua
Battlefield Recover

How can these risk and hazards be mitigated?

CW3 Timothy S. Ashcom
DOTDS, Fort Rucker, AL

Evacuation and recovery of downed aircraft places unique challenges on commanders. Planning, coordinating, and executing the safe recovery and evacuation of Army Aviation assets is vital for the preservation of our combat resources. General procedures used to develop, coordinate, and execute aircraft recovery and evacuation are detailed in Field Manual (FM) 3-04.513(1-513), Battlefield Aircraft Evacuation and Recovery.

Maintenance evacuation and recovery

Physical procedures for maintenance evacuation and battlefield recovery of aircraft are almost identical; both require rigging of the aircraft for helicopter evacuation or vehicle transportation. This article, as it pertains to physical procedures and the use of rigging kits, applies to both maintenance evacuation and battlefield recovery.

Maintenance evacuation is the physical act of moving an aircraft from a maintenance location on the battlefield to another maintenance location for repair. Movement is accomplished either by fly-out or aerial or ground recovery means. This type of evacuation normally is conducted to cross-level maintenance workloads or to relieve units of disabled aircraft during tactical moves. Aircraft recovery is an unanticipated operation that results from an aircraft having gone down from either a component failure or a combat damage-induced forced landing on the battlefield. In either case, the aircraft is disabled and cannot be flown out. Based on an assessment the aircraft can be destroyed or abandoned, repaired and flown out, or recovered to a maintenance site by aerial or ground means.

The preferred recovery method is to repair the aircraft at the scene of the forced landing. The aircraft then can be returned to service or prepared for evacuation to a maintenance site. Ground recovery remains an option to return an expensive asset to service when the aircraft cannot be repaired at the site or recovered aerially. The time allotted to repair the aircraft at the scene depends on the tactical situation. If time is not sufficient or the enemy situation dictates, recovery can be achieved by aerial or ground transportation.

Recovery operations always require detailed coordination. Manpower and recovery assets must be synchronized in response to time and the tactical situation. Extensive coordination among the battlefield functions of maneuver,

tion and ry of Aircraft

fire support, air defense, intelligence, and combat service support often are required. Command, control, and tactical procedures are preplanned and are included in unit standing operating procedures (SOPs), contingency plans, operations orders (OPORDs), and air mission briefings.

Responsibility for a recovery originates with the commander of the unit to which the disabled aircraft is assigned; however, responsibility may pass to a higher echelon when it is beyond the capability of the unit to complete the operation. A recovery operation begins when an aircraft has experienced a forced landing or is otherwise disabled on the battlefield. It ends when the aircraft has been recovered to, and is under the control of, a maintenance facility.

Recovery operations are unique. Each operation is discrete and could involve the initiative and imagination of commanders and staff to synchronize the operation within a range of variables. Aircraft that cannot be recovered and are in danger of enemy capture are destroyed according to Technical Manual (TM) 750-224-1-5. The authority for destruction will be included in SOPs and OPORDs. If possible, aircraft are cannibalized before destruction.

Accident investigation board

According to Army Regulation (AR) 385-40, Accident Reporting and Records, the commander who first becomes aware of an Army aircraft accident places a guard at the scene. This prevents anyone from moving or disturbing the aircraft or detaching parts until it is released by the accident investigation board president and by the U.S. Army Safety Center, if taking part.

In the combat environment, it might not be possible to comply fully with this requirement. Further, an aircraft damaged as a direct result of hostile fire is considered a combat loss rather than an accident. Situation permitting, the recovery operation may not begin until one of the following occurs:

- The commander of the unit to which the aircraft is assigned orders that an accident investigation board, as prescribed by AR 385-40, is not required; or
- The board president releases the aircraft.

Evacuation method

The evacuation method is accomplished by on-site repair of the disabled aircraft. The aircraft is prepared for a one-time evacuation mission to a regular maintenance area with a minimum flight crew (only the pilot, when possible). The pilot should be proficient in all emergency procedures for the particular aircraft. Advantages of the one-time evacuation mission method are speed, economy, and minimum likelihood of further damage. Disadvantages include the requirement for a clear takeoff path, the possibility of unfound damage causing a crash, the requirement for special tools and equipment, and the effects of weather conditions.

Aerial (sling-load method)

Aerial (sling-load method) recovery and evacuation involves preparing the disabled aircraft for movement, connecting it to a suitable lift helicopter with a component from an aerial recovery kit, and transporting it to a maintenance area. Advantages of aerial recovery or evacuation include less disassembly requirements and disabled aircraft accessibility, both of which contribute to a speedier rescue than the surface method (discussed on next page).

Some of the disadvantages are the possibility of dropping the disabled aircraft (thus inflicting more damage), the effects of rotor downwash on the sling load, the effects of weather conditions, the possibility of loss of or damage to the recovery aircraft, and the requirement of a cleared approach and departure path for the recovery aircraft.

Surface method

The surface method of recovery and evacuation involves preparing the disabled aircraft for movement, lifting it onto a suitable transportation vehicle, and transporting it to a maintenance area. One advantage of the surface recovery method is that it restricts the enemy's ability to detect movement of recovery assets to an area relatively close to the movement routes. In addition, this method is used when weather conditions prohibit flight or threaten total loss of the aircraft during transport. Disadvantages include route security assets that are needed somewhere else might be occupied in the surface recovery effort; the time needed for surface recovery is much greater than for aerial recovery; recovery personnel and equipment assets are unavailable for long periods; the relatively high exposure time on the battlefield with slow-moving equipment increases the threat; a significant amount of aircraft disassembly or modification often is required to adapt the aircraft to surface travel; ground routes must be accessible and meticulous reconnaissance of the route is required; and loading procedures and travel on rough terrain can cause further damage to the aircraft.

On-site recovery procedures

Procedures performed at the site of the disabled aircraft include making the recovery area accessible, using communications correctly, and making the aircraft secure, safe, and ready for stable flight.

Condition of the pick-up site

The pick-up site must be cleared of all trees, obstacles, and trash. The recovery helicopter pilots must know of conditions that might restrict their visibility, such as dust or snow. Trees and obstacles should be cleared from the pick-up site, and foliage that is cut to clear an area must fall away from the area. This is done by appropriate tree notching or by a constraint applied to the tree using positioning straps and rope.

The pick-up area should be cleared thoroughly of all trash before the recovery helicopter arrives. Any item left unsecured can become an airborne missile, which could endanger recovery personnel or equipment. Recovery helicopter pilots also should be warned if the pick-up area has accumulated loose snow or is dusty. This enables the pilots to pre-plan for their approach, hookup, and departure of the downed aircraft area.

Risk management as applied to aircraft recovery and evacuation operations

The loss of an aircrew and/or airframe not only impacts the combat capability of an aviation unit, but the psychological trauma from the loss of a fellow crewman can, and will, adversely affect unit morale. In addition, high loss rates rapidly can deplete available operational readiness float (ORF) assts. FM 3-04.513(1-513), dated 27 September 2000, discusses the importance of including downed aircraft recovery missions into the battalion and brigade staff tactical decision-making process and applying risk management techniques and controls to reduce or mitigate risks.

Risk management is a common-sense tool that leaders can use to make smart risk decisions in tactical and everyday operations. It is a method of getting the job done by identifying the areas that present the highest risk and taking action to eliminate, reduce, or control the risk. It is not complex, technical, or difficult. Rather, it is a comparatively simple decision-making process, a way of thinking through a mission to balance mission demands against risks. ♦

—CW3 Timothy S. Ashcom is a doctrine writer and Collective Training Branch Chief in Combat Service Support, Directorate of Training, Doctrine, and Simulation (DOTDS), Fort Rucker, AL, DSN 558-2358 (334-255-2358), e-mail: ashcomt@rucker.army.mil.

The Write STUFF

Want to be a famous writer? The following tips will help you become the next best thing: a contributor to *Flightfax*!

Perhaps you've never written an article before. Don't let that scare you! It can be surprisingly easy, and the results are rewarding. By sharing your knowledge, you can make a valuable contribution to your fellow aviators. Whether your story is a long feature or a simple tip, it just might save someone's life or an expensive piece of equipment.

Flightfax is Army Aviation's only risk management publication. Popular topics include spatial disorientation, weather and environment, foreign object damage (FOD), flight data recorders, aviation maintenance, and night vision goggles (NVGs). A favorite is "War Stories," tales from pilots and crewmembers about close calls, near-misses, or lessons learned the hard way.

Getting started

The first thing you need to do is decide what you want to say. Then, just let it flow! Here are some tips:

■ Write about your personal experiences. The tone should be conversational, as if you are talking to a friend.

■ Keep it simple, direct, and easy to understand. Avoid language, jargon, or acronyms that might be unfamiliar to your reader. If you have to use technical terms or acronyms, include a brief definition.

■ Articles should be saved in Microsoft Word format and double-spaced. Most stories run one to two pages (about 500 and 1,000 words, respectively) and are restricted to four pages in length.

■ Remember that each issue of *Flightfax* is planned 3 months in advance, so make sure your article is still relevant and will interest readers several months down the road.

■ Your article will be more effective if you include supporting photographs or cartoons.

Graphics

Appropriate graphics enhance the reader's understanding. Clear, sharp photographs are important. Digital photos in JPEG or TIF format of at least 300 dpi are preferred; however, 5 x 7 color prints, negatives, and 35mm slides are acceptable.

Photograph soldiers or equipment doing something—avoid those boring static or posed photos. Be sure the photographs do not show any safety violations (i.e., a soldier performing maintenance wearing a watch or ring, or soldiers outdoors without proper head gear). Good photographs don't always need a story; we can use them for a poster or the front cover.

Submissions by mail must include a printed manuscript, text on a 3.5-inch disk, a cover letter, and complete photo captions.

Mail your complete publication package to:

U.S. Army Safety Center
ATTN: Flightfax
Bldg. 4905, 5th Ave.
Fort Rucker, AL 36362-5363.

The quickest way to get your story to us is by e-mailing it to **flightfax@safetycenter.army.mil**. Remember to include your rank, name, unit, address, and office telephone number (commercial and DSN). Also, please add a brief biographical sketch for your byline. Help us make *Flightfax* the best publication in the military—after all, it's your magazine!

For more information, contact Paula Allman, *Flightfax* Managing Editor, DSN 558-9855 (334-255-9855), or e-mail paula.allman@safetycenter.army.mil. ♦

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class A:** The crew noticed smoke and heard a grinding noise coming from the transmission area. Shortly afterward, the #2 engine transmission caution light illuminated. The crew completed emergency landing and shutdown procedures when the AFT DECK FIRE caution light illuminated. The crew egressed safely; however, the aircraft was consumed by fire.

CH-47

D Model

■ **Class C:** While conducting a 30-minute ground run after completing an engine upgrade, the #1 generator failed, causing the XSMN AUX oil pressure light to illuminate. The crew immediately shut down the aircraft. Post-flight inspection revealed a black ring around the generator, and the aft transmission filter was popped. A serviceability check showed a large amount of debris in the area. It is suspected the generator shaft sheared and caused foreign object debris damage to the transmission.

MH-60

K Model

■ **Class D:** During high-altitude parachute operations, the jumpmaster inadvertently pulled the cargo door window emergency release handle. The left cargo door windows separated from the aircraft and struck two main rotor blades, one tail rotor blade, and the left horizontal stabilator. The crew performed a precautionary landing. Damage was noted on the post-flight inspection by the technical inspector. The aircraft was cleared for a one-time flight to the airfield, where it was repaired and returned to service.

OH-58

C Model

■ **Class C:** During daylight initial entry rotary-wing training for a low-level autorotation, the student pilot entered the maneuver at the correct entry point but applied too much aft cyclic to decelerate the aircraft. The aircraft subsequently "ballooned." The aircraft began to settle past the middle 1/3 of the safety lane. At about 25 feet above ground level, the instructor pilot (IP) determined the aircraft would not make the safety lane and took the controls. The IP rapidly rolled the throttle to full open and applied collective to stop the rate of descent, overtorquing the aircraft to prevent a hard landing.

■ **Class C:** The aircraft experienced an engine over-temperature condition during start-up. Turbine outlet temperature spiked to 1,000 °C before engine shutdown. Engine replacement was required.

D(I) Model

■ **Class C:** Aircraft experienced engine and transmission over-torque readings of 128 percent and 131 percent (mast) for 4 seconds, respectively.

D(R) Model

■ **Class C:** Mast and engine torque readings exceeded limitations during a readiness level progression evaluation flight. Engine replacement was required.

UH-60

A Model

■ **Class C:** The crew was conducting a night unaided approach into a landing zone (LZ) when the aircraft's main rotor blades struck a tree. It was determined the landing light was not turned on soon enough, and the aircraft was lower than thought at the time of the tree strike.

■ **Class C:** The aircraft contacted wires during a passenger transfer mission. The uppermost wire made contact with the left side of the aircraft, causing damage to the chin bubble, step fairing, gunner's window, cargo door, stabilator, one main rotor blade, and the main landing gear cowling. The aircraft landed without further incident.

L Model

■ **Class A:** The aircraft entered an uncommanded yaw during takeoff and landed hard. One soldier suffered minor back injuries.

UH-1

V Model

■ **Class C:** The aircraft experienced an overspeed condition during an emergency governor operation following a perceived engine failure. The crew conducted a precautionary landing without further incident.

C-12

■ **Class B**: The crew was en route to a passenger pickup point when they suspected lightning had struck the aircraft. The aircraft landed, and post-flight inspection confirmed lightning strike damage.

RC-12

N Model

■ **Class D:** As the aircraft rotated during takeoff, the right-side outboard engine cowling separated from the aircraft. The crew aborted the mission and returned to the airfield without further incident.

For more info on selected briefs, call DSN 588-9552 (334-255-9552) or DSN 588-3410 (334-255-3410).

Flightfax Readership Survey

In an effort to keep current with field needs, we need your feedback. Please take a few minutes to fill out the form below and return it to us using the pre-addressed mailer on the back or fax it to Ms. Paula Allman, 334-255-3003.

1. Name (optional) _____ Rank/Grade _____

2. Duty Status (Active, Reserve, Guard, Civilian, Other?) _____

3. What is your—

Branch? _____ MOS or civilian specialty? _____

Job title? _____ Duty location? _____

Total Flight time? _____

4. Which item best describes your current duty assignment?

- ☐ Operational flying
- ☐ Aviation maintenance
- ☐ Aviation safety—unit
- ☐ Other (specify) _____

5. How often do you read *Flightfax*?

- ☐ Every month
- ☐ Occasionally
- ☐ Rarely

6. When do you receive *Flightfax*?

- ☐ In the month it's dated
- ☐ After the month it's dated

7. Have you visited the Army Safety Center Web Site (http://safety.army.mil)?

- ☐ Yes, at work
- ☐ Yes, at home
- ☐ No

8. How would you prefer to receive *Flightfax*?

- ☐ In printed form
- ☐ Electronically (e-mail, Web)
- ☐ Other (specify) _____

9. How do you use the information in *Flightfax*?

- ☐ In safety meetings
- ☐ On bulletin boards
- ☐ In reading file
- ☐ In unit safety publications/directives
- ☐ To keep informed
- ☐ Other (specify) _____

10. What would you like to see added to *Flightfax*? _____

_____

_____

11. Use the scale below to rate how useful these articles are to you:

None = 1 Low = 2 Medium = 3 High = 4

___DASAF's Corner
___Investigators' Forum (accident reviews)
___War Stories (Near misses)
___Performance Updates (stats/trends)
___Accident Briefs
___Maintenance
___Safety messages
___Seasonal articles
___POV safety
___Broken Wing Awards
___NCO Corner
___Posters
___Other (specify) _____

12. Do you feel the articles have ever prevented or decreased the probability of an accident by you or someone you know? Explain.

_____

_____

_____

13. Rate the following types of info in terms of your interest and need.

None = 1 Low = 2 Medium = 3 High = 4

___Lessons learned
___Hazards, risks, and controls
___Risk-management process
___Humorous articles
___In-depth reports of accidents, causes, and solutions
___Safety articles on seasonal topics (e.g., cold weather injuries)
___Technical information on equipment and systems
___Statistical studies
___Accident rates
___Articles on new developments, equipment, etc.
___Maintenance topics

14. Rate the overall quality of *Flightfax*.

Poor = 1, Fair = 2, Good = 3, Exceptional = 4

Content:
___Accuracy
___Effective coverage of topic
___Choice of topics
___Credibility
___Interest to aviators

Layout:
___Appearance
___Illustrations
___Readability

15. Comments/suggestions to improve Flightfax. _____

_____

_____

_____

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FORT RUCKER, AL 36362-5363

U.S. ARMY SAFETY CENTER
ATTN: MS. PAULA ALLMAN
BLDG 4905, 5TH AVE
FORT RUCKER, AL 36362-5363

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

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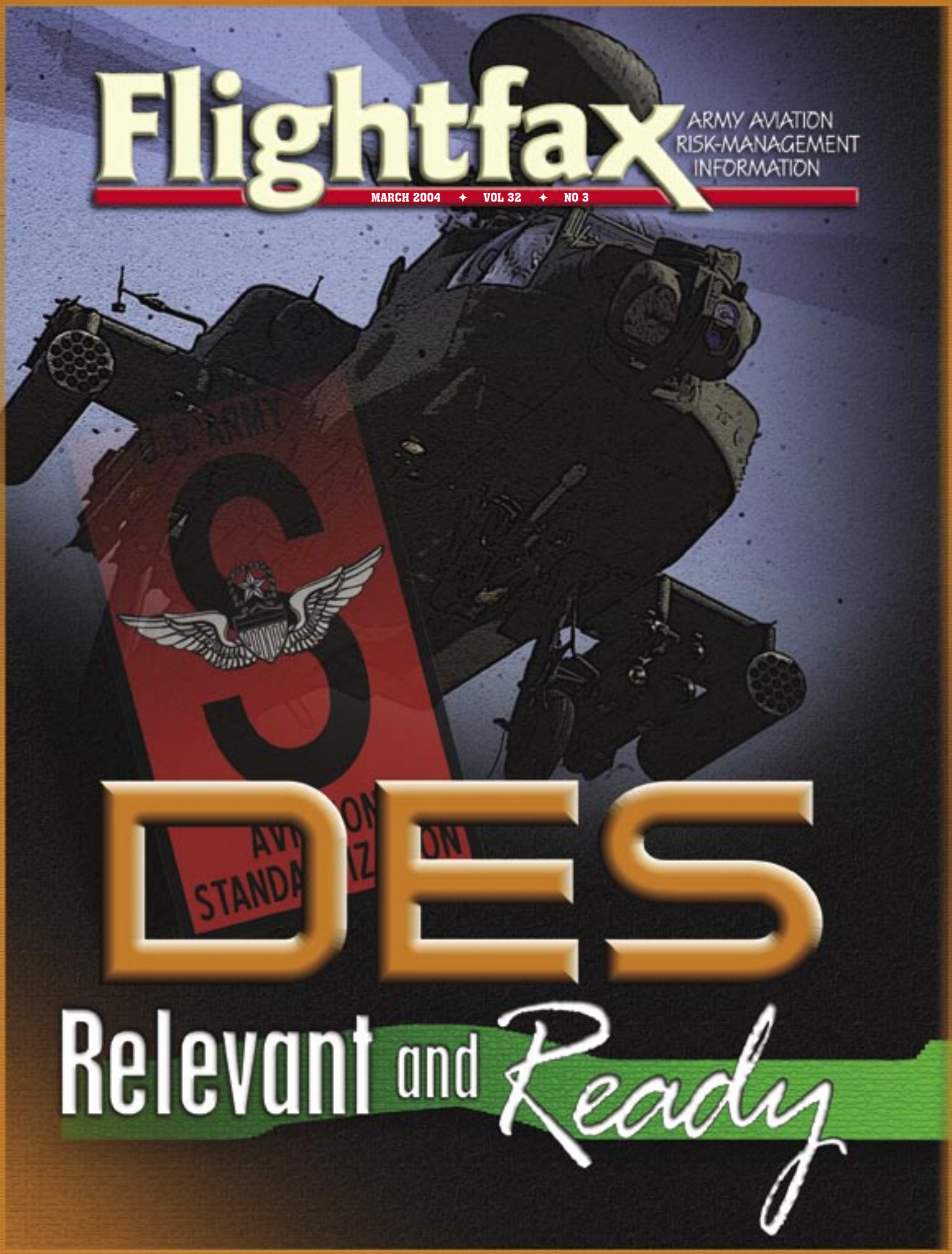

DES

Relevant and Ready

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
COL Christopher Gallavan – Publishing Supervisor
Paula Allman – Managing Editor
Danny Clemmons – Graphics
Julie Shelley – Staff Editor
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

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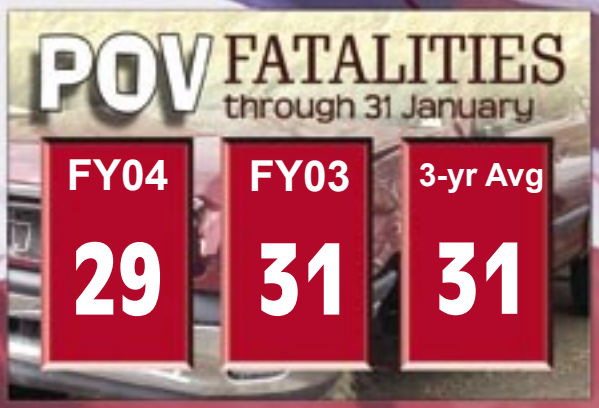

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

Lessons Noted, or Lessons Learned?

We are an Army at war. We have great pride in our Soldiers, for they are the centerpiece of our formations. They clearly are the critical component to our combat readiness. Each and every Soldier is special—a father, son, mother, or daughter. These men and women are expensive to train and important to our success in the Global War on Terrorism.

As a team, we must pay close attention to lessons learned from preventable accidents to protect our fighting ability and win our Nation's wars. **However, if these lessons are noted rather than learned, we'll continue to pay the price and lose Soldiers unnecessarily**.

As your Director of Army Safety, I personally receive an e-mail every time a Soldier is killed in an accident. I find it sobering that rarely is there a new kind of fatal accident, just a different name in the report. We continue to lose Soldiers to the same mistakes over and over: falling asleep while driving, vehicle rollovers caused by speeding, driving without seatbelts, improper handling of unexploded ordnance, negligent discharges due to poor muzzle awareness, and failure to perform proper weapons clearing procedures. On the aviation side, brownouts and poor crew coordination continue to rear their deadly heads.

Knowing these hazards cause 80 percent of all our accident fatalities, one could ask the question, "Are we actively learning from our mistakes and successes, or are we just noting them?" From statistical analysis and visits throughout our Army, I'm concerned that we might be doing too much of the latter. I'll give an example.

I recently visited an aviation unit that had experienced a Class A accident a couple of months before. The accident was caused by a compilation of errors including poor crew selection, poor crew coordination, failure of the crew to mark known hazards on their maps, failure to perform proper reconnaissance, and failure of the leadership to give a proper mission brief. These are all mistakes we can learn from. However, when I asked the battalion staff if their crews had been briefed on the details of the accident, I was shocked to hear that the answer was "No!" A small part of the battalion leadership had been briefed, but the line pilots and Soldiers flying the missions every day had not. Lessons noted—**not** lessons learned.

It's critical that we share our experiences now more than ever. Over the next 4 months we'll have more than 250,000 Soldiers on the move, and we'll conduct a 120,000-Soldier battle handover for OIF-2 alone. Our deployed Soldiers have gained invaluable experience and insight, including the development of standing operating procedures (SOPs) that have reduced brownout-induced Class A accidents from 75 percent in Fiscal Year 2003 to 11 percent this year. I ask these successful units to consider a couple of questions. Have you put your new SOPs and tactics, techniques, and procedures in writing so they become institutional knowledge? If so, have you

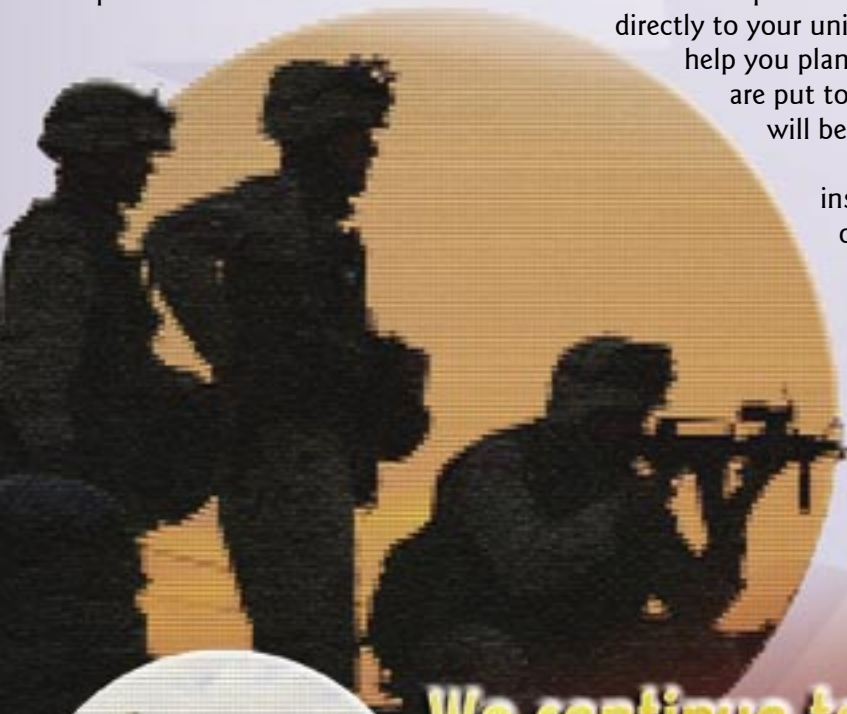
actively provided those documents to your replacing unit **and** the Army as a whole so your experiences can be turned into better training for all follow-on units?

Clearly, your transition home will provide different challenges than those you left overseas. What are you doing to transition your risk management thought process? Once the enemy was the biggest risk, but now it will be privately owned vehicles (POVs). Over the last 10 years, POV fatalities have accounted for 56 percent of accidental deaths in the Army. It's hard to imagine returning home safe from a combat zone only to lose a buddy to a POV accident. Don't be the one to lose your battle buddy.

Here at the Safety Center, we continue to provide you information through our Web-based tools and written publications. Check us out on the Web! You'll be surprised at how easy it is to collect information that applies directly to your unit and location. Try out the ASMIS-1 POV module to help you plan and reduce risk while traveling. Until these tools are put to use, the Army's detailed knowledge of accidents will be just lessons noted.

Ensure you turn your own experiences into institutional knowledge. If you have a success story or experience the Army can learn from, send it to us at **warstories@safetycenter.army.mil**. Allow us to turn lessons noted into lessons learned.

Keep your leader lights on!



We continue to lose Soldiers to the same mistakes OVER & OVER:

- Falling asleep while driving
- Vehicle rollovers caused by speeding
- Driving without seatbelts
- Improper handling of unexploded ordnance
- Negligent discharges due to poor muzzle awareness
- Failure to perform proper weapons clearing procedures
- Brownouts and poor crew coordination

Are we actively learning from our mistakes & successes?

USAAVNC

Commander Sends...

As we reshape Army Aviation to meet the needs of the field as we fight the Global War on Terrorism, there is no better place to start than at the Army Aviation Warfighting Center in Fort Rucker, AL. In this issue of *Flightfax*, we will touch on one of the changes we have made to assist field commanders. The following article will explain the new mission given to the Directorate of Evaluation and Standardization (DES) so they can meet the demands of our deployed forces. Scheduled visits are a thing of the past. Now DES will task-organize their team to fit your schedule and your needs as you prepare to deploy or return from a deployment. I hope you like what you read as we educate you on DES' new role in supporting our branch.

Above the Best!

BG E.J. Sinclair
Commanding General
U.S. Army Aviation Center

DES Relevant and Ready

CPT Thad Fineran
Directorate of Evaluation and Standardization
Fort Rucker, AL

The Directorate of Evaluation and Standardization (DES) is committed to providing relevant tools and information regarding aviation training and standardization to you, the combat aviator. To accomplish this task we have developed new initiatives and revised our focus. Our new mission statement and intent, outlined below, form the foundation for all of our efforts.

Mission

DES executes assistance and analysis for aviation units and training programs worldwide for the Commanding General (CG), U.S. Army Aviation Center (USAAVNC), in order to achieve standardization and expertise in relevant tactics, techniques, and procedures (TTPs).

Intent

DES' purpose is to provide relevant tools and information regarding aviation training and standardization to the combat aviator. DES accomplishes this by establishing real-time links between warfighting units and the USAAVNC, and by carrying relevant tools to the aviation commander to enhance training programs and end-user success. On order, DES collaborates subject matter expertise within aviation doctrine, training, and fielding agencies to enhance aviation products worldwide. The end state is a dynamic aviation assistance program that achieves the goals of the CG, USAAVNC, and ensures aviation standardization enhancement is achieved. This change in focus has many implications for you as the end user in Army Aviation. We'd like to address these changes here and how they can benefit your aircrew training programs (ATPs).

Concept of operation

In order to effectively execute our new mission and intent, changes had to be made to DES' evaluation techniques. Quite frankly, our feedback from the aviation community indicated past evaluations often conflicted with and detracted from normal unit training and operations. Our focus, in place of these evaluations, is now a concept of unit assistance visits. The intent behind these visits, scheduled at your request and on your timeframe, is to bring the complete set of aviation training tools to your door.

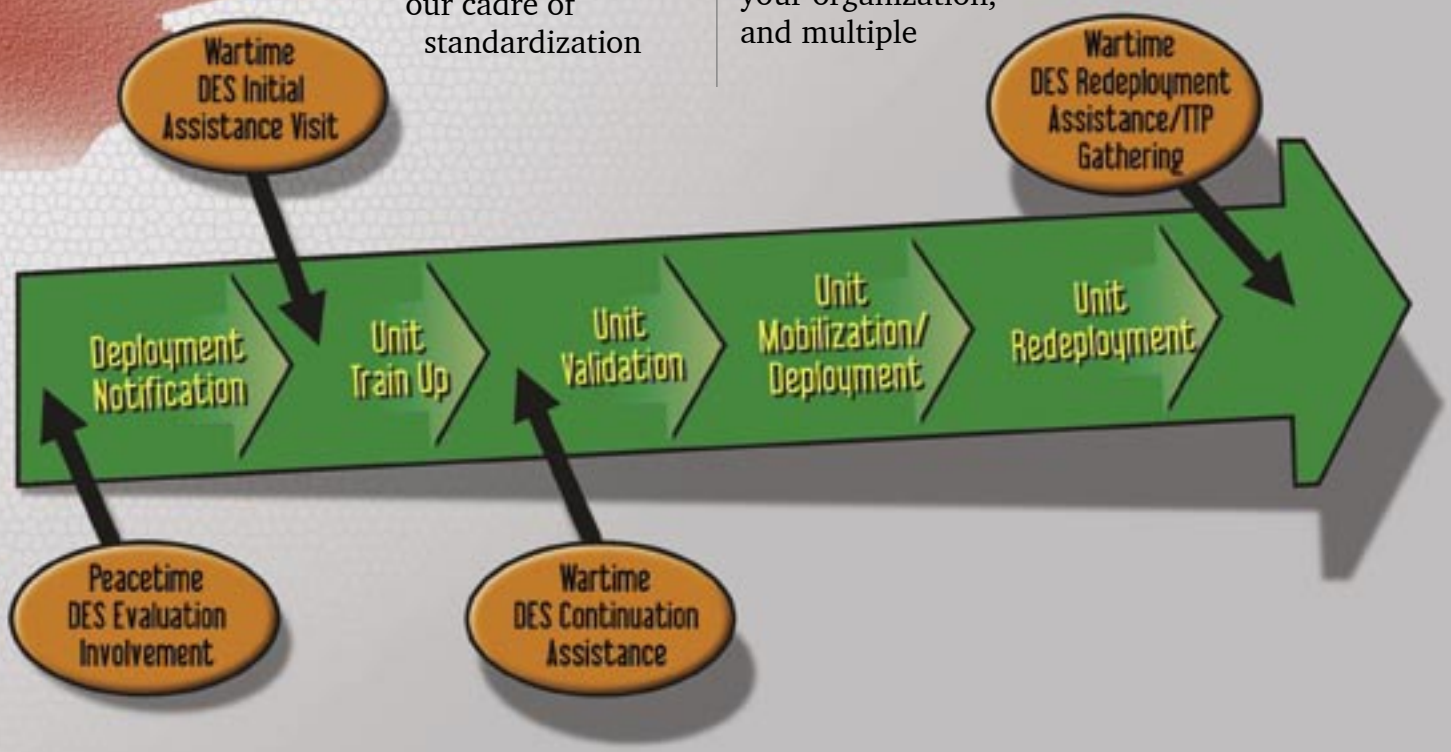
A simple metaphor to explain this concept would be a workshop. Each aviation unit has a particular workshop that has a variety of tools necessary to complete their mission. During previous evaluations, DES would examine your workshop and identify which tools were broken or missing.

Our focus now is not only examining your workshop, but also bringing a full complement of tools to your organization and completing your toolkits with relevant, real-time equipment pertinent to your particular mission. We intend to do this by collaborating subject matter expertise and relevant experience from multiple centers of aviation doctrine, training, and development. As we continue to develop our cadre of standardization pilots, you will see experts in aircraft survivability equipment (ASE), tactical operations, power management, aviation gunnery, environmental training, aviation mission planning, and other vital, relevant functional-area experts. If you have an aviation need that falls outside our normal areas of expertise, we'll enlist the aid of other organizations such as the Center for Army Lessons Learned (CALL), the combined training centers (CTCs), and the U.S. Army Safety Center (USASC). To illustrate these changes, let us review a typical unit assistance case using the new methodology.

Unit assistance

The first, and probably most significant, enhancement to DES' concept of operations is the absence of scheduled unit evaluations. Since we are a Nation at war, deploying aviation units need more than a visit every 18 to 24 months to evaluate aviation standardization programs. Therefore, the number one priority for unit standardization and training assistance is the deploying aviation unit. The diagram below represents how DES can fit this assistance in a typical deployment cycle.

These visits can last various amounts of time depending on the particular needs of your organization, and multiple



visits to the same organization could become more common. Additionally, the visit will be markedly different than DES evaluations you have received in the past.

Assessment

First, the needs of your unit will be assessed by the requesting command and our subject matter experts (SMEs). This will determine the general needs for training and standardization functional areas. Several enhanced functional areas have been added to increase DES' overall effectiveness. Previous functional areas are compared to the new enhanced functional areas below:

Previous Functional Areas	Enhanced Functional Areas
SOP Review	Lessons Learned and TTP from Redeployed Units
ATP, ATM, and Tactical Training Implementation	Mission Planning and Execution
IATF and IFRF Review	Power Management and Environmental Training
Night Vision Devices	Aircraft Survivability
Aviation Maintenance (Preflight) and Armament	Equipment Training
Additional Training Requirements	Advanced and Tactical Area Gunnery, Running and Diving Fire
Operational Risk Management	TTP (Master Gunner Integration)
Individual and Crew Proficiency Evaluations	Multi-ship Operations
	Internal and External Load Operations
	CALL, CTCs, TacOps, and SERE SME Integration
	Academic Training for Identified Areas
	UAV Standardization
	Flight Maneuvering Handbook
	RAID and Fixed-Wing Operations

Many of the enhanced functional areas are familiar to you already, but we've added some significant areas of emphasis that have become very relevant in today's deployment environment. DES will still analyze and assist in the previous functional areas as well, since these are definite indicators and requirements for sound aviation operations.

Assistance package

After your command has assessed functional area needs, our team can begin preparing and coordinating the appropriate assistance package. Once we arrive, there will be a short analysis phase where we review the functional area needs and basically "examine your workshop." This will include the normal questions and reviews you've come to expect during a DES or Aviation Resource Management Survey (ARMS) visit, but focused towards a different end. Rather than issue you a grade on the content and completeness of your workshop, we will utilize this information to determine where and how to continue our assistance and tool sharing. It is similar to a proficiency flight evaluation, where the end goal is not a SAT or UNSAT grade, but rather a basis for continuation in the training program.

After this short analysis phase, DES personnel will begin working with individuals and the command to enhance their training programs, pass new and pertinent information, and collaborate aviation training and lessons learned from the myriad of aviation proponents throughout our community. This phase of the assistance visit will vary in length and is designed to provide the command and standardization personnel with every tool possible to benefit your aircrew training program. Following this visit, your unit can coordinate for follow-on assistance from our

teams, whether it is the entire team or unique SMEs who can provide additional individual assistance.

After deploying units return home, there are again unique and challenging standardization and training events that need focus. We'd like to be involved continually in this process as your unit redeploys for two reasons. First, our assistance can help your command address common questions and training issues that arise from the waivers and extensions you've encountered during the deployment. Additionally, numerous personnel changes and aircraft reconditioning programs can delay and detract from your ATP. DES can again bring personnel who recently have seen these issues to help restructure your standardization and training programs and get aviation units quickly back to full operations.

Secondly, your unit will have unique and valuable perspectives of what you encountered during the deployment. These relevant topics are highly sought after by other units we'll be assisting in their deployment phases, so again DES can provide a collaboration of efforts and ideas throughout the spectrum of aviation deployment operations. We'd like to help put all the pieces together, from the front-line warfighting aviation units to the aviation proponents and directorates, then back to the schoolhouse itself, in order to enhance the aviation product and procedures we currently work under.

The bottom line is this: *if your aviation unit has a training or standardization need, we will assemble and deploy the package to you in a timeframe that allows you successful mission accomplishment in today's contemporary operating environments.*

End state

The end state of this enhanced focus is a relevant and ready aviation force, working with progressive doctrine and tactics, which combines the best Soldiers with viable aviation products that meet the needs of the tactical force.

That being said, DES needs your help in achieving this goal. *Number one*, we must know what you need. We will task-organize our teams to fit your schedules and your requirements, all on our dime. In the purest sense of the words, we are here to help. Let us know when, where, and how we can provide standardization training and assistance to your units. *Number two*, we might ask your Soldiers to travel with us. There is no one more recent or experienced in the aviation arena than those who have just come out of a deployment. One unit's assistance might require subject matter expertise we do not have, and we will need to get experts from the field to help future units prepare for these deployments. *Number three*, do not let standards drop as a trade-off of this change in focus. One difficulty the aviation community will continue to experience is a lack of training time and focus. With the spectre of DES coming to evaluate your unit now gone, standardization emphasis and training has the potential to decline. This potential decline in standardization administration will only lead to longer deployment preparations, difficulty during DES assistance visits, and a decrease in overall aviation safety. Remember, we still must "examine your workshop," and if the basics of your workshop are not in order, very little time for the advanced "tools" will be available during these critical preparation phases of training.

Summary

The mission of DES is clear. We are here to assist the aviation community by establishing and collaborating standardization expertise and relevant TTPs. We intend to establish real-time links between the warfighting units and the USAAVNC, carrying relevant tools to the aviation commander and enhancing your battlefield success. We will combine aviation-wide subject matter expertise within aviation doctrine, training, and field agencies to enhance aviation products worldwide. It's a large mandate, but we're up to the task. Let us know how we can involve you. ♦

—CPT Thad Fineran, Deputy Director and Medical Service Corps Advisor, DES, DSN 558-3589 (334-255-3589), e-mail thaddeus.fineran@rucker.army.mil.
To schedule a DES visit, please contact Mr. Nick Smythe, DSN 558-2244 (334-255-2244), e-mail nick.smythe@rucker.army.mil.

Commander's Task List: the other option

CW3 James K. Scala
Directorate of Evaluation and Standardization
Fort Rucker, AL

Properly preparing and maintaining the Commander's Task List (CTL) within the Individual Aircrew Training Folder (IATF) can be a daunting task, especially in today's aviation environment. Highly experienced CW4 standardization instructor pilots (SPs) and instructor pilots (IPs) at the company level are very difficult to find these days. More often than not, the SP is a mid-grade CW3 and the IP is a CW2. During deployments, units might find themselves separated from their parent unit and unable to confer with that senior CW4 SP at the battalion level.

Additionally, the standards section could find itself short on help and with records in need of care. Some might opt for the easy solution and create a cookie-cutter CTL with "Base Task Requirements per ATM" marked on the CTL. Training Circular (TC) 1-210 states that an "X" in this box shows that the crewmember must comply with the minimum applicable base task performance and evaluation requirements specified in the appropriate aircrew training manual (ATM).

If this block is marked, you don't have to list base tasks or iteration requirements on the form. The IP or SP also is indicating that one iteration is sufficient for this individual aviator to maintain his proficiency. That's one iteration for the entire year! I don't know many crewmembers that maintain proficiency based on one iteration for the year.

Although this method is as easy as marking an "X" and a simple method of completing the CTL, it's not a method that creates proficient pilots. When the instructor briefs the crewmember that he's required to complete just one iteration for all base tasks during the coming year, the crewmember will perceive that his proficiency meets unit requirements.

The other option some people consider is placing an "X" in "Base Task Requirements Detailed Below" and listing all the tasks. When using this method, you have two options for listing base task requirements. In option (a), you may list all base tasks along with the appropriate iteration and evaluation requirements. This might seem unnecessary and time consuming for some experienced aviators. After all, IPs and experienced pilots in command (PCs) are going to fly more than other crewmembers. They also will perform more iterations of hovering flight than we care to document.

The second option is a simple, yet overlooked, method that can be used to develop proficient crews. I refer to this as option (b) since it's listed as sub-paragraph (b) in TC 1-210, paragraph 3-15b(4). With option (b), the IP would place an "X" in the "Base Task Requirements Detailed Below." This allows the IP to then list only those base tasks for which additional iteration or evaluation requirements have been established. In this case, you must include a statement in the remarks section: "The remaining base task requirements are as specified in the appropriate ATM." For this option, if an 800-hour CH-47 PC has minor difficulties and is reluctant to perform Task 1082, "Precision Approach"; Task 1029, "Roll-On Landings"; and Task 1060, "Flight with AFCS Off," the IP can list just these 1000-series tasks on the DA 7120-1. Along with the tasks, the IP will annotate the appropriate number of iterations the instructor believes will assist the crewmember in maintaining proficiency.

As the preface of TC 1-210 states, the recordkeeping system is designed to reduce the administrative workload of unit standardization personnel. It is a document that provides guidance in developing a crewmember's continuation training by highlighting the crewmember's weaknesses and maintaining proficiency. But let's not forget TC 1-210 also provides guidance for tailoring training to meet the individual, crew, and unit needs based on the Mission Essential Task List (METL). Tailoring base task iteration requirements to meet individual needs in order to ensure the unit's mission success is critical. Don't sacrifice the crewmember's proficiency and training needs for the ease of recordkeeping. ♦

—CW3 James K. Scala, CH-47 SP/IE, DES, DSN 558-3354 (334-255-3354), e-mail james.scala@rucker.army.mil

STACOM Messages 04-01

February 2004

UH-60 Submerged Boost Pump

There is some confusion in the field as to when or if the submerged fuel boost pumps are required to be **ON** or **OFF** to properly complete the UH-60 health indicator test (HIT).

First, some background. There was a time when the submerged fuel boost pumps weren't even installed on the aircraft. The pumps were added following several incidences of engine flameout believed to be caused by the vaporization of JP-4 in the fuel lines. They were required to be **ON** to maintain pressure and ensure the fuel stayed in a liquid state in the fuel lines during certain ambient temperatures. It also was believed that changing the fuel to JP-8 would help. However, these measures did not fix the problem.

The flameouts were later found to be caused by the fuel lines themselves and the way they were routed to the engines. A modification was applied to the fuel lines, but not all aircraft were immediately fitted with the modification, which also lacked engineering confidence. Because of these factors, it was decided that the requirement to turn the submerged fuel boost pumps **ON** before flight would be maintained. The requirement to not turn the pumps **ON** before the HIT check was a conscious decision that allowed engineers to collect engine reliability data without the pumps operating. Also, the aircraft most likely wouldn't have yet left the ground.

So now to answer the question heard so often from the field: "If I have to fly the aircraft out of parking to another spot to perform the HIT, do I turn the submerged fuel boost pumps **ON**, and then should I turn them **OFF** prior to performing the HIT?"

The answer is that you follow the order of the checklist and turn the pumps **ON** before takeoff. Since the engines are allowed to run on their own without the pumps, engineers can gather the necessary data indirectly. And, once you've repositioned, there's no need to turn the pumps **OFF** before performing the HIT. The submerged fuel boost pumps have ***absolutely nothing*** to do with the task. Now go fly!

—CW4 David Kenny, UH-60 SP/IE, DES, DSN 558-1461 (334-255-1461), e-mail david.kenny@rucker.army.mil

Remote Altimeter Setting Source

According to FAA 7110.65, Air Traffic Controller Handbook, and FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), the destination altimeter setting, whether from a local or remote source, is the setting upon which an instrument approach is predicated. You must have a current altimeter setting to execute an instrument approach.

Current altimeter sources are Air Traffic Control (ATC); a Remote Altimeter Setting Source (RASS) given by an approach controller as reported from an airport other than the destination; a Fixed Base Operator (FBO); or an automatic reporting system such as the Automatic Terminal Information Service (ATIS), Automated Surface Observing System (ASOS), or Automated Weather Observing System (AWOS).

The U.S. Army Aeronautical Services Agency (USAASA) determined that if the ASOS or AWOS is noticed to airmen (NOTAM) out-of-service and no RASS is published, you can still file a flight plan as long as the descent from en route minimum altitude for instrument flight rules (IFR) operation, approach, and landing can be made in visual flight rules (VFR) conditions. You cannot file if the destination weather is IFR because the destination altimeter setting, whether from a local or an authorized remote source, is not available.

—CW3 James K. Scala, CH-47 SP/IE, DES, DSN 558-3354 (334-255-3354), e-mail james.scala@rucker.army.mil

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Aviation Door Gunnery

CW4 David Kenny
Utility Division
Directorate of Evaluation and Standardization
Fort Rucker, AL

Aviation door gunnery has become a hot issue lately. Many leaders and aviation standardization people don't have a good understanding of the Army's annual door gunnery training program. Even if you're not "in the know," you can develop and conduct a successful aviation door gunnery program.

Did you know you could supplement your unit with non-flight personnel from outside units? Army Regulation (AR) 600-106, *Flying Status for Non-rated Army Aviation Personnel*, paragraph 4-32c, allows "Those organizations with assigned UH-1/UH-60 aircraft and no documented target alert and data display set (TAADS) door gunner positions may place Soldiers on crewmember flying status as the second door gunner *once the unit is deployed in an imminent danger/hostile fire area.*"

These Soldiers can come from anywhere inside or outside the unit. If you have additional Soldiers available in a deployed environment, you can assign them to fly in place of one of your crew chiefs as a non-rated crewmember. This would place them in a paid flying position, meaning they would draw flight pay. The relieved crew chief could then perform maintenance or meet crew rest requirements before the next mission.

If you plan on using this method, carefully read the italicized portion above where it says, "…*once the unit is deployed in an imminent danger/hostile fire area*." Simply put, you can't train the Soldiers or compensate them for flight pay *until* you're deployed. With that in mind, you can request a waiver to this requirement upon notification of deployment. Training for these non-flyers can begin when the waiver is approved.

As a prerequisite, non-rated crewmembers must satisfactorily pass a Class III flight physical per AR 40-510, *Standards of Medical Service*. In addition, the individual must be selected by the commander for the duties to be performed and placed on flight status in accordance with (IAW) Training Circular (TC) 1-210, *Aircrew Training Program Commander's Guide to Individual and Crew Standardization*, paragraph 3-3c(2)(b).

TC 1-210 states that non-rated crewmembers must be trained to perform their duties IAW the appropriate aircrew

training manual (ATM). Required individual training includes aircraft qualification, aircrew coordination, gunnery, and if required, night vision goggles (NVGs). An Individual Flight Records Folder and an Individual Aircrew Training Folder also must be created for each crewmember.

The individuals selected for door gunnery must receive all the training normally given to a crew chief, since they are considered non-rated crewmembers. This includes all the minimum flight time requirements for aircraft qualification, NVG qualification, and aircrew coordination per TC 1-210, TC 1-212, and the Aircrew Coordination Course (ACC). Upon completion of the aircraft qualification and ACC requirements, the door gunner begins actual gunnery training.

The Commander's Task List for these Soldiers must include all the base (1000-series) tasks listed in the ATM. Mission training consists of those tasks selected by the commander that best meet the unit's Mission Essential Task List (METL) for that position. They don't have to learn every mission task the regular crew chief performs, just the ones they'll be expected to participate in as a door gunner (multi-ship, external loads, etc.).

Continuation training also applies. This means readiness levels, annual proficiency and readiness tests, and annual flying hour requirements. Additionally, any supplementary training requirements from TC 1-210 such as nuclear, biological, and chemical (NBC) training; environmental training; fratricide prevention; and everything else the unit normally trains must be completed. The goal here is to create a fully functional crewmember. Skimp on the training and you create a liability.

The individual performing gunnery duties also can be awarded the Aircraft Crewmember Badge IAW AR 600-8-22. All they must do for a permanent award is participate on flight status, remain physically qualified, and serve not less than 12 months. They also can receive the award if the additional provisions in AR 600-8-22 are met: complete 15 combat missions under probable exposure to enemy fire, become incapacitated for further flight duty by reason of being wounded in action, or be injured as the result of an aircraft accident. For the temporary award, the Soldier must be performing gunner duties, and the aviation unit commander must publish orders for the wear of the badge. This is a great incentive for Infantry units and commanders to allow their Soldiers the opportunity to help crew aircraft.

This is a program that can be used by the aviation command structure to greatly enhance their ability to go to war. The keys here are the early identification of gunner candidates and having a plan in place to begin training. You could find yourself unprepared for demands on personnel and resources if you wait until your unit deploys overseas. By then it might be too late. ♦

Editor's note: *This information regarding door gunnery is focused on UH-60 crewmembers, but also applies to CH-47 personnel. CH-47 crewmembers should be trained similarly, with reference to the CH-47 ATM regarding academic and flight task requirements.*

—CW4 David Kenny, UH-60 SP/IE, DES, DSN 558-1461 (334-255-1461), e-mail david.kenny@rucker.army.mil

For more information regarding UH-60, UH-1, or CH-47 door gunnery training and programs, please contact SFC Brad Kitch, DES, DSN 558-1748, or SFC Sean Dunn, DES, DSN 558-1439. For those of you who don't know, Fort Rucker has a new Gunnery Branch at the Directorate of Training, Doctrine, and Simulation. For more info concerning the new Gunnery Branch, contact SSG Richard Graves, DSN 558-1897 (334-255-1897) or e-mail richard.graves@rucker.army.mil.

When the Minimums Become the Maximums

CW5 Larry Gauthier
Directorate of Evaluation and Standardization
Eastern Army National Guard Aviation Training Site
Pennsylvania Army National Guard

When I started flying, our unit's hour requirement to become an aircraft commander (AC) was 500 hours of first-pilot time. Back then, we logged time as first pilot and copilot versus pilot-in-command (PC) and pilot (PI). When I became an AC, I had over 700 hours of total flight time, so I was fairly well prepared for my new duty designation. The experience level dropped as the unit lost their Vietnam aviators to retirement, so they kept lowering the hour requirement for one to become today's PC.

So what's my point? Commanders tell me that today's aviators are not as experienced as the old. I agree with that statement. Compared to today's pilots, I had much more flight experience before I was placed in charge of the aircraft.

With training dollars cut and the operating tempo (OPTEMPO) increased, commanders look for ways to meet training requirements as soon as possible to have functioning pilots. I had the luxury of the "fat" training years during my formative aviation growth. But, are commanders really making the most of the training time allotted them?

When I hear conversations like the following between the commander and instructor pilot (IP), I don't think those commanders are seeing the forest for the trees.

(IP): "Sir, John's goggle flight tonight wasn't as good as I would like to see and I think…"

(Commander): "Did he meet the standard?"

(IP): "Well, kind of, but it wasn't pretty and I think…"

(Commander): "Since when is pretty a standard? Does he have the minimum hours?"

(IP): "Yes, but…"

(Commander): "Put him in Readiness Level (RL) 1. I need him to fly a mission tonight."

How many pilots think they don't have to fly any more during their semiannual period once they've completed their minimum flight hour requirements? Did this thought process originate from observations during their night vision goggle (NVG) aircraft qualification or refresher training? The training guide (figure 4-2) in Training Circular (TC) 1-210, *Aircrew Training Program Commander's Guide to Individual and Crew Standardization*, recommends 8 hours of total time, but has a note that states: "The total time, excluding the SFTS or static aircraft training period, may be reduced to no less than 4.5 hours based on the IP's or standardization instructor pilot's (SP's) recommendation concerning the aviator's proficiency."

After careful review of hundreds of training records during Directorate of Evaluation and Standardization (DES) evaluation and assistance visits, I have discovered that we have lots of very proficient NVG pilots, because most have progressed in only 4.5 hours of NVG time entered on DA Form 7122-R. Maybe this notation originated even earlier during their aviation career. Maybe it was in flight school, when the IP put the student up for his check ride because he had the minimum hours and another class was starting. Maybe it happened when his check ride performance was less than desired, but he met the minimum standards (and another class was starting), so he was passed and sent to his new unit. His unit IP wasn't satisfied with his proficiency flight evaluation, so he was put through RL progression, again with minimal flight time. Then, a short time later, "John" rolled the aircraft over during an NVG landing with blowing dust.

Who was at fault? The new pilot? The IP for not giving him adequate training? The commander for putting pressure on the IP to advance the pilot? Let's look at how this individual was trained at his unit.

What guidance did the commander give his IP as to how he wanted his aviators trained? The commander sets the tone for his unit's proficiency by the way he develops his Commander's Task List (CTL) for each position. Figure 3-1 of TC 1-210 guides the commander into selecting all base tasks as indicated in the appropriate aircrew training manual (ATM); selecting the applicable mission tasks; developing any additional tasks; and specifying the modes of flight (day, night, NVG, or nuclear, biological, chemical [NBC]) and the number of iterations to be performed in each mode.

Ideally, the commander and SP sit down together after reviewing the unit METL and discuss each task that was selected. For this discussion, we will look at some of the base tasks listed in TC 1-212 (UH-60).

(IP): "Sir, perform slope operations…in what modes do you want your pilots to be proficient?"

(Commander): "I want them to be able to do slopes in day, night, and NVG modes."

(IP): "But sir, shouldn't we also select NBC?"

(Commander): "Why? It's not marked in Figure 5-1."

(IP): "For two reasons, sir. One, I don't think we will always be landing on level terrain when we are conducting NBC operations. Two, that table falls under the continuation training chapter. Don't confuse annual task and iteration requirements with that of developing a task list or RL progression. Remember, RL progression requires pilots to demonstrate proficiency in each mode of flight required by the ATM and the CTL we're developing right now."

(Commander): "Good point!"

(IP): "Sir, what about perform simulated engine failure at a hover?"

(Commander): "I see the ATM just has an 'X' under the day column."

(IP): "No sir, that isn't the day column. It's the column that shows which tasks are mandatory for a standardization flight evaluation, which could be completed during day, night, night NVG, or NBC modes. Don't

you think our pilots should be able to perform that task in all modes, sir?"

(Commander): "Yes, I do. Put an 'X' in each block."

The commander and IP cover all tasks in this manner. The thought process is that the new aviator will demonstrate proficiency in each task and in each mode to an IP before being released to the unsuspecting (or suspecting) PC.

The majority of aviation commanders and IPs view the blocks marked "X" under the night column as the ***only*** tasks that need to be trained. Yes, those tasks need to be trained, but they are not the only ones! They are the **MINIMUM** tasks determined to be different enough under night conditions that need to be completed at least once during continuation training, not RL progression training (remember, there are separate requirements for each).

I hear comments like, "Sure, that's the ideal thing, but we don't have the time to train all modes." Time should not be an issue. If the commander's evaluation determined he should be placed in RL 3, he probably needs more than a couple hours' training to demonstrate proficiency in base tasks. Schedule day out and night returns—you'll be able to evaluate base tasks in day and night modes very efficiently.

Don't forget the instrument maneuvers. If your new pilot is a UH-1 pilot, he learned to do instrument takeoffs from the ground with the hood on. Many hovered out with the hood in place and tilted their head back to see under it, using the skid shadow as a hover height reference. The first thing they realized in night instrument flight (as they bounced off the black pavement) was that visual references are limited with the hood on. The second thing they discovered is that due to age, they now need glasses to read the approach chart. Isn't it nice they discovered their visual acuity problem with an IP versus an unsuspecting PC on a night instrument meteorological conditions (IMC) flight! I think it will be hard to find anyone that says the pucker factor is the same whether you are flying day IMC or night IMC.

What's the point of training a pilot? Is it just to put a check mark in the block of another requirement, or is it to keep our crew and passengers safe during mission accomplishment? Do we take the fast, **MINIMUM** way out and mark, "Base Tasks per ATM," which means that task was performed once in any mode authorized by the ATM or commander? Or do we select appropriate iterations for the proficiency of that aviator? Do you ever wonder what the proficiency difference is between an SP and a PI? Apparently none, because they both usually have "Base Tasks per ATM" checked.

What do you think, commanders and IPs? Is just meeting the **MINIMUM** requirements specified in the ATM satisfactory?

Most IPs I know care about their pilots' proficiency. They pray that none of the pilots they've just evaluated (and determined satisfactory) ever crash. If that happens, they'll lie awake at night thinking, "What went wrong? Was there something I missed? Did I fall into the trap of passing a pilot because I knew he'd done better and maybe it was just an off night?

Most IPs I know care about their pilots' proficiency. They pray that none of the pilots they've just evaluated (and determined satisfactory) ever crash. If that happens, they'll lie awake at night thinking, "What went wrong? Was there something I missed? Did I fall into the trap of passing a pilot because I knew he'd done better and maybe it was just an off night? How can I stand in front of his wife and kids and justify why Mom or Dad is not coming home tonight? Will saying, 'I gave him the **MINIMUM** time' or 'There wasn't an 'X' in the box' help anyone sleep at night?"

Hopefully this will get you thinking about the quality of your aircrew training program. If it doesn't, it should. ♦

—CW5 Larry Gauthier, UH-60 SP/IE Standardization Officer, EFSB-DES (EAATS), DSN 491-9883 (717-861-9883), e-mail larry.gauthier@pa.ngb.army.mil

Investigators' Forum

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

Aviation Maintenance Can Be Deadly

MAJ Ray Jenkins
U.S. Army Safety Center

Army Aviation would cease to exist without highly trained and qualified maintainers. It is the duty and responsibility of every leader and supervisor to ensure all maintainers are trained, qualified, and equipped properly. Most maintenance programs are considered mundane and uneventful, and aviation maintenance is no exception. This doesn't mean the job is unimportant; in fact, most aircraft maintainers don't get hard-earned and deserved recognition. However, the importance of doing the right thing and being safe while working on and around Army aircraft sometimes takes a back seat to mission accomplishment.

Several accidents stemming from the "simple" procedure of inflating tires on Army aircraft have occurred over the past few years. Since 1990, there have been five accidents and two fatalities between the Army and the Navy involving aircraft tire or wheel explosions. This seemingly simple maintenance practice has become one of the deadliest examples of failing to adhere to standards and published procedures and not using the proper equipment.

Some Army aircraft tires are filled with nitrogen. Nitrogen is more stable than compressed air and is inert (does not support combustion). Compressed air contains about 15 to 20 percent oxygen, which makes it more volatile.

There have been documented cases of crashes caused by tires exploding in flight, which is why nitrogen is used to fill tires on military and commercial aircraft. However, even nitrogen tires can react violently. The destruction and devastation that occur when someone over-inflates an aircraft tire is hard to describe, but very much a reality. One such accident occurred recently in Iraq.

A sergeant and a specialist were replacing and servicing a tire on a UH-60 during a 500-hour phase. The specialist was removing and replacing the tire assembly, with the sergeant supervising. After installing and torquing the new wheel assembly, the specialist began lowering the aircraft. The sergeant decided the tire needed more pressure, so the specialist jacked the aircraft back up.

The sergeant went to the tool room, got the nitrogen cart, and pulled it to the aircraft's side, about 3 feet from the tire. The sergeant noticed the cart's low-pressure side couldn't be used because it didn't have the proper fittings. In addition, the tool room didn't have a tire inflation kit, which has a built-in tire gauge and an over-pressurization valve that prevents the tire from being over-inflated. The sergeant told the phase team supervisor that the cart's low-pressure side didn't work and that there was no tire inflation kit available.

The phase team supervisor asked the sergeant if he'd ever filled a tire from the cart's high-pressure side without using a tire inflation kit. The sergeant said he had lots of times, so the supervisor told him to add a little nitrogen at a time and then check the tire pressure.

The sergeant attached the high-pressure side hose to the tire and opened the valve on the high-

pressure side bottle. He then was supposed to close the valve and check the pressure. The sergeant closed the valve completely, but the tire exploded when he leaned over to check the pressure.

The explosive force was so great that it tore the horizontal strut out of the airframe at the attachment point and drove the vertical strut back into the fuselage about 12 inches. The inside part of the wheel that hit the strut continued under the aircraft and ricocheted off the wall 30 feet from the aircraft. That's the destruction part.

As the wheel left the spindle, it severed the sergeant's arms above the elbow. It then struck the specialist in the lower torso, killing him instantly and forcing his body 19 feet from the aircraft. That's the devastation part—one Soldier permanently injured and another Soldier killed. These Soldiers were lost because the standards weren't enforced and the wrong equipment was used.

Performing maintenance has inherent hazards, just like any other aviation operation or combat. To lose a Soldier in combat is a hard pill to swallow. You want to believe he was highly trained, highly skilled, and highly motivated, and doing the right thing. To lose a Soldier to a non-combat accident is a loss we just can't afford.

It is the ultimate responsibility of every leader, supervisor, and Soldier to ensure that realistic training and adherence to standards are the only ways we do business. The cost of not doing it the right way is just too much to pay. ♦

—MAJ Ray Jenkins, Aviation Systems and Accident Investigation Division, U.S. Army Safety Center, DSN 558-9853 (334-255-9853), e-mail ray.jenkins@safetycenter.army.mil

"Train as you fight." Those words are a foundation of schoolhouse teaching in Army Aviation. Recent operations in Southwest Asia have illustrated the need for tough, realistic training, especially in the desert environment. In Fiscal Year 2003 alone, brownout or whiteout contributed to 12 Class A accidents, nearly 40 percent of the total Class A accidents for that year.

The Army has the perfect training environment for desert operations at the National Training Center (NTC) in Fort Irwin, CA. Aviation units that rotate to the NTC each year get the opportunity to experience actual brownout conditions in their own aircraft. The rotations offer real-world scenarios that prove invaluable in the Iraqi or Afghan deserts. But what about units that don't rotate to the NTC, or new aviators that don't get the chance for hands-on training before they deploy?

Fighting Brown with Simula

Julie Shelley
Staff Editor

FlightSafety International in Fort Rucker (Daleville), AL, might have the answer.

FlightSafety, a commercial aviation training company, recently unveiled a new simulator that is sure to set the bar for future Army Aviation simulation training. Using the latest technology to bring photo and satellite images to life, their UH-60 Black Hawk simulator offers the next-best thing to actually being at the NTC or Baghdad. Paul Garritson, FlightSafety's UH-60 Programs Director at the Daleville center, said the sharp increase in brownout-related aviation accidents led to the development of the brownout model in the advanced simulator.

"FlightSafety saw brownout conditions as an area that needed simulation training to help reduce the accident rate and save lives," he said. "This simulation is going to help save lives and equipment, as well as enhance our warfighting capabilities. Advanced simulation can reduce aircraft training time by as much as 40 percent or more and provide a more qualified pilot to the field upon graduation from flight school."

Once a pilot steps into the simulator, he or she will be in familiar surroundings. The cockpit is an exact copy of the Black Hawk, and has two extra seats behind the pilots' station for the instructor/operator and an observer. The real fun starts, though, when the flying begins.

The graphics are so realistic you'll see the "silver side" of leaves when you hover close to trees. Water sprays up and ripples from rotor wash when the aircraft hovers over a pond. Smoke from a simulated battle momentarily turns the area a hazy black as you fly over and through it.

And that's just the Fort Rucker database. With the touch of a button, you can be transported to the NTC or Iraq. The brownout conditions the NTC is famous for are replicated using color satellite images and three-dimensional technology. As you land at the NTC's Bicycle Lake, the aircraft's rotors churn up light to heavy dust conditions. The ground is completely obscured, and it's up to you to make sure you don't crash. Press another button and you're in Baghdad, hovering over the city. The Tigris River is in plain view, and the contrast between city and desert is apparent.

The simulator is a design concept for assisting Fort Rucker with its mission of qualifying aviators in the Black Hawk. Mike Mulvenon, FlightSafety's Business Development Manager for Army Programs, said the Fort Rucker facility was the obvious choice for the simulator's home.

"The Daleville center supports the Army's C-12 fixed-wing training program. We got involved several years ago with this initiative to support Army Aviation at Fort Rucker," he explained. "The Army was lacking simulation support in their flight school. We got into the Black Hawk and put it here to show the Army our capabilities and, in that process, build a digital database to replicate all the Fort Rucker flying area, as well as to build two additional databases: one to support brownout or desert-type operations, and the other to support mountain-type operations."

The UH-60 simulator will be joined in the future by comparable simulators for all airframes to support Flight School XXI. Those will be housed in a building next door to the current Daleville facility, just a few miles from the Fort Rucker post. The value of the advanced training will reach far beyond just brownouts.

For example, emergency procedures iterations that are too risky to perform in an actual aircraft can be repeated safely in a simulator. FlightSafety's simulator has a debriefing capability so pilots and instructors can go over every detail of each flight and pinpoint strengths and weaknesses. When the new building is completed, the simulators will be linked together for collective crew and aircrew coordination training.

"It will improve every aspect of aircrew coordination training, especially with the technology we have as well as the debriefing capability," Mr. Mulvenon said. "We'll show the crew where they're not communicating or using the right terminology to get their points across, which helps improve standardization and safety.

"We're still a work in progress, but we're at the stage now where we can safely and adequately do a complete training program evaluation," he said, adding that over-water and shipboard helicopter operations modules are in development. "It's going to be improved even more as we continue to expand this database."

For more information on the UH-60 simulator, contact Mr. Garritson at paul.garritson@flightsafety.com or Mr. Mulvenon at mike.mulvenon@flightsafety.com. ♦

Editor's Note: *Tomorrow's aviators will benefit from today's technology like never before. Continue to look for other brownout training initiatives in the coming issues of Flightfax.*

—Julie Shelley, Staff Editor, *Flightfax*, U.S. Army Safety Center, DSN 558-1218 (334-255-1218), e-mail julie.shelley@safetycenter.army.mil

WAR Stories

There I was...

If It'll Fit, It'll Fly!

CW4 Kim Randall
Wisconsin Army National Guard

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

Here's a little nugget of wisdom I'm afraid I will never forget, thanks to the teachings of one who should have known better. It was a hot summer day in the jungles of southern Wisconsin. I was a recently returned WO1, fresh from the halls of "Mother Rucker" and assigned to one of our senior, combat-experienced UH-1 pilots for the duration of this 3-day training exercise.

We had just flown in to hot refuel and drop off some troops and mermite containers for the field site lunch. Did I mention it was hot? Our crew consisted of a well-seasoned crew chief (CE), our intrepid pilot in command (PC) who had "been there and done that" many times over (my hero of the day), and myself. We unloaded our cargo and passengers and hovered into position for a top-off at the fuel point.

After receiving our load, our PC noticed that our passengers and cargo were being loaded into the back of a 2½-ton for the ride to the encampment about 2 or 3 miles away. I guess

he felt sorry for them having to make that ride across rough terrain in the back of that truck on such a hot day. With a few gestures, he got their attention and had them come back over. Moments later the passengers, mermites, weapons, and field gear were packed in the back of our now fully fueled aircraft. It was so packed there was cargo sitting in the passengers' laps, between their knees, and under the seats. It was so full our CE had to get out to make room.

Being the new guy, I was sure I didn't have to mention our potential (but obvious?) over-gross situation to this highly experienced and combat-trained veteran sitting next to me. But I did anyway.

Without so much as a backward glance, my hero said with a smile, "If it'll fit, it'll fly!" Still not quite believing what I was seeing and hearing, I made one more meek attempt to suggest that "maybe" we should just recalculate our weight and balance to make sure. Nothing doing! With a widening smile, he spoke the immortal words we've grown to know and regret in aviation: "Just watch this!"

The PC began adding power and had actually coaxed our steed to about a foot and a half off the ground when a slight crosswind gust weathervaned us, and our rotor RPM bled off. We settled abruptly with a thump, and I turned to start unloading our cargo, thinking that was the end of the adventure.

"No, leave them onboard!" he told me. At this point I was really stunned. "We're actually going to attempt this again?" I asked. "Yes! If it'll fit, it'll fly. You just have to know how to work it!"

So once again, awed by the pro and too new to make waves, I sat back and didn't say anything. Crew coordination—who needs it with so much experience at the controls? For the second time he wavered into the air, actually making it to about 3 feet this time. Did I mention it was hot?

Now it got interesting. A gust hit us again, pushing us sideways and down. Our poor Huey was shuddering, lights were flashing, and our LOW RPM audio was wailing, but to my amazement the PC was still fighting the controls and trying to keep it flying.

Now it got interesting. A gust hit us again, pushing us sideways and down. Our poor Huey was shuddering, lights were flashing, and our LOW RPM audio was wailing, but to my amazement the PC was still fighting the controls and trying to keep it flying.

I finally got my nerve back and yelled at him to just put it on the ground!

"I can't!" he yelled back. "We've drifted over the fuel point!"

Well, the temperature could have dropped 40 degrees and we still would have been sweating in the cockpit. The PC continued to nurse our faltering bird along at minimal RPM, trying not to drift into the tree line on one side or the fuel tanker on the other, and all the while attempting to keep from spearing the fuel point nozzle and grounding stake up through our belly.

All this took probably no more than 20 to 30 seconds, but it seemed like eternity. When we were finally clear of the last fuel hose, our warrior dropped us through the last foot and a half with a heavy thud.

After one deep breath, he half-smiled and said, "Ok, now we can unload the passengers." I wish I could say that was the only time I allowed another pilot to put me into such a compromising situation without a fight, but it's not. However, I'll save that story for another time. ♦

—CW4 Kim Randall, Aviation Safety/Logistics Officer, 1-147th Command Aviation Battalion, Wisconsin Army National Guard, Madison, WI. He can be reached at DSN 724-3896 (608-242-3896) or e-mail kim.randall@wi.ngb.army.mil.

Parker Awards: Spotlighting Safety Excellence

Julie Shelley
Staff Editor

Accomplishing even the simplest mission safely is an achievement in our Army, especially for aviation units. In wartime, the challenge is even greater. Units that succeed in safety are recognized in several different ways, and Army Aviation is no exception. The LTG Ellis D. Parker Outstanding Unit Awards are presented annually at the U.S. Army Aviation Center in Fort Rucker, AL, and recognize excellence in leadership, training, maintenance, and safety. The following units were selected for their performance in Fiscal Year (FY) 2003, and some of their accomplishments are highlighted below.

Overall Winner and Combat Support Category Winner

9-101st Aviation Regiment
Fort Campbell, KY

To say the 9th Battalion, 101st Aviation Regiment was busy in FY03 would be an understatement. In preparation for Operation Iraqi Freedom (OIF), the battalion executed a brigade field training exercise (FTX) and door gunnery, which included training Infantrymen as door gunners. The battalion's leadership also attended Exercise Victory Scrimmage in Heidelberg, Germany, to plan for the upcoming combat deployment. The preparation paid off last winter when the battalion launched its aircraft and ground equipment from Jacksonville, FL, for the deserts of Southwest Asia.

In theater, the battalion executed reception, staging, onward movement, and integration (RSOI) while simultaneously planning and executing brigade air assaults. To support operations deep in the theater, the battalion established a forward area refueling point (FARP), the most forward and longest-running one in the division. The battalion's aviation unit maintenance company maintained an overall aircraft mission capable rate of 82 percent, a true accomplishment in the harsh Iraqi desert. ♦

Best Combat Battalion

1-101st Aviation Regiment
Fort Campbell, KY

Wartime operations are far from easy, but some units and individuals seem to thrive in a combat environment. The 1st Battalion, 101st Aviation Regiment is an example. Deployed to support OIF in February 2003, the battalion flew all their AH-64Ds on several crucial missions and destroyed dozens of enemy vehicles and several weapons caches. In addition, the battalion's ground assault element convoyed their ground vehicles more than 925 miles without incident or accident.

Split more than 110 km between base locations, the battalion maintained a mission capable rate of 87 percent and flew 128 percent of its annual flying program. The battalion logged almost 2,800 incident-free combat hours and conducted more than 150 security, reconnaissance, quick reaction force, and raid missions in just a 4-month period in FY03. ♦

Best Combat Service Support Battalion

421st Medical Evacuation Battalion
Wiesbaden Air Base, Germany

The 421st Medical Evacuation Battalion flew all over the world—literally—in FY03. Every company was deployed in support of the Global War on Terrorism in such places as Kosovo, Afghanistan, Kuwait, and Iraq, to name just a few. The 421st's aircrews flew more than 8,600 hours without a Class A, B, or C accident, a true feat in combat.

The importance of the medical evacuation mission cannot be disputed. During FY03 alone, more than 4,000 injured Soldiers, Sailors, Marines, and civilians were transported to medical facilities by 421st crews. The battalion accomplished their missions within the operating budget and achieved a mission capable rate of 97 percent for ground vehicles and 79 percent for aircraft. ♦

Best Table of Distribution and Allowances Battalion

1-223rd Aviation Regiment
Fort Rucker, AL

All Army pilots commence their flying careers at Fort Rucker, and it is here that their sense of safety is first developed. The 1st Battalion, 223rd Aviation Regiment sets the standard for student pilots in leadership, safety, training, and maintenance.

The battalion trained almost 2,400 student pilots in FY03, flying 15,988 accident- and incident-free hours in 18 different courses of instruction. The 1-223rd also validated CH-47 Flight School XXI requirements and implemented flight training transformation initiatives to positively impact the future of Army Aviation. ♦

BG Carl I. Hutton Memorial Award

159th Aviation Brigade
Fort Campbell, KY

The BG Carl I. Hutton Memorial Award is presented annually by the Order of Daedalians to units that demonstrate outstanding professionalism and make invaluable contributions to the advancement of flight safety in Army Aviation. The award was presented to the 159th Aviation Brigade for their accomplishments toward these goals.

Congratulations to these units! ♦

—Julie Shelley, Staff Editor, *Flightfax*, U.S. Army Safety Center, DSN 558-1218 (334) 255-1218, e-mail julie.shelley@safetycenter.army.mil

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class B:** The crew was firing the fourth 10-round burst from the 30mm cannon when the gun barrel reportedly exploded. Shrapnel penetrated the fuselage, target acquisition and designation system (TADS), and the front of the cockpit. One main rotor blade also suffered damage. Neither crewmember was injured.

■ **Class E:** The auxiliary power unit (APU) failed suddenly during a maintenance operational check (MOC) of the aircraft systems after phase inspection. Further inspection revealed the APU shut down automatically after suffering internal foreign object damage (FOD).

EH-60

A Model

■ **Class E:** The #2 engine turbine gas temperature (TGT) indication went erratic during cruise flight. The aircraft landed without further incident. Maintenance replaced the panel indicator.

MH-47

E Model

■ **Class E:** While accelerating during initial takeoff for instrument flight rules (IFR) flight, the combining transmission PRESSURE LOW light and MASTER CAUTION light illuminated, with 9 psi displayed on the power train page. All maintenance panel indications were normal. The crew landed the aircraft at the departure end of their runway without further incident, and indications in the cockpit returned to normal. However, when the crew departed the runway to return to the hangar, the low pressure indications returned. The crew landed and shut down the aircraft without further incident. A broken wire was found in the vicinity of an old splice on the combining transmission pressure transducer wire bundle.

OH-58

C Model

■ **Class E:** The MASTER CAUTION light illuminated while the aircraft was on the ground with the engines running. Maintenance replaced the starter generator.

■ **Class E:** Transmission oil splashed on the windscreen upon landing. The aircraft was shut down without further incident. Maintenance replaced the transmission.

■ **Class E:** During cruise flight the MASTER CAUTION light illuminated with no other segment lights. The aircraft landed without further incident. Maintenance replaced the caution panel.

■ **Class E:** Transmission oil pressure maxed out during landing. The aircraft was shut down without further incident. Maintenance replaced the oil pressure gauge.

■ **Class E:** Upon landing, engine oil temperature exceeded 107 °C to 110 °C for less than 5 minutes. The aircraft was shut down without further incident. Maintenance replaced the oil pressure indicator.

D(R) Model

■ **Class E:** During maneuver operations urban training (MOUT) tactical training, the crew overtorqued the mast in a left banking maneuver at approximately 30 knots. Mast torque on the full authority digital electronic control (FADEC) monitor displayed 126 for 2 seconds. No other limits were exceeded. The crew landed the aircraft at the nearest suitable location and reported the event to maintenance. Maintenance visually inspected the aircraft and found no damage. The aircraft was released for flight.

UH-60

A Model

■ **Class E:** While attempting to start the aircraft for a maintenance run-up, the crew started the APU and was about to start the #1 engine when the APU made a loud banging noise and stopped. The advisory panel APU FAIL light illuminated. The crew found a piece of metal from inside the engine embedded in the APU's intake screen.

■ **Class E:** During startup the #2 engine experienced a fuel leak. The aircraft was shut down, and the mission was cancelled.

RC-12

P Model

■ **Class E:** The ALT WARNING light illuminated in flight at 140 knots after 20 minutes of elapsed mission time. The crew cross-checked the cabin altitude and noticed it was climbing. The crew then donned their oxygen masks and performed the emergency procedure. The aircraft descended to below 10,000 feet and returned to base for a maintenance checkout. Maintenance determined the pressure controller was faulty due to fair wear and tear and replaced it. A full MOC was completed with no faults discovered, and the aircraft was released for flight.

Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

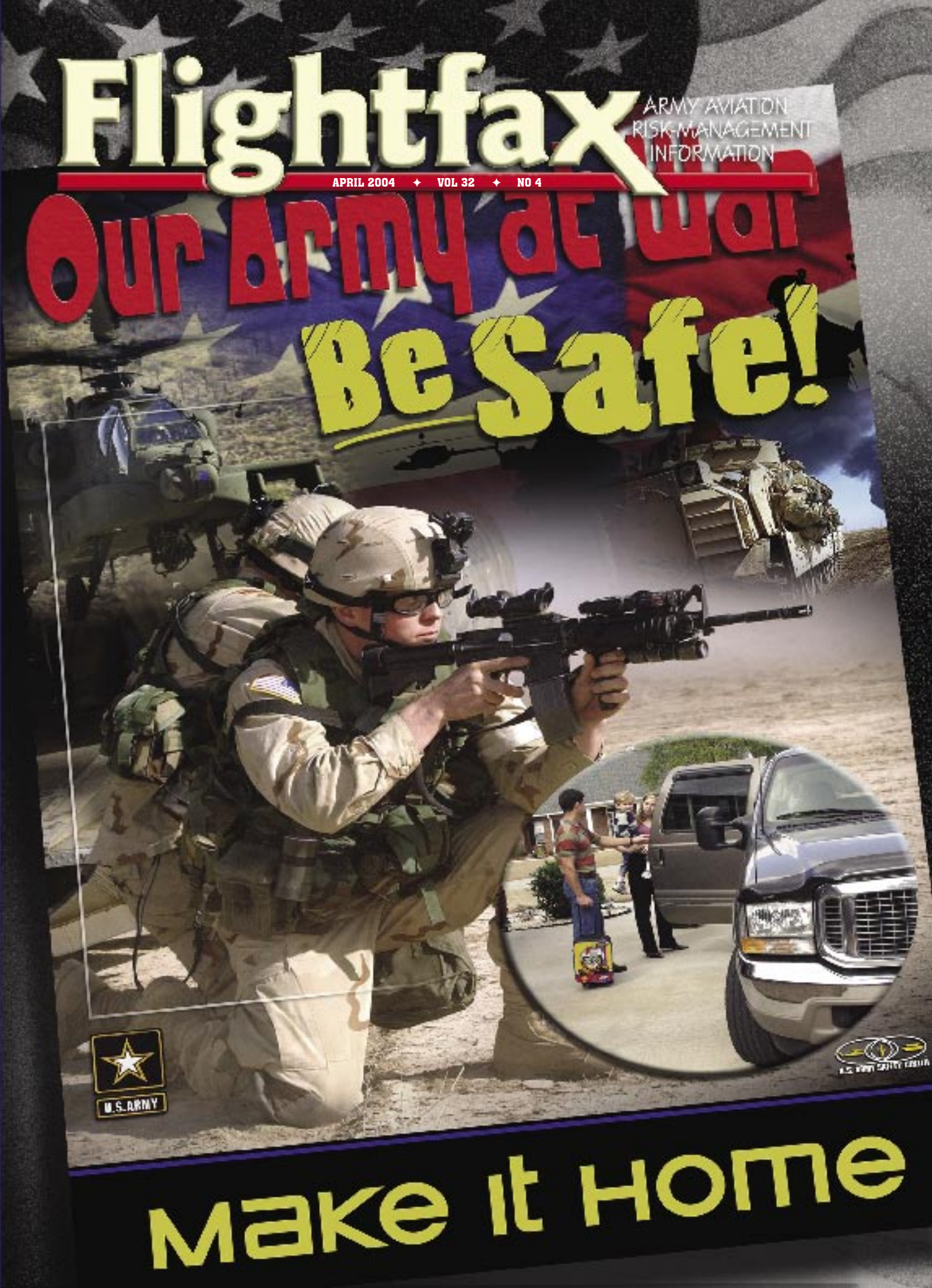
Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

APRIL 2004 ✦ VOL 32 ✦ NO 4

Our Army at War

Be Safe!



Make it Home

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
COL Christopher Gallavan – Publishing Supervisor
Paula Allman – Managing Editor
Danny Clemmons – Graphics
Julie Shelley – Staff Editor
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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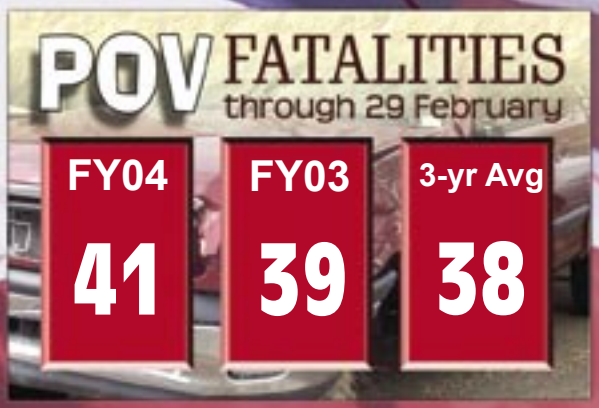

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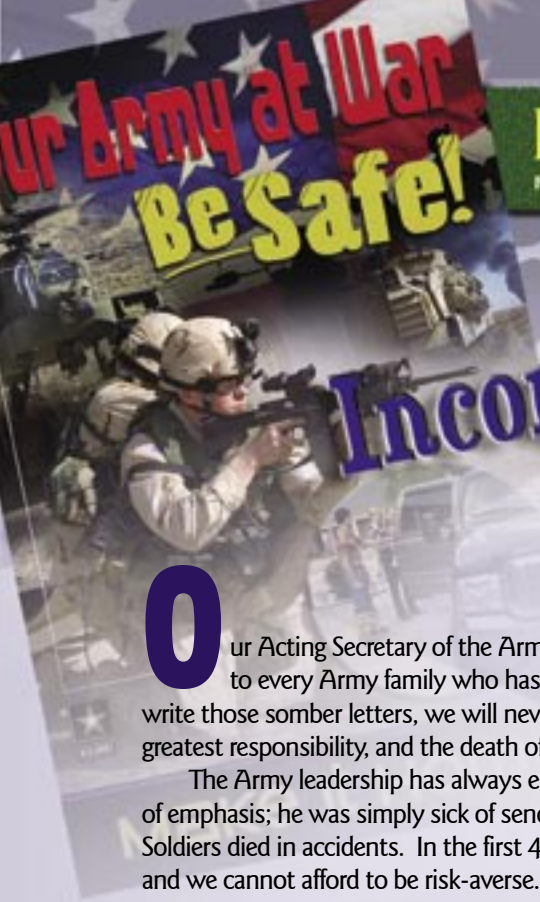
JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding



DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

Incoming! The Army Safety Campaign

Our Acting Secretary of the Army, the Honorable Les Brownlee and our Army Chief of Staff, GEN Peter Schoomaker, send a letter to every Army family who has lost a Soldier while serving in the Global War on Terrorism. For those of us who have had to write those somber letters, we will never forget how heart wrenching it was each and every time. The welfare of our Soldiers is our greatest responsibility, and the death of any American Soldier is something our senior leadership takes very personally.

The Army leadership has always emphasized the enforcement of safety. However this January, Secretary Brownlee hit a new point of emphasis; he was simply sick of sending letters to families who lost loved ones to accidental fatalities. During Fiscal Year 2003, 255 Soldiers died in accidents. In the first 4 months of this year, 101 Soldiers have died. We certainly have a tough job to do for our Nation, and we cannot afford to be risk-averse. Accidental fatalities are NOT the cost of doing business—engaged, caring leadership can prevent accidents from happening.

In a January trip to Iraq, Secretary Brownlee saw first-hand the effect of quality leadership in the actions of a young company commander. Before any vehicle rolled out on a mission, the captain looked each Soldier directly in the eye and said, "I want YOU to be safe!" He wasn't doing it out of procedure or obligation. He was doing it because his unit was a "band of brothers" who truly cared about each other's safe return. Because they cared so deeply for one another, safety was personal.

When Secretary Brownlee returned from Iraq, he charged the Army Safety Center to develop an Army Safety Campaign and inspire units across the Army to adopt the model he saw in Iraq. The motto for the Army Safety Campaign is "BE SAFE!" Why be safe? Because your Soldiers are counting on you to bring them home safely, and your family is counting on you to make it home.

The practice of bringing all your soldiers home safely is a lot tougher than writing it on paper. Commanders and leaders in the field are already doing a great job at pushing the importance of safe practices and protecting their Soldiers' welfare. However, the Army Safety Campaign will apply Army-level resources, communication tools, and knowledge that are not available at the unit level. The Campaign will have two main efforts: (1) to enable Army leaders at all levels to risk manage more effectively through the use of new web-based tools, and (2) to inspire stringent enforcement of basic standards through a multi-faceted communication campaign.

The Army Safety Center is working overtime to build and refine Web-based programs and put Army-level safety knowledge at the hands of all Soldiers. These tools, the Army Safety Management Information System-1 (ASMIS-1), Risk Management Information System (RMIS), Accident Reporting Automation System (ARAS), and the Commander's Safety Brief, if used, give the leader on the ground the ability to predict and prevent the most likely accidents.

Communication of the Army Safety Campaign began with emphasis at the highest level. The campaign plan was briefed to general officers at the Senior Army Leader Conference in early February. Secretary Brownlee, GEN Schoomaker, and Sergeant Major of the Army Kenneth Preston personally appear in the Army Campaign Safety Video found on our Web site, providing every Soldier and Army employee with their message. SMA Preston has taken the lead in communicating the importance of proper training and standards enforcement throughout our Army. For example, in this issue of Flightfax he addresses the troubling problem of negligent discharges.

In addition to our senior leadership, the Army Safety Center has provided new tools to help you communicate the importance of safety to your Soldiers. The "Drive to Arrive" series of videos includes top country music stars and NASCAR drivers asking our young Soldiers to use risk management and stay safe.

All of our new risk-management and communication tools can be found on our Web site at **http://safety.army.mil**. Be part of the Army Safety Campaign; take 5 minutes to look and see what is there. Inspire the Soldiers in your unit to do the same. It may help your unit predict and prevent the next accident. Most of all, rigidly enforce those basic standards that may be inconvenient but, nonetheless, keep your Soldiers safe. A simple correction or additional question may prevent you from having to send a terrible letter.

Our Army at war—Be Safe!
Make it Home! Wherever you are!

Joe Smith

Operation Guardian Angel

CW4 Darrel "D" Smith
V Corps Aviation Safety Officer

During war, Army buddies watch over each other. However, when they leave their buddies and return home, they need family and friends to watch over and assist them through what can be a difficult time of readjustment.

Why are Soldiers returning from war at high risk?

Many Soldiers are returning from a war zone where they have served for 12 months or longer. Returning home will be a major readjustment for them. They will have to readapt to a normal lifestyle again because driving, social interaction, and everyday life will be much different from what they experienced in Iraq. Some Soldiers may tend to drink too much, while others may experience difficulties with relationships. These factors place them at high risk for accidents and injuries.

What is Operation Guardian Angel?

Operation Guardian Angel is a national campaign that encourages families, friends, neighborhoods, and communities to remind Soldiers to be safe after they've returned home. Operation Guardian Angel's goals are to protect Soldiers from accidents and injuries, to let Soldiers know Americans are proud of them and care about them, and to provide citizens an opportunity to get involved with Soldiers. Anyone, civilian or military, who cares enough to help Soldiers can be a Guardian Angel.

What can Guardian Angels do?

Guardian Angels can talk to Soldiers and remind them to drive carefully, have a designated driver if they drink, or offer to call a cab to get the Soldier home safely. In recreational activities such as hiking or swimming, Guardian Angels can remind Soldiers of the importance of using the buddy system and appropriate safety gear. The Guardian Angel's role, just as the name implies, is to be there for Soldiers and help them be safe for the sake of themselves, their families, friends, and the Army. ♦

Editor's note: The Guardian Angel program was initiated by LTG Ricardo S. Sanchez,

Commander of Combined Joint Task Force 7 (CJTF-7), Baghdad, Iraq. CW4 Darrel "D" Smith, V Corps Aviation Safety Officer, developed the program for soldiers returning from Iraq. For more information on Operation Guardian Angel, contact CW4 "D" Smith at 06221-57-5664 (DSN 370) or e-mail glavnsafof@hq.c5.army.mil.

If you would like to apply to be a Guardian Angel, you may do so on the U.S. Army Safety Center Web site at http://safety.army.mil/guardianangel/index.html.

An In-flight Movie for Soldiers

Think you'll be bored on that flight back from Iraq? While you're munching the airline pretzels, the Army will provide you a little entertaining encouragement to be safe—Southern style. The man with the deep-Southern drawl is retired Mississippi State Patrolman Captain Pete Collins. The video you'll be seeing is part of the Army's "Be Safe" Campaign and has a much focused theme.

When it comes to safety, Collins explains, "No one cares until it's personal. 'Safety' is just another word unless it knocks at your door."

The 30-year veteran state patrolman has worked 184 fatalities. He talks about a chilling experience where he held a little boy thrown from his drunk father's pickup truck. The father didn't buckle the boy's seatbelt, and he died in Collins' arms as his father watched from a distance. He also recalls the day he knocked on a mother's door to tell her all three of her children died on the way to their school's homecoming football game. The driver who hit them had a blood alcohol content of .38.

He explains that although he was trained to write down names and not get involved, he could not follow those rules.

"I committed the cardinal sin as a trooper. I let my job get personal and it changed my life forever," he said.

Because of his experiences, he wants to make safety "personal' to others in the hope it may one day save their lives. He said he is honored to be part of the Army's Safety Campaign because it allows him to give something back to the Soldiers who keep the American flag flying.

Jon R. Anderson
Heidelberg, Germany

USAREUR's Reintegration Eases In

Troops and family members eagerly anticipating reunion after a year of untold hardships—both in Iraq and at home—might feel like they've earned a nice, long vacation. But there are a few things returning Soldiers need to take care of first.

GEN B.B. Bell, U.S. Army Europe (USAREUR) Commander, has made one thing clear: "Don't worry. No training, maintenance, or other unit work until troops have had plenty of time for rest and recuperation." GEN Bell calls this time an opportunity "to heal the warrior spirit."

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The first 7 days

Officials have mapped out a 45-day program designed to smoothly transition troops from the combat zone to home station. The process is called the Deployed Cycle Support Program and is designed to focus on the human dimension of redeployment. That process begins the moment the plane touches down in Europe. The main objective is to account for each Soldier and get them reunited with their family or into the barracks.

Each wave of arriving troops will be greeted by a general officer and a brief welcome-home ceremony. The only other speed bump before being released is that Soldiers will have to turn in weapons and any other sensitive items.

The next day begins a 7-day series of briefings, medical screenings, and other tasks. That's 7 days straight—no weekends or federal holidays that happen to fall within that window. The good news is that Soldiers will be on a half-day schedule, working only about 4 hours a day. The idea is to gradually reintroduce Soldiers to life outside the combat zone and allow leaders to identify any Soldiers who might be having a difficult time readjusting.

There will be deployed unit chaplains and local community chaplains "working in tandem" to prepare Soldiers and their spouses for the stress and family friction that typically come in the wake of a long deployment. Community leaders also are planning a number of retreats not only for couples, but also for single Soldiers. Meanwhile, school leaders will have teams of counselors and psychologists on hand to help children deal with any reunion anxiety.

The fun begins

After Soldiers have ticked off all 17 required "pre-block leave" items on their reintegration checklist, they will be eligible to immediately begin 30 days of vacation. The Army has reopened the Von Steuben Hotel in Garmisch specifically for returning troops and those

on mid-tour rest and relaxation (R&R) leave. The Patton Hotel, another Army-run lodge in Garmisch, has dedicated half of its rooms for troops just out of the combat zone. Both facilities are offering discounted packages. Returning troops and their families also can expect deep discounts in their local communities for everything from trips and tours to arts-and-crafts programs.

Plans are also in the works to extend the time parents can remove their preschool children from child development centers without being charged. Currently, parents can take their children out for 2 weeks; however, 4 weeks is being requested so families can spend the entire block leave together without having to pay for child care not being used. Likewise, teachers and administrators of Department of Defense Dependents' Schools in Europe are preparing for extended absences among school-age students. Students will have 2 weeks to make up any missed assignments upon returning.

Show me the money

"With tax breaks and combat zone stipends, many troops should have plenty of cash waiting for them when they get home. But they should also be prepared to see a lot of that extra money in their paycheck disappear," said COL Kevin Troller, Commander of the 266th Finance Command. On average, most troops have been getting an extra $1,000 a month; however tax exclusion, hazardous duty, and hostile-fire pay all end once Soldiers leave the Middle East.

Back to work

Once block leave is over, officials say a final 8 days have been carved out for Soldiers to finish up any unresolved personal issues. That's also the time to check off any remaining items on the reintegration checklist. Battalion commanders will use the checklist to certify each Soldier has completed the reintegration process with USAREUR Headquarters, so troops should expect that step to be high priority when they get back to work.

That rounds out the 45-day plan. From there the focus will shift to fixing gear and eventually heading back out to the training ranges. Officials hope to have units combat-ready within 270 days after arriving back in Europe.

Note: The 3rd Infantry Division, Fort Stewart, GA, and the 101st Airborne Division, Fort Campbell, KY, have implemented similar post-deployment reintegration programs. Privately owned vehicle safety is one key focus for returning Soldiers. Fort Stewart tripled the number of motorcycle safety courses presented because of the large number of returning Soldiers who have purchased motorcycles. Fort Campbell is currently offering the Motorcycle Safety Foundation Basic Rider's Course for new motorcycle riders. Nearly 100 new riders have attended during February and March. ♦

Editor's note: We at the Army Safety Center continually strive to develop ways to protect our Soldiers, both on and off duty, and very often look to existing best practices as we become aware of them. This redeployment strategy, implemented by GEN Bell for Soldiers returning from combat to USAREUR, is a best practice. This is an excerpted article and was edited due to space limitations. For the complete article, go to **http://www.stripes.com**.

Do You Really Kno
If That Weapon Is Loaded?

SMA Kenneth O. Preston
Sergeant Major of the Army

About a year ago, then Sergeant Major of the Army Jack Tilley published an article in *Countermeasure* magazine discussing negligent weapons discharges. It's time to revisit this serious issue. Since the beginning of the Global War on Terrorism, 25 Soldiers have died and another 14 have suffered permanent disabilities because of negligent weapons discharges. In almost every case, it was another member of the Soldier's unit who was responsible. How tragic to survive the battlefield only to be shot by your battle buddy! Who is the real enemy?

Some think these numbers are relatively low, but I'm here to tell you even one is unacceptable and we, as leaders, can't stand for it. We must identify the problem, establish solutions, and train our Soldiers so we'll never have to tell another family member their loved one died because of "friendly fire." Accidental or negligent discharge—call it whatever you want—is a core safety issue I am focusing on as Sergeant Major of the Army.

Many of these discharges occurred in base camps or areas where the weapons control status was "green" except for Soldiers in a security role. So what went wrong in these incidents?

In almost every case Soldiers didn't follow established procedures on when, where, and how to clear their weapons. We call these procedures standards. You'll find clearing barrels at the entrances of compounds and base camps, at the base of guard towers, and at helipads. Clearing barrels are the focal point for leaders such as OICs, NCOICs, and convoy commanders to ensure their Soldiers' weapons are cleared and in green status.

In one incident a Soldier was shot and killed in his tent because another Soldier didn't clear his weapon when his team returned from a mission. Peeling the onion a little more, we found this Soldier was riding in the back of a truck with several other Soldiers and was asleep during the clearing process. These Soldiers weren't required to dismount the truck, so instead they handed their weapons to another Soldier on the ground to clear them. Unfortunately, one weapon—the one involved in the shooting—was missed. In this incident, unit leaders failed to hold Soldiers responsible for clearing their weapons and NCOs responsible for supervising the process. The result of leaders not enforcing standards and allowing Soldiers to become complacent was the needless death of a young Soldier.

In another incident a Soldier was killed when he was shot in the head by a 25 mm cannon on an M2A2 Bradley Fighting Vehicle (BFV). The deceased Soldier and another Soldier were standing approximately 20 feet in front of the BFV, which was positioned on the unit

ow

perimeter for security operations. The crew kept the 25 mm cannon loaded, with the "ghost round" cycled. The BFV was unmanned until the driver entered the vehicle to start the engine. When he switched on the MASTER POWER switch, the 25 mm cannon cycled and fired a round, killing the Soldier. The other Soldier was severely wounded in the neck by a discarding petal from the projectile.

I told this story while visiting troops stationed around Iraq and asked them if they would ever stand in front of a loaded weapon on a range. In every case the answer was "Never!" We must emphasize that we train as we are going to fight.

In this incident, unit leaders allowed Soldiers to become complacent about the potential danger associated with weapons orientation. Unit leaders did not enforce keeping loaded crew-served or vehicle-mounted weapons manned at all times.

I love to watch seasoned Soldiers and leaders moving along a busy city street. Seasoned Soldiers know their weapons are lethal and ensure their muzzles are never pointed at anyone as they move among the populace. These Soldiers instinctively practice muzzle awareness all the time.

When in the ready position, seasoned Soldiers keep their trigger finger poised alongside their weapon's magazine well and off the trigger until they need, or anticipate the need, to shoot. How do Soldiers become seasoned and skilled? The answer is training and experience.

Training enforces important disciplines such as muzzle awareness and trigger finger position. Leaders must teach and enforce the right standards and never allow Soldiers to become complacent in weapons handling. Weapons handling is a perishable skill. Repetitive focused training builds experience, creating Soldiers who are inherently safe.

Long periods of time between training events or during combat operations (when it might be hard to train) can lead to complacency. Recurring focused training on weapons handling and unit standing operating procedures can combat complacency and reinforce established standards. We need the discipline of first-line leaders along with the oversight of senior leaders to halt these needless, tragic deaths.

Negligent discharges often happen because of the reasons listed below:

- **Lack of muzzle awareness and discipline**.
- **Insufficient training**.
- **Ineffective supervision**.
- **Negligence**.
- **Inattentiveness**.
- **Indiscipline**.

These same reasons caused nine Soldiers to be killed or seriously wounded while cleaning their weapons. Soldiers not clearing their weapons and maintaining a weapons control green status in designated areas killed or wounded 18 others. Twelve Soldiers were injured or killed because of a lack of muzzle awareness and discipline, coupled with unintentionally pulling the trigger. Learn the standard, teach the standard, and enforce the standard.

I've learned during the last year that if a unit doesn't have well-established standards and discipline *before* they deploy to Afghanistan, Iraq, or the Balkans, they'll have a tough time establishing standards once they're there. Ultimately, it's Soldiers who pay the price in needless deaths and accidents.

Weapons proficiency is the province of the NCO. From the youngest corporal to the Sergeant Major of the Army, we're the primary trainers and guardians of the standard. Competence is our watchword. Our young Soldiers look to us for an example to follow.

The Soldiers we train today will be tomorrow's leaders; just as today's leaders will be tomorrow's senior leaders. We must give our Soldiers and leaders the tools, techniques, and procedures to prepare them for that task.
I need your help! ♦

Peeing White, R

LTC Joseph F. McKeon
Command Surgeon, U.S. Army Safety Center

This is serious. We are a Nation at war, and we keep getting Soldiers hurt or killed! You, the Soldier or civilian reading this article, matter... truly. I don't care if you're an MH-47 pilot or a contractor in a tool room. You matter. There aren't enough of us to go around as it is. Take care of yourself and your battle buddy. Make sure you make it home! Odds are you are only about one-fourth of the way through your life. Don't rush things and end up dead. Take a minute and do it right!

Okay, here we go again... another article on heat injury prevention. Is it almost summertime already? Time flies, whether you're doin' 20 or just getting through your initial obligation. Any way you look at it, it's going to get hot. And heat kills, literally. Batteries, paint jobs, unwatered plants, dogs left in cars, or unacclimatized Soldiers—the single biggest environmental threat is heat. And it's *unforgiving*.

Here's the deal. We've got four divisions moving in, four moving out. Everybody is going to be exposed to a heat threat this summer. Whether you are deployed for a month to a maneuver training center (NTC, JRTC, or CMTC) or for a year elsewhere, you *will* be faced with a heat threat in the coming months. When you're packing your full battle rattle with your sleeves down and your gloves on, you're a walking teapot. As your body sweats to cool off, you're losing water. If you wait until you're thirsty enough to want to drink, it's too late—you're already behind the curve! Do you realize that just a 2-percent decrease in your total body water will lower your functional IQ? Who can afford to lose intelligence? Heck, if I had 10 more IQ points, I could have been a pilot instead of just a flight surgeon!

So how can you tell if you're adequately hydrated? You've seen the charts that tell you how much to drink for a certain workload in a given environment. Some Soldiers think "more is better"—so as long as they continue to down water, they'll be okay. However, metabolic needs vary with the individual, and it's possible to become water intoxicated and die. A good rule of thumb is you should have to hit the latrine every 90 minutes to 2 hours. Check your urine color. It should *not* be a concentrated yellow color. We used to say, "Peeing white, ready to fight!"

If it's lunchtime and you haven't gone since you got up, you aren't drinking enough. Coffee doesn't count. Caffeine (also from sodas) is a diuretic. That means it makes you urinate more than you drink. You are "bouncing checks" as far as hydration goes (more coming out than going in). So drink water, not coffee or sodas.

If you're a leader, check on your troops. If you think you aren't a leader, think again. Whenever two or more are gathered, somebody is the

Ready to Fight!

leader! Look out for your battle buddy, and look out for yourself. Drink water, avoid strenuous work in the heat of the day, and acclimatize before stressing your troops. Take care of yourself. Where else are you going to live? ♦

Editor's note: For a more in-depth discussion of heat injury prevention, see the April 2003 ***Flightfax****.*

—LTC Joseph F. McKeon, USASC Command Surgeon, DSN 558-2763 (334-255-2763), joseph.mckeon@safetycenter.army.mil

Fluid Replacement and Work/Rest Guide

Acclimatized (after approx two weeks training) Wearing BDU, Hot Weather

		Easy Work		Moderate Work		Hard Work	
Heat Category	WBGT Index, (F°)	Work/ Rest	Water Intake (Qt/h)	Work/ Rest	Water Intake (Qt/h)	Work/ Rest	Water Intake (Qt/h)
1	78-81.9	NL	½	NL	¾	40/20 min	¾
2 (Green)	82-84.9	NL	½	50/10 min	¾	30/30 min	1
3 (Yellow)	85-87.9	NL	¾	40/20 min	¾	30/30 min	1
4 (Red)	88-89.9	NL	¾	30/30 min	¾	20/40 min	1
5 (Black)	> 90	50/10 min	1	20/40 min	1	10/50 min	1

- The work-rest times and fluid replacement volumes will sustain performance and hydration for at least 4 h of work in the specified heat category. Fluid needs can vary based on individual differences (± ¼ qt/h) and exposure to full sun or full shade (±¼ qt/h).
- NL= no limit to work time per hour.
- Rest means minimal physical activity (sitting or standing), accomplished in shade if possible.
- **CAUTION:** Hourly fluid intake should not exceed 1½ quarts.
- Daily fluid intake **should not exceed 12 quarts.**
- If wearing body armor add **5°F** to WBGT in humid climates
- If wearing NBC clothing (mission-oriented protective posture (MOPP 4)), add **10°F** to WBGT index for easy work, and **20°F** to WBGT index for moderate and hard work.

Easy Work = Walking hard surface 2.5 mph <30# load, Weapons maintenance, Marksmanship training
Moderate Work = Patrolling, Walking sand 2.5 mph no load, Calisthenics
Hard Work = Walking sand 2.5 mph w/load, Field assaults

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

Aviation Safety Investment Strategy Team

Dr. Mike Cupples
U.S. Army Safety Center

Over the last 10 years, the Army has experienced a favorable trend of reduced aviation accident rates. It is generally accepted by Army leaders that these aviation safety successes have been driven by three factors: (1) a systematic process for developing aviation training, (2) the disciplined development of leaders, and (3) the introduction of system safety design principles into aviation materiel systems. However, since September 2002 and the beginning of the War on Terror, the increased operations tempo and worldwide deployments have resulted in an increase in aviation accidents.

Army Aviation is not risk averse. The high cost of training, however, combined with the harsh environments we expect our aviators to operate in daily equal high risk. As part of a risk management campaign to enhance readiness and protect the capability of the force, Army leadership directed that the Aviation Safety Investment Strategy Team (ASIST) chart a path towards improving aviation safety. The team was chartered to define measurable accident prevention goals and identify the most important Armywide investments to achieve these goals.

Specifically, ASIST will integrate accident prevention and risk management requirements into the aviation planning, programming, and budgeting system and prioritize and validate requirements in various areas of doctrine, organization, training, materiel, leader development, personnel, and facilities (DOTML-PF). The ASIST initiative responds to the increasing risks in Army Aviation operations, as well as to proposals from the Office of the Secretary of Defense to establish department-level aviation safety goals.

Defense Secretary Donald H. Rumsfeld challenged all the services to reduce accidents by 50 percent over the next 2 years, starting in May 2003. To contribute to the accomplishment of this goal, ASIST is analyzing all aviation accidents, identifying significant hazards and controls, and providing relevant results to enhance Army readiness through aviation safety improvements.

A series of ASIST aircraft-specific analysis working groups have convened for the MH/UH-60, MH/CH-47, and AH-64A/D helicopters during January, February, and March 2004, with future analysis groups scheduled for the remaining aircraft from April through June 2004. The analysis covers Fiscal Year 1999 to present—to include available accidents in Iraq and Afghanistan—and will update the ASIST master database for applicable aircraft types.

Identified aircraft hazards, preliminary associated controls, and other relevant information were loaded into a Microsoft Access database on a laptop during each analysis group meeting. Twenty-five or more subject matter experts representing the following organizations worked together to analyze the aviation Class A, B, and C accident reports.

- U.S. Army Safety Center
- U.S. Army Aviation Center (USAAVNC) Aviation Branch Safety Office (ABSO)
- U.S. Army Aviation and Missile Command (AMCOM) Safety Office
- Aircraft Product Manager's Office
- Program Executive Officer-Aviation (PEO-AVN)
- Aviation and Missile Research, Development, and Engineering Center (AMRDEC) Aviation Engineering Directorate (AED)
- U.S. Army Research Laboratory (ARL)-Human Research and Engineering Directorate (HRED)
- U.S Army Aeromedical Research Laboratory (USAARL)
- U.S. Army Training and Doctrine Command (TRADOC) System Manager
- 1st Battalion, 223d Aviation Regiment, USAAVNC
- 1st Battalion, 14th Aviation Regiment, USAAVNC
- Directorate of Training and Doctrine (DOTD), USAAVNC
- Directorate of Combat Developments (DCD), USAAVNC

The updated ASIST database should produce more descriptive and informative reports and tables that will be available to influence Army Aviation DOTML-PF in the near future and annual fiscal program objective memorandum (POM) development drills.

The ASIST is chartered and guided by the Commanding Generals of the USAAVNC and AMCOM, the PEO-AVN, and the Director of Army Safety (DASAF). The success of this analytical effort continues to be the ability to identify hazards and controls based on the analysis of actual aircraft accidents. Establishing measurable objectives and directing a plan to achieve them is an important step from senior Army leadership toward making aviation safety a proactive, requirements-based program. ASIST and the associated activities of the Army Safety Coordinating Panel provide a sound basis for Army participation in the Department of Defense Safety Oversight Council and the Army Safety Campaign Plan. ♦

—Dr. Mike Cupples, Senior Systems Safety Engineer, Aviation Systems and Aircraft Investigation Division, USASC, DSN 558-9858 (334-255-9858), e-mail mike.cupples@us.army.mil

Coming Soon to a Unit Near You ACTE

Aircrew Coordination Training Enhancement

In early 1998, the Army identified the need for a comprehensive effort to revitalize, sustain, and maintain the Aircrew Coordination Training (ACT) program. The results of their study included an imperative to design, develop, and implement a fully integrated, continuous ACT program. ACT was taught in a traditional manner, using slides and lecture-based course material. Although somewhat effective, this type of generic instruction was not designed for updates or continuous refinement. In March 2003, ACT Refresher requirements were added to reinforce the original training.

The U.S. Army Safety Center (USASC) has teamed with the U.S. Army Aviation Center (USAAVNC) to provide commanders with a single-source training solution aimed directly at improving the crew and team coordination effectiveness of Army aircrews and aviation leaders in their day-to-day mission planning and flight operations. This new ACT program, entitled Aircrew Coordination Training Enhancement (ACTE), is now ready for implementation.

ACTE uses state-of-the-art instructional courseware to collect all existing training requirements and allow for automated updates. ACTE provides behaviorally-based, mission-oriented initial and sustainment training with Web site-based, periodic updates. Strategies for training and evaluating ACT behaviors will include tools and techniques relevant to aircraft and unit missions. Scenario-based practice sessions will complement the Army's risk management process by applying ACT skills to reduce crew-level errors and to monitor and manage errors arising during a mission.

ACTE will be deployed to the entire aviation community over the next year, with the intent to provide the first training to those units with impending deployments. The program will be taught using Classroom XXI facilities. If these facilities do not exist, the training team will provide instruction using laptop computers preloaded with the required courseware.

The U.S. Army Safety Center has teamed with the U.S. Army Aviation Center to provide commanders with a single-source training solution aimed directly at improving the crew and team coordination effectiveness of Army aircrews and aviation leaders in their day-to-day mission planning and flight operations.

During initial fielding and instruction, USASC will manage the program, providing a course manager, training calendar, and travel coordination. The Directorate of Evaluation and Standardization (DES) will administer the program using a four-to-six person mobile training team. Upon completion of initial unit training, USASC will transfer control of the entire program to USAAVNC.

The program is exportable, tailorable, and non-disruptive. The certified ACTE trainers will deploy to your unit home station or forward-deployed location and provide train-the-trainer (TTT) instruction to standardization pilots, senior instructor pilots, and standardization instructors. Once these personnel have completed the required 4-day TTT course, battalion or company commanders can weave TTT-taught instructor pilot, pilot-in-command, and pilot training into existing training schedules. The only burden will be accessing a computer with a CD-ROM drive!

Although a final training schedule has not been established, initial plans include immediate train-up of active-duty, Guard, and Reserve units preparing for deployment. Training for active-duty units will be completed at home station, while Guard and Reserve training will be conducted at centralized training facilities. Training might include simulator and aircraft scenarios in addition to classroom scenarios, depending on available resources.

Undoubtedly, proper use of ACTE can provide commanders with another tool to ensure all crewmembers are fully trained and able to execute the full spectrum of Army Aviation operations. Those units desiring priority training or more information should contact MAJ Steven Van Riper at steven.vanriper@safetycenter.army.mil or CW5 Eric Schimmer at eric.schimmer@safetycenter.army.mil. ♦

TSAS: Can It Save Lives and Aircraft?

Braden McGrath, Ph.D.
NAS Pensacola, FL

Spatial disorientation (SD) and its effects and remedies have been taught in physiology training and reviewed in every ready room repeatedly, yet we continue to lose aircraft and lives. Based on accident rates for the Air Force, Navy and Army, SD accidents result in the tragic loss of 40 lives on average per year. The cost of SD accidents also includes mission failure, the impairment of mission effectiveness, the monetary value of aircraft and equipment lost, and fatalities and disabilities. The estimated annual materiel cost of SD accidents is in the billions of dollars. These figures are staggering and, in today's military aviation, there is an added emphasis on night flying, all-weather capability, and low altitude missions, all factors that increase SD.

CAPT Angus Rupert at the U.S. Naval Aerospace Medical Research Laboratory (NAMRL) developed the Tactile Situation Awareness System (TSAS). TSAS uses the sense of touch to provide SD and situational awareness (SA) information to aircraft operators, especially in degraded visual conditions. The system consists of a matrix of tactile stimulators (tactors) embedded into a lightweight air-cooling vest originally developed by Defence R&D Canada. The vest is modified with a quick-disconnect fitting (which does not impede egress in an emergency) and supports the tactors in close proximity to the torso.

The environments and utilization for TSAS are numerous. TSAS is designed to improve aircrew SA, reduce aircrew workload, and demonstrate potential suitability for the missions of military aviation. Used in a tactical environment in unforgiving terrain and brownout conditions, the system can provide pilots and aircrews with the aircraft's flight condition. When flying in this severe environment, TSAS provides SA and the ability to maintain an outside scan while trying to recognize ground cues to make a landing. TSAS also is designed to provide missile warning and terrain SA by using variable frequency directional inputs.

Using data from existing aircraft sensors or a custom self-contained sensor package for non-bus aircraft, TSAS obtains the aircraft position, velocity, attitude, altitude, and threat information. Similar to pages on a multi-function display, TSAS has the following modes that display critical information needed during a particular phase of flight:

- In the hover mode, TSAS provides horizontal drift and vertical altitude information.
- In the forward flight mode, TSAS provides attitude and altitude cueing. It also can provide backup navigational cueing in conjunction with existing navigation displays.
- In the approach mode, the system provides glide slope and course information, as well as airspeed deceleration information.
- In the threat mode, TSAS provides the threat direction and general distance to the pilot without the pilot actually having "eyes on." As the aircraft is turned, the tactors continuously provide threat position and relative distance. This mode of operation enables the pilots to fly with their eyes outside the aircraft in a hostile environment.

The Army's 160th Special Operations Aviation Regiment (SOAR), with funding from Special Operations Command (SOCOM), specifically requested that TSAS provide approach cueing for

Figure 1: TSAS testing in aircraft and simulators

a pilot-adjustable hover altitude, as well as a zero-zero, no-hover landing. This cueing provides deceleration and lateral drift information during the approach and will aid in alleviating brownout and whiteout landing accidents. A recent review of Army operational accidents for Fiscal Years 2002 and 2003 predicts that TSAS could have helped prevent up to 66 percent of these accidents.

The TSAS has been tested in the CV-22, MH-53M, and the MH-60K simulators, and the UH-60A, MH-53M, and Canadian Bell 205 aircraft (figure 1).

The consensus from the helicopter pilots that have participated in the various simulator and flight tests is that TSAS can save lives and aircraft. Results suggest that TSAS reduces pilot workload and increases flight safety by decreasing instrument-scanning requirements while flying in degraded visual conditions. Qualitative and quantitative data showed that hover performance improved with TSAS usage (figures 2 and 3, respectively). The system is intuitive, easy, and simple for pilots to learn. Within 2 minutes in the simulator, pilots were able to hover without the aid of visual instruments.

One Army pilot commented that in instrument meteorological conditions (IMC), the TSAS vest could be the difference between mission success and an accident. A Marine pilot said that of all the gear and equipment tested for aviation, the TSAS was perhaps the most practical item that had major potential in giving pilots useful information in a non-encumbering manner.

An added benefit of the system is the cooling effect provided by the air-cooling vest. TSAS currently provides ambient air through the vest to provide the pilots with some cooling and can be modified to provide heated and chilled air through the system. The weight, size, ease of installation, relative affordability, and potential aircraft and aircrew survivability make this system a promising technology for Army Aviation (figure 4). ♦

—Braden McGrath, Ph.D., is a Research Aerospace Engineer with the Henry M. Jackson Foundation and is assigned to the NAMRL, NAS Pensacola, FL. He can be reached by calling DSN 922-4441 (850-452-4441) or e-mail brad@namrl.navy.mil. Dr. McGrath received a Ph.D. in Aeronautical Engineering from the University of Sydney and a Master of Science in Aeronautics and Astronautics from the Massachusetts Institute of Technology. He has 14 years' experience in military research and development applicable to aircraft avionics and simulator design related to SD. He currently is the Principal Engineer for the Spatial Orientation Systems Department at NAMRL.

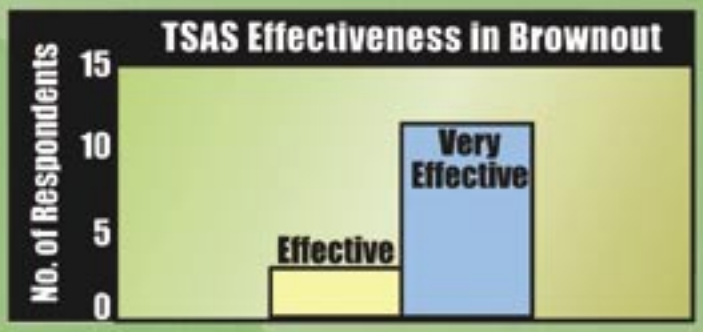

Figure 2: Questionnaire if TSAS cues are effective when hovering in brownout conditions. (Data are from 15 160th SOAR pilots representing a total of 216 years of military service.)

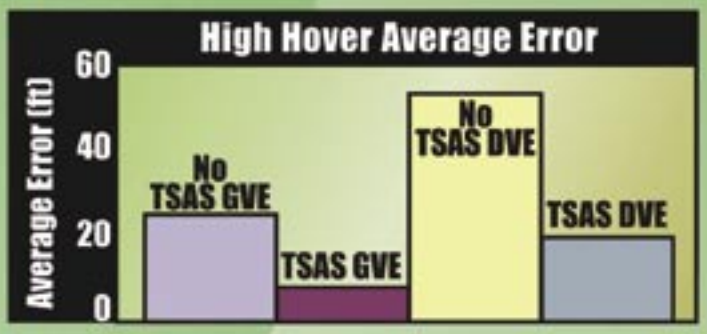

Figure 3: Hover error in good visual environment (GVE) and degraded visual environment (DVE) with and without TSAS cues. (Data are from 11 pilots [Army, Air Force, and Canadian] directed to maintain a stable 150-foot hover over a point on the airfield.)

Figure 4: TSAS system

Can You Lead Us Home?

COL Curt Potts and LTC Dan Williams
3rd Infantry Division
Fort Stewart, GA

Here is another success story of a unit that trained effectively in preparation for Operation Iraqi Freedom (OIF) and made it home to tell about it.

It was 13 March 2003, and this was the final rehearsal for the first battle of the campaign the world knows now as Operation Iraqi Freedom (OIF). The mission was to destroy the border observation posts along the Iraqi-Kuwaiti border. The plan called for a joint and combined operation involving Army attack aviation, artillery, and Air Force air power, and was precisely timed with cruise missile attacks deep inside Iraq. This was the kickoff for a ground invasion for the 3rd Infantry Division (3ID).

The mission had been planned and rehearsed many times from the operational level down to the individual crewmembers in each cockpit. The aviation brigade was 3ID's main effort for this operation. The aviation brigade commander controlled and commanded this mission from a C2 UH-60 console aircraft. The brigade operation had two companies of AH-64D Longbow Apaches, and the battalion commander from 1-3rd Aviation Battalion had 13 aircraft. The 2-3rd General Support Aviation Battalion supported this operation with a C2 UH-60, four standby UH-60s with immediate personnel recovery teams onboard, and six MEDEVAC aircraft.

We knew combat was imminent, we just didn't know how soon it would happen (one week later). This rehearsal was a high-profile, corps-level operation run to precise timings on a tactical satellite (TACSAT) communications suite of radios. Unfortunately, the weather didn't cooperate with our plans for war.

About a month earlier, a UH-60 Black Hawk had encountered inadvertent instrument meteorological conditions (IIMC) and crashed, killing all onboard. The rapid buildup for war brought many units together from all over the world; some of those units were used to flying in many different kinds of environments. However, IIMC recovery plans, in-depth procedures, and aviator in-country experience were all in a state of development at the time of the crash. As a result, our task force paid particular attention to the weather on 13 March.

Our attached Air Force weather detachment gave the report "500–2." We were looking for 1,000–3, especially since the fine dust that seemed to hang in the air over Kuwait was especially bad that week. It coated everything like a fine powder. We mitigated the risk by using our best crews and executing additional rehearsals. Then we launched.

On the night of the mission, illumination was zero percent, which we had all trained for, and the dust clouds were thick. Still, the time had come for combat

and we felt the pressure to execute. This was real, and we had to do it! At 2100 local, the armada took off fully loaded and integrated with all the corps assets that would make this operation successful in battle. The Air Force cancelled due to weather. Their part would be simulated.

In our Longbow battalion, all the front-seaters wore night vision goggles (NVGs) as an aid when forward-looking infrared (FLIR) conditions were less than optimal. I remember how bad the target acquisition and designation sight picture was that evening. The dust was thick and prevented all but the hottest targets and ground features from showing up. The Kuwaiti desert looked like one large pool table, and we were "game on." I also remember looking through the UH-60 crew's NVGs and thinking they were much worse off with no FLIR.

What saved the Apaches that night has worked many times over the years—embedded FLIR symbology and a knowledge of obstacles along the route. Those two factors created confidence as a counterbalance to a first-generation FLIR on a bad night. I thought about our C2 UH-60 pilots in the front and the brigade commander in the back working the myriad of necessary joint and corps-level communications suites, to include TACSAT. The best pilot in the brigade, the brigade standardization instructor pilot (SP)—a CW5 and Master Army Aviator—was at the controls. I knew we would pull this off!

About 10 minutes from the airfield, I heard transmission calls from the UH-60 about the weather. "Can you guys see anything up there?" and "This stuff is thick!" Much of the same was transmitted on internal secure nets between my commanders, but we all felt the pilot night vision system symbology and flat desert terrain would allow us to continue.

I was flying about 5 rotor discs behind my B Company, and the UH-60 was about 10 discs behind me. We were all blacked out and traveling about 120 knots a few hundred feet off the sand en route to our attack by fire positions. This was the kind of night flying that leaves you a little nauseous and dry-mouthed, and one in which key aviation leaders must participate in the air if they are to earn and keep the respect of their aviators.

In the back of the UH-60, the brigade commander was pleased with the effectiveness of the complex command and control communications suite. His code words had precise meaning to the ground artillery, Air Force, intelligence, and division and corps-level ground commanders. However, he suddenly began to sense uneasiness in the cockpit. He asked the experienced crew if everything was all right. They commented on the weather and thought they could still make out the battalion commander's Apache. The flight continued and the weather deteriorated to a steady condition, but marginal, even for a final combat mission rehearsal exercise (MRE).

In the 21st century, precise navigation systems due to global positioning system technology and heads-up display (HUD) functions have greatly pushed the envelope for night and poor weather flying. Without these types of technologies, none of us could have flown that mission. But that night, even those technologies had problems in the Black Hawk.

Again, discussion in the UH-60 cockpit ensued and button-pushing began. The brigade commander asked, "Is

everything okay up there?" The brigade SP replied, "Sir, we've lost our HUD and our GPS isn't working. We have no navigation and I can barely see the Apache—I've lost him!"

The aircraft slowed to about 50 knots, causing the distance between the battalion commander and the brigade commander to increase exponentially as the mission continued. "Sir, we're going to have to land or go back; I have no navigation and can't see anything."

The brigade commander, a seasoned combat veteran, knew he would fight another day and the Apaches would continue with the rendezvous as briefed and accomplish the mission. He called the battalion commander. "Viper 06, this is Falcon 06, we have lost our onboard navigation and cannot see your flight. Can you see us and can you lead us home?"

I turned the battle over to my senior company commander and gave instructions to continue the mission. We then broke with the flight. We moved cautiously back up the route with a reduced airspeed as we searched for the UH-60, trying to avoid a midair collision. At about 50 discs away, we asked the Black Hawk pilot to flash his position lights. He did, and we soon found him. We passed the UH-60 on the right and returned slowly to Camp Udairi.

Once safely on the ground I calculated my fuel and checked the mission timeline. I asked the brigade commander to allow me to return to the route, link up with my companies, and continue the MRE. He told me to be careful and make all calls on FM to the division. The lack of TACSAT in Apaches during OIF made the use of UH-60 aircraft a necessity, yet the ability to fly in adverse weather differs from airframe to airframe depending on the encountered conditions. Aviation leaders must be aware of these differences and maximize their capabilities under all conditions.

I took off again and flew in relative silence for about 20 minutes until barely audible FM communications broke over the waves. I contacted my companies on their internal UHF HAVEQUICK nets and determined they were precisely on timeline and about to engage the targets. I assumed the battle, took over the sync matrix calls to higher headquarters, and completed the mission.

Would we have done anything different? No, probably not. We had planned and briefed the mission thoroughly. We had conducted multiple rehearsals at the brigade, battalion, company, and platoon levels. The weather was legal and initially good for the mission. Crews were battle-rostered according to experience. We had 6 months of desert training under our belts, and the brigade's leadership was involved in every facet of the mission. We flew the aircraft we were issued to the limits of their capabilities in the conditions we encountered. We were going to war! War is always a "come as you are" proposition. We had trained under blackout conditions and in less-than-favorable weather before. The Black Hawks were necessary for command and control and a valuable part of the brigade's attack mission. Key leaders and decision makers were present in the flight and evaluated and took the same risks asked of their aviators.

This is a true vignette and an example of what we call the "brotherhood of war." Just a week later and after the successful destruction of 13 observation posts by our unit, my pilot in command and I lost most of our onboard flight and navigation systems after taking fire and conducting evasive maneuvers. "Viper 06, this is Falcon 06, can you lead us home?" would be replaced with "Falcon 06, this is Viper 06, can you lead us home?" But that's another story in itself. ♦

—COL Curt Potts, "Falcon 06," is the commander of 4th Aviation Brigade, 3ID. He can be reached by calling DSN 692-8469 or by e-mailing curtis.potts@stewart.army.mil. LTC Dan Williams, "Viper 06," is the commander of 1-3 Attack Battalion. He can be reached by calling DSN 352-6217 or by e-mailing daniel.williams1@us.army.mil. Both COL Potts and LTC Williams are Master Army Aviators. They recently returned from OIF.

Your Opinions Can Change Things!

Tired of inconvenient, uncomfortable, inadequate, or hard-to-use seatbelts in Army vehicles or aircraft? Do you have an idea for making those seatbelts more user-friendly, comfortable, and effective?

Now is the time to make your opinion known! The U.S. Army Aeromedical Research Laboratory would like to hear what you've got to say. Just take a few minutes and fill out their seatbelt questionnaire at **www.usaarl.army.mil/seatbelt/seatbelt.htm**. All suggestions or comments will be kept confidential.

—For more information, contact Mr. John F. Gouda, USAARL, Fort Rucker, AL. He can be reached by e-mail at john.gouda@us.army.mil.

www.usaarl.army.mil/seatbelt/seatbelt.htm

From Our Aviation Branch Chi

Effective February 23, 2004, the Army announced the initial results of its ongoing review of Army Aviation. The comprehensive review has produced several strategic recommendations that will be acted on now to ensure Army Aviation meets the current and future challenges of an evolving operational environment and incorporates lessons learned from the Global War on Terrorism. BG E.J. Sinclair, our Aviation Branch Chief, gives us an update.

The lessons learned after 2½ years of war have provided our Army and our branch the opportunity to assess known requirements and build increased capabilities to meet the threats of the operational environment. Several recent decisions on modularity, force stabilization, and Active Component/Reserve Component (AC/RC) optimization reflect many of the changes our Army has made to maintain its relevance and readiness. Each of these decisions increases lethality, enhances combat capability and unit cohesiveness, improves Soldier and unit predictability, and balances force requirements.

Based on a comprehensive review of Army programs conducted by the Aviation Task Force, we have made some strategic decisions that fix Army Aviation now and improve future capabilities. As a result, we will restructure aviation organizations to reflect current and anticipated needs, increase aircraft survivability, sustainability, and operability, divest programs that no longer meet the needs of the changing operational environment, and extend aviation capabilities beyond the 2020 timeframe. These strategic aviation decisions support the termination of Comanche. By using the resources currently allocated for 121 Comanche platforms, we can accelerate transformation of Army Aviation to meet our needs through the next two decades.

> **"Our Soldiers deserve the best equipment and support that our Nation can provide to them, especially during this period of national emergency."**
> **BG E.J. Sinclair**

We must ensure all concerned fully understand the positive impact of these decisions. Our Soldiers deserve the best equipment and support that our Nation can provide to them, especially during this period of national emergency. We must ensure they understand that lessons learned in 2½ years of war have greatly amplified our abilities to assess and develop future capabilities to meet 21st Century security challenges and changes in the threat. These assessments have resulted in decisions that will propel Army Aviation in a way that will greatly improve our combat capabilities in the near term and in the future.

All of the resources allocated to the Comanche program will be reallocated within

Army Aviation programs. This will allow us to restructure and revitalize Army Aviation to meet our current and future needs. Specifically, the revitalized Army Aviation program will:

■ Accelerate aircrew protection and Aircraft Survivability Equipment (ASE) fielding initiatives to meet the current and evolving threat while providing every aircraft with the best possible equipment.

■ Recapitalize 1,400 aircraft to extend aviation capabilities beyond 2020.

■ Acquire almost 796 new aircraft (through FY11) to meet our requirements—this is in addition to the 101 UH-60s and 6 CH-47s already in the FY05 budget, so we really end up with 903 new aircraft.

■ Add $300M to accelerate the unmanned aerial vehicle (UAV) program to extend battlefield awareness and strengthen manned-unmanned teaming.

■ Transform Reserve and Guard aviation by replacing 870 aging aircraft (422 UH-1s and 458 OH-58s) with 303 Light Utility aircraft. This will also allow us to standardize AC and RC aviation organizations.

■ Leverage the technology base and knowledge gained through the Comanche program as appropriate and invest in joint aviation programs for the future.

■ Fund a new aviation munitions strategy that ensures we have missiles and rockets to meet our wartimes requirements and our training requirements. It will fill the gap in rockets shortages for training impacting our aircrews.

■ Allow us to integrate combined arms and support (CAAS) cockpits and fly by wire technology into our UH-60 and CH-47 fleets, greatly reducing maintenance requirements and the logistics tail.

■ Implement the multi-functional aviation brigades immediately and should be completed within 3 to 4 years. 3ID has already begun to reorganize under this structure and we will accelerate the reorganization Armywide.

■ We will implement the two-level maintenance concept by FY08 and will field a common aviation logistics automation system—CTS-A while the CH-47 fleet retains AMAC beginning this year.

I hope this gives you a better understanding of why some decisions were made. It will take the 100 percent support of every Soldier in our branch to successfully execute this strategy. It is truly exciting times in our branch. If you have any questions, please fell free to ask. But, again we need to speak with one voice and move our branch forward. ♦

Above the Best!

BG E.J. Sinclair
Commanding General
U.S. Army Aviation Center

Knowing Your Enemy

LTC Joel E. Best and CW5 Michael A. Moore
HAATS, COARNG

This enemy has killed many of our friends, destroyed countless aircraft, wrought havoc in units, and wasted valuable assets. It is without emotion, beliefs, or motives. Fearless and uncompromising, it cannot be reasoned with. What is this most lethal of enemies? It is all around us—it is the environment.

The enemy without

The evidence continues to mount; the environment can be and often is *more* lethal to the successful accomplishment of Army Aviation's mission than the human enemy. The most recent proof is the spate of brownout accidents in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), as well as high, heavy, and hot accidents in Afghanistan. Together these operations account for over 75 percent of recent accidents. Whether it is brownout or whiteout, high-density altitude, mountainous terrain, high gross weight, desert operations, or night vision systems, we are suffering too many incidents and accidents from this enemy.

It doesn't matter if accidents occur in Southwest Asia or at home station. The net result is the same: an unnecessary loss of our national treasure—the lives and aircraft needed to sustain readiness and relevancy. The Center for Army Lessons Learned (CALL) and *Flightfax* have correctly identified the environment as a significant threat, yet accidents continue to mount.

How, then, do we defeat this environmental enemy? "Risk management," you say. How do we assess environmental risk when we do not understand its complex nature? Aircrew coordination? What good is crew coordination if we do not understand what to say and when to say it? Both risk assessment and crew coordination are two legs of a three-legged stool. The third leg is power management. Let's get some facts on the table about power management.

First, power management is not a more complex performance planning card with superfluous data that masks relevancy. Power management is a particular training method that enables aircrews to derive maximum utility from the aircraft in any environment while mitigating risk and expanding versatility (see the June 2003 *Flightfax*). It includes power references in the standards of tasks wherever possible.

An effective power manager is a master of the aircraft, the environment, and himself. Power management is an objective standard for deducing how well you have mastered this trinity. With the additional insights and skill provided by power management techniques, aviators are prepared for the challenges posed by the lethal environments in which we routinely operate but, as yet, fail to understand.

The enemy within

"We have met the enemy and he is us." The helicopter was developed to free our Army from the tyranny of terrain. The lessons of Vietnam, where air mobility came to fruition, are again here for the learning. The challenges of mountainous terrain, high-density altitudes, brownouts, and night vision goggles are not new. Nor are the requisite responses to these challenges new. Specific, consistent, environmental-based training and incorporating high standards are the means by which this enemy will be defeated. These environmental conditions share similar traits. We need to reflexively recognize those traits and threats; know their specific impact in terms of aircraft power, controllability, and orientation; and be able to correctly determine the result.

Power-referenced training, as conducted by the High Altitude Aviation Training Site (HAATS), demands precision execution that leads to the awareness and skill levels required to accomplish the defeat of this lethal foe. We cannot continue to train for the environmental enemy on occasion. The development of a habit formation that allows us to reflexively and correctly see, assess, and act on short notice demands that we train to power management standards continuously. Negative habit formation, stemming from training at or near sea level in light aircraft with abundant power is killing us when time and power are marginal.

For a more comprehensive overview of actual power management protocols, please review the aforementioned June 2003 *Flightfax*. HAATS, located in Eagle, CO, serves as this Nation's pre-eminent power management mountain training site. We stand ready to assist you in the development of effective environmental training programs that will defeat the environmental enemy of today and tomorrow. For more information on HAATS training programs, please contact us at DSN 877-8180 or visit our Web site at **http://www.coloradoguard.com/webpages/haats_flash.htm**. Our objective is to ensure Army Aviation remains high "Above the Best." ♦

—LTC Joel E. Best, HAATS Commander, COARNG, DSN 877-8180 ext. 2928 (303-677-8180 ext. 2928), e-mail joel.best@co.ngb.army.mil and CW5 Michael A. Moore, HAATS Standardization Instructor Pilot, DSN 877-8180 ext. 2922 (303-677-8180 ext. 2922), e-mail mike.moore@co.ngb.army.mil.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

CH-47

D Model

■ **Class C:** While hovering over a slingload with a 16- to 21-knot tailwind, the ground crew was unable to hook the load to the aircraft. While the pilot attempted to reposition the aircraft, the crew controlling the load in the cargo area changed duty positions without coordination with the pilot. The flight crew did not realize the ground crew had placed the sling on the forward hook. As the aircraft began to move forward the load was dragged, causing it to tip over and toss the hookup team on the ground.

MH-47

E Model

■ **Class A:** After returning to the airfield for passenger pick-up, the crews of two MH-47E aircraft requested clearance to ground taxi to the airfield refueling point. Tower cleared Chalk 1 into Point 2 and began refueling operations. Subsequently Chalk 2, after completing passenger upload, received instructions to ground taxi into Point 3. Chalk 1, monitoring the call, requested that Chalk 2 be cleared into Point 4 so Chalk 1 could depart the refueling point without being obstructed by Chalk 2. As Chalk 2 attempted to ground taxi past Chalk 1, the forward and aft rotor systems contacted Chalk 1's aft rotor system. The crews of both aircraft immediately shut down the engines. The collision damaged nine rotor blades and one forward and two aft rotor heads. No personnel were injured. (This mishap occurred in 2002; however, the Safety Center is just now receiving the report.)

TH-67

A Model

■ **Class B:** The aircraft rolled over onto its right side after liftoff to a hover. The main rotor system contacted the ground. Investigation is ongoing.

OH-58

D(R) Model

■ **Class A:** Aircraft crashed for unknown reasons. The two pilots suffered fatal injuries. Investigation is ongoing.

■ **Class A:** Aircraft struck wires and crashed into a body of water. The two pilots suffered fatal injuries. Investigation is ongoing.

■ **Class D:** During hover flight to parking, the pilot in command (PC) initiated a left pedal turn to position the aircraft over the parking pad. The copilot heard a thumping sound during the turn. The aircraft landed on the pad without further incident. Post-flight inspection revealed damage to the lower portion of the vertical fin. The damage was determined to be non-repairable, so the vertical fin was replaced.

UH-60

A Model

■ **Class C:** The maintenance test pilot identified a generator failure during run-up for a post-phase maintenance operational check. The mechanic reported that the input module housing was glowing red and that he smelled burning oil. The aircraft was shut down immediately. Post-mishap inspection revealed that an internal plug was left in the oil return line from the input module and restricted oil flow back to the transmission.

■ **Class D:** The aircraft's nose door came open on short final to the runway and damaged the center windshield and OAT sensor. The pilot took the controls and landed and taxied the aircraft to parking without further incident.

L Model

■ **Class D:** While performing a single-ship, opposite-direction, right-hand turn out of a two-ship formation flight, Chalk 2 encountered unexpected bright lights from a nearby city. The lights nearly shut down the PC's night vision goggles (NVGs), and rain on the aircraft's windscreen caused a halo effect and further blurred his vision. The PC looked away from the lights and did not notice a descent in the turn. When the PC leveled the aircraft, the crewmembers heard a thumping sound. The crew performed a precautionary landing and shut down the aircraft. Damage to one blade tip cap, an antenna, and an anti-collision light was found. A tree strike is suspected.

C-12

F Model

■ **Class D:** While passing 12,000 feet on climb-out, the pilot allowed the #1 engine N_1 speed to rise to a maximum of 101.7 percent for 19 seconds (101.5 percent being normal). The flight was terminated because of fuel weight at the time of the incident. The engine monitoring system showed no overspeed or abnormal indications during the event. However, the engine manufacturer said the engine needed to be replaced. The engine was found to be within tolerances after further testing.

Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

THEY FIRED THE FIRST SHOTS OF OIF
NOW, THEY'RE BACK
1-3 AVN
BACK FROM IRAQ III
VIPERS STRIKE TO KILL
THE BOEING COMPANY IN ASSOCIATION WITH THE U.S. ARMY PRESENTS A KLOPPER-FERGUSON-HARDING PRODUCTION OF "BACK FROM IRAQ III"
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CW4 VINCENT STELLA / CW3 JON LARUE / CW3 MIKE MADURA / CW2 MATT ROWE / SFC DON ELDER / SFC DANNY PATNEAUDE
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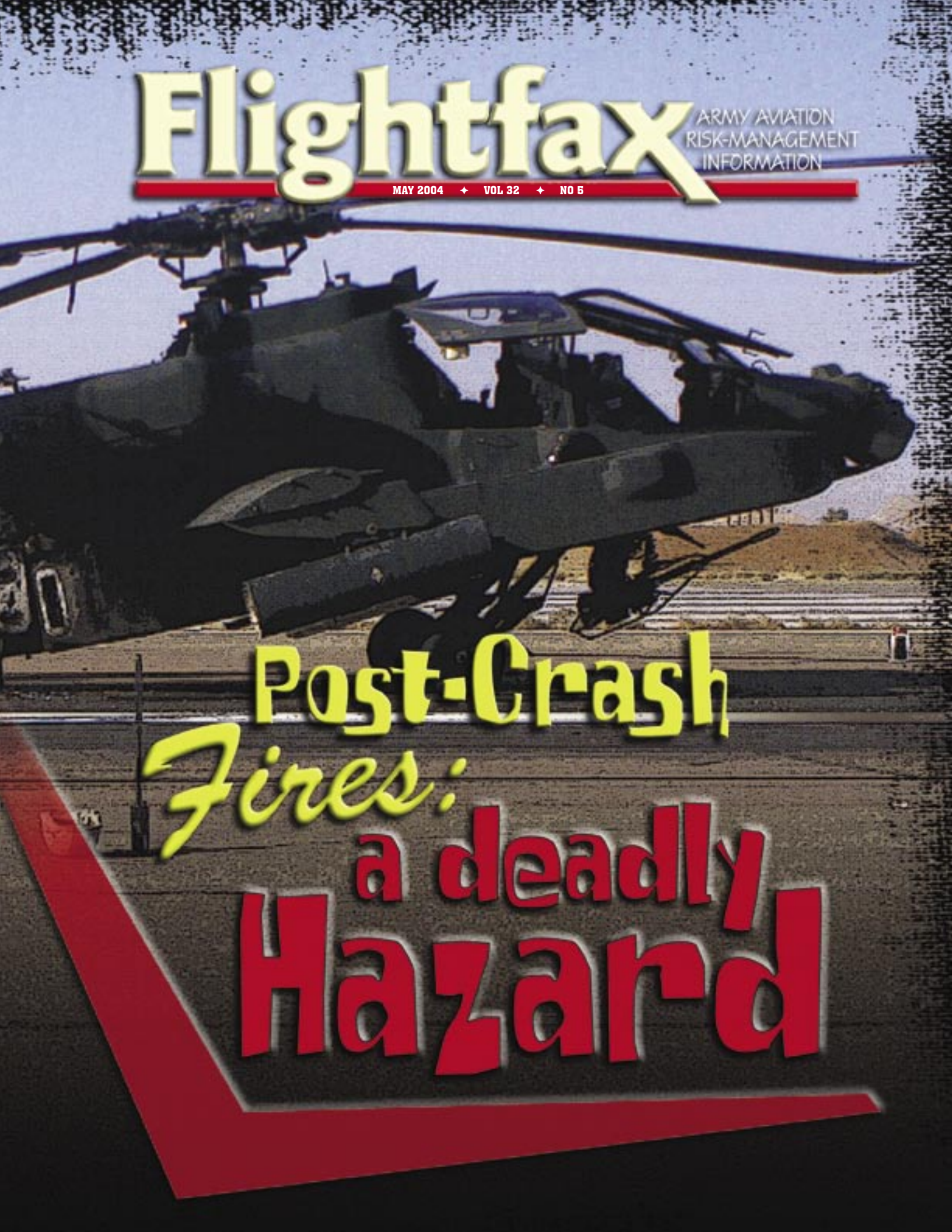

Post-Crash Fires: a deadly Hazard

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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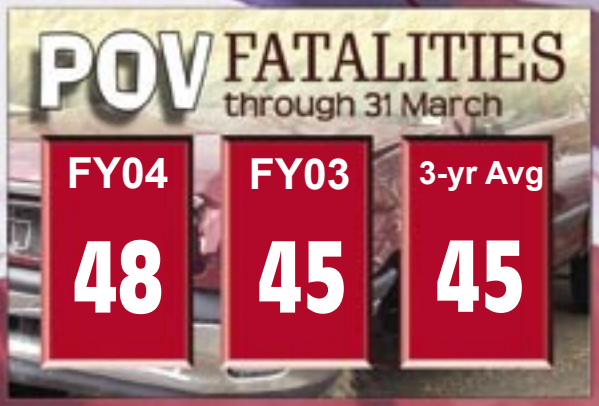

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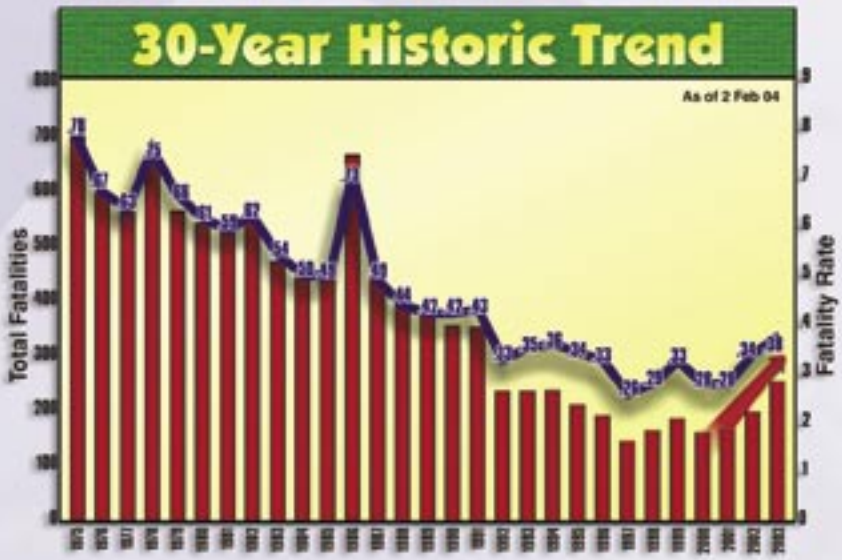
JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

Why Paragraph 6 Won't Cut It Anymore

The steady reduction in Army accidental fatalities between 1975 and 2000 is one of the Army's true success stories. During these years, we came to recognize that protecting Soldiers' lives was vital to preserving our combat readiness. As an Army, we developed a series of programs designed to aggressively attack the three main accident categories: materiel failure, environmental conditions, and human error. During those 25 years, safety modifications to our equipment have made materiel failures extremely rare. In addition, aggressive research programs and control measures have radically decreased the number of accidents caused by environmental conditions. The most significant factor was the emphasis on safety by senior leadership. That emphasis resulted in a decrease in the number of Army accidents caused by human error.



Since Fiscal Year 2000, the Army has experienced a troubling increase in accidental fatalities. The number of environmental and materiel causes remains low, and senior leadership emphasis continues to be strong. In fact, senior leaders are energizing the system to promote risk management. The major commands are actively involved, and their safety programs have some great initiatives. So where are we falling short? Clearly, the Global War on Terrorism has increased our Soldiers' exposure to risk as they conduct 7-day-a-week operations throughout 120 countries. But there is more to the story . . . .

A careful study of the root causes of Army accidents over the last 12 months has identified a glaring trend: the failure of junior leaders to properly manage risk. Company-level planning and troop-leading procedures routinely fail to mitigate our most basic hazards. In the air, crews conducting pre-mission planning are not properly identifying wire hazards. In a 6-week period, we had four wire strikes and three destroyed aircraft, which resulted in six fatalities. On the ground, junior leaders are not following troop-leading procedures and, therefore, recons, pre-convoy inspections, and rollover drills and rehearsals are not mitigating risks. In the last 3 weeks three HMMWVs, an LMTV, and an M2 Bradley have experienced rollover accidents that resulted in six fatalities. Whether it is a platoon leader who fails to properly reconnoiter and supervise mission planning or a squad leader who fails to demand his soldiers wear seatbelts and not speed, most accidents can be prevented by basic actions at the junior leader level.

8 Troop-Leading Procedures

1. Receive the mission.
2. Issue the warning order.
3. Make a tentative plan.
4. Start necessary movement.
5. Reconnoiter.
6. Complete the plan.
7. Issue the complete order.
8. Supervise.

Operations Order

1. Situation.
2. Mission.
3. Execution.
4. Service support.
5. Command and signal.
6. Oh yeah, what about safety?!?

So, is our junior leadership to blame? If so, then how have they performed so admirably in every other facet of the Global War on Terrorism? Why would their ability to conduct risk management be any different? The truth is, as an Army we have failed to teach and coach our junior leaders on how to properly mitigate risk. We give our future leaders 1 or 2 hours of classroom instruction and, 3 months later, expect them to conduct risk management as a convoy commander in Baghdad. More often than not, the cadre at our schools complete the field training risk management plan without including their students in the process. How can we expect junior leaders to understand and use risk management if we don't give them the chance to practice it during their troop leader procedure training? Simply put, we can't.

How are we doing in the field? We are not teaching our junior leaders the right lessons. We teach them that risk management is, literally and figuratively, paragraph 6 of their operations order—*an afterthought*. By this, they infer safety is a restriction to their training or mission. However, when safety is embedded early in the mission-planning process, the unit can implement better control measures and conduct more challenging training.

Safety is not about being risk averse. It is about mitigating risk so everyone makes it home from a hard mission to fight another day. Our most powerful control measures are standards and discipline. Special Operations forces regularly conduct complex missions around the world, but do so with one basic premise: do the basic things right. Just by doing the basics to standard, any unit can make the tough jobs look simple. This is the attitude we need to instill in our Soldiers, especially our junior leaders.

The Safety Center is actively working with Training and Doctrine Command (TRADOC) to improve the quality of risk management training by taking it out of the classroom and embedding it into troop leading and field training. Furthermore, we are developing videos and interactive tools to improve our leaders' understanding of how to use our ASMIS-1, RMIS, and ARAS tools to conduct better risk management. In the interim we need every Soldier, regardless of rank, to stop treating risk management as an afterthought. As GEN Schoomaker has repeatedly stated, "We cannot afford to be risk averse, but we must be smart about managing our risks."

In 1992, the introduction of the 5-step risk management process resulted in an immediate reduction in Army accidents. Former Army Chief of Staff GEN Dennis Reimer's emphasis on reducing off-duty accidents in 1997 had a similar positive impact. These initiatives were successful because they inspired an immediate culture change. To curb the current accident trends and make the Army Safety Campaign a success, we also must inspire a culture change in the way we view risk management.

Our Army is at war. Be safe and make it home!

Joe Smith

LTC Anthony W. Potts
Product Manager for Apache Modernization and Recapitalization, PEO-Aviation

APU Clutch Failures Cause Damage in Apaches

It was a routine flight over the northern part of Iraq, or at least as routine as combat patrols had become during Operation Iraqi Freedom (OIF). Apache XX-05219 was in the traffic pattern setting up a downwind to final approach. However, this flight was soon to become anything but ordinary.

The crew was alarmed by an unusual growling noise coming from the aircraft. The growling sound was followed immediately by aircraft vibrations. Within the cockpit, through the hearing protection afforded by the integrated helmet and display sighting system (IHADSS) and over the drone of the engines and rotors, the crew detected a rhythmic thumping sound. The sound was accompanied by small impact tremors that seemed to coincide with the thumping.

Within 60 seconds of the first indications, the crew received an APU FIRE light, followed by an AFT DECK FIRE message. The situation worsened immediately. The ENG FIRE 2 light illuminated on the caution warning panel. Ground observers confirmed the worst; flames were seen trailing out of the back of the aircraft. Crash rescue rolled to the runway to await the stricken aircraft.

Ground observers confirmed the worst; flames were seen trailing out of the back of the aircraft. Crash rescue rolled to the runway to await the stricken aircraft.

The crew turned to set up a roll-on landing to get the aircraft on the ground as quickly as possible. The crew had the aircraft on the ground in less than 2 minutes after the first indications. At that time flames were rolling from the aft catwalk area. The crew exited the aircraft, and the crash rescue team worked to extinguish the fire. The once-amazing Longbow Apache sat on the runway, fire extinguished, but burned almost completely in half just aft of the main transmission.

While conducting a mission in the vicinity of Balad Army Airfield (AAF) 6 days later,

the crew of Apache XX-05211 received an APU FIRE warning light, followed by ENG 1 and ENG 2 FIRE advisory lights. The crew attempted to return to a safe area around Balad AAF. The wingman notified 211's crew that there were smoke and flames coming from the aircraft. The crew accomplished a controlled landing close to friendly forces and egressed the aircraft. Post-landing fire consumed almost all of the aircraft.

COL Ralph Pallotta, Apache Project Manager (PM), was notified within hours of the incident. He immediately stood up a Tiger Team that would be dedicated full-time to resolve the problem. I was selected to lead the Tiger Team. The mission was to determine the cause of the failures, provide an analysis of the associated risks, develop a fix, write the safety-of-flight (SOF) message, and ensure the logistics provisions were developed in parallel. We then were to export the fix to the field as rapidly as possible.

The situation that made this issue different from most other SOF issues was that we were at war. Since we were at war, the PM office had to find a solution without taking the aircraft out of the fight. The mere presence of the Apache on the battlefield caused rebel forces to retreat to safe havens. There was little doubt the Apache mission during combat escort or on border patrol prevented the loss of life every day in the Iraqi and Afghan theaters of operation. We had to work fast to keep the fleet in the air, yet do everything possible to minimize the risk to our crews.

The Tiger Team was comprised of the Project Management Office; Aviation Engineering Directorate; Integrated Materiel Management Center; Defense Logistics Agency (DLA); U.S. Army Aviation and Missile Command; Boeing Engineering; and Honeywell (who builds the APU clutch).

The investigation immediately focused on the APU clutch as the probable cause of the aircraft fire. A safety investigation determined that the APU clutch seized, and part of the APU clutch housing broke away from the APU. Connected to the end of the #7 driveshaft and spinning at 8,200 RPM, the broken housing began to beat violently throughout the engine deck. Fuel and hydraulic lines were severed, and the sparks generated by the metal-to-metal contact ignited the flammable liquids.

A safety investigation determined that the APU clutch seized, and part of the APU clutch housing broke away from the APU. Connected to the end of the #7 driveshaft and spinning at 8,200 RPM, the broken housing began to beat violently throughout the engine deck. Fuel and hydraulic lines were severed, and the sparks generated by the metal-to-metal contact ignited the flammable liquids.

Because of the extent of the damage, the root cause of the failure was extremely difficult to determine. However, we have a very good understanding of the conditions that contributed to the catastrophic failure of three APU clutches that led to extensive damage to three Apache aircraft (two D models and one A model).

As the investigation unfolded, we focused on the elements that were common to all three failures. The obvious factors were that all aircraft were operating in a desert environment. Potentially damaging elements associated with desert environments include sand and dust, along with periods of extreme solar heating. Interviews with field commanders also revealed that desert combat operations required extensive runtime on the APU. Indications were that APU runtime in the desert was as much as six to eight times what is experienced during peacetime operations.

We looked at some of the other countries that flew in similar environments to determine if they had experienced similar problems and, if so, what they were doing about it. We found that the Israeli Air Force had several clutch failures early in the life of their program (although not catastrophic), and had reduced their time before overhaul (TBO) on their

clutches to 250 hours. They also believed their failures were caused by high temperatures combined with extended runtimes.

We had seven clutches flown back from the OIF theater for immediate evaluation. On some clutches, we found that much of the grease was gone from the output duplex bearing. In some clutches there was evidence of heat discoloration. We also noted that some of the seals that separate the input and output sections of the clutch were damaged or weren't positioned properly, allowing oil to flow from the input to the output section, which can wash the grease away from the bearing.

Given these factors, we concentrated our efforts on the aircraft with the highest-time clutches. The team developed a procedure to allow disassembly, inspection, and repack of the grease in, or conditional replacement of, the duplex bearing in the field. While empirical data indicated that about 375 hours of "recorded" flight time on a clutch seemed to be the danger zone for this failure mode, there were sufficient outlying data that caused us to take a more conservative approach to mitigate the risk of a catastrophic clutch failure. It was decided to conduct the inspection at 125-hour intervals.

To establish the proper logistic trail, we ordered special tool kits required for the disassembly, including arbor presses, bearing repack and replacement kits, and additional duplex bearings, to name a few. Initial training was conducted at the Honeywell facility in a "train-the-trainer" fashion, and then training teams were dispatched to Apache users all over the world. Once all training was complete and tools and kits were on hand, we released the SOF, which minimized risk and still provided commanders with operational flexibility to continue their missions. The SOF used a time-phased approach that concentrated on the greatest-risk aircraft first (those with 375 or more hours on the APU clutch), and then required inspections on all remaining aircraft, reducing the hour requirement by 125 hours every 20 days until the fleet was completed.

To date we have shipped over 1,100 kits to the field. There have been no reported incidents of APU failures once the SOF was applied. We are working to shift the responsibility to provide the repack and replacement kits to the DLA. Units will order the kits through standard Army supply channels beginning in the April or May 2004 timeframe.

Historically, the APU clutch has been problematic for the Apache. A Commercial Operation and Support Savings Initiatives (COSSI) program began in 2000 with the goal to build a clutch that was more reliable and would achieve a TBO of 1,500 hours (from the current 500-hour TBO).

The new COSSI clutch has six distinct improvements over the current APU clutch: grease-lubricated duplex ceramic ball bearings; a back-up bearing system; a shaft displacement detector to detect worn primary bearings and loss of centerline; an improved seal system to preclude seal contamination; a torque limiting control valve for "softer" engagements; and an aluminum input housing and steel output housing.

The new COSSI clutch was completed in the fall of 2003. We immediately began to fly it on aircraft at Fort Rucker, AL, where we have over 300 hours of time on the first clutch with no known problems. The initial TBO is set for 750 hours, with plans to extend it out to 1,500 hours once we gather enough field data to support that decision. The APU clutch SOF does not apply to the new COSSI clutch.

The original plan was to field the COSSI clutch beginning in January 2004 and continue through 2010. However, the PM made the decision to accelerate that fielding schedule to have the entire Army fleet retrofitted not later than July 2005. All Longbow Apaches coming off the assembly line have the new COSSI clutch. Accelerated field retrofits began in February 2004. We are rapidly fielding the clutch to the Operation Enduring Freedom and OIF theaters of operation and will continue the fielding based on Army G-3 priorities. ♦

—LTC Potts is the Product Manager for Apache Modernization and Recapitalization Program Executive Office for Aviation (PEO-A), Huntsville, AL. He can be reached by calling (256) 313-4248 or e-mail anthony.potts1@us.army.mil.

Emergency Egress

and some points to consider

CW4 Tim Borre and CW4 Pat MacDonald
UH-60 SP/IE, DES Utility Division
Fort Rucker, AL

During an uneventful flight across Iraq, you notice anxiety building among the pilots of the UH-60 you're flying in. The cabin quickly begins to fill with smoke, and it's becoming extremely difficult to see and breathe. As the aircraft approaches its intended landing point, it becomes apparent that you're going to land in a lightly wooded area. At this point, the crew chief shouts for you to assume a crash position and prepare for a rough landing.

As the aircraft settles into the trees, you hear blades and fuselage breaking through the branches. All you can think about at this point is getting out of the back of this helicopter. The Black Hawk finally comes to a stop, but the cockpit is rapidly filling up with fumes. You manage to unbuckle, but you can't find an exit on the right side of the cabin where you were sitting. You realize the aircraft has landed on its right side, so those doors must be blocked. Your only option is to try and find an exit on the left.

You feel your way around the other passenger seats, stumble to the forward portion of the cabin door, find the door handle, and pull. The door is jammed! Not to worry—the passenger briefing included emergency exit locations and you know where the cabin windows are located. But where are the emergency handles? You don't remember the crew briefing saying anything about the handle locations, but they must be near the door's rear because you saw some kind of handle in that location on the right side. No such luck. You feel your way forward along the cabin windows and finally find the handle. You pull the handle, but the windows stay in the same position. It must be malfunctioning.

Now what? You try pushing the window out with your arm. The window falls to the ground. You climb out, coughing up black smoke and gasping for clean air. You're out, but where is the rest of the crew? Oh yeah, the crew mentioned something about a rendezvous point upwind of any fire and 50 feet from the aircraft. Since you're probably not of the mental capacity at this point to determine the wind direction, you just start walking.

Where is the rest of the crew? Looking back at the burning wreckage, you see movement in the aircraft. You don't recall the crew chief mentioning anything about a fire extinguisher, so how can you go back and fight the flames that are now starting to engulf the cockpit? Moments later, it's obvious that it's too late for the crew….

The crew brief is the place where our entire egress plan is finalized and committed to memory before we launch for the current mission. If we don't really think about what we've briefed or know how to execute the egress plan, we might create another chance to become injured or die after we've just survived an accident. The following are some actions regularly briefed by crewmembers that might be good examples of what NOT to do.

■ Typical egress procedures include exiting the rotor system at the left or right rear (where most aircraft operating manuals indicate the greatest rotor clearance is). This is only valid for an undamaged aircraft on flat terrain, not after the struts or skids have collapsed or when landing on sloping terrain. This could possibly be the worst place to go—you just survived the crash, only to lose your head during egress! The actual rotor system (or what is left of it) determines the safest place to exit.

Always remember that the most important thing you can do is to actually practice your emergency plans and procedures. The time to discover that something won't work is during training, not during an actual emergency. You then can fine-tune your procedures for your area of operation and unit.

■ The assembly point is 50 meters at 12:00; if 12:00 is unusable, then 3:00 followed by 9:00, then 6:00 as a last resort. Too much distance can delay the head count and lead to someone dying in the aircraft. Start the assessment of others onboard as you are unbuckling. If you notice no movement from some, then you should go to those passengers first. It's not good to make it outside and then realize someone is still onboard. Also, the further you go away from the aircraft, the greater your chances of getting lost or injured.

■ Another common action is to go upwind for the assembly point. After the crash, do I stick my finger up to determine this, or do I remember Automatic Terminal Information Service (ATIS) and use my compass? If it's a dark night, how do I determine wind direction? Rather than making laps around the aircraft or calling metro, keep it simple by starting with 12:00; if this is unusable, proceed clockwise to the first good point. The first person to the assembly point then can use the whistle or strobe (for nighttime crashes).

There have been several accidents where the first people to assist the crew are either passengers or support personnel. Support personnel can be the hookup men for sling load missions, forward arming and refueling point personnel, pickup zone (PZ) control, or any other non-crew personnel involved with aviation operations. The information you brief to them may enable them to drag you out and save your life. Keep this in mind when you shut down at the PZ or landing zone to finalize plans before starting the operation.

Standardization and training also are important things to consider. If there is no egress plan in the standing operating procedures, then you probably have as many procedures as you do pilots in command. This creates a problem for the other crewmembers because, under duress, which egress procedures will they follow? When training crewmembers, these tasks can be evaluated orally; but when you allow this, you must be sure they can perform it. About 90 percent of one unit's non-rated crewmembers could tell you the three steps for an emergency engine shutdown, but when asked to do it, only about 10 percent could.

As an example of crawl-walk-run, first have your crewmembers learn the three steps. Then, on a static aircraft, place the power control levers, fuel system selectors, and boost pump switches in the normal position for flight and have them perform the steps. Finally, during shutdown and after the cool-down period, have your crewmembers perform the steps as necessary.

Always remember that the most important thing you can do is to actually practice your emergency plans and procedures. The time to discover that something won't work is during training, not during an actual emergency. You then can fine-tune your procedures for your area of operation and unit. ♦

—CW4 MacDonald (patrick.macdonald@rucker.army.mil) and CW4 Borre (charles.borre@rucker.army.mil) can be reached at DSN 558-1792/3198 (334-255-1792/3198). They both are UH-60 standardization pilots and instrument flight examiners within the Directorate of Evaluation and Standardization (DES) Utility Division.

Aircraft Hydraulic System

Jerome C. Smith
GSE Systems Engineer,
Redstone Arsenal, AL

Contamination of hydraulic systems has been identified as a possible cause of several aircraft incidents. It is an accepted fact that contamination shortens the service lives of hydraulic components. Finding a means of keeping water, air, and particulate contamination out of Army helicopter hydraulic systems is the goal of the Research, Development, and Engineering Command (RDECOM) Integrated Process Team (IPT) on aircraft hydraulic systems contamination control.

Important objectives of the IPT include the identification of equipment and procedures that will limit the introduction of contamination during servicing and maintenance. One of these initiatives is the addition of a new 2-gallon reservoir servicing unit (RSU) to all aviation unit maintenance (AVUM) No. 2 and aviation intermediate maintenance (AVIM) pneudraulics shop sets. The RSU's most significant improvement is seen when servicing the Apache.

The current method of filling the Apache reservoirs is to punch a hole in a 1-quart can of hydraulic fluid, insert a tube into the can, connect the tube to the FLUID FILL port on the manifold, and use the aircraft accumulator charging pump to fill the reservoirs. The problems with this approach are:

- The process of opening the can adds contamination to the oil.
- The tube, normally stored on the aircraft, will be dirty inside and out.
- Any unused fluid has to be returned to Hazardous Material (HAZMAT) for disposal at the installation level.

The RSU provides a quick and easy means of filling aircraft reservoirs with hydraulic fluid that is clean, dry, and air-free. The RSU is sealed to allow storage of the hydraulic fluid over extended periods without picking up moisture from the surrounding air, thus eliminating the need to dispose of unused fluid. A 2-micron filter is installed in the output hose, which is flushed back into the unit's reservoir prior to each use. The return tube is transparent so fluid can be checked for air bubbles. The fluid is delivered at 4 cubic inches per stroke through the ground support equipment (GSE) return quick disconnect, so you don't need a wrench or Leatherman® to remove the cap on the 1/4-inch fill port.

The Program Manager (PM) for Aviation Ground Support Equipment (AGSE) is currently fielding initial-issue RSUs. Additional or replacement RSUs will be stocked under NSN 1730-01-504-5279. Normally doing a task by the book requires additional effort. Servicing the Apache reservoir with the RSU not only controls contamination, it also provides a quicker and easier way.

Other IPT initiatives are being applied to the aviation ground power unit (AGPU). An article in the July 2000 *Flightfax* discusses the importance of servicing the desiccant in the AGPU's vent dryer to keep humid air out of the reservoir. The PM-AGSE is currently investigating the installation of a water sensor to immediately warn the operator if the water content exceeds the 250 ppm limit. In addition, the AGPU's dual-service manifold is being modified to add aircraft-type quick disconnects to allow all AGPU hoses, to include the adapter hoses, to be flushed prior to connecting to an aircraft. These hose flush procedures are already in Change 8 to the AGPU's -12.

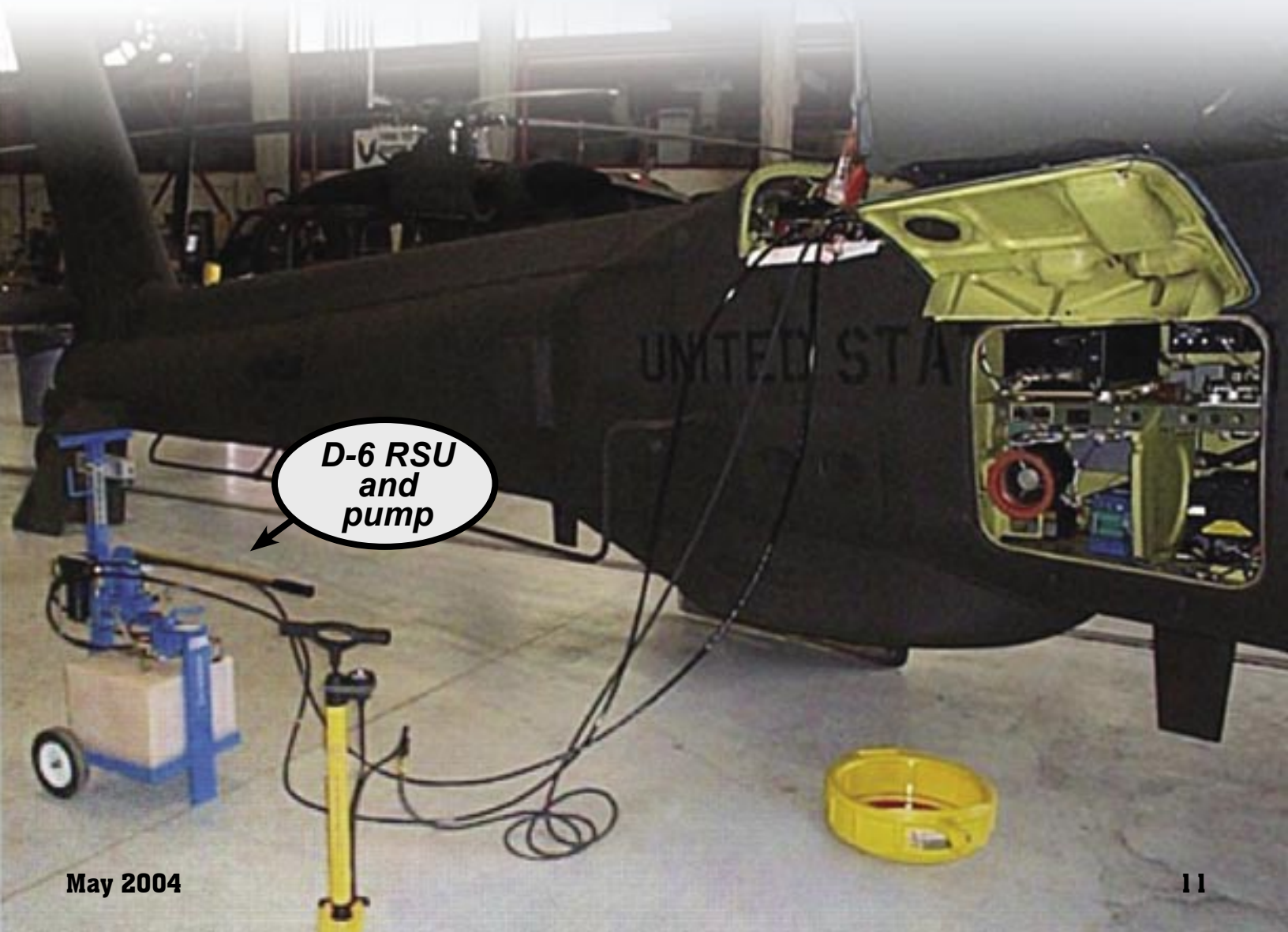
Finally, the IPT is addressing the third and possibly most-often ignored contaminant—*air*. Air can be just as harmful as the other forms of contamination. Long before there are any

spongy controls or pressure fluctuations, air can cause overheating of hydraulic systems and cavitation of the high-speed pumps. IPT teams in the field sampling helicopter hydraulic systems have found evidence of excessive air contamination at an alarming rate. Even more alarming is the apparent lack of understanding of the issue by maintenance personnel. Except when quick disconnects are used, each time we open a hydraulic system we add air. Bleeding the hydraulics system of trapped air can be an easy task. Then again, there's the Apache.

The Apache has no push button to bleed air out of hydraulic fluid. The bleed procedures require the aircraft to be powered by the AGPU, allowing the bulk of the air to end up in the AGPU's vented reservoir. Finally, any air trapped in the aircraft reservoirs can only be removed by overfilling. This is still the easy part. To drain the reservoirs back to operating level, you currently need both AGPU air and hydraulic pressure.

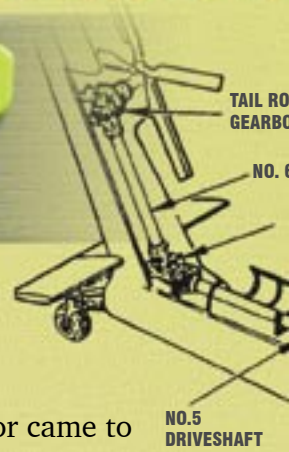
The IPT also is investigating the use of a high-pressure, manual hydraulic fluid dispenser and a hand air pump to perform this task. Our hope is that this cart will be as successful as the RSU in facilitating the essential bleeding of air from the Apache hydraulic systems in a quick and easy way. ♦

—For more information, contact the author by calling DSN 897-2350, ext. 9858 (256-705-2350, ext. 9858) or e-mail jerome.smith@rdec.redstone.army.mil. Mr. Smith works in the Aviation Engineering Directorate as a GSE Systems Engineer in Huntsville, AL.



Is the AH-64A/D Tail Roto

A Fragile Thing?



CW4 Daniel R. Zimmermann
AH-64D IP/IE
Fort Rucker, AL

It was a warm spring afternoon in Illesheim, Germany, in 2000. The sun was shining and a warm breeze was blowing across the ramp in front of the hangar as Dave and Jeff headed out to the Apache they were going to perform a test flight on that day. It was one of those nice days, rare in Germany, that lull you into a comfortable routine. This day's last run-up would turn out to be anything but routine.

The day's flight was to have nothing to do with tail rotor driveshafts or input drive clutches. At least that's not what it started out to be. The aircraft was scheduled for rotor smoothing and had already been run-up and flown five times. The pre-flight checks and the pilot and co-pilot checks all went smoothly for the sixth flight. The aircraft was run-up to idle on the number one engine with the rotor blades turning at idle RPM.

During the number two engine start, initial indications were well within limits: the engine gas generator speed (N_G) was rising normally, the turbine gas temperature (TGT) was on the rise, engine power turbine speed (N_P) was coming up, and torque was normal. The start sequence was almost complete when a sudden, violent explosion was heard in the crew stations that literally rocked the aircraft. The co-pilot in the front crew station was slammed side to side and from canopy to canopy as the aircraft shook from the explosion. The pilot's feet were knocked off the pedals as they violently cycled back and forth.

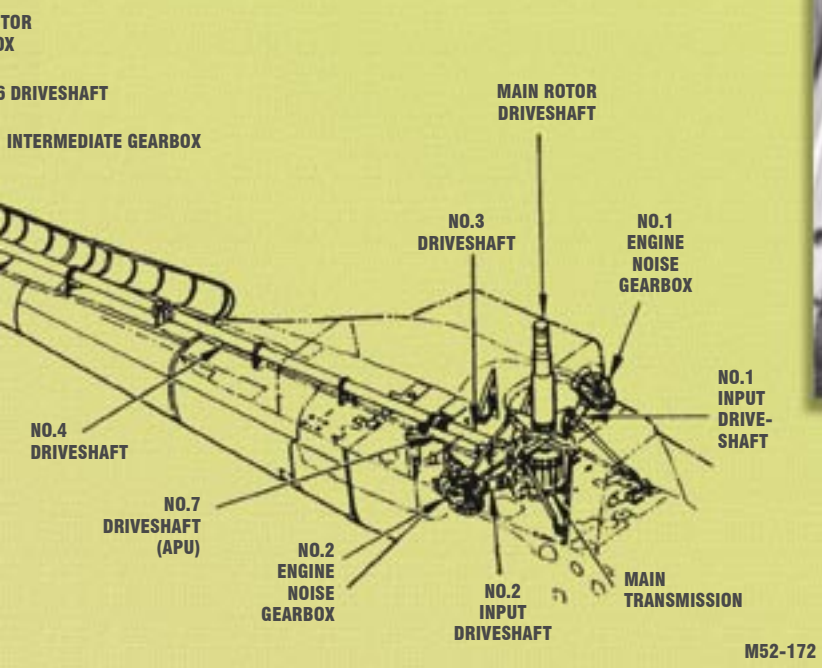
After the initial shock, the pilot heard a loud grinding noise just before he performed an immediate dual engine shutdown. A concerned crew engineer (CE) made his way to the pilot crew station to inform him that his tail rotor was not turning and they should not fly the aircraft. There was no doubt in both crewmembers' minds that they were not flying this aircraft after what they'd just experienced.

So, what did happen? The crew was performing an aircraft run-up and had one engine idle while the second engine was being started. After the initial explosion the tail rotor came to a complete stop, as witnessed by the CE. Upon further inspection, the number four tail rotor driveshaft was found to have twisted apart just forward of the aft anti-flail assembly.

What is a driveshaft and how does it do its job of transferring engine power to the tail rotor?

To answer this question, let's take a look at the drive train system of the AH-64. In the figure above, you can see that the number four driveshaft is the second of four driveshafts that transfer engine power to the tail rotor. The driveshaft is a hollow, thin-walled aluminum tube that is lightweight and very strong. The driveshaft is dynamically balanced at the factory to be vibration-free at operating speeds in excess of 4,800 RPM. While turning at such high speeds, the driveshaft is able to transfer up to 550 horsepower to the tail rotor. Slow-motion video of these driveshafts show large amounts of twisting taking place as varying loads are applied. The driveshaft also has to withstand severe vibrations at lower

or Driveshaft



speeds, such as those during run-up.

Is the driveshaft fragile? The answer is yes and no. These driveshafts can withstand many stresses, and usually do so very well. The Apache's drive train has been tested to absorb combat damage and still continue to operate without failure, as indicated in this photo (top, right corner) of a driveshaft that survived a bullet hole while in flight in Iraq.

In normal operation, it is not advisable to take such risks with these aluminum tubes. Small dents and scratches can be the weak point, causing catastrophic in-flight failures.

So what happened? Why did the driveshaft fail? There were no known scratches or dents. The aircraft had been run up five times the same day prior to the driveshaft failing. Was it the driveshaft's fault?

Accident investigators inspected much of the aircraft's drive train system and found nothing wrong with the driveshaft other than the obvious damage. What they did find was that during the number two engine start sequence, the overriding input drive clutch either failed to engage initially and then suddenly engaged; or the clutch was engaged, suddenly disengaged, and then re-engaged immediately afterward. At any rate, there was damage to the number two engine drive clutch indicating some kind of sudden engagement. This sudden engagement caused a severe shock to the drive train, causing it to fail at the weakest point.

The 10-foot-long driveshaft was twisted in half approximately 3 feet from the aft end, just in front of the aft anti-flail assembly. The forward anti-flail assembly and the catwalk directly above it contained the forward portion of the driveshaft.

Army Aviators start up and shut down aircraft many times on any given day. Most start cycles are routine and uneventful. However, occasionally a start sequence can have an unexpected ending. ♦

—CW4 Zimmermann is an AH-64D Instructor Pilot and Instrument Examiner at A Company, 1st Battalion, 14th Aviation Regiment, Fort Rucker, AL. He can be reached by calling DSN 558-5035 (334-255-5035) or e-mail daniel.zimmermann@rucker.army.mil.

Investigators' Forum

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

C-12 Test Flights: Who Should B

MAJ Ray Jenkins
U.S. Army Safety Center

When most people think of Army Aviation, helicopters immediately come to mind. What many don't know, however, is that fixed-wing operations are a vital component in accomplishing the Army's mission. One of the most recognizable and versatile airplanes in the Army's fleet is the C-12. Since only a small number of Army Aviators go on to fly these aircraft, training in specialty fields such as maintenance test flights (MTFs) is often scarce. And, just like in the rotary-wing community, accidents happen with even the most experienced fixed-wing aviators at the controls.

The Army doesn't offer a fixed-wing maintenance test pilots' course (MTPC). So, when an MTF has to be performed, the unit commander will designate the "most qualified" aviators and instructor pilots (IPs) as the maintenance test pilots (MPs). These individuals are not required to have completed an MTPC or modification and maintenance course, but they must be designated in writing as MPs and have an MP task list. The newly assigned fixed-wing MPs are then taught the necessary MTF maneuvers by someone already performing the task.

The scenario described above was the case in a fatal C-12 accident last fall. A highly qualified CW3 fixed-wing pilot was designated by the battalion commander to perform MTFs. This CW3 was considered to be the best fixed-wing pilot in the entire brigade and was well liked. He was described as the consummate professional in the C-12 and had over 3,900 total flight hours, with 1,500 of those in fixed-wing aircraft.

It was a clear fall day when the CW3—the designated MP—and his co-pilot (who had more than 1,500 hours of flight time) departed the airfield in a C-12 for an area known as "test flight valley." Maintenance had replaced the stall strip on the outer edge of the C-12's wing; this procedure required that an MTF be performed before the aircraft could be released. As part of the MTF, the crew was supposed to stall the aircraft to check for proper installation of the stall strip.

It is important to understand that once the MP begins to stall the aircraft, there are five separate conditions that can occur while checking the aircraft's stall capability. If any one of these conditions occurs, the aircraft is in a stalled mode of flight. These five conditions are: the stall warning horn activates; the aircraft begins to buffet; the aircraft exhibits a lack of control responsiveness; any detected roll; and excessive loss of altitude. Training Circular (TC) 1-218, *Aircrew Training Manual, Utility Airplane C-12*, directs that the crew should immediately reduce pitch attitude, apply maximum available power, and complete a go-around at the onset of the stall warning horn. If the crew detects any indication of a buffet before the warning horn speed range's lower limit, they should reduce pitch attitude and, if necessary, apply opposite rudder to stop any roll and then complete a go-around. The crew should never attempt to use ailerons to stop the rolling movement.

The accident crew planned to do four maneuvers to complete the MTF. They climbed to 9,000 feet above ground level (AGL) and contacted approach control for a block of airspace. The

MP was on the controls, and the co-pilot was reading the checklist. After trimming the aircraft the crew began to reduce airspeed, looking for the first indication of a stall. The co-pilot read the parameters at which the stall warning horn should activate, and the MP began the maneuver by reducing power and slowing the aircraft. As the aircraft began to slow, the co-pilot read the airspeed at which the stall horn should activate.

When the stall horn finally activated, the co-pilot didn't state the speed range. A few seconds later the MP said he had the yoke full aft and was waiting to see what the aircraft was going to do. The aircraft stalled completely, rolled upside down over the left wing, and continued to roll into a right-wing-low spin. When the aircraft continued to spin, the MP said he was pushing the nose over to recover. At 5,900 feet AGL the MP asked the co-pilot for an altitude read-out. After the co-pilot stated the altitude the voice recorder, for unknown reasons, stopped recording. The aircraft impacted the ground in a right-wing-low attitude in excess of 120 knots. Both pilots were killed.

This article is written for those pilots who perform MTFs in the C-12, which is not rated for spins. The aircraft's manufacturer claims that recovery from a spin in the C-12 is unlikely. The guidelines in TC 1-218 and the MTF manual are clear as to what indications to look for when stalling the aircraft. If these guidelines are followed, this maneuver can be accomplished safely.

First, the crew must always perform stall checks according to the MTF manual. Since these checks are detailed and have numerous steps, the MP must keep the co-pilot informed of the actions being executed. Stall checks also call for various trim speeds for various configurations. The crew must ensure they have enough altitude when performing stall checks to allow a safe recovery by 4,000 feet AGL.

The Army Safety Center has recommended that a fixed-wing MTPC be established, and also urges that anyone performing an MTF on the C-12 cease the maneuver at the first indication the aircraft has stalled. The loss of an aircraft is unfortunate, but the loss of an aircraft and crew is devastating. Follow the standards, and FLY SAFE! ♦

—MAJ Jenkins is an accident investigator with the Aviation Systems and Accident Investigation Division, U.S. Army Safety Center, DSN 558-9853 (334-255-9853), e-mail ray.jenkins@safetycenter.army.mil.

Editor's note: Several C-12 accidents have been attributed to loss of aircraft control during low-speed flight to a stall condition. Because of the C-12's T-tail design, these aircraft may not manifest the buffeting pitching and rolling characteristics that typically indicate a stall condition in other fixed-wing aircraft. Because of this, pilots may be unaware that their aircraft has stalled. Safety of Flight (SOF) C-12-04-01, C-12 Series Aircraft, Staff Warning System Test, *was issued on 13 April 2004. The RC-12 series aircraft will be addressed in a seperate SOF to be published in the near future.*

e Doing Them?

Letters to the Editor

Keeping Returning Soldiers Safe

I am writing as the mother of a Soldier who recently returned from Operation Iraqi Freedom (OIF). While my son was serving in Iraq, I faithfully corresponded and sent morale-booster packages to him, his squad, his platoon sergeant, and other Soldiers in his platoon. Birthdays, Valentine's Day, Easter, Fourth of July, Halloween, Thanksgiving, and Christmas were some of the events they missed with their families, so we parents laced our letters, cards, and e-mails to them with love, hope, and prayers. We diligently prayed they would come safely home.

Now by the grace of God they are home. For the most part, they're between 21 and 26 years old. They're all young and they've all saved up their hazard pay. They're anxious to get out, be free, make up for lost time, and spend that hazard pay.

Summer's on the way. Although they've not been home for long, six Soldiers (my son included) from one platoon have bought new motorcycles, and I'm sure there are more within the company. One of these Soldiers already has had an accident and is in intensive care as I write this. We don't know if the accident was caused by human error, mechanical problems, lack of training, or lack of experience. I do know that I called my son and asked him to promise not to ride his newly purchased motorcycle again. He gave me that, "Yeah, Mom."

Soldiers had to gain experience beyond their years to survive the dangers they faced during OIF. But that doesn't mean they'll come home knowing how to safely ride a motorcycle.

I believe safety can work—but only if people work together. We, as Soldiers' families and friends, must work together to protect them after they've come home. Why bring them back safely from Iraq only to see them die on their own soil on a motorcycle?

—An Army Mom

Editor' note: The mother who sent this letter recently joined Operation Guardian Angel. The U.S. Army Safety Center supports this program. It is designed to get concerned families, friends, and patriotic Americans involved in helping Soldiers stay safe after they return from OIF. With more than 6,000 new motorcycles on order through AAFES for returning Soldiers, this is an area that desperately needs dedicated Guardian Angels. If you are interested, visit the Guardian Angel Web site at http://safety.army.mil/index-guardianangel.html. Why not sign up and help the Army win the War on Accidents?

What About the Non-rated Crewmembers?

Safety awareness has become more prominent, and I feel there is a genuine desire from the Safety Center to reduce accidents and to safeguard our personnel and equipment.

After reading the January 2004 DASAF's Corner, two issues struck me as a shortcoming in our quest to reduce accidents. First, there is a lack of training for our mission briefers (junior officers); and second, there is a lack of integration of non-rated crewmembers in the risk management process. The second paragraph states, "...commanders and aviators are doing everything... to mitigate risk" and "...the risk must be acknowledged and accepted at the right level." For most missions, the commander doesn't get involved if the briefing falls below his level of risk. This is where the system begins to break down.

The regulation for mission briefers (AR 95-1) places a requirement on the chain of command with no provisions or considerations made with respect to experience or background. As I traveled with the Directorate of Evaluation and Standardization (DES), it was evident there was, for the

most part, NO training for briefing officers and, consequently, no standards for training.

Some units were better than others, but essentially if you were listed as a briefer per the regulation, you could brief. However you quickly learned that process via "O-J-T" and trial and error. With the stakes as high as they are, we shouldn't leave something of this importance to chance. Commanders will and should always have the final say, but we should have a product in the toolbox to teach the basics of the briefing process. We talk about the process, but never provide any training on how to actually complete the process. This training could be supplemented and become a common start for everyone.

When looking at accidents, we record each rated crewmember's background, but what about the non-rated crewmembers? For example: the flight engineer or crew chief (rank, total time, time in aircraft), mission briefer (rank, total time, time in aircraft, status D/N PI or NVG PC, etc.), level of risk (low, medium, or high, etc.), and who approved the mission (commander, operations officer, platoon leader, etc., to include their background and experience). I think a historical overview of the entire assessment, management, and briefing process in previous accidents would be enlightening.

In BG Smith's discussion of ways to reduce brownout accidents, I saw no reference to the non-rated crewmembers. I've been a Chinook pilot since 1986, and our Cargo community values our non-rated crewmembers.

I feel we, Army Aviation as a whole, have discounted an important asset. Looking at the numbers, the aircraft that have to land to perform their mission (CH-47 and UH-60) were the ones having the most brownout accidents; this is where we should concentrate our prevention efforts. Building simulators that replicate visual cues is great and will be a welcome training aid, but what about aural cues?

In the Cargo community, the calls from the flight engineer and crew chief are absolutely essential during the landing sequence. In the DASAF's "Aircrew Coordination Training" paragraph, "...66 percent of the Class A accidents ... had lack of crew coordination as a contributing factor." Again, was this only between the pilots, or did it involve the non-rated crewmembers? I might be overly sensitive to the non-rated crewmember issue, but the lack of reference to that segment of our community in our premier aviation publication does not send the message to those crewmembers that they are a valued part of the community. Thank you for listening.

—CW5 Noel C. Seale, CH-47 SP/IE, e-mail noel.seale@us.army.mil

Editor's note: All crewmembers are a valued part of our community and are extremely important to us. We try to be versatile with our articles in terms of interest and need. Check out page 20 in this edition; we have an article discussing non-rated crewmember issues. **Flightfax** *is planning a special "Non-rated Crewmember" edition in the near future. Let me know what you want to see in this special issue by calling DSN 558-9855 (334-255-9855) or e-mail* ***Flightfax@safetycenter.army.mil****.*

New Perspective on FOD

CPT Dan Carlson
Los Alamitos AAF, CA

Foreign object debris (FOD) is a significant concern at all airfields. At Los Alamitos Army Airfield (AAF) in Los Alamitos, CA, we recently upgraded our FOD control program with new equipment. Los Alamitos AAF has 4 square miles of property that sits under the Class B shelf of Los Angeles International Airport. Besides Army Aviation assets, this airfield hosts several Department of Defense (DOD) customers to include Air Force One, Marine One, NASA, Air Force C-5s, C-130s, KC-135s, KC-10s, and high performance fighters. The airfield is operated by the California Army National Guard and primarily supports UH-60, UH-1, OH-58, CH-47, and C-12 flights. The airfield has over 2 million square feet of ramp and taxiway space, as well as over 2 miles of runway that are 200 feet wide.

Heavily-used commercial airports and Air Force airfields use expensive high-speed runway sweepers to perform the FOD control function. For several years, Los Alamitos AAF had relied on FOD control personnel ramp walks and a poorly maintained city sweeper that seemed to just push dirt around. Personnel ramp walks are usually done by the maintenance section of the hangar. This method of ramp walking is not ideal, as the mechanics often miss several pieces of FOD because of distractions or talking. This method is also very costly in the long run, averaging some 70 man-hours a month at our facility. Maintainers should instead be spending their time on getting aircraft flying. Additionally, high-speed runway sweepers cost well over $100,000 and are expensive to maintain. We needed an efficient compromise between the two that would be financially obtainable.

After researching online and at ground support conventions, we found a product called the "FOD BOSS." This product comes in squares and is pulled behind a vehicle. It uses friction against the ground to pull the FOD up off the surface, where it is caught in pouches to be dumped later. The company offered a 1-month demonstration period at no charge. We accepted the demo, and upon first usage found the product to be invaluable. The product picked up items such as nails, bolts, sand, and even coins. The product costs just under $10,000 and was readily available. After a demo our state aviation officer decided to purchase a FOD BOSS for every facility throughout the state, recognizing the cost benefits for maintenance programs.

Here's an example of the FOD BOSS saving the day (and my career). Los Alamitos AAF recently manned an Air Force mobility exercise. The airfield was the portal for all large cargo and tanker aircraft in the DOD inventory, to include C-5, C-130, KC-10, KC-135, C-141, and C-17 aircraft. We had 50 landings in just 2 days and passed over 2,000 passengers through the terminal area. One particular day, a KC-135 had just landed and called the control tower from taxiway 6. The pilot refused to taxi because of the FOD that had blown on the taxiway. This particular taxiway needed to be widened for this reason, but budgeting has not allowed for it in recent years. In the

heat of the California summer, the dirt is very dry. Between the asphalt areas, the outboard engines of these large aircraft blow loose debris onto the taxiway. This occurs close to our ramp areas, as well as with helicopter traffic repositioning to the dirt pads.

The landing schedule was so tight during this exercise that another C-17 had joined this aircraft. The tower called me on the radio and explained that an additional two aircraft were being sequenced in the Class B airspace, and the KC-135 and C-17 needed to be moved ***now!*** Upon inspection of the site, I found the area to be in bad shape. Dirt, rocks, and weeds were lying all over the taxiway. We could have filled wheelbarrows with this much FOD! In the past, if this occurred we would've had to sweep the area with brooms. An area this large (75' X 500') would have taken hours to clean, and in this specific case would have shut down our runways to the incoming Air Force aircraft.

I called our fuel sergeant, who also manages the FOD program, to bring out the FOD BOSS. It has three sweepers that work in conjunction with each other to sweep an area 24 feet wide. Within 5 minutes, we had this area clean enough for the KC-135 to pass. During the next few minutes, the FOD BOSS needed to be emptied. After it was emptied, we cleaned the remaining areas so the C-17 could pass.

While I was standing next to the taxiway staring at the large aircraft waiting to taxi, it was the longest 10 to 15 minutes of my short career here at the airfield. There is no question the FOD BOSS saved the day. Without this taxiway, the Air Force taxi plan was shot because of our weight-bearing capacity on other taxiways. The remaining aircraft would've had to be diverted to another airport, further unraveling their transportation plans as well as congesting the southern California Class B airspace sequencing plans at FAA TRACON facilities. Thanks to the FOD BOSS, the VIPs on board these aircraft were never aware of the problem, and the mobility exercise went off without a hitch.

The FOD BOSS does have its limitations. It needs a flat surface and is most accurate when driven at 15 mph, but can be used at speeds of up to 25 mph. It cannot get down between cracks or pick up large items that should be picked up by hand. One of the many advantages of this product is that just one sweeper by itself can be pulled under wings and rotor spans by a tug. This allows it to get close to aircraft, where loose tools or small fasteners may lay. It works well even in the rain.

To augment our FOD BOSS program, we chose a street sweeper that was below $100,000 with adequate suction to pick up FOD while traveling at 5 mph. The company had a sales office locally, and we were able to get a sweeper demo. It has a radio and climate controls necessary for hot summer days while driving at 5 mph or less. This vehicle can pick up standing water and get down into the ramp grounding points in the concrete.

FOD is a never-ending issue at airfields. Whether serving as a joint airfield or strictly for helicopter traffic, FOD knows no boundaries. Thanks to our state aviation leaders in California, we have put our money where our mouth is and made a significant dent in FOD and its effects. We now FOD-sweep the airfield once a week as a practice. The ramps have never been cleaner for a cost of less than $125,000. This total expenditure will be easily offset by reduced maintenance man-hours and reduced loss or injury as a result of FOD. ♦

—CPT Carlson is the Operations Officer at Los Alamitos AAF. He can be reached by calling DSN 972-2005 (562-795-2005) or e-mail Daniel.Carlson@ca.ngb.army.mil.

NCO CORNER

Emergency Procedures and the Non-rated Crewmember

SFC Steven K. Robertson
CH-47 SI, Co G, 140th Avn Regt
California Army National Guard

A CH-47 departed on the second period of a readiness level (RL) progression training flight. The flight training would be conducted at the tactical training area 20 miles to the northeast of the airfield. During the ramp check, the flight engineer (FE) noticed and reported vibrations and unusual noise coming from the aft transmission area.

Moments later the noise and vibrations increased, becoming audible in the cockpit. The FE recommended landing as soon as possible. A landing procedure was initiated; however, before landing, the UTILITY HYDRAULIC PUMP FAULT light on the maintenance panel illuminated. The utility hydraulic pressure began decreasing, and hydraulic fluid began seeping from the lower aft transmission cover. The utility hydraulic pump was replaced, and the aircraft was released for flight.

On another occasion, a CH-47 departed for an instrument flight evaluation. While at cruise altitude prior to the approach, the FE began the second ramp and cabin check. While checking the maintenance panel, the FE observed a slight decrease in the #2 flight control hydraulic fluid level. The FE continued the ramp check and decided to check the fluid quantity again. This time he observed a steady decrease in the fluid level. The FE notified the pilots of a potential leak. The crew discontinued the approach and landed the helicopter at a nearby civilian airport.

During engine shutdown, the FE observed the aft pylon was covered with hydraulic oil that had leaked from the aft swiveling actuator. A maintenance crew replaced the actuator, and the aircraft returned to home station.

The preceding vignettes describe actions performed by the non-rated crewmember. The problems were discovered before an emergency indication in the cockpit. In the non-rated crewmember training program and in any unit before studying specific –10 emergency procedures, three basic emergency tasks should be taught.

1. Recognize the emergency situation. While flying (as this comes with experience), if something doesn't sound right or if something doesn't feel right or look right, it can indicate a pending problem. A crewmember may observe fluid seeping or leaking from a component. While there may be no emergency procedure for what was observed, eventually a fluid leak can damage the system or component.

2. Notify the pilot. Timely input of clear and concise statements to the rest of the crew will assist the pilot in the decision-making process, as well as with how to deal with the potential emergency. Some observations may require immediate action steps, such as fire or smoke in the cabin. It is important for the non-rated crewmember to correctly identify the component or system. If a junior non-rated crewmember is undergoing training, it is imperative that during the non-rated crewmember briefing that the senior CE or FE discuss who will respond during an emergency or maintenance malfunction during flight.

3. Recommend a course of action. Not all maintenance problems or caution lights clearly define a course of action. For instance, in the CH-47, if the BAT SYS MAL (Battery System Malfunction) light illuminates during flight, the pilot using the checklist will reset the BATT CHGR circuit breaker. If the caution light remains on, the pilot will turn off the battery switch on the overhead panel. The non-rated crewmember should know what would cause this light to come on during flight:

- **Overheated battery or charger**.
- **Battery cell imbalance**.
- **Output short**.
- **Open circuit**.

The non-rated crewmember should check the battery area from inside the cabin to see if the structure around the battery compartment is warm to the touch, and also check out the left bubble window to see if there is any smoke coming from the battery compartment or if any fluid is venting from the battery vent tube. If the non-rated crewmember observes any of the previously mentioned items, he should recommend landing as soon as possible due to the nature of a hot NICAD battery.

Any RL 1 crewmember (rated or non-rated) has completed the aircrew coordination course. The proper flow of information to the pilot in command will determine the correct course of action during an emergency. Aircrew standardization and evaluations provide reinforcement in handling emergencies as they occur. Timely execution of input provided by the crewmember can mean the difference between a minor incident and a major accident.

Every crewmember should do their best to review chapter 9 procedures in their aircraft's operator's manual and be familiar with the systems installed on the aircraft. Ask yourself before your next flight, "Do I want to be the person who takes this work for granted, or do I want to be ready and knowledgeable about the piece of equipment I am assigned and trained to operate?" ♦

—SFC Robertson is a CH-47 Standardization Flight Engineer Instructor (SI) at Company G, 140th Aviation Regiment, California Army National Guard, e-mail steven.robertson@ca.ngb.army.mil.

AVIATION STANDARDIZATION

STACOM

Standardization Communication

MESSAGE 04-02

Emergency Procedure Training

Recent evaluations by the Directorate of Evaluation and Standardization (DES) have revealed some confusion concerning the interpretation of AR 95-1, 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) applies to single-engine helicopter touchdown emergency procedures, but does NOT apply to multi-engine helicopters.

Paragraph 4-8, b(1) states:

"Hydraulics-off, autorotations (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:

- Multi-engine helicopters cannot be operated with the flight control hydraulics disabled.
- Practice touchdown autorotations are prohibited in Army multi-engine helicopters.
- There are no Aircrew Training Manual procedures for loss of directional control in Army multi-engine helicopters.
- Roll-on landings are normal operating procedures, and AR 95-1 does not require air-to-ground communications or crash 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.

—For more information, contact DES, Fort Rucker, AL, DSN 558-9029 (334-255-9029) or e-mail cameronc@rucker.army.mil.

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ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

D Model

■ **Class B:** The aircraft's engine recorder showed an overtorque of the #1 engine and transmission of 136 percent for 3 seconds. The overtorque was discovered during the post-flight inspection. No abnormalities or exceedances were reported by the crew during flight.

■ **Class D:** While accelerating to forward flight, the crew heard a loud whining noise and felt a severe vibration in the aircraft. The cockpit began filling up with fumes and smoke as the pilot initiated an approach to an open field. During short final, the APU FIRE audio and warning activated. After landing, the crew activated the APU primary discharge button while the ENGINE 1 FIRE alarm activated. The crew performed an emergency engine shutdown and evacuated the aircraft.

■ **Class D:** The aircrew heard a progressively louder noise coming from the aircraft's transmission area during cruise flight. The noise ended with a loud "bang" followed by the illumination of the APU FIRE light. The pilot in command took the controls and safely landed the aircraft at a local airfield 2 kilometers away. Post-flight inspection revealed that the #7 driveshaft had sheared at the shaft's APU end.

CH-47

D Model

■ **Class C:** The aircraft was ground-taxiing on an airfield when the main rotor blades contacted low-hanging branches from nearby trees. Five of the six blades were damaged. The damaged blades were replaced on site, and the aircraft returned to its home station.

■ **Class C:** The aircraft's door separated during a maintenance test flight. The door was recovered.

OH-58

A Model

■ **Class C:** Aircraft encountered whiteout conditions during a run-on landing to an approved landing site. The aircraft rolled over on its left side, damaging the main rotor system.

D(I) Model

■ **Class B:** Aircraft landed hard following a perceived engine malfunction, causing damage to the aircraft. No other details were reported.

D(R) Model

■ **Class A:** Aircraft reportedly contacted wires and descended into a body of water. Both crewmembers were fatally injured in the crash. This mishap is under investigation.

UH-1

H Model

■ **Class C:** A VS-17 panel marker became dislodged from the ground and flew into the aircraft's main rotor system as it was landing to a field site. The aircraft was shut down without further incident.

V Model

■ **Class C**: The aircraft was approximately 3 to 5 feet above ground level during an approach, when a VS-17 panel marker dislodged from the ground and flew into the main rotor system. One rotor blade was damaged, which was suspected to be non-repairable.

UH-60

A Model

■ **Class C:** Damage to the aircraft's tail wheel strut was found during post-flight inspection. Further inspection revealed damage to the trailing edge of one main rotor blade and the ALQ-144, which is suspected to have occurred when the blade struck the ALQ.

■ **Class C:** Shearing damage to the aircraft's tail wheel strut was found on post-flight inspection. The aircraft had performed several landing iterations just before the inspection.

■ **Class D:** During climb-out, the crew heard a loud noise coming from the aircraft. The crew aborted the flight and returned the aircraft to the local airfield. The aircraft landed uneventfully; but while ground-taxiing, the crew heard another noise. The crew immediately parked the aircraft on the nearest available pad. Maintenance replaced the right-hand landing gear strut and released the aircraft for flight.

L Model

■ **Class D:** The pilot was landing the aircraft from a hover and allowed the aircraft to drift to the right rear. The tail wheel struck the ground and broke the tail wheel pin, allowing the tail wheel yoke to spin 180 degrees. The pilot then over-controlled with the cyclic and caused three main rotor blades to contact the top of the AN/ALQ-144. The right main landing gear contacted the ground and caused a rolling movement. The pilot in command took the controls and brought the aircraft to a controlled hover.

Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

Shortcut to Online Safety

Tired of memorizing user IDs and passwords? You can now use the same password for your Army Knowledge Online (AKO) account to access our online Risk Management Information System (RMIS) and Accident Reporting Automation System (ARAS) safety tools.

Can't get an AKO account, but still want to access RMIS? Just register through our new system at **https://safety.army.mil** and click on the ARAS banner or the "Sign-in" or "RMIS" buttons at the top of the page.

Need RMIS information immediately? Contact our Help Desk at (334) 255-1390, DSN 558-1390, or e-mail helpdesk@safetycenter.army.mil.

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

JUNE 2004 ✦ VOL 32 ✦ NO 6

Learning from Other's MISTAKES

SPECIAL EDITION OF WAR STORIES

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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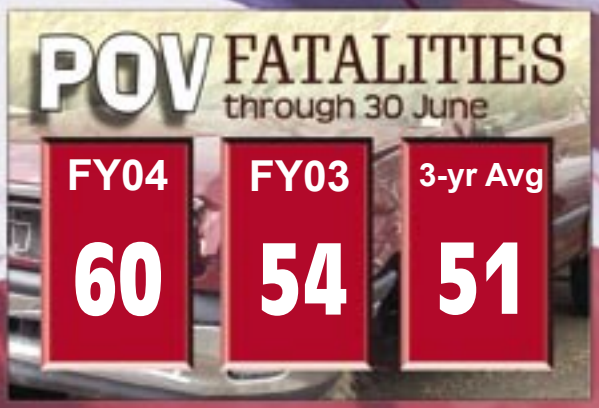

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

Is Perception Reality?

In the opening month of Operation Iraqi Freedom (OIF), I served in theater as an assistant division commander for the 82d Airborne Division. Four days after "G-day," I had the opportunity to visit a company of Soldiers from an Apache Longbow battalion that had been in a difficult battle south of Baghdad. Several aircraft in the company were damaged beyond immediate repair and not all of the mission's objectives were met. As a senior leader, I wanted to know what had happened.

The platoon leader who'd led the first aircraft into the battle was particularly frustrated. Here's how he described the mission: The joint suppression of enemy air defense (J-SEAD) was fired too early and was, therefore, ineffective; and close air support (CAS) was unavailable during the mission time window. The lack of synchronization gave the enemy time to react, creating a hornet's nest directly around the Apaches' battle positions and routes of flight. I asked him what he thought we needed to do differently. "Sir," the lieutenant stated bluntly, "we need to start by disbanding the Safety Center!" The lieutenant had no way of knowing that I would soon become the commanding general of the Army Safety Center.

Did the Safety Center cause a lack of J-SEAD synchronization or establish CAS allocations for the night? Obviously not. However, the lieutenant felt that so many good home-station training events had been cancelled or watered down "in the name of safety" that the unit was not ready to conduct difficult combat operations. He felt the Army was more worried about fratricide than about killing the enemy. He believed we practiced risk aversion rather than risk management. The platoon leader attributed the mission's planning failures to an institutional attitude, and he felt the roots of that attitude began at the Safety Center.

That was his perception … but is it reality? That Apache platoon leader's words have echoed through my head for the last 10 months as I've traveled across our Army. If you listen closely, you will hear echoes of "safety" as a bad word among our junior leaders. They feel safety is a constraint rather than a combat multiplier for mission accomplishment; safety either slows them down or doesn't allow them to train on the razor's edge; and in combat, they think there just isn't time for safety. Since many junior leaders feel safety is a bad word, it's not being embraced down where the rubber meets the road.

Very little in life is true black or white—perception or reality depends on where you sit. We must work hard to balance the risks of our profession. As leaders get more time on task, their experience allows them to see a bigger picture—one a lieutenant or squad leader cannot yet see. An aviation lieutenant might complain when a battalion commander tells him that he must fly 200 feet above ground level (AGL) until he arrives at the battle position. The lieutenant believes this restriction reduces the quality of his training. However, the battalion commander knows that even in the 160th Special Operations Aviation Regiment (SOAR), missions are flown well above the highest obstacles and wires until it's absolutely mission essential to do otherwise. If the 160th SOAR enters a low-level flight profile, it's only after detailed threat planning and careful risk management. If the battalion commander fails to make the lieutenant understand the big picture, the lieutenant will walk away viewing safety as a constraint to getting the job done rather than effective risk management. If junior leaders don't embrace safety, they won't enforce safety during the 23 hours of the day when senior leaders aren't watching. This is what I see happening across our Army.

In last month's issue of *Flightfax*, I stated that the actions of our junior leaders would determine the success of the Army Safety Campaign. Inspiring junior leaders will require senior leaders to engage them with discussion, education, and mentorship. It will take both good old-fashioned leadership and some out-of-the-box thinking. The Army Safety Team has some great tools to help—check out our Web site at **https://safety.army.mil**. Our Web-based tools can help coach leaders on how to conduct their challenging missions safer and in a manner the digital generation will find interesting and intuitive. In another initiative, U.S. Army-Alaska (USARAK) recently held a junior leader safety council to establish "bottom-up" initiatives and a peer-teaching program. This might be worth a shot in your unit.

The Chief of Staff, Army, GEN Peter Schoomaker, emphasizes training hard and to standard. He doesn't want our Soldiers to be risk averse, so let's get the job done. Embed risk management in all you do. Make standards and discipline your control measures. Question things that appear to hide behind safety or that inhibit realistic training, because in combat you'll fight like you've trained.

The current accident trend is on course to be our worst in 10 years. To curb that trend, we must stimulate a culture change among our Soldiers and junior leaders. We must do more than just teach safety—we must inspire safety.

Our Army is at war. Be safe and make it home!

Joe Smith

WAR Stories

There I was...

Ever hear the saying that there are bold aviators, and there are old aviators—but never old, bold aviators? Well, there is some truth to that. Perhaps the old, bold aviator was just plain lucky at times and was able to beat the odds. Aviators often relearn the lessons of those who have come before them through their "There I Was" experiences. These experiences often come with a high level of pucker factor, solidifying these lessons for a lifetime. Some stories are in the spotlight for all to see; others you'll only hear about when you buy that old guy another round. Either way, war stories have two things in common: They are tales of how a crew came together to handle a critical situation and lived to fly again, and they have lessons that can be passed on. These war stories can have a profound effect on all of us if we listen and learn from them. It's the pilot who believes he's so good that it can't happen to him who will grace a future edition of *Flightfax*!
Here are some of those stories…

Respect the Weather

CW3 Kenneth R. Czarnecki
DES, Fort Rucker, AL

For the past 20 years, I've flown all types of missions including anti-submarine warfare, medical evacuation, VIP flights, and air assaults. I've had my share of "I won't do that again!" encounters with deteriorating weather while flying visual flight rules (VFR) during day and night under night vision goggles (NVGs). It's true that we Army Aviators can't do anything about the weather, but we can—and must—respect it and learn all we can about it. The unpleasant fact is that some of us haven't developed the necessary professional respect because we haven't fully learned what

adverse weather can do. Army Aviators often push themselves and the aircraft to their limits and go "scud running" when better judgment would've been to turn around.

If anyone has flown to Fort Drum, NY, they can attest that in the "north country," weather patterns can change quicker than you can key the mike and say "PIREP." Fortunately, luck was with us one night. The story goes something like this:

There I was, in a typical NVG training flight of five. Inadvertent instrument meteorological conditions (IIMC) were not briefed because the weather was forecasted to be good. Oh, how wrong we were! As we turned the corner and headed down "the bowling alley," the weather quickly deteriorated. Looming on the horizon was an ominous mass of black clouds. At that point, the radios erupted with chatter. "Lead, IMC!" "Chalks 2 and 3, IMC!" I was in Chalk 2 undergoing my NVG mission training, flying through an unexpected rain shower when I suddenly lost the ground. I announced, "Right seat, IMC!" Then my CW2 instructor pilot (IP) stated "Left seat, IMC!" The two crew chiefs had lost the ground as well.

The flight completed multi-ship IIMC breakup procedures according to the standing operating procedures, and I executed the attitude, heading, torque, and airspeed measures I'd been taught in flight school. When we finally broke out of the clouds—after what seemed like an eternity—I rejoined my flight and flew back to Wheeler Sack Army Airfield. After finally breathing again we held a nervous, yet educational, debrief. The company standardization instructor pilot (SP) vowed, "I don't care what the weather is, we will *always* brief IIMC from now on!"

When faced with deteriorating weather during flight, deciding the best course of action is not always easy. Can you safely circumnavigate the storm? Should you land at an alternate airfield, or should you turn back? One important criterion to help you reach the right decision is to ask yourself if continuing the flight would cause you to rely on luck to ensure your safety. If the answer is yes, then you'd better make another decision. And the importance of your decision cannot be overemphasized. If you're to head for an alternate field or make a 180-degree turn, the time to do it is before you get caught inside a storm. Once trapped, you're committed to continue. There's no turning back!

Control of the aircraft is the most important factor in recovering from unplanned flight into IMC. If you fail to make this transition, you are in serious trouble. Control is maintained by leveling the wings on the **Attitude** indicator; maintaining the **Heading**—turning only to avoid known obstacles; adjusting **Torque** to climb power; and adjusting the **Airspeed** to climb airspeed.

As the standardization officer for one of the battalions deployed to Poland during Victory Strike III, I had the pleasure of watching the brigade commander award coins to two UH-60 Black Hawk crews that went inadvertent IMC. They had done it right! They relied on their training and executed procedures that brought their crews and aircraft safely back home.

Sobering facts for Army and civilian aviation

In my research, I came across some sobering facts for Army Aviation. From fiscal year 1991 to 2001, the Army had an alarming number of IIMC-related mishaps. The cost was more than $141 million in aircraft and crewmember losses. Why were these happening?

During the last 10 years (FY94 to present), the Army lost 31 soldiers to IIMC-related mishaps. Just recently, IIMC claimed another Army crew. A UH-60 Black Hawk was lead in a flight of two when radio contact was lost during IIMC procedures. Aircraft wreckage was located approximately 24 hours later with no survivors onboard.

Let's put this into perspective. According

to AR 385-40, *Accident Reporting and Records*, Table 2-1, "Cost Standards Table," the Army pays $1.1 million to train a pilot and $125,000 for every enlisted crewmember. This is a direct cost and doesn't include the cost of the loss of experience and training of new personnel. That means from a strictly fiscal standpoint, the Army keeps losing valuable soldiers to IIMC incidents that bear a cost in not only the airframes destroyed, but more importantly the tremendous loss of a trained Army Aviator and Soldier.

In the civilian community, the numbers are shocking. From 1991 to 2001, the National Transportation Safety Board had the tragic job of cataloging 19,972 general aviation accidents. Of those, 4, 771 accidents and over 30 deaths were due to weather. Low ceiling and visibility are one of the leading causes of 1,525 weather-related accidents. Alarmingly, in 1,979 of those weather-related accidents, the pilots never received a weather brief. Common sense and professionalism could have prevented nearly 42 percent of those accidents.

I bet you've heard the following excuses: "Aw, I don't need a weather brief, look at that sky." "I know where we are; I don't need to update the weather, we'll be okay." "The weather isn't coming in that fast, we should make it." Those confident words can end up being deadly!

Historically, IIMC was always the "had-to-brief" contingency. Yet, sometimes it was the forgotten part of the brief or the last thing mentioned while everyone was looking at their watches. "Oh, we'll brief IIMC at Flight Lead's aircraft at the update; the weather is fine anyway." Unfortunately, IIMC is seldom rehearsed as a flight or crew. Remember, the cockpit of an aircraft during inadvertent IMC is no place to make last-minute changes. Rely on the old admonition of "plan the flight, and fly the plan."

Prepare crews

In the book *Breaking the Phalanx*, Douglas Macgregor (COL, U.S. Army, Ret.) mentored us to "Equip the man, not man the equipment." With that in mind, the Army expects and equips UH-60 aircrews to go IIMC. AR 700-138, *Army Logistics, Readiness, and Sustainability*, defines the role of the UH-60 as a transport for personnel, cargo and equipment, and medical evacuation, and also to serve as an air ambulance service under visual meteorological conditions (VMC) and IMC.

Conversely, the AH-64 and OH-58D aircraft communities don't routinely participate in missions involving IMC. Commanders can prepare the attack and scout crews by requiring specific hood training at the end of missions. The real benefit of this is that the crews become more comfortable talking to approach control and organizing their cockpits for IMC. Modifying attack and scout aircraft to instrument flight rules (IFR) standards would be part of the answer.

The key is confidence. If the crews are not confident, all the IIMC briefings in the world won't help. Before Desert Storm, Army Aviation pilots in command (PCs) averaged 3,000 hours of accrued flight time. Around 1993, that average fell to 1,400. Today, Army PCs have an average of 400 hours' experience.

Army Aviation must promote safeguards and improvements to protect the force and successfully develop technology, organization, training, and leadership. Commanders should task SPs, IEs, IPs, and instrument unit trainers to develop an aggressive instrument training program with synthetic flight training systems (SFTS) scenarios, no-notice instrument evaluations, end-of-mission training opportunities, and academics. Training IIMC as a flight is a confidence builder and should be trained regularly. The Army cannot afford to lose any more soldiers to this unpredictable and deadly enemy. Army Aviation must equip and train our aviation warriors properly; however—and most importantly—aviators must respect the weather and know their own limits. ♦

—CW3 Czarnecki is a UH-60A/L SP/IE for the Directorate of Evaluation and Standardization (DES) at Fort Rucker, AL. He can be reached at DSN 558-1748 (334-255-1748) or e-mail kenneth.czarnecki@rucker.army.mil.

Not My Day

Jon Blake
U.S. Army Safety Center

Somewhere in the deep fog that enveloped my brain I could hear someone saying, "The MEDEVAC crew said this guy was flying a helicopter that hit a tree. It appears he has no movement below the waist, so we need to look closely at his back."

When I heard that, something in the back of my mind reminded me that I was a helicopter pilot and should be concerned. I tried to wake up and shake off the confusion, but I couldn't. I then heard another voice say, "I think he has a torn ascending aorta." Someone else said, "No, I think the blood is coming from somewhere else." I didn't know much about medicine or gross anatomy, but I did remember from aeromed and safety training that there are a couple of things that cause people to die in a crash. One is a violation of living space, such as a crushed cockpit. The other is exceeding tolerable G forces, which causes organs and other parts—such as the heart, lungs, and aorta—to tear away from their attachment points. Whatever was wrong, the situation wasn't good.

Still in an inexplicable haze, my brain tried to capture all the sounds and put everything together, but it just couldn't. Who were these people talking about? Why couldn't I open my eyes? When I heard someone ask for "the patient's" name and social security number, the response was just enough to jump-start my brain. They were talking about me! That, coupled with some guy sticking a foul-smelling swab under my nose, immediately brought me back to life. At first I couldn't focus on anything; the lights were too bright, and there were people milling around who looked concerned and busy. The scene looked like something on the TV show "ER," except I was part of the cast.

My brain was still too slow to capture most of the information being presented. Everything was in slow motion. I felt someone tugging at my flight suit. I realized the suit was being cut off my legs. I tried to move, but couldn't. I tried to stop him, but couldn't. Next, some guy wearing BDUs and a white coat asked me if I knew my name. "What a stupid question," I thought. "Of course I know my name. It's…?" Then he asked if I knew where I was—another seemingly simple question. If it was so simple, why couldn't I give him an answer? I wanted to give this guy my name; it was right there on the tip of my tongue, but I just couldn't get it out. This must have struck me as funny, because I started laughing out loud. The other guy must have thought it was funny too, because he started laughing.

As my brain began to awaken, I became more aware of my surroundings. And, as quick as a lightning strike, the pain began to surge up my back and into my brain. The pain felt like a combination of a knife and burning torch being stuck into my back. The doctor sensed my sudden reaction to the pain (probably because of the loud, shrill cry that extended over the entire hospital) and ordered more morphine. After a few minutes he came over, introduced himself, and asked me if I knew what had happened and where I was. Sure I did—what kind of idiot did he think I was? I

just couldn't get the words out. He then asked me if I knew his name. What was up with these questions? "Sure, you just told me! It's…?" I couldn't remember. This went on for several hours.

After several more hours I became aware of what had happened the preceding day. I was in a helicopter crash. My back was broken in three places. I couldn't move my legs. Several of my ribs were broken, and one of my lungs collapsed. I also had suffered numerous other internal injuries. When the surgeon told me I would probably never walk again, I became just a little concerned. Fortunately, he was wrong. I did get my legs back, although I still don't have feeling in some parts, especially the outer portion of my feet. I didn't have to learn to walk again, but I did have to relearn how to balance with no feeling in my toes and heels.

Now, what does all this have to do with tree strikes? Duh—don't hit the trees! It sounds uncomplicated, but something as simple as poor crew coordination can quickly bite you in the butt (or tail rotor) and ruin your day, or the rest of your life.

My accident was caused by two major factors:

■ **Failed crew coordination**. When asked to reposition the helicopter, neither my copilot nor I completely cleared the aircraft, although each thought the other had. The tail rotor struck the only tree within 500 miles. The gearbox, vertical fin, and everything aft of the horizontal stabilator separated from the aircraft, and I had the wildest 3.8-second ride of my life.

■ **Fatigue**. We were both standardization instructor pilots, so the standing operating procedure allowed us to fly longer than the normal 8 hours per day. We were entering our ninth flight hour at the time of the accident and, even though we both felt fine when the commander asked us to extend the flight, neither realized the true effects of fatigue.

The bottom line is that tree strikes can kill you in an instant. I was lucky, but I'll suffer the effects of that accident for the rest of my life. Don't let mission creep, the other guy, or simple fatigue put you in the hospital or the grave (see AH-64 video "Oh Ye of Little Faith" on the Risk Management Information System Web site at **https://rmis.army.mil/**). ♦

—Mr. Blake is the Program Manager for Strategic Communications at the U.S. Army Safety Center and a retired CW4 Master Army Aviator. He may be reached at DSN 558-3770 (334-255-3770) or e-mail jon.blake@safetycenter.army.mil.

A Buffet of Trouble

CW3 John Priestner
A Co., 3/229th ATKHB
Fort Bragg, NC

It was one of those plum assignments. Our National Guard unit was tasked to provide an AH-1 Cobra for an air show. This type of tasking doesn't come down very often, so everyone in the unit wanted to do it. Where else could you get paid to go to an air show? You get free food, lodging, and a rental car. What a deal! I happened to be in the right place at the right time and was selected to go.

Our mission was to fly the Cobra to the host airport on Friday night, spend the weekend, and fly back on Sunday afternoon. During the air show we were to stay by the aircraft and answer questions. What a great way to spend a weekend.

I arrived at our facility around 1600 and inquired about the other pilot. He hadn't arrived yet, and no one was sure when he'd be there. He was driving in from a major city located about 2½ hours away. While I was waiting, I started preparing for the flight. I got the logbook and looked at the weather. It was a beautiful day, and there was no weather forecast within our location. I went out to the aircraft, conducted the preflight, and stored my equipment.

It was getting late, and I was concerned about the other pilot. Someone at flight operations told me an accident had occurred on the interstate and there was a traffic delay. This wasn't welcome news, because I'd been briefed not to depart after dark. The Cobra didn't have a night system, and we didn't have goggles.

I continued to prepare for the flight anyway. I wanted to be ready to leave as soon as the other pilot arrived. I filled out the performance planning card and filed the flight plan. Then I started looking at the route. Our destination was approximately an hour and half north. Since the Cobra had only an automatic direction finder available for navigation and the flight would probably end during the night, I looked for non-directional beacons (NDBs). There were only a few available. Due to the NDBs' limited range, the flight would have to be a lot longer if we used them to get to the airport. This was unacceptable! We had to get there early so we could enjoy the reception buffet for the air show's pilots. It was not to be missed! Just then a brilliant idea occurred to me. The destination airport was just off a major interstate. Our facility was located on the same interstate. How hard could it be to follow a major interstate?

The other pilot, who had been tied up in traffic, finally showed up at 1730. We got his equipment and headed out to the aircraft. We did a walk-around, briefed the mission, and talked about the route. We decided to follow the interstate. We also talked about not departing after dark. "Dark" can be a little subjective—after all, what quantifies dark? We looked at each other and decided it wasn't dark yet (we were both thinking about that buffet!). So we jumped in, ran up the aircraft, took off, and headed north.

We might have convinced ourselves it wasn't dark at the airfield, but it was pitch black

downwind. It didn't take long to realize this wasn't going to be as easy as we thought. A layer of scud clouds was forming in the valleys along the interstate. These clouds were very low and didn't cover the ground, but they did force us to fly higher.

It didn't take long to lose the interstate. We were trying to keep on the map as we continued to fly north and slow down. The land north of our airfield is predominantly state game lands, which are densely forested with no big roads or landmarks. And did I mention it was very dark? There were hardly any lights at all. It doesn't matter how big the interstate or how small the road if it's dark and there are only a few cars. A one-lane road looks the same as an interstate if only one car is driving on it.

This was not a pretty picture. We had moved too far north to use our airfield's NDB, and we couldn't reach another to help us navigate. We were over a densely wooded area with very few lights. We had about 75 minutes of fuel remaining, with at least 30 minutes of flight left before us *if* we found our way. We were circling and praying we could find something on the map to orientate us. We also were worried that we might accidentally run into the airspace to our east, which belongs to a large airport. But we couldn't call them, because then we'd have to admit we didn't know where we were!

We continued to move slowly north. I finally noticed a large group of lights to the east. It looked like a mining facility that I'd passed on my way to our airfield. We moved to the east and were able to positively identify the mining facility. It was still very hard to see the interstate due to the cloud layer and the lack of traffic, but at least we were able to place ourselves on the map. The good feelings didn't last, however; we quickly lost the interstate again.

We flew a time distance for several minutes and finally decided to try our destination airport's approach control. We told them we were to their southwest and prayed they would be able to get us on radar. They came back with radar contact 19 miles to the southwest. What a relief! We asked for vectors to the active. (I don't think many pilots request radar vectors from 19 miles out unless they're lost!)

The bottom line is that complacency kills. We always kid each other about "get-home-itis" and cheating death, but rules are made for a reason. Always follow your standing operating procedures and be prepared for changes. Never plan to follow roads as a primary navigation tool, and don't take unnecessary risks such as night flying. Also, admitting a mistake is much better than dying—that night, we let our pride affect our judgment.

The rest of the flight was uneventful. We landed with 20 minutes of fuel left, even though the flight had been almost twice as long as planned. But we missed the buffet.

The bottom line is that complacency kills. We always kid each other about "get-home-itis" and cheating death, but rules are made for a reason. Always follow your standing operating procedures and be prepared for changes. Never plan to follow roads as a primary navigation tool, and don't take unnecessary risks such as night flying. Our flight could've been delayed until morning. Also, admitting a mistake is much better than dying—that night, we let our pride affect our judgment. We didn't call approach control sooner because we didn't want anyone to know we were lost. An accident is often the result of a chain of events, and we certainly tested this theory that night! I'm just glad we were able to learn from this experience and apply it throughout our aviation careers. Maybe you can learn something too. Fly safe! ♦

—CW3 Priestner may be contacted via e-mail at john.priestner@us.army.mil.

It's Combat, We'll Be Okay!

CW4 Robert Morriss
DCMA, Boeing
Philadelphia, PA

"What were we thinking? How in the world did we get in this situation?" Those were my thoughts while I was part of a flight of 18 CH-47Ds during the first Gulf War. This ill-planned flight was conducted at night with helicopters from two different units. Fifteen of the 18 crews were using NVGs, while the other 3 were flying unaided. Before the night was over, I realized that we almost crashed three times. Here is why the situation was so dangerous.

The three unaided CH-47s were placed as Chalks 2, 3, and 4, with Chalks 5 through 18 wearing NVGs. It gets worse! I was a maintenance officer in Chalk 2, flying a broken CH-47D that was left behind because of numerous maintenance problems. Some of the maintenance issues were night-flight related. Sheer luck kept a catastrophe from happening that night, for when we awoke the next morning, we found ourselves positioned underneath two huge sets of transfer power lines. Just a few hours before, we were flying blind and had no clue those lines even existed!

Here's a brief synopsis of the situation that led to this mismatched formation. We were positioned at the West Heliport in Saudi Arabia. Our parent unit had advanced, leaving us behind with three unserviceable CH-47s. The plan was for our unit to establish a forward area, and then later send a contact team for aircraft recovery purposes. The maintenance faults among the three -47s varied; my helicopter had an inoperative radar altimeter, no power turbine inlet temperature (PTIT) indication on the number one engine, and inoperative power transfer units (PTUs) for both hydraulic systems.

The day prior to the air campaign, the West Heliport housed approximately 90 different helicopters from numerous units. About midday, we noticed that most of the other helicopters were scrambling at a fast pace. Hence, we went to the adjoining CH-47 company for information. We were told that every helicopter had to be evacuated off the heliport at all costs. At that time, we were told the Iraqis were planning to bomb the area early the next morning. Their company commander suggested that we scatter with the aircraft later that night. Our officer in charge agreed.

I soon discovered this was a bad plan. Chalk 1 was aided, but Chalks 2, 3, and 4 were unaided, relying directly on Chalk 1 alone for navigation and obstacle clearance. If that wasn't enough, shortly after takeoff I realized I had a fairly inexperienced copilot. He couldn't hold position in the formation, and we immediately lost sight of Chalk 1. Luckily, Chalk 1 turned his position lights up bright as we closed in on him. Additionally, our engine torque and rotor RPM kept fluctuating, so I took the controls to try and catch Chalk 1 and diagnose our problem.

I glanced in for a moment, realizing the RPM changes were self-induced by the copilot. I assumed immediately that I was single pilot and kept the controls while flying staggered left, which placed me flying cross-cockpit off of Lead. I estimate we kept about one and a half to two rotor disk separations. This separation was comfortable because I had flown with the pilot in Chalk 1 in a previous assignment. However, with task overload, he completely forgot that several of the aircraft behind him had no NVGs. This became apparent when I saw my position lights illuminate a set of power lines as they passed 5 feet below my chin bubble! I immediately informed Chalk 1 that we had just barely cleared the wires and reminded him of the scenario. The plan was to fly 90 miles and land to the left side of a perpendicular road.

The landing zone (LZ) had a reconnaissance performed the day before and was free of obstacles.

Since we were unaided, we were completely dependent on Lead's judgment. Approximately 10 minutes prior to landing, I briefed the crew on my intentions. If Lead browned out, we had no choice but to either land or conduct a massive instrument takeoff (ITO) and call out our heading and altitude.

I also told my copilot to retract the searchlight while on short final so it wouldn't blind us with reflection from the dust. The searchlight controls were on his thrust lever, and I had no access to them. Realistically, I knew if Lead browned out we would absolutely have to land. Otherwise, there would be 3 CH-47s flying blind and 15 others for us to hit. Furthermore, as Chalk 1 turned right for final, I maintained one rotor disk separation to keep visual. As he came close to the ground, I backed off to approximately three rotor disk separations. That's when things got crazy.

As I expected, Chalk 1 browned out so bad that I lost sight of him. Now I'm unaided, no radar altimeter, with an extremely inexperienced copilot in the middle of the night, with only one real choice—land! Just when I thought things couldn't get any worse, my copilot turned on the white light and moved it directly in front of my windshield. I had my hands full or I would've punched him! I repeatedly screamed over the intercom, "Retract the search light!" However, he had frozen stiff! I finally changed hands on short final and, flying with my left hand, I reached across and retracted the light. It's hard to explain, but the reflection off the blowing dust had completely blinded me. I kept the helicopter in a landing attitude, and when I felt the aft gear touch down, I kept us level and lowered the thrust lever.

I remember thinking that we'd made it, that the worst was over. That thought lasted about 2 seconds. Now, 17 other CH-47s were trying to land on us like a huge navigation aid. It got so bad that I finally had to turn on the anti-collision lights. And since they were landing all around us I had to leave the rotor RPM at full flight, which caused even more blowing dust. It took approximately 25 minutes of Chinooks flying chaotically in circles to land the entire flight.

We were extremely lucky! Lead had missed the initial LZ and relied completely on his inaccurate Doppler. The flight had flown 5 miles off track and landed along the wrong road. Not once did anyone mention over the radio that massive power lines bordered only meters to the north. If any of the three unaided crews had conducted an ITO or go-around, they would've absolutely perished.

Once we shut down, I said a few prayers and went to bed exhausted. The next morning when I awoke, I spotted two massive sets of transfer power lines positioned directly above and in our immediate flight path. I looked behind us to see two huge 40-feet-long trenches cut by our aft landing gear. In turn, the other two unaided aircraft had landed directly behind us, following the same 'land at all costs' thought process. One of them landed in a depression and the forward rotor blades came to rest only a couple of feet from the ground. All three of us had left long skid marks, which were made in our desperate attempt to land at all costs.

We were extremely lucky! Lead had missed the initial LZ and relied completely on his inaccurate Doppler. The flight had flown 5 miles off track and landed along the wrong road. Not once did anyone mention over the radio that massive power lines bordered only meters to the north. If any of the three unaided crews had conducted an ITO or go-around, they would've absolutely perished. This was all in the name of combat necessity. I still get chills when I think about it. ♦

—CW4 Morriss is a CH-47 Maintenance Test Pilot for Defense Contract Management Agency (DCMA), Boeing. He may be reached by calling 210-845-6946 or by e-mail at Rob.morriss@us.army.mil.

The "Bad Old Days"

Robert Bailey
Yuma Proving Ground, AZ

It's an all-too-familiar story—a case of "get-there-itis" that almost cost two pilots their lives. Only in this story, I was one of those pilots. Read on and learn from my mistakes!

My copilot and I had a mission to support a recruiting office in Seattle, WA, by staging a static display in a shopping mall parking lot. We left our airfield early in the morning in our show aircraft, an AH-1G. The weather conditions at launch time were barely legal, but the forecasters were calling for conditions to improve throughout the morning.

We followed Interstate 5 north through Tacoma, scud-running all the way. As we got further north, however, the conditions didn't improve—in fact, they got substantially worse! At one point we were dodging light poles at a freeway interchange.

As you can probably guess, things only got worse from there. We were near the approach end of Seattle-Tacoma Airport when we realized heavy jets would be coming in very low. We hadn't contacted their approach control, so climbing the aircraft for an instrument flight rules recovery was no longer an option. Looking down at the freeway only compounded our sense of disorientation.

The dominoes kept falling. We saw high-tension power lines looming in the haze. We couldn't go over or under, and we couldn't stop or go on. With gritted teeth we inched over what we thought was the top strand, only to see another wire higher up. Moving on pure inertia, we eased the last few feet over the top wire just as we lost visual contact with the ground. Descending cautiously back to where we could see the ground, we came to a high hover and agreed to park the bird and wait the weather out. A small hole opened, and we parked in a shallow valley for a couple of hours.

The rest of the trip was uneventful, but while we were on the ground waiting for the weather to clear, we discussed a few points. I'll share those with you.

- The weather man can be either right or wrong, but there is no in between. If he's right, that's great. If he's wrong, it can cost you a lot, including your life!
- There are only a few missions worth risking death to accomplish. A Saturday at the mall is not on that list.
- This one's simple: Know where the wires are BEFORE departure!
- Crew coordination is essential when conditions are good. It becomes a matter of life and death when things turn rotten.

This story took place many years ago, before nap of the earth qualification training, global positioning systems, cell phones, crew resource management (CRM) training, universal instrument qualification for helicopter pilots, and any number of risk mitigators we now take for granted. Would any of these have helped us that day? You bet! But we would have had to use them correctly for them to work. When you think it's a pain to do all the risk assessments, mission planning, and CRM training, think about the "bad old days" and how far we've come. ♦

—Mr. Bailey is currently a civilian contractor at Yuma Proving Ground, AZ. He retired from the Army as a CW5 with just short of 6,000 hours. He may be contacted via e-mail at robert.bailey@yuma.army.mil

News Flash!

Plan for the FY04 Army Safety Conference, 31 August to 2 September 2004. Stay tuned to the July 2004 *Flightfax* for location and agenda details.

Our Army at War
Be Safe! Make it home.

NCO CORNER

The Last One

MSG Shane Curtis
U.S. Army Safety Center

Through my years at the Army Safety Center, I've written several articles for *Flightfax*. I've always tried to emphasize that being safe is the safest way to go—it's one of the easiest ways to stay alive! We all can and do learn from each other, either through prior mistakes, lessons learned, or from good news stories.

I ask all enlisted Soldiers to take a good look at their everyday duties, the duties they're required to do in order to successfully complete their mission. Write down what went well and what didn't; then compile a list of suggestions on what can be changed for the better. Get your suggestions out to your fellow Soldiers—they can make a difference and possibly save a life. How can you do this? It's easy! Just tell your story in *Flightfax*.

Aviation NCOs have a section called "NCO Corner" reserved just for them each month in *Flightfax*. I've told most of my stories as a crewmember. Some have been good news stories, some have not. I hope something can be learned from each of them. What did I do wrong? What did I do right? What should I have done? What would've been a better way of doing it? What changes should or could've been made?

Speak up and be heard. You can make a difference in Army Aviation, and you can make this business safer for all.

Everybody has a story that needs to be told. You can save a life by telling your story. Soldiers read this magazine and learn from it. Aviation is a big field with big needs, from the platoon sergeant down to the new private. And those new privates need to start being safe today! Their leaders should mentor and shape them into tomorrow's safety managers early in their careers. We can't wait until tomorrow to be safe.

Speak up and be heard. You can make a difference in Army Aviation, and you can make this business safer for all. Chances are someone will say, "I've been there!" or "That's the same thing that happened to me!" You could tell how you used DA Form 2028 to make corrections to a technical manual and how those corrections made Army Aviation safer. The smallest change can make a very big contribution towards the safety of your fellow Soldiers. And the next life you save could very well be your own.

I soon will be closing out my military career after 26 years of active-duty service. I leave this portion of *Flightfax* to you, the enlisted Army Aviation Soldier. Please let others learn from your experiences. And, most of all, continue to fly safe! ♦

—MSG Curtis is a CH-47 Aviation Systems Safety Manager at the U.S. Army Safety Center. He can be reached at DSN 558-9859 (334-255-9859) or by e-mail at shane.curtis@safetycenter.army.mil.

Investigators' Forum

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

A "Thump" in the Night

CW5 Thomas A. McGee
Idaho Army National Guard

It was a cold Idaho night in February. The AH-64A attack helicopter crew was flying at cruise altitude—1,200 feet AGL—and had completed 1.2 hours of their planned mission when they heard and felt a "thump." They could not determine the cause or suggest a plausible reason for the noise, so they returned to the Boise airport and landed. The post-flight inspection showed a bird had struck the right pylon. The bird was most likely a goose, based on the damage and blood.

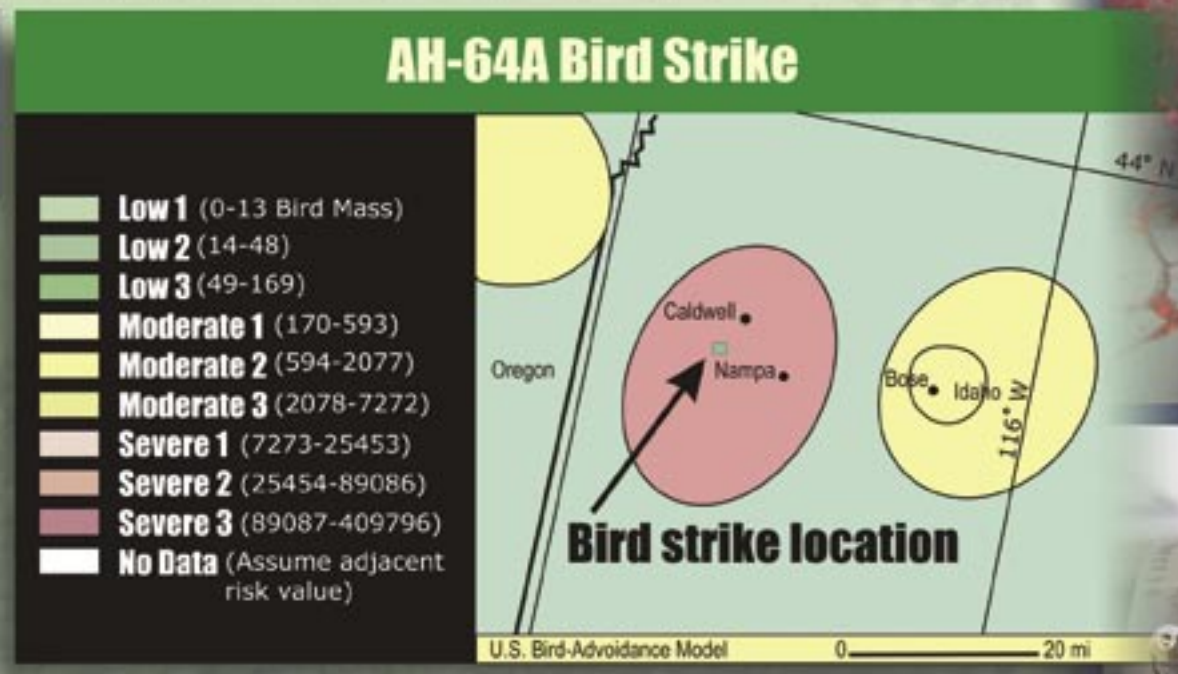
Our unit has experienced at least three bird strikes in the past 10 years. In one previous incident, the bird strike damaged an AH-64A engine inlet nacelle. In another, a bird hit the copilot-gunner front windshield, which fortunately didn't shatter. Our local flying area is close to migratory bird flyways, and these concentrations of ducks and geese contribute to the problem.

USAF Wildlife Strikes by Year

Year	Cost	Count	Cost/Count
1985	$5,452,151.00	2719	$2,005.20
1986	$18,079,969.00	2853	$6,337.18
1987	$241,045,661.00	2729	$88,327.47
1988	$4,000,668.00	2649	$1,510.26
1989	$24,880,855.00	3072	$8,099.24
1990	$7,797,017.00	2956	$2,637.69
1991	$17,953,037.00	2772	$6,476.56
1992	$24,514,446.00	2289	$10,709.67
1993	$9,506,792.00	2441	$3,894.63
1994	$16,828,509.00	2385	$7,055.98
1995	$90,687,089.19	2662	$34,067.28
1996	$7,479,091.15	3114	$2,401.76
1997	$10,339,360.66	2739	$3,774.87
1998	$25,548,135.66	3523	$7,251.81
1999	$29,936,759.37	3365	$8,896.51
2000	$34,063,781.42	3440	$9,902.26
2001	$13,412,830.41	3848	$3,485.66
2002	$10,541,941.04	3989	$2,642.75
2003	$54,975,399.28	4318	$12,731.68
2004	**$15,000.00**	**10**	**$1,500.00**

Current as of 13 January 2004

Table 1



So, what is the cost of bird strikes and how many happen per year? Table 1 shows the high number and significant cost of bird strikes in the U.S. Air Force (USAF) alone. You might think this is a problem relevant to high-flying, fixed-wing aircraft; but as shown in Table 2, as of 5 May 2004 the Army has suffered numerous bird strikes too, a total of 411 since FY92, resulting in $1,423,540 in damage.

So what can we do? A great resource is the USAF's Bird Air Strike Hazard (BASH) program found at **http://afsafety.af.mil/AFSC/Bash/home.html**. This source provides a vast array of information, from bird strikes and their costs to avoidance models that show the areas that pose the highest probability of bird strikes. The avoidance models are great tools for flight planning during peak times of the year when birds are concentrated. In fact, the area shown in the diagram above (where our most recent strike took place) is a high-risk area. We've been lucky that we haven't had a more serious accident over the years.

To help mitigate the risk we face, our new risk assessment matrix will include an element for bird strike avoidance. I would highly recommend that you review your local flying areas using the BASH program and consider that information in your flight planning. Fly safe!

—CW5 Thomas A. McGee, IDARNG/AASF, ASO/SASO, DSN 422-3970 (208-422-3970)

FY92-Present* Army Aviation Bird Strikes	
Class C	21
Class D	75
Class E	351
Total	411

*As of 5 May 2004

Table 2

Broken Wing AWARDS

Julie Shelley
Staff Editor

The Broken Wing Award recognizes aircrew members who demonstrate a high degree of professional skill while recovering from an in-flight failure or malfunction requiring an emergency landing. Requirements for the award are listed in Army Regulation (AR) 672-74, *Army Accident Prevention Awards*. The Army Review Board met recently and approved the following awards.

CW3 Rodney Swanson

82d Airborne Division
Fort Bragg, NC

Acting as the pilot in command (PC) and under night vision goggles (NVGs), CW3 Swanson was on final approach in a CH-47D during a combat air assault mission in Afghanistan. In addition to the crew, 36 paratroopers were onboard in a seats-out configuration. The aircraft was in brownout conditions when CW3 Swanson noticed a right lateral drift and took the controls, electing to execute a go-around. The dust cloud created by the aircraft caused the crew to completely lose visual references in the landing zone.

As the crew climbed through 60 feet above ground level (AGL), the #1 engine catastrophically failed and caught fire. CW3 Swanson recognized that he did not have single-engine capability or the altitude to fly out of the situation. He executed the emergency procedure for an engine failure while simultaneously pulling the #1 fire pull handle and entering an autorotation. CW3 Swanson continued with the underlined steps for emergency engine shutdown and placed the #1 engine condition lever to the STOP position. While maintaining what little rotor RPM remained under maximum gross weight conditions, CW3 Swanson applied cushioning thrust just before the aircraft impacted the ground. The aircraft was destroyed by the impact and post-impact forces. The personnel onboard, however, escaped injury.

CW3 Swanson's skill at maintaining control of the aircraft allowed it to impact in a level attitude, which mitigated the severity of the impact. He was able to accomplish this despite the lack of visual references in the brownout conditions. The entire incident lasted 3 to 5 seconds.

Thanks to CW3 Swanson's knowledge, skill, and technique, all 41 Soldiers onboard the aircraft escaped injury and death. ♦

CW3 Claude Doughty

Nevada Army National Guard
Reno, NV

Flying lead in a flight of two OH-58A+ Reconnaissance and Interdiction Detachment (RAID) aircraft, CW3 Doughty and his crew chief were returning to home station when their aircraft's vertical fin experienced a severe materiel fracture. Just prior to the incident, the trail aircraft's crew observed what they thought to be a vibration in the vertical fin of CW3 Doughty's aircraft. After repositioning their aircraft to get a better look, the second crew agreed that what they saw was probably an optical illusion. The crew decided not to alarm CW3 Doughty or his crew chief.

A few minutes later, the trail aircraft's crew noticed that CW3 Doughty's aircraft made an immediate 100-foot descent with a simultaneous 20-degree left yaw. Immediately after the abrupt maneuver, one of the trail pilots

observed that the lead aircraft's vertical fin had broken in half and was hanging to the right. The pilots contacted CW3 Doughty to inform him of the situation, at which time he regained control of the helicopter. CW3 Doughty also began to search for a suitable landing area in the mountainous terrain they had entered a few minutes before the emergency.

Since CW3 Doughty wasn't sure if the tail rotor had suffered any damage, he decided to perform a run-on landing to an unimproved area the formation had just passed. To restrict the aerodynamic forces on the vertical fin's broken half and keep it from folding back into the tail rotor, CW3 Doughty initiated a gradual descent and elected to do a 270-degree shallow left turn. Without any further damage to the aircraft, he was able to accomplish the run-on landing on a very small, unimproved dirt road that was surrounded by cattle. CW3 Doughty was able to fly his aircraft back to home station about 5 hours later after maintenance personnel arrived and replaced the vertical fin.

The mishap was recorded as only a Class D accident thanks to CW3 Doughty's sound decision-making at the onset of the emergency. ♦

CW2 Timothy Edgette
CW2 Chad Dominique
82d Airborne Division
Fort Bragg, NC

Only 5 minutes from landing and termination of an NVG mission in Afghanistan, the CH-47D flown by CW2 Edgette and CW2 Dominique experienced dual flight control hydraulic failure. CW2 Edgette, who was the PC, and CW2 Dominique, the PI, first noticed that the MASTER CAUTION, #2 HYDRAULIC, and #2 AFCS lights flickered twice, and then illuminated steadily. They immediately informed the crewmembers and had them check for abnormal temperatures, pressures, or leaks. The flight engineer (FE) checked and confirmed that all pressures and temperatures were normal. CW2 Edgette and CW2 Dominique then executed the proper emergency procedure.

As CW2 Dominique maintained control of the aircraft, CW2 Edgette turned on the #2 power transfer unit and informed flight lead and the air mission commander (AMC) of the situation. However, only a couple of seconds later the flight engineer instructor discovered a massive hydraulic leak coming from an unknown source in the aft transmission area. The FE, who was monitoring the maintenance panel, then announced that the #2 hydraulic pressure had dropped to zero.

CW2 Dominique reported to CW2 Edgette that the controls were "locking up," and began adjusting the aircraft for a 200- to 300-foot rate of descent in the event of total loss of flight control movement. CW2 Edgette immediately executed the emergency procedure for dual flight control hydraulic failure, turned on the #1 power transfer unit, announced that he had the controls, and informed the rest of the crew and the AMC they were "going down." He also turned on the IR landing light and ensured the brakes were released.

After confirming both his and CW2 Edgette's shoulder harnesses were locked, CW2 Dominique started the auxiliary power unit (APU) and manned the flight controls so they could work together to maintain the aircraft's attitude and ensure a safe landing. CW2 Edgette and CW2 Dominique had to maneuver the aircraft—with a total lack of flight control movement—over several deep washouts and terrain unsuitable for a safe rolling landing. They finally were able to land the aircraft in a dry riverbed with no injuries to the crew or serious damage to the aircraft. The emergency lasted only 30 to 45 seconds.

The clear thinking, expeditious decisions, professionalism, superb crew coordination, and precise situational awareness of the entire crew facilitated the positive outcome of this situation. ♦

—Julie Shelley, Staff Editor, *Flightfax*, U.S. Army Safety Center, DSN 558-1218 (334-255-1218), e-mail julie.shelley@safetycenter.army.mil

AVIATION STANDARDIZATION

STACOM

Standardization Communication

MESSAGE 04-03

Emergency Procedures

A growing concern with the UH-60 community has developed regarding the proper actions during emergency procedures. The purpose of this STACOM is to help the UH-60 community better understand the options that are available to the pilot. We will use the Stabilator Auto Mode emergency procedure as an example.

Much debate has arisen over **WHEN** and **WHERE** to slew or **NOT** to slew the stabilator during an auto mode failure. Adding to that, the response to the emergency procedure can vary widely depending upon the situation, making the understanding of this system critical.

The UH-60 Operator's Manual states that for a Stabilator Auto Mode failure, you must perform the following steps:

1. Cyclic-mounted stabilator slew-up switch—Adjust, if necessary, to arrest or prevent nose-down pitch rate.

2. AUTO CONTROL switch—Press ON once after establishing a comfortable airspeed.

So let's clearly address the "**WHEN** to slew-up" issue. **ANYTIME the pilot feels the need to arrest a developing, or prevent a further, nose-down pitch rate from occurring**, then slewing the stabilator UP is appropriate.

WHERE to slew is not necessarily your first concern—it's AIRCRAFT CONTROL—i.e., **ARRESTING** or **PREVENTING** the nose-down pitch rate. Once aircraft control can be assured, then we can address the appropriate position to slew the stabilator more definitively. An example of this might be during an accelerated takeoff and a STAB AUTO MODE failure occurs. If the acceleration is continued, the stabilator would have to be slewed up to arrest the developing nose-down pitch rate. The **WHERE** to slew the stabilator is based upon the

handling characteristics of the aircraft. You must slew it up far enough to prevent further nose-down pitch rates from occurring for the desired flight profile you have selected.

The **WHERE** issue is further addressed based upon information not necessarily covered in the UH-60 Operator's Manual. Slewing the stabilator to any position other than *zero and continuing* a typical accelerative takeoff profile can result in demanding more aircraft power, increasing mast extension stress, and potentially imposing further risk to longitudinal control, especially if a subsequent emergency were to occur (i.e., an engine failure where the collective would need to be adjusted down). *Therefore, if the situation lends itself to being able to slew to zero, this would be the best choice*.

To aid instructor pilots (IPs) in training this task, it should be clear there are different "**WHEN to slew**" scenarios and two distinct stabilator response options. One is if a continued acceleration is desired to an airspeed above 40 knots, then **WHEN** to slew is immediately to arrest or prevent a developing nose-down pitch rate. Therefore, the stabilator should be slewed to zero if you plan to continue the acceleration. After reaching your established comfortable airspeed, then perform step two: **AUTO CONTROL RESET** - Press ON once.

The other scenario is that if holding a specific airspeed during the takeoff sequence wouldn't have a negative effect on the mission, then the option of announcing "not slewing" and "establishing a comfortable airspeed" can occur, allowing step two to be accomplished in a timely manner. Keep in mind applying critical information from the stabilator warning must be considered as well.

Remember WHEN to slew the stabilator up = anytime the pilot needs to arrest or prevent the nose-down pitch rate. Aircraft control is the most important factor.

WHERE to slew the stabilator is secondary, but has a significant affect in ARRESTING OR PREVENTING further nose-down excursions; therefore, slewing the stabilator to zero enhances longitudinal control margins and increases power availability during acceleration.

Lastly, IPs should train emergency procedures in all flight modes, considering all of the various mission scenarios we will train and fight in. Stabilator Auto Mode failures, as well as various other malfunctions, should be trained NOT ONLY during takeoff profiles but also at a hover, in cruise flight, and on final approach. Instructor pilots need to be creative on how and when to introduce emergencies, which add to obtaining a better understanding of the effect the emergency has on the aircraft's handling characteristics. Train the different options available and then match the best option for that situation.

—CW3 Kenneth R. Czarnecki is a UH-60A/L SP/IE for the Directorate of Evaluation and Standardization at Fort Rucker, AL.
He can be reached at kenneth.czarnecki@rucker.army.mil .

Standardization communications (STACOMs) are prepared by the Directorate of Evaluation and Standardization (DES), USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-2603/2442. Information published in STACOMs may precede formal staffing and distribution of Department of the Army official policy. Information is provided to commanders to enhance aviation operations and training support.

Parting Shots: Safety Sends...

"Safety Sends"* is a new Army Safety Campaign Plan initiative to help keep senior leaders abreast of current accidents and their impact on combat readiness. Composed weekly by the Director of Army Safety, *"Safety Sends"* is provided to general officers and features summaries of accident trends and snapshots of accidents that occurred recently, including contributing factors. Each month, *Countermeasure* and *Flightfax* will feature a condensed *"Safety Sends"* message. Below is a summary of the first *"Safety Sends."

We are an Army at war, and it is a fast-moving train with over a quarter-million Soldiers moving in one direction or another. Every Soldier and piece of equipment in this fight counts. Fatalities continue to rise, and we have two enemies in this war: the human enemy and accidents. Since World War I over half of our wartime losses have been due to accidents—not the enemy. As professionals we study the art of war in great detail, but that study is focused only on the enemy, not accidents.

The Acting Secretary of the Army, Chief of Staff, Army, and Sergeant Major of the Army fully recognize the importance of engaging both enemies. The strategic message is clear: the most potent weapons against accidental losses are leader involvement and accountability across the force. Each of us must commit to the fight and get the message down to first-line leaders and individual Soldiers. Conducting small operations with junior leadership safely is our challenge, and nothing we do will be effective unless we make safety personal.

Over the last 6 months, the Army Safety Center has made great strides to develop and refine digital tools to attack this undeclared enemy. This is the first step in making the study of accidental losses easier and an integral part of our culture. Visit our Web site at **https://safety.army.mil**. First-line supervisors should use these tools in their risk management process. The Risk Management Information System (RMIS)—the Safety Center's accident database—recently became more accessible than ever to supervisors wanting vital accident statistics, and getting a password for the protected RMIS site is now at the touch of a button. All you need is an Army Knowledge Online (AKO) account. The new "Login" link found on the Safety Center Web site uses your AKO password for all our tools, including the new Accident Reporting Automation System (ARAS) and the Army Safety Management Information System (ASMIS). Now you don't have to remember another user name and password!

Privately owned vehicle (POV) accidents continue to be one of our greatest challenges in reducing fatalities. The POV module of ASMIS-1 has been on the street for just over 2 months and already has 7,700 registered users and over 5,000 risk assessments on file. We recently reviewed 109 POV accidents and found that only one user had been involved in a crash, and he was a passenger! This shows the system is connecting with the digital generation. If you really want to make a difference in your formation, mandate that a printed copy of your Soldiers' POV assessments be attached to leave and pass forms. The ASMIS-1 system can be accessed through the Safety Center's Web site at **https://safety.army.mil/asmis1/**.

We have the right focus on the main operations, but we aren't getting it right in our supporting efforts—those small convoys and single-ship aircraft missions. We haven't adequately prepared our junior leaders, who must execute these missions with the right skills, education, and access to knowledge to make good risk decisions. Focusing on pre-mission planning, troop-leading procedures, and pre-combat checks is critical. Thanks for taking the time to hang in there. We are at your disposal and will help in any and every way to protect the force as we fight the Global War on Terrorism. ♦

BG Joe Smith
Director of Army Safety

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class A (Damage):** The crew was conducting a night reconnaissance mission under the forward looking infrared at a training center. After completing a three-way positive control transfer so the backseat pilot could change a radio frequency, the copilot gunner (on the controls) became spatially disoriented and allowed the aircraft to descend with near-zero forward airspeed. The tailboom struck a tree, causing a loss of tail rotor thrust, before the crew could recover the aircraft from the descent. The aircraft continued its descent into the trees and crashed onto its right side. Both crewmembers egressed the aircraft uninjured.

CH-47

D Model

■ **Class C:** While performing a 30-minute ground run after an engine upgrade, the #1 generator failed, causing the XSMN AUX OIL PRESS light to illuminate. The crew immediately shut down the aircraft. A black ring was found around the generator on post-flight inspection, and the aft transmission filter was popped. A serviceability check the following morning showed a large amount of debris. It is suspected that the generator shaft sheared and caused foreign object damage to the transmission.

OH-58

C Model

■ **Class C:** Two aircraft made contact during flight. The aircraft were flying in the same area, and both crews had acknowledged each other before the accident. The number one aircraft initiated a left turn near the ACP, crossing in front of the number two aircraft. Neither crew believed the two aircraft had touched. Post-landing inspection revealed Class C damage to the main rotor blades of the number one aircraft and to the tail rotor blades of the number two aircraft.

D(I) Model

■ **Class C:** Aircraft experienced a mast overtorque condition as the crew was attempting to avoid wires at 200 feet above ground level. One main rotor blade and the vertical fin contacted the wires. No other details were reported.

UH-60

A Model

■ **Class B:** Aircraft encountered blowing snow during landing to a cleared strip. All four main rotor blades contacted trees. The aircraft was shut down without further incident.

■ **Class B:** The main rotor system contacted the fuselage and severed the tail rotor driveshaft while the crew was conducting a roll-on landing. The roll-on landing was being performed as part of aircraft qualification course training with a non-rated student pilot on the controls. The accident is under investigation.

UC-35

A Model

■ **Class B:** Both engines were suspected to have exceeded speed limitations during climb-out while departing the local airfield. A download of the engine data recorder confirmed overspeed conditions on both engines.

■ **Class C:** The aircraft's #1 engine speed registered at 103 percent during descent. Post-flight maintenance inspection confirmed damage to the engine.

RQ-7

Shadow Model

■ **Class B:** Air vehicle suffered Class B damage after experiencing a reported generator failure during flight. Both the vehicle and its payload were destroyed in the crash.

■ **Class C:** Air vehicle experienced generator voltage regulator failure during flight, followed by a landing system failure. The flight termination system parachute deployed, and the vehicle hit the ground about 1 mile short of the airfield.

Editor's note: **Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).**

2004 ALSE Users Conference

The dates for the 2004 ALSE Users Conference are 24-26 August 2004 at the Huntsville Hilton in Huntsville, AL, in which 150 rooms have been set aside if you wish to make your reservations now. Contact Melanie Barksdale at PM Air Warrior for more information, DSN 746-4703 (256-876-4703) or e-mail Melanie.barksdale@peoavn.redstone.army.mil.

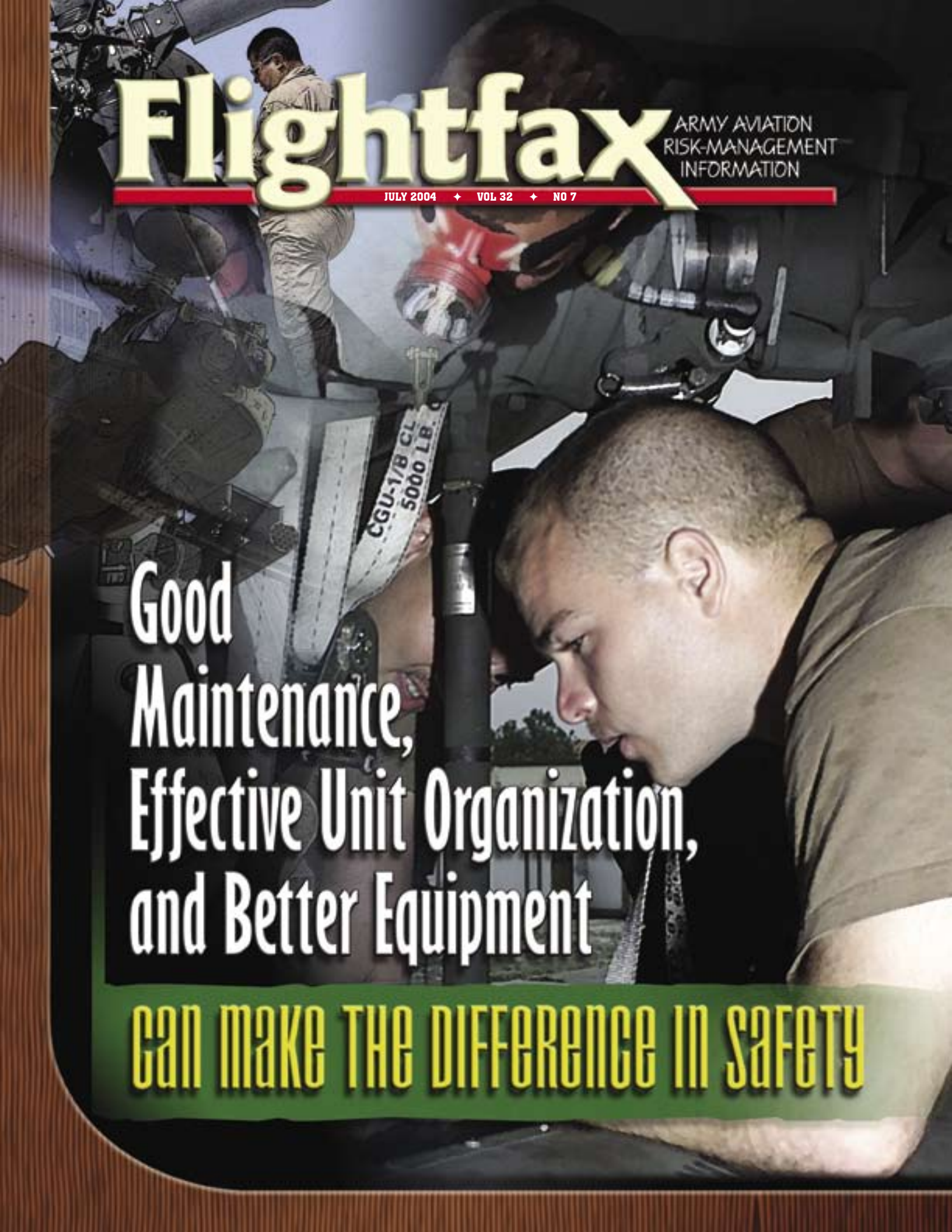
LEARN FROM THE MISTAKES OF OTHERS...

YOU WON'T LIVE LONG ENOUGH TO MAKE ALL OF THEM YOURSELF.

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

JULY 2004 ✦ VOL 32 ✦ NO 7



Good Maintenance, Effective Unit Organization, and Better Equipment

can make the difference in safety

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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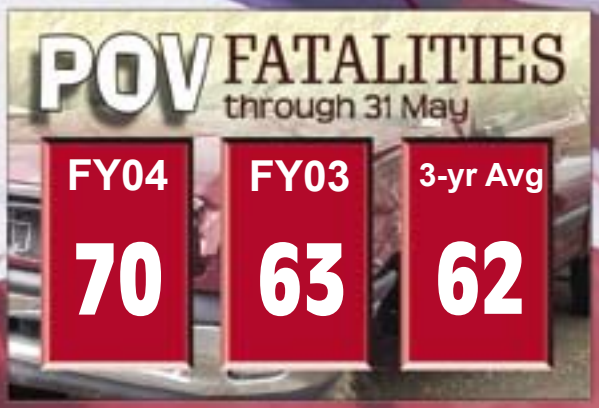

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner

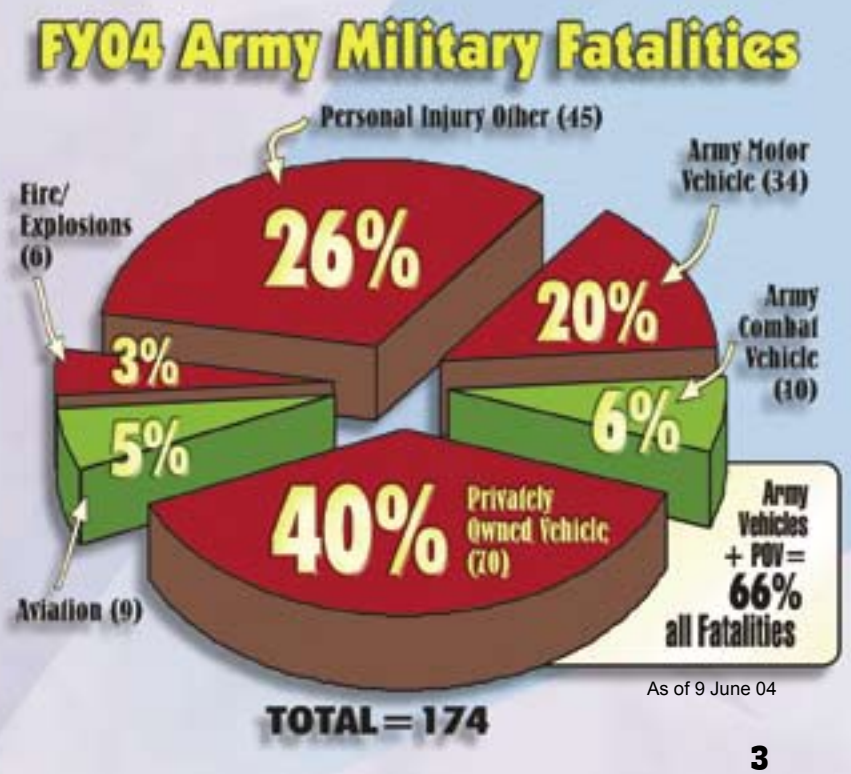
FROM THE DIRECTOR OF ARMY SAFETY

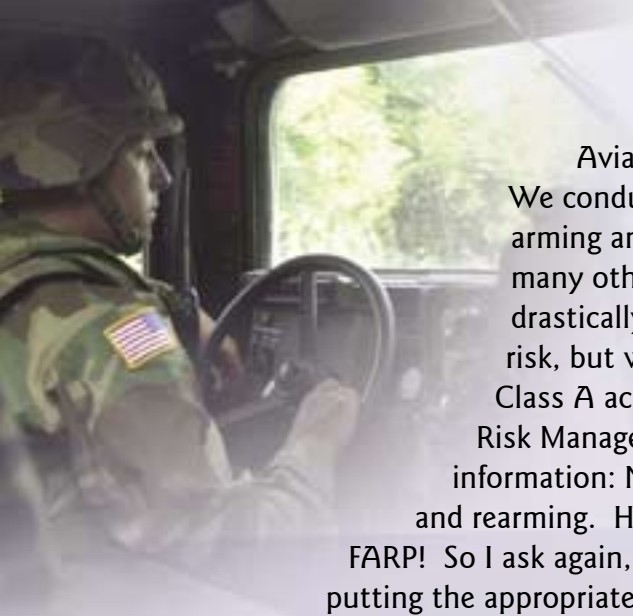
Where Are You at Risk?

In my 30 years of service, I've never seen the Army as busy as it is right now. This spring we completed a series of rotations in the Central Command (CENTCOM) area of responsibility (AOR) that totaled over 250,000 Soldiers coming in and out of theater—the highest number since World War II. The challenges of the Global War on Terrorism, especially those in Iraq, have gripped the attention of our Army and our Nation.

Whether in theater or at home, our Soldiers and leaders stay focused on accomplishing their part of the mission. We train, we deploy, we fight, we redeploy, and we prepare to repeat the cycle in 12 to 18 months. Leaders at all levels understand that safety is important to their unit's welfare and combat readiness. But do we know what our leading hazards are? Or are we concerned only with the hazards that we might confront in theater? Do we truly understand what is going to get us hurt or killed? Do we spend the appropriate amount of time and resources toward preventing accidents?

Accidents have always been a significant concern. Since World War I, 55 percent of Americans killed in combat died because of accidents. As aviation Soldiers, we know the danger of accidents and spend significant resources to reduce the risks of our aviation operations. That is why over the last 30 years, the percentage of Army Aviation accidents has declined significantly. This year is no different, with only 5 percent of the Army's accidental fatalities attributed to aviation accidents. The raw numbers are also lower, which is why aviation is one of the only areas of the pie chart reflected in green. You wouldn't know it from listening to the press, but to date, Army Aviation's safety statistics are a great success story!





Aviation units do much more than just conduct aviation operations. We conduct convoy operations, motor pool operations, forward arming and refueling point (FARP) operations, weapons handling, and many other common tasks in which we continue to lose Soldiers at a drastically high rate. We always talk about FARP operations as high risk, but when I had my aide (a former III/V platoon leader) pull the Class A accident statistics on FARP operations using the Safety Center's Risk Management Information System (RMIS), we found some interesting information: Not a single Soldier on record has died while actually refueling and rearming. However, we have lost several Soldiers driving to or from the FARP! So I ask again, do you really know where you are at risk, and if so, are you putting the appropriate resources toward lowering those risks?

If you are in the CENTCOM AOR, your hazards lie in two major categories: Army motor vehicles and personal injuries. If you are in a HEMMT or HMMWV driving too fast for the road conditions or riding without a seatbelt, you just became your own worst enemy—more dangerous than any terrorist or improvised explosive device (IED). If you don't effectively enforce proper weapons clearing procedures and muzzle awareness in your squad or platoon, your own teammates will be more of a danger to you than any brownout approach under goggles.

What about when you're not deployed? This year alone, 72 percent of fatalities were caused by automobile or motorcycle accidents at home. This is tragic. There is honor in facing death while fighting for your country. There is no honor, however, in dying on a 3-day pass because you were too stubborn to wear your seatbelt, pull off to the side of the road when you were tired, or wear your motorcycle helmet.

So now that you know where the hazards lie, I ask another question. Do we spend the appropriate amount of time and resources to ensure our Soldiers and battle buddies drive defensively on America's roadways? We must train hard to be ready to fight, but all that training is wasted if Soldiers don't make it to the fight.

As an Army Aviation organization, we need to take the same safety approach we use for our big air assaults and apply them to our small convoy operations and POV trip planning. The Safety Center has provided two Internet tools to help you identify and assess hazards specific to your mission, whether you're at home or in theater. RMIS, available on the Safety Center Web site at **http://rmis1.army.mil**, can tell you the leading accident causes for any specific piece of Army equipment, installation, or type of mission. The ASMIS-1 POV Risk Assessment Tool, also located on our Web site at **https://safety.army.mil**, will assess a Soldier's travel plans and simultaneously inform the first-line supervisor what the greatest risks are for any driving trip.

Internet and multimedia tools enhance the risk management process, but there is no substitute for good leadership. We need our leaders to understand where they are in time and place, correctly identify their unit's risks, and take appropriate action to reduce those risks. Whatever the leader emphasizes gets done. Tough, caring leadership is not always popular, but our Soldiers count on their first-line leaders to make the tough calls and ensure they make it home safely.

Our Army at War: Be Safe and Make it Home!

Joe Smith

Good Maintenance, Effective Unit Organization, and Better Equipment

can make the difference in safety

The Army expends a lot of time, money, and manpower to improve safety at the lowest level and prevent accidents. This is especially true in Army Aviation. Every effort is made to provide good maintenance, effective unit organization, and better equipment to the Soldier in the field.

Two organizations featured in this issue are on the cutting edge in this regard. The Directorate of Combat Developments (DCD) has a significant safety role to play as the Army reorganizes or transforms to combat threats to our Nation. DCD is developing unit organizations and materiel requirements to bring Soldiers, leaders, and equipment together into efficient combat-ready organizations that can safely accomplish their missions. Aviation maintenance and supporting Soldiers are especially important when units deploy to harsh environmental conditions. While unit organization and materiel all have a role in safety, it's the actions of Soldiers and their leaders that actually, reduce risks where the rubber meets the road.

The U.S. Army Aviation Technical Test Center (ATTC) at Fort Rucker, AL, is also contributing to safety. Its ongoing Lead the Fleet (LTF) program is assisting Army Aviation with its transition to a condition-based maintenance program. LTF is gathering data and information designed to identify aircraft and aviation systems problems before Soldiers encounter them in the field. Evaluation of the safety and health characteristics of each item and system is conducted throughout the life cycle of a test. The LTF program provides insight into personnel hazards, as well as materiel and aircraft problems. It also provides conclusions regarding equipment maintenance hazards and any associated operational hazards inherent in the system.

Editor's note: Both DCD and ATTC are making it easier for Soldiers to be safe in our Army. I challenge other organizations to take an active role in supporting and promoting safety throughout the Army. Let us hear how your organization is taking an active role in promoting safety.

Aviation Unit Maintenance Transformation

LTC Rob Sanders
Directorate of Combat Developments
Fort Rucker, AL

The new aviation brigade, or Aviation Unit of Action, is designed to be modular, scalable, and tailorable, and can task organize as required to conduct reconnaissance, security, air assault, close combat attack, mobile strike, and maneuver sustainment support. All units are designed to be modular, tailorable, and standardized to the extent possible, both between echelons and components of the force. In addition, each supported brigade combat team (BCT) Unit of Action has an organic brigade aviation element (BAE) that provides integration and synchronization of aviation into the BCT commander's scheme of maneuver.

Each of the Aviation Unit of Action's four aviation battalions, as the principal fighting component of the Unit of Action, are optimized to conduct and support tactical operations. The battalion contains the first level of staff planning, integration, coordination, and sustainment for aviation in combined arms operations. It is normally the lowest-level aviation unit that operates independently or autonomously for any extended period of time, and then only with required support from the Aviation Unit of Action. The flight company, as the primary fighting component of the battalion, is the basic building block of aviation and is also optimized for offensive actions.

Aviation flight companies are configured with 8 to 12 aircraft based on standard company building blocks. While the company is capable of limited independent action for a short duration, it normally fights as part of a battalion. Companies are normally assigned to a functionally pure aviation battalion for training, safety and standardization, leader development, sustainment operations, and the conduct of major combat operations. Depending on METT-TC, these companies may be task-organized into aviation battalion task forces, particularly for small-scale contingencies. The standardization of company building blocks across the force is fundamental to achieving modularity, tailorability, and flexibility for full-spectrum dominance.

The requirement to make aviation unit maintenance operations at the battalion level and below both more effective and efficient was a fundamental objective during this transformation redesign. Modularity was a key enabler to meet this objective. The Army Transformation Plan defined modularity as a force design methodology that creates capabilities-based unit elements that enable responsive and rapid identification, packaging, deployment, and sustained employment of fully mission-capable organizations capable

of operating in a joint and combined environment in support of combat commanders. The intent of modularity in aviation unit maintenance (AVUM) is to increase flexibility by providing right-sized, appropriately capable maintenance elements to the aviation force based on the company building block designs.

The Aviation Task Force developed small, capable maintenance modules focused toward an aircraft type and aligned with the lowest practical level while ensuring effective maintenance support to the operational commander. The new AVUM design provides aircraft and component repair maintenance sections that can be task-organized as required into platoons in support of operational companies or troops. This enhanced modularity can be achieved within current aviation personnel end strengths; however, achieving this level of modularity does require additional tools and test equipment.

The major change in the AVUM company was the addition of modular maintenance and logistics support. This redesign requires minimum changes from current aviation maintenance doctrine while increasing our ability to task-organize to support deploying units down to the flight company level. The redesigned AVUM company will now be called an aviation support company (ASC) to align aviation sustainment terminology with the Army's sustainment terminology.

The ASC depicted in this paragraph is the general support aviation battalion (GSAB) ASC, which is the most modular ASC in the Aviation Unit of Action. The ASC is modular at the section level and is capable of supporting a minimum of three separate flight company deployments. The ASC Headquarters is comprised of an HQ element; a production control element with a dedicated production control officer (MTP-trained warrant officer) and production control NCOIC, ALSE section, and tech supply section; and a modular QC element with teams to support each flight company as required. The aircraft repair platoon (ARP) has a section for each flight company and, in the case of the GSAB, has teams to support modular deployment down to the flight platoon level. The component repair platoon (CRP) has three modular teams per section, one for each flight company.

Each repair platoon is now led by an aviation lieutenant who has attended a restructured aviation maintenance manager course. This platoon leader is assisted by an MTP-trained warrant officer in the ARP and an aviation maintenance technician warrant officer in the CRP. Each of the repair platoons is authorized tools and test equipment to sustain the flight companies while conducting limited independent action for short durations, as well as indefinite battalion-level operations. In addition, each platoon has three shop equipment contract maintenance (SECM) vehicles to enable the packaging and transport of tools, test equipment, and personnel in support of the flight companies, as well as execution of maintenance tasks at these dispersed and remote locations.

As always, the most important resource in aviation sustainment is the Soldier. The training, ingenuity, and leadership of our aviation logistics Soldiers allow them to deliver readiness to the warfighter in the face of diverse threats on the battlefield. Our Soldiers are working hard toward meeting our aviation readiness requirements, and we owe them the resources, training, tools, parts, and management systems necessary to meet the combat commanders' expectations. The bottom line is that the ability to provide this modular capability requires that our Soldiers be properly trained and led, and that these modular teams are equipped correctly. ♦

—LTC Rob Sanders, Directorate of Combat Developments, DSN 558-2220 (334-255-2220), e-mail robert.sanders@us.army.mil.

Leading the Fleet in Sustainment So Condition-Based Maintenance

MAJ Jong Lee
U.S. Army Aviation Technical Test Center
Fort Rucker, AL

Have you ever wondered why we use flight time as a factor to calculate aircraft usage? Is 1 hour of flight time really causing 1 hour of wear to aircraft components? Do aircraft A and B below accumulate the same wear on aircraft components?

Aircraft A: Takes off from Cairns Army Airfield, Fort Rucker, AL, and flies for 2 hours straight and level and lands at Redstone Arsenal, Huntsville, AL. Environment: Moderate temperature and no dust.

Aircraft B: Takes off from Baghdad International Airport and flies a combat aerial resupply mission at contour and nap-of-the-earth flight modes with several landings and takeoffs, and finally returns to Baghdad International Airport after 2 hours. Environment: Hot and extreme dust.

Using the latest on- and off-board technology and analytical processes, the Army Lead the Fleet (LTF) program is investigating the relationship between aircraft usage, vibration, component wear, environmental conditions, and maintenance. The LTF process identifies issues and collaborates among Army agencies to solve critical issues with component reliability and sustainment in the aviation fleet *before* such issues manifest themselves in the operational fleet and degrade readiness in a theater of war.

In addition, LTF is an innovative multi-year program designed to deliver information to support development of a condition-based maintenance (CBM) program for Army Aviation. LTF results have contributed to enhanced readiness, a reduced rate of growth of operating and support costs, and enhanced operational risk management. Additional cost avoidance will be achieved through a reduction in maintenance man-hours required for scheduled maintenance.

LTF collects valuable information to support the transition of aviation maintenance from calendar time and hours flown to a condition and usage basis—in other words, CBM. The G-4 has designated LTF as a pilot program for data collection and information development in support of the Army's transition to CBM. Information produced may also prove useful in supporting the analysis and development of two-level maintenance (2LM).

What is LTF?

The LTF program is funded by the Deputy Chief of Staff (DCS) for Logistics, G4, and managed by the Program Manager (PM), Lead the Fleet, at the Aviation Missile Research, Development and Engineering Center (AMRDEC) in Redstone Arsenal. The LTF team

lutions and Transformations to

includes:

- Aviation Technical Test Center (ATTC), Fort Rucker.
- Aviation Engineering Directorate (AED), Redstone Arsenal.
- Operational Research Center of Excellence (ORCEN), United States Military Academy (USMA), West Point, NY.
- WESTAR/COBRO Corporation, Huntsville and Fort Rucker.

ATTC at Fort Rucker operates the sample set of aircraft in carefully selected profiles that are representative of current operational mission profiles and requirements. ATTC flies at an operational tempo (OPTEMPO) significantly higher than the overall fleet average. The resulting usage and maintenance data are collected and analyzed to support development of changes in materiel, maintenance procedures, flight profiles, and training.

Testing is conducted at a variety of sites from Duluth, MN, and Fort Carson, CO, to El Centro, CA, and the southeastern United States to ensure realistic environmental effects. The aircraft are not kept in hangars except for extended maintenance and severe weather warnings. Supporting maintenance is compliant with current Department of the Army (DA) standards. Data collection will expand to selected aircraft operating in the field on a non-interference basis. Adding operational data collection is a critical step in supporting the transition to CBM.

LTF success examples

The LTF team has completed design and testing of a special tool for the CH-47D. When used during replacement of the drive link bearings, the tool will save 18,000 man-hours per year. This is approximately 9 man-years!

LTF has already made a significant contribution to flight safety. The LTF team identified excessive, accelerated wear on AH-64A pitch control links (PCLs) during high OPTEMPO operations. The rate of wear in a single flight period had the potential to cause catastrophic failure. The findings resulted in the item manager pulling 2,000 substandard parts out of the distribution system. The PCL action also saved 29,900 man-hours of maintenance and avoided $12 million in test flight costs.

Warfighter support

LTF also provides an opportunity to conduct ground and flight testing using LTF aircraft. The aircraft PMs (Program Executive Officer,

LTF CH-47 Drive Link Special Tool

- Maintenance efficiency: 9 man-years saved.
- Readiness: 19,000 hours of additional up time.
- O&S cost reduction: $1.9 million (test flights).
- Total procurement cost: $27,000 (fields all AVIM units in the Army).

AH-64A&D Pitch Control Link (PCL)

- LTF team identified excessive, accelerated wear on PCLs during high OPTEMPO operations.
- Findings resulted in 2,000 substandard parts being pulled from the distribution system.
- 29,900 man-hours saved and $12 million in test flights avoided.

Aviation) and AED frequently use this "piggyback" capability. LTF has a rapid testing and validation capability to test critical warfighting modifications to aircraft. Examples include:

- AH-64A/D combo pack (trades ammo for fuel)–flight certified for theater.
- Hellfire missile blast fragmentation sleeve–enhanced weapons effects.
- Evasive maneuvers–tested and certified AH-64A/D maneuvers for use in theater.

The pictures at the right show LTF AH-64A and D aircraft during combat maneuvers envelope expansion testing. ATTC aviators expanded the AH-64A/D aircraft operational envelope to +/- 60 degrees pitch and +/- 120 degrees roll.

The year 2015

By the year 2015, the Army will exploit emerging technologies to lighten support requirements, project forces faster, and change sustainment requirements. The future maintenance concept will predict equipment failures based on real-time or near real-time assessment of equipment condition obtained from embedded sensors, external tests, and measurements using portable equipment. There will be reduction of maintenance down-time and increased operational readiness by repairing or replacing system components based on the actual condition of the component as opposed to scheduled or time-phased maintenance procedures.

Current predictive trending techniques use historical data to confirm maintenance decisions that are based on expert opinion. This systemic approach and trend analysis will give the aviation logistician a basis from which to make fact-driven maintenance decisions. The Army will use these emerging technologies to establish CBM as a new framework for logistics support. LTF will establish the systems engineering framework for Army Aviation CBM. ♦

—MAJ Lee is the Assistant Program Manager for LTF at ATTC. He may be reached by calling DSN 558-8164 (334-255-8164) or by e-mail at jong.hyuk.lee@us.army.mil.

AH-64A Combat Maneuvers Envelope Expansion

AH-64D Combat Maneuvers Envelope Expansion

Army Oil Analysis PROGRAM

CPT R. Shane McWhorter
Army Oil Analysis Program, LOGSA
Redstone Arsenal, AL

The Army Oil Analysis Program (AOAP) is a valuable maintenance and diagnostic tool to detect impending component failures in both aeronautical and non-aeronautical equipment. The program monitors the condition of oil for contaminants and uses specific diagnostic equipment that detects physical property, oil condition, and debris analysis.

In the AOAP, the term "oil" covers all fluids used in wetted lubrication systems (such as hydraulic fluid, grease, transmission fluid, and oil). The AOAP's goal is to extend life expectancy of Army equipment components by targeting root causes of failure and/or pre-empting crisis failure management. The program also saves money by providing "on-condition" oil analysis to monitor equipment condition and extend oil drain intervals. The paragraphs below highlight some examples of how AOAP has helped the Army Aviation community when used as part of the unit's maintenance toolbox.

The Coleman Barracks AOAP Laboratory near Mannheim, Germany, notified a deploying AH-64 aviation unit that all 12 oil samples from their unit were contaminated. The Fourier Transform Infrared (FT-IR)—which detects the presence of contaminants such as water, fuel, coolant, acidity, additive level, and oxidation—discovered that the wrong type of servicing oil was present in the 12 Apaches. The FT-IR detected the presence of MIL-H-5606 servicing oil mixed with MIL-H-832822 SPEC. The unit's aviation maintenance officer was notified immediately and elected to do a full service on all helicopters. The service confirmed that MIL-H-5606 had been mixed inadvertently with MIL-H-832822 SPEC. The helicopter systems were rechecked by AOAP and released for normal sampling. The AH-64 unit sent a letter of appreciation to Coleman Barracks for their exemplary work in detecting this potential problem.

In October 2003, the Fort Carson, CO, AOAP Laboratory issued a maintenance recommendation to the maintenance officer of a nearby Army National Guard unit. Spectrometric analysis indicated a possible failure trend, and the lab recommended immediate inspection of a UH-1V's 42 degree gearbox for abnormal or excessive wear due to aluminum and iron (Al & Fe) wear detected in recent oil samples. The rapid increase in Al & Fe content indicated a possible failure trend.

Upon receipt of DA Form 3254-R, "Oil Analysis Recommendation and Feedback," unit personnel removed the aircraft's 42 degree gearbox and found that the seal-retaining pin had dislodged and fallen into the gearbox's internal workings. The gearbox was inspected thoroughly, and no damage to its internal parts was found. The Soldiers flushed out the fragments and replaced the gearbox on the aircraft. The unit then filled the fluids and took another sample as directed.

The above examples illustrate how a routine preventive maintenance program can potentially save Soldiers' lives and ensure the equipment they operate is fully mission capable. ♦

—CPT McWhorter is the Deputy for Technology and Acquisition for the AOAP-LOGSA at Redstone Arsenal, AL. He can be reached at DSN 645-6661 (256-955-6661) or by e-mail at rodney.mcwhorter@us.army.mil.

NCO CORNER

shop talk

Army Aviation NCOs provide the crucial link between the aircraft they maintain and the pilots that fly them, often working in adverse conditions with little support. These NCOs, equipped with their specialized knowledge and training, keep our Army's aircraft flying day and night all over the world. They know proper maintenance is a critical component of safe aviation operations. The NCOs below shared their thoughts with *Flightfax* while attending the Aviation Advanced Non-commissioned Officer's Course at Fort Rucker, AL. Read on and learn from their near misses.

Great Flying FOD!

My platoon sergeant and I were walking across the flight line at my first duty station when we saw an object fly in front of us at head level. The object slammed against a hangar door and fell to the ground. We walked over to the hangar and identified the object as an 18-inch adjustable wrench.

Looking across the ramp, we saw an AH-1 from another battalion running up for main rotor track and balance. Their crew chief approached my platoon sergeant and claimed the wrench. However, it wasn't going to be that easy! My platoon sergeant took the crew chief and the wrench to their platoon sergeant.

It later came out that neither the crew chief nor the maintenance test pilot did a proper FOD check after making adjustments during the track and balance. As the aircraft ran up, the wrench flew off the aircraft and shot through the air. Considering that the wrench missed my platoon sergeant and me by only 10 to 15 feet—and at eye level—I think we were pretty lucky! ♦

—SSG James McMinn

Maybe It'll Do

We were preflighting an aircraft when someone noticed the tail wheel tire pressure was low. The crew chief quickly went to get the nitrogen cart and tire fill kit. Our unit was using an Air Force unit's tool room at the time, and the type of nitrogen cart they had was a model the crew chief wasn't familiar with. To make matters worse, their tire pressure check and fill kit was signed out, but the person who signed for it was on pass.

This probably sounds like a recipe for disaster, and someone should have known better. Even so, the Air Force NCO working the tool room assured the crew chief the nitrogen cart could be used without the check and fill kit. He also gave the crew chief brief instructions for using the cart and kit.

The crew chief, armed with this newfound knowledge, came back and began to fill the tire. When the pressure reached 125 psi, he tried to cut off the cart's fill pressure. However, turning off the pressure was a lot harder than he thought. By the time he was able to cut the pressure off, 1,100 psi had been pumped into

the tire. The tire blew up, and everything from the tail strut down had to be replaced.

Editor's note: *Since 1990, there have been five accidents and two fatalities between the Army and the Navy involving aircraft tire or wheel explosions. This crew chief was lucky he didn't get hurt; but unfortunately this same scenario killed a Soldier in Iraq last year while he was servicing a Black Hawk tire (see March 2004* ***Flightfax*** *for story).* ♦

—SFC John Bazzano

Where One Door Opens...

I was on my last check ride for standardization flight engineer instructor designation on a UH-1H. Before flight, our crew of four verified all forms and records for completed inspections and performed the pre-flight and checks by the checklist. The cargo doors were locked and pinned to the open position.

The first 1.5 hours of flight progressed normally. We were on our way home at about 200 feet AGL and at 110 knots when the left-side cargo door swung forward from the rear—still attached to the door lock pin. The door then separated from the aircraft with a loud "bang" and flew up toward the main rotor blades. Fortunately the door didn't hit the blades, but it did come down and fly past the aircraft's rear, barely missing the vertical fin and tail rotor.

I was sitting on the floor, attached to a harness, when I realized what was happening. As I was trying to inform the crew of the situation, the instructor pilot began asking about the noise. After a few minutes, we landed at our airport without anything else happening.

During post-flight inspection, we discovered the aircraft's lower cargo door tracks and slider strip were worn beyond repair. Both were to be inspected during phase maintenance, but since the doors were installed, there wasn't much room to see between the tracks and sliders. Our crew, as well as our maintenance teams, made a grave oversight. Luckily we didn't lose an aircraft or—most importantly—our lives!

Maintenance procedures, inspections, and aircraft restrictions for our aging UH-1 fleet were incorporated into our unit's SOP shortly after this incident. We all learned our lesson that day, and now others can benefit from our experience. ♦

—SFC Raymond Daugherty

Mercury Rising

We had just completed the preflight checks on our aircraft and were doing the health indicator test check. The pilot gave me the exhaust gas temperature (EGT), but it was about 40 degrees over our target. I relayed the temperature we were looking for, but we looked at the book again and decided to go with the next-highest outside air temperature.

The EGT was now 35 degrees over the one specified. The pilot in command finally asked what temperature we were looking for, and when I told him he gave me a number exactly 20 degrees above the target. Then he said, "Let's go."

We were a few minutes into the flight when the copilot noticed the EGT was climbing in excess of 600 degrees. I told him we needed to go back to our home airfield immediately. When we got there and inspected the aircraft, we discovered the bleed band bolt was installed incorrectly at the actuator. The aircraft had just returned from maintenance. This error was missed by not only the technical inspector and the pilot that completed the preflight, but also by the crew chief that performed the maintenance and daily inspections.

Little mistakes can have big consequences. We were lucky some serious damage wasn't done that day. We never should've taken off in an aircraft that was exhibiting signs of trouble on the ground. Pay attention and don't compromise when it comes to safety! ♦

—SSG Fred Brooking

No Rings, No Kidding!

CW4 William F. England
Kansas Army National Guard

I've heard it said my whole aviation career: "Take off your rings!" Your supervisor and safety officer aren't kidding when they say, "No rings will be worn when you're involved in aviation operations!" I nearly lost my left-hand ring finger once because I forgot to take off my wedding ring.

I was on a 6-month stabilization force rotation in Bosnia-Herzegovina and working as part of a night quick-reaction force (QRF) UH-60 crew. I always wore my wedding ring, except when I was performing flight-related duties. Many aviators and crewmembers did the same thing. For the QRF, I would take off my ring when I went to preflight and run up the aircraft at the beginning of my shift. Once the aircraft and crew were "cocked and locked," I would put my ring on again. This was the way I did business at home, throughout my unit's train-up, and up to this point in the rotation. It hadn't been a problem so far, but that was about to change.

I was in transition from the step to the ground when I realized that my ring was caught. As I continued my descent, the ring dug into the palm side of my finger and tore a section of skin about a half-inch long. The ring also tore a smaller gouge on the other side of my finger.

I was about halfway through my week-long night QRF shift. Our crew had completed the preflight, run-up, and commo checks, and the other pilot and I were relaxing in the company operations office. We were alerted around 2200 to go to the task force operations office for a possible mission. After a lot of waiting and several false starts, we finally got our briefing. We rushed out to the aircraft, loaded our troops, and got underway. Things were pretty rushed because of the earlier delays, but we launched and dropped our troops at their designated location.

We then headed to a nearby base operated by another nation and waited for the call to pick up our troops. Upon arrival at the base, we hot-refueled and repositioned the aircraft for shutdown. The refuel, reposition, and shutdown were uneventful. As I was preparing to exit the aircraft, I took off my gloves and noticed that I still had on my wedding ring. "I always take that ring off!" I said to myself. "Well, no point in taking it off now since I'm done flying."

I took off my kneeboard, unfastened my seatbelt, and began to climb out of the right seat. As I stepped down, I was holding the doorframe with my right hand and resting my left hand on top of the seat's armor panel. I let go of the doorframe and continued toward the ground, with my left hand still on top of the panel. When my hand began to slide across the panel, however, my ring caught on a screw that was sticking up from a panel mount. I was in transition from the step to the ground when I realized that my ring was caught. As I continued my descent, the ring dug into the palm side of my finger and tore a section of skin about a half-inch long. The tear went from where the ring naturally rested up to the bend point under the first knuckle. The ring also tore a smaller gouge on the other side of my finger.

I was able to dislodge the ring from the screw before I reached the ground. Immediately after stepping down, I gingerly pulled the ring off of my finger. Man, did that hurt! I determined the extent of my injury and alerted the other crewmembers to what I had done. One of them applied a couple of bandages to cover the tears and help stop the bleeding. The next day I went to see the flight surgeon. Although I didn't need stitches, she lectured me about how lucky I was not to have lost my finger.

What did I learn from this experience? Never, ever climb on an aircraft—or anything else—while wearing a ring. Take it off, and don't forget! It's just not worth the pain. ♦

—CW4 England is a UH-60 pilot with A Company, 1/108th Aviation, Kansas Army National Guard. He may be reached by calling (785) 862-0774 or by e-mail at william.england@us.army.mil.

Where's This ELT Go?

emergency locator transmitter

Numerous accident reports contain this statement: "Rescuers were led to the aircraft accident site after receiving a signal from an emergency locator transmitter (ELT)." The ELT is a survival device installed on Army helicopters to expeditiously locate crew and passengers involved in aircraft accidents, thus saving lives. An airworthiness release (AWR) authorized the installation and operation of the Emergency Beacon Corp. (EBC) 302H-series ELT on Army Black Hawk helicopters.

The EBC 302H ELT was specifically designed and adapted for military operations. It has a line-of-sight range of 1,200 miles and can withstand an impact of up to 1,000 G-forces (Gs). The 302H will operate up to 200 hours after activation in temperatures ranging from –20°F to 160°F, and up to 20 hours fully submerged in salt water. Additionally, it simultaneously transmits on both UHF and VHF emergency frequencies.

In May 1995 AWR 543 was published, authorizing installation of the EBC-302HM ELT on all standard UH-60A/L helicopters. The latest revision to this AWR was in February 1999. It contains specific and detailed installation, operation, and testing instructions for the EBC-302HM ELT. The 302HM is a non-standard piece of equipment, and thus not required for normal operation. However, the AWR authorizes the installation of the 302HM if your organization so desires. Additionally, another AWR was published in December 1999 addressing ELT installation and testing procedures on all U.S. Army aircraft incorporating ELTs. The concern of the Utility Helicopter Project Management Office (UH PMO) safety staff is the proper installation location of the device.

In the UH-60A/L, the ELT is to be mounted on the stowage box assembly on the back of the copilot's seat. This stowage box assembly is also known as the "Gunner's Ammunition/Grenade Stowage Compartment" (see figure 2-4 [sheet 2 of 2], page 2-8, Technical Manual 1-1520-237-10). This is a non-stroking portion of the seat frame.

Depending on the terrain and weather conditions, improper installation of the ELT can drastically lower your chances of survival. A 5 to 7 G-force is required to activate the ELT. During an accident sequence, the seat strokes to absorb crash forces. If the ELT is installed on a stroking portion of the seat, the purpose of the ELT is defeated. Please read and adhere to the installation, operation, and testing procedures contained in AWR 543. ♦

—Submitted by Mr. Gary D. Braman, CAS Inc., Huntsville, AL, DSN 746-4177 (256-876-4177), e-mail gary.braman@uh.redstone.army.mil. **Reprinted with permission from the "Black Hawk Newsletter."**

If you have questions or require a copy of AWR 543, please contact Mr. Gary Trotter, Aviation Engineering Directorate, Redstone Arsenal, AL 35898. His telephone number is DSN 897-2350, ext. 9693 or (256) 705-9693. He may also be contacted via e-mail at gary.trotter@rdec.redstone.army.mil.

HIRTA Messages: Keeping Flying Interference Free

Unacceptable system anomalies can occur in aircraft that fly too closely to high-powered emitters such as radio, television, radar, satellite, and microwave systems. To counter this threat, High Intensity Radio Transmission Area (HIRTA) messages are issued for a specific aircraft or groups of aircraft to ensure they don't get too close.

The affected systems include the primary communication, navigation, identification, flight control, and vehicle management systems, as well as the pilotage displays and sensors and instruments. Unacceptable anomalies can cause safety issues such as inadvertent dispensing of ordnance or inaccurate navigation while in instrument meteorological conditions (IMC). They do not include anomalies involving mission equipment such as mission radios, mission displays and sensors, and non-safety issues associated with weapons systems.

HIRTA messages provide generic standoff distances pilots should use to avoid all identifiable high-powered emitters. The distance is chosen to provide the least restriction possible and still keep the message at a reasonable length. The messages contain specific emitter locations (latitude and longitude), followed by a standoff distance for each specific site. Some messages have standoff distances based on visibility and flying conditions (day or night, VMC or IMC). These distances allow for reduced restrictions when certain flight systems are not required. Some messages also include shipboard guidance and standoff distances. All messages contain guidance for exiting a HIRTA area if one is entered inadvertently and anomalies are encountered, including required information for reporting HIRTA incidents.

There have been numerous cases in the UH-60 where filter pin adapters have failed and are not readily available for replacement. The UH-60 HIRTA messages provide guidance and standoffs for those aircraft that have to fly without specified adapters.

All HIRTA messages are classified. Forces Command (FORSCOM) and the National Guard Bureau currently distribute HIRTA messages. Both organizations have unclassified information on their Web sites instructing units how to access the messages, which are posted on classified sites or news groups and are accessible via SIPRNET. The FORSCOM SIPRNET news group is **news://fcsmwww1.force1.army.smil.mil/FORSCOM.DCSOPS.Aviation**. ♦

For additional information on HIRTA messages, contact Mr. Frederick T. Reed III at the Aviation Engineering Directorate, AMSRD-AMR-AE-S, Redstone Arsenal, AL 35898; phone (256) 705-9745; or e-mail fred.reed@rdec.redstone.army.mil.

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A Song to Save Soldiers

Recording artist Mark Schultz has joined with the Army to help launch the new safety awareness campaign, dubbed "**Be Safe – Make It Home**." Schultz' song, "*Letters from War*," deals with a Soldier returning from war and was inspired by diaries the singer's great-grandmother kept while three of her sons fought in World War II. As the centerpiece of the safety awareness campaign, the song will be used in a music video, training video, and in public service announcements. The goal is to educate Soldiers and the general public about the Army's high number of fatal accidents.

"Statistically, this has been a rough year for Army accident casualties," said BG Joseph Smith, Director of Army Safety. "In an attempt to reverse this trend, the Secretary of the Army initiated the '**Be Safe**' campaign to educate Soldiers, with the end result of keeping them alive and well. We want our troops to be safe and make it home when participating in everyday activities that can lead to accidents, such as driving, swimming, and biking."

The campaign's "Letters from War" video and other materials are available to all Soldiers, Department of the Army civilians, defense contractors, and family members. For more information, visit the Army Safety Center's Web site at **https://besafe.army.mil/**.

Aviation Safety Officer Refresher Course

The Aviation Safety Officer (ASO) refresher course isn't mandatory; however, it is an excellent opportunity for ASOs to develop professionally by reviewing current safety issues and initiatives that will allow them to better safeguard their organizations. The next ASO refresher course is scheduled for 13-17 September 2004. Please coordinate for attendance through your command and ensure your unit enrolls you in the Army Training Requirements and Resources System (ATRRS). Hope to see you there!

New ASO Course Prerequisites

Attention future ASOs! New ASO course prerequisites have been published in DA PAM 611-21 and ATRRS as of January 2004. The prerequisites reflect experience and academic requirements that must be met before attending the course.

Experience

All Army Aviators attending the course must have at least 50 hours of pilot-in-command (PC) time in an Army aircraft. PC status establishes credibility as a pilot, mission planner, and risk management integrator. Students must produce a copy of their last flight record closeout with the PC hours annotated or a memo from the commander stating that their flight experience requirement has been met.

Commanders may request a waiver to this requirement by contacting the ASO Course Director at U.S. Army Safety Center, Bldg 4905, 5th Ave, Fort Rucker, AL 36362, FAX to DSN 558-9528, or e-mail hedmanw@safetycenter.army.mil. Please justify why the prerequisite cannot be met.

Academic prerequisites

All ASO course attendees, except foreign officers, must complete the Commander's Safety Course, the Action Officer Course, and the AMMO 45 Course prior to attending the ASO resident course. The Commander's Safety Course and the Action Officer Course may be accessed through the Army Distance Learning Web site at **https://www.aimsrdl.atsc.army.mil/secured/accp_top.htm**. The AMMO 45 Course must be ordered online from the Defense Ammunition Center Web site at **https://www3.dac.army.mil/AS/products/p_45.asp**. Students must provide a copy of the computer-generated end-of-course certificate or a copy of their unofficial ATRRS transcript, which may be obtained through the AKO portal when inprocessing the course.

The future

The new prerequisites are only the beginning of a more comprehensive ASO training program that is currently under development. The plan calls for a three-tiered approach to develop ASOs over several years rather than providing one 6-week course for a career in safety.

The first tier will consist of an Additional Duty Safety Officer (ADSO) Distance Learning Course that is currently under development for those officers and NCOs that are assigned as safety officers in any Army unit. An additional module covering ASO duties and responsibilities, based on AR 385-95, will follow. Both of these courses will become prerequisites for the ASO resident course and provide the fundamental skills and knowledge required to manage a unit safety program.

The ASO Resident Course, or tier two, will then focus on more advanced tasks and practical hands-on training oriented toward managing a safety program at the battalion level and above. The third tier includes advanced safety track training conducted as a part of the Aviation Warrant Officer Advanced Course. A critical task list for this tier of training has already been developed and will focus on specialized duties of a senior ASO. Although these efforts take some time to develop, they are on the fast track for completion. The future is so bright for ASOs, you'll have to wear shades! ♦

—CW5 Wes Hedman is the Chief of the Aviation Safety Training Division at the U.S. Army Safety Center. He may be reached by calling DSN 558-2376 (334-255-2376) or by e-mail at hedmanw@safetycenter.army.mil.

Honing the Edge of the Aviation Safety TEAM

CW4 Mark W. Grapin
State Aviation Safety Officer
Kentucky Army National Guard

In each of the last several years, the Kentucky Army Aviation Support Facility (KYAASF) has conducted an in-house, week-long refresher course for aviation safety officers (ASOs) and non-commissioned officers (NCOs) assigned to one of its several supported units. Recently, this training was expanded to include operations personnel, commanders, aviation life support equipment (ALSE) technicians, maintainers, and a wide variety of other affected and interested personnel.

"During the last two courses, we extended the invitation to aviation units outside the state and have been very pleased with the reception and participation," said COL Benjamin F. Adams III, State Army Aviation Officer for the Kentucky Army National Guard (KYARNG) in Frankfort, KY.

During this year's course, the number of personnel from outside the state more than doubled and even included participants from the active component. COL Adams was quick to point out that the structure and content of the training has outgrown the "refresher" label.

"The U.S. Army Safety Center (USASC) Training Division has been very supportive in sharing information they use in the formal ASO Refresher Course offered at Fort Rucker, AL," he said. "Both teams–the KYARNG and the USASC Training Division–worked hard to ensure the workshop wasn't merely a duplicate of the course already offered at Fort Rucker." As a result, the workshop was clearly structured as a unique event, and the USASC Training Division benefited from shared research that was updated and forwarded back to them.

Refresher training for ASOs is by no means new. USASC has been conducting refresher training for years. In fact, Army Regulation 385-95 talks about the importance of training for ASOs and aviation safety NCOs, and NG Circular 385-95 further emphasizes this. In Kentucky, COL Adams added state-level influence to this need by insisting on excellence in the material covered and timeliness of the subjects. For instance, one KYARNG fixed-wing aircraft recently experienced a lightning strike, so emphasis was placed on the actions required during the first moments and hours following a mishap, particularly when away from home base.

Interest in the Aviation Safety Workshop, as it's officially known, also garnered a request from the U.S. Army Aeromedical Research Laboratory at Fort Rucker to present a block of instruction

on the ALSE Retrieval Program. The program of instruction for the workshop took the participant from understanding why they're there–actually *doing* aviation safety–to very practical and logical subjects they'll use every day. Participants showed up with their unit or facility safety files, and two of the blocks of instruction dealt with organization of those for the current year and setting up files for the next year.

The Frankfort City Fire Department Crash and Rescue Team joined the class during the third day for a dry run of the pre-accident plan rehearsal conducted on day four. The dry run was conducted over a specially-constructed, three-dimensional terrain board in the classroom, during which several scenarios were examined. The class was in the field on day four and participated in a very realistic rehearsal of the facility pre-accident plan.

Workshop participants consider several accident scenarios over a terrain board in the classroom.

"We hand-receipted a crashed and de-mil'd OH-58D and laid it out as it appeared in the original crash," said CW2 Matt Willey, ASO for the KYAASF. "The Frankfort Fire Department brought out a smoke generator, and we placed it in the aircraft. When the firefighters pulled up in response to our having activated the crash alarm, they saw a smoking aircraft and two pilots posing as injured aircrew members in the front seats."

Simply by following the pre-accident plan, this portion of the workshop gave a "come-as-you-are" look at strengths and shortcomings in the critical steps of pre-accident planning. During the full rehearsal in the last workshop, firefighters and Army aircrew members weren't the only ones in attendance: Both city and county fire agencies were on hand, and the Frankfort City Emergency Management Office, two local newspapers, and even the Mayor of Frankfort turned out to learn about pre-accident planning.

Workshop participants apply what they learned during a full rehearsal of the pre-accident plan.

The workshop this year also included a discussion of the KYARNG's newly-developed family safety pamphlet. As an inter-service publication, it is likely the first of its kind developed as a joint effort between the Air Guard and Army Guard teams at the state level. The pamphlet includes such timely subjects as privately owned vehicle safety and unexploded ordnance, in addition to dozens of other off-duty factors that affect those in uniform, civilian employees, and their families.

"Working with the Air Guard team in joint operations such as program development and training are an inherent part of our relevance to our transforming forces," said COL Adams. "A great indicator of our success is when a member of a sister service or another state calls and asks how they can be a part of it. We're all too glad to share it."

Several people have already asked for seats in the next workshop. Subjects are sure to be relevant, practical, and timely. And, participants will no doubt include a number of Air Guardsmen seated alongside members of the KYARNG and those from several surrounding states–all honing the edge of the Aviation Safety Team. ♦

—For more information on the Aviation Safety Workshop, contact CW4 Grapin at DSN 667-1534 (502-607-1534) or e-mail mark.grapin@us.army.mil.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

CH-47

D Model

■ **Class C:** Aircraft suffered Class C damage after the ramp contacted the ground during FARP operations. The aircraft landed to the FARP with a reported tail wind when the ramp hit the ground.

■ **Class E:** A loud grinding noise was heard from the aircraft's forward pylon area during start-up. The #1 FLT boost pump was replaced.

■ **Class E:** The aircraft's fuel gauges indicated 3,800 pounds while the aircraft was on the ground. In flight about 15 minutes later, the gauges showed 4,700 pounds. The right main needle then began spinning. The aircraft landed and was shut down without further incident. Maintenance replaced the indicator and completed a fuel quantity calibration.

■ **Class E:** The aircraft's utility hydraulic caution capsule illuminated at 200 feet mean sea level and 120 knots. The flight engineer confirmed zero pressure with no abnormal temperatures, no leaks, and no change in the utility reservoir volume. The pilot in command started the auxiliary power unit, at which time the utility hydraulic caution capsule extinguished. After landing, maintenance discovered the utility pump had failed.

OH-58

C Model

■ **Class B:** The aircraft yawed in excess of 100 degrees from the runway heading during a simulated anti-torque maneuver. No other details were provided.

UH-1

V Model

■ **Class E:** The aircraft was returning to the local airfield after a cross-country medical transfer flight when the engine chip light illuminated. The crew performed a precautionary landing to a field without injury or damage to the aircraft. Maintenance performed multiple serviceability checks and detected excessive metal chips. The engine was replaced.

UH-60

A Model

■ **Class B:** After landing, the aircraft's main rotor blades struck the tail rotor driveshaft just forward of the intermediate gearbox. Minor contact also was made between the main rotor blades and ALQ-144. The crew was conducting a MEDEVAC mission and making a dust landing approach at the time of the accident.

■ **Class E:** The #2 engine chip CW light flickered on during a night vision goggle readiness level progression flight. The engine power control lever was retarded, and the aircraft was flown single-engine to the local airfield. Post-flight inspection of the engine chip actuator revealed metal chips exceeding the limit. Maintenance was unable to determine which section had failed. The engine was replaced.

Editor's note: **Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).**

Army Safety Center Conference Canceled

The Army Safety Conference that was tentatively scheduled for 31 Aug to 2 Sep in Atlanta, GA, has been canceled. We will let you know if and when we plan to have the conference. Last year's conference offered a variety of guest speakers who addressed the Army's leading concerns in flight and ground safety. For a flavor of that conference, check out the Virtual FY04 Safety Conference at https://safety.army.mil and look under "Quick View," "Archives," and "First Quarter 2004." Stay tuned to the Army Safety Web site and the safety list servers for further details.

Parting Shots:

OUR ARMY AT WAR: BE

"*Safety Sends*" is a new Army Safety Campaign Plan initiative to help k
Composed weekly by the Director of Army Safety, this column features
including contributing factors. Each month, *Flightfax* will feature a con
Army Safety Center Web site at **https://safety.army.mil** and the Arr

Just over 3 weeks ago, two aircraft were conducting a training mission under night vision goggles (NVGs) and in formation. As the flight approached a river in a heavily forested area, the lead aircraft radioed, "I'm in a fog bank and will be back out shortly." It was the last transmission the crew ever made.

This accident follows a trend established over the past several months. We've lost five Army aviators in three Class A accidents where inadvertent instrument meteorological conditions (IIMC) were a contributing factor. In FY03, IIMC incidents claimed 11 lives. This isn't about avoiding weather or environmental conditions—it's about being prepared for them.

As we look at IIMC, it's important to recognize this dialog is also relevant to other environmental conditions. Brownout and whiteout also cause aircrews to lose situational awareness when they lose visual reference with the ground. Clearly, there are basic crew and pre-mission planning actions common to all of these circumstances.

The Army Aviation Directorate of Evaluation and Standardization (DES) recently identified poor training in degraded environmental conditions as a problem across the Army. Now is the time to look at this issue. With many units rotating, we are "in the seam" to make an impact. Deploying aviators will go a year without simulator training, and those returning have an excellent opportunity for individual training before collective plans take precedence. There are several excellent articles in the December 2003 and February 2004 issues of *Flightfax* concerning IIMC and environmental conditions.

Four Vignettes on IIMC:

■ An aircraft was on the second leg of an NVG training flight in mountainous terrain. The crew did not update their weather upon departure. They deviated from their planned flight route and did not initiate IIMC procedures when they flew into heavy rain showers. The aircraft impacted the ridgeline, killing all five personnel on board. Contributing factors: Failure to update weather and failure to initiate IIMC procedures.

■ A flight of two departed the airfield with a special visual flight rules (VFR) clearance using an expired weather briefing. However, a pilot in-flight weather report (PIREP) indicated the area was under IMC. When the flight encountered the deteriorating weather conditions, Chalk 1 initiated a return to base without positive communication with Chalk 2. Chalk 2 continued on course and crashed, killing all four personnel on board. Contributing factors: Failure to update weather under known IMC; failure to plan for IIMC break-up of flight; and failure to initiate formation IIMC breakup procedures.

■ Prior to takeoff, a flight of two received a PIREP from another aircraft reporting

Safety Sends... #6

SAFE AND MAKE IT HOME!

keep senior leaders abreast of current accidents and their impact on combat readiness. s summaries of accident trends and snapshots of accidents that have occurred recently, ndensed message. The full version and past "*Safety Sends*" may be found on the my Knowledge Online Web site at **www.us.army.mil**.

weather conditions of zero visibility and zero cloud height. Despite this, flight lead elected to take off and fly the mission. As the flight encountered deteriorating weather conditions, flight lead aborted the mission and attempted to return to base under visual conditions. Chalk 2 lost situational awareness and crashed, killing both personnel on board. Contributing factors: VFR departure in known IMC and failure to initiate IIMC breakup or recovery procedures after encountering IIMC.

■ A flight of two was conducting an NVG cross-country training flight. It was raining in the local area, and before departure the dew point was within 2 degrees of the temperature (an indication of potential fog or cloud obscuration). During flight, Chalk 1 reported entering fog, and Chalk 2 initiated action to avoid the fog. Chalk 1 crashed, killing all three personnel on board. Contributing factors: Failure to evaluate known weather conditions and failure to initiate IIMC procedures after encountering IIMC.

Tool Kit Highlight: Environmental and IIMC Training

DES found that many units are not taking the time to plan and execute effective instrument training; therefore, aircrews are not comfortable when encountering IMC. Aircrews and leaders are failing to consider appropriately the impact of adverse weather conditions or degraded environmental conditions on the mission. In garrison, our synthetic flight training systems are powerful tools to prepare crews to respond to inadvertent weather or environmental conditions. This requires a well-planned training program. If simulation systems are unavailable in a deployed theater, enforcing good pre-mission weather planning and rehearsal can go a long way in preventing these types of accidents.

The Aircrew Coordination Training Enhancement (ACTE) Program is headed your way. Please make maximum use of this tool. It is greatly improved and will reinforce the need for well-defined responsibilities in the cockpit. Add this to a rehearsed plan for inadvertent weather or degraded environmental conditions, and you have a winning combination. I would again encourage you to visit our Web site at https://safety.army.mil to get more information on the ACTE Program. ♦

BG Joe Smith
Director of Army Safety

Attention AH-64A/D Maintainers

In recent months, three maintenance technicians have suffered serious finger injury from the rear face of the Load Maintenance Panel (LMP)/aft avionics bay vaneaxial cooling fan.

Efforts are underway to provide warnings in technical manuals and the IETM/IETP and provide adequate protection (shroud/screen) to prevent contact with the cooling fan blades.

In the meantime, exercise extreme caution when inspecting any components in the right aft avionics bay with power applied.

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

AUGUST 2004 ✦ VOL 32 ✦ NO 8

UAVs

"Help from Above"

SPECIAL ISSUE!

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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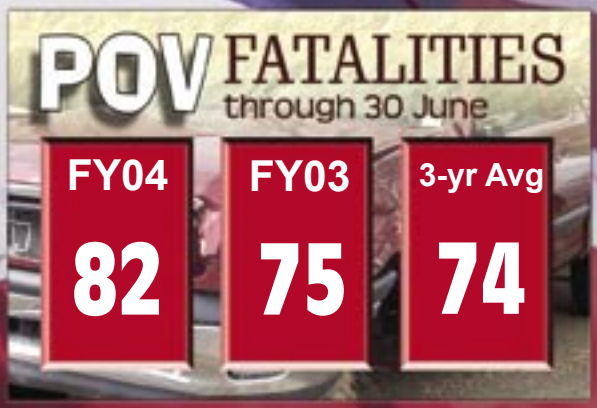

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

Make It Personal … Because It Is!

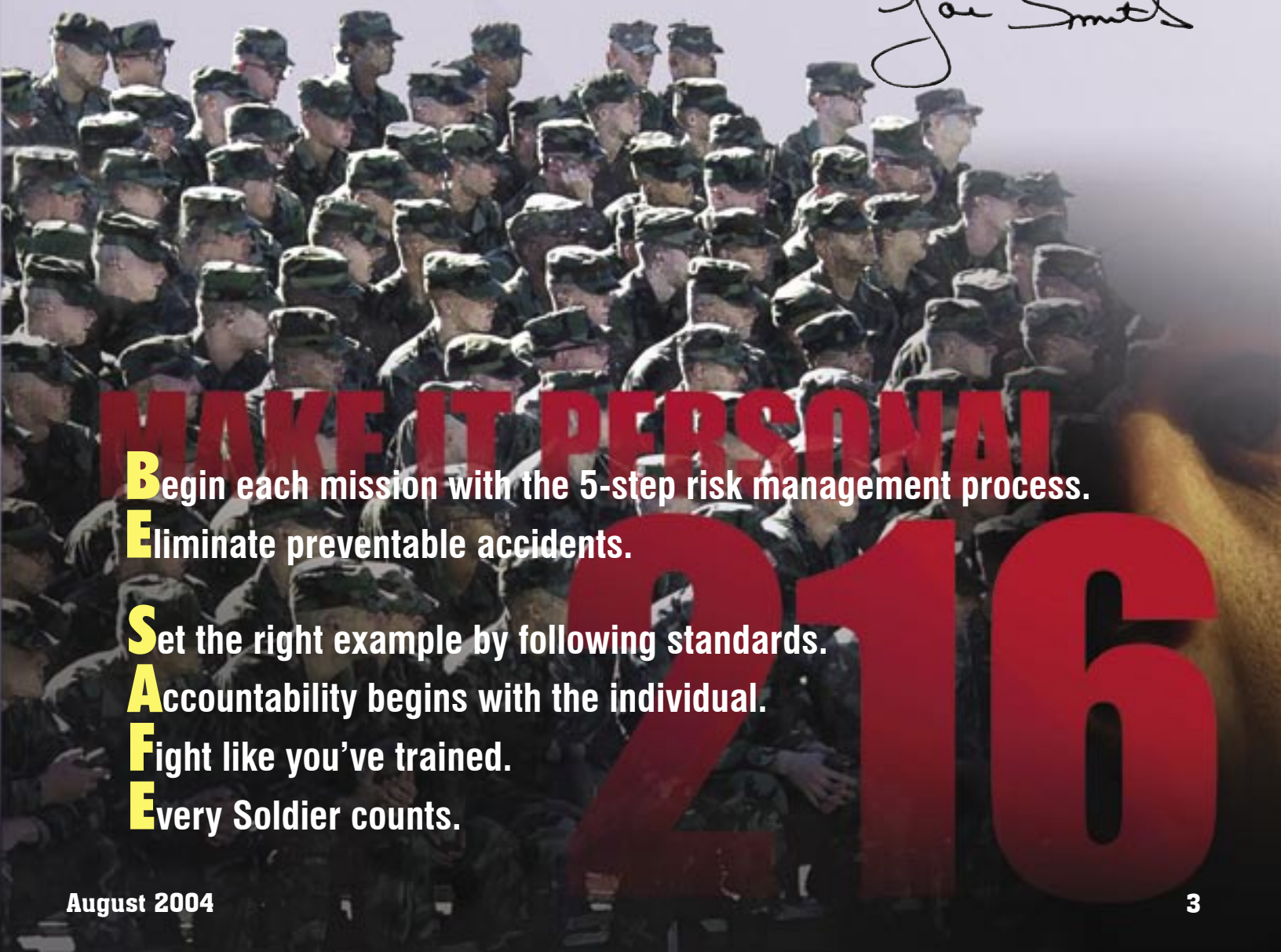
A picture is worth a thousand words. The image below represents the blank faces of the 216 Soldiers we've already lost to accidents this year, most of them preventable. These men and women—America's sons and daughters—were once in our formations serving our great Nation. Now they're gone.

Over the last 90 days, a name has been added to this growing list of needless deaths every 34 hours. Was one of the 216 Soldiers a personal loss to you? If not, then these numbers are just statistics … blank faces; not lessons learned, but lessons noted. I challenge you to actively learn from other's mistakes and successes.

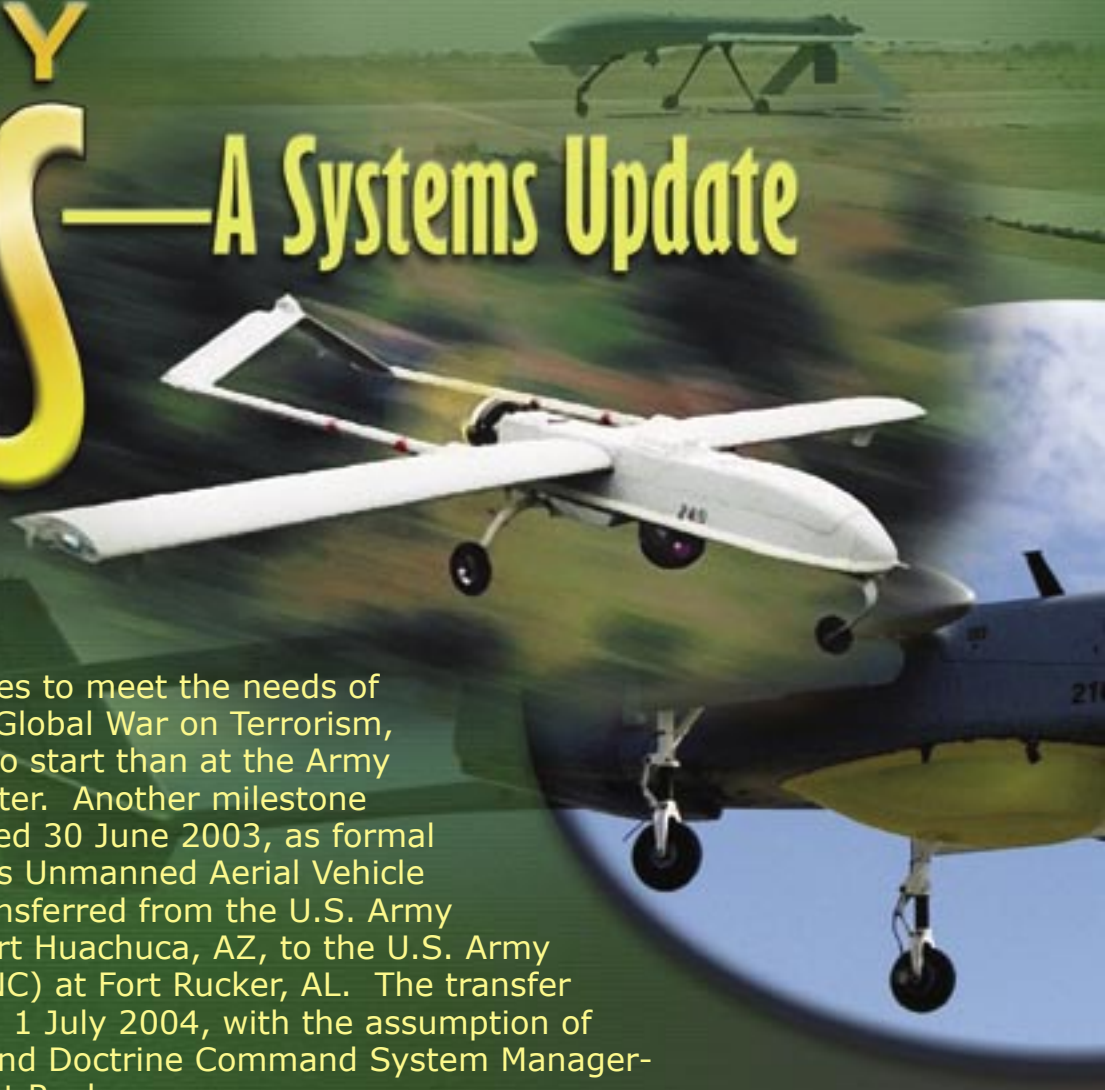
Don't add your name to this roll call, the same goes for your battle buddy—you're both irreplaceable. When leaders are in charge, they take charge. Do the harder right and make a difference—BE SAFE! Make it personal … because it is!

Our Army at War: Be Safe! Make It Home.

Joe Smith



ARMY UAVS—A Systems Update



COL Jeffrey T. Kappenman
TSM-UAVS
Fort Rucker, AL

As Army Aviation reshapes to meet the needs of the field as we fight the Global War on Terrorism, there is no better place to start than at the Army Aviation Warfighting Center. Another milestone for Army Aviation occurred 30 June 2003, as formal proponency of the Army's Unmanned Aerial Vehicle Systems (UAVS) was transferred from the U.S. Army Intelligence Center at Fort Huachuca, AZ, to the U.S. Army Aviation Center (USAAVNC) at Fort Rucker, AL. The transfer continued to progress on 1 July 2004, with the assumption of charter by the Training and Doctrine Command System Manager-UAVS (TSM-UAVS) at Fort Rucker.

Proponency for UAVS was transferred to Fort Rucker with the evolution of roles for unmanned aerial platforms on the battlefield. Traditional UAVS missions of reconnaissance and surveillance are expanding and more closely resemble Army Aviation's core competencies of close combat, mobile strike, vertical maneuver, reconnaissance, aerial sustainment, and security. With the USAAVNC's knowledge of manned aerial platforms, Army leadership decided it was a natural progression to leverage that knowledge to the unmanned force. This unification of manned and unmanned aviation under a single branch provides the most effective and efficient method for managing the development of UAVS for current and future forces.

Army Aviation continues to recognize the advantages of UAVS in stability and support operations in Iraq. During major combat operations, Soldiers have been in the field fighting our Nation's Global War on Terrorism (GWOT) with the Hunter, Shadow, and Raven systems. In particular, the Shadow was employed in support of selected brigades, while the Hunter provided support to V Corps and its divisions. The Hunter also provided surveillance for the 3ID during its move north to Baghdad.

The Hunter has the longest lineage of any UAV, having served the Army since 1991. There are three Hunter companies that have served in the GWOT. Each company is comprised of six aerial vehicles organized under the aerial exploitation battalions. These

companies have all supported Operation Iraqi Freedom (OIF), flying more than 4,400 hours.

The Shadow system started its service in 2001. Current procurement plans provide for a total of 41 systems through 2007. The Shadow platoon has four air vehicles and serves under the maneuver brigades to support their operations. Six Shadow platoons have served in OIF, amassing more than 6,000 hours.

The newest UAVS is the Raven, which is a company- and platoon-level system. The Raven is deployed by a dismounted Soldier to assist the unit's situational awareness within 8 kilometers of the receiver. A total of 185 Raven systems will be fielded by December 2004. The program manager currently is providing system training to units in theater.

The Army has conducted numerous efforts in the past year to improve the capabilities and reduce the accident rates of UAVS. In February 2004, USAAVNC conducted a functional area assessment (FAA) to assess the UAVS program, prioritize funding decisions, and develop the way ahead. The FAA conducted a holistic look across the domains of Doctrine, Organization, Training, Materiel, Leadership, Personnel, Facilities (DOTML-PF), Safety and Standardization spectrum. This FAA provided USAAVNC proponents a baseline for actions that must be taken to improve UAVS unit capabilities.

The GWOT provided another opportunity to assess DOTML-PF. In early 2004, the Army G3 directed an operational assessment (OA) of UAVS in OIF and Operation Enduring Freedom (OEF). A team representing various DOTML-PF elements was organized and led by MAJ James Brashear and supported by the Army's Operational Test Command. Due to security concerns, the team did not deploy to OIF/OEF but was able to question redeployed Shadow and Hunter units in theater. The data collected from the OA will be used to support senior Army decision-making regarding future requirements, operational employment, acquisition, and resourcing.

In May 2004, an Army Aviation Safety Investment Strategy Team (ASIST) for UAVS hazards control working group convened. Representatives gathered at the U.S. Army Aeromedical Research Laboratory (USAARL), Fort Rucker, to identify hazards and controls from the reading and analysis of 59 UAVS accident reports. Identified UAVS hazards, preliminary associated controls, and other relevant information were loaded into a database. This database will contribute to deficiencies in design, as well as shortcomings in training and standardization.

These are but a few of the efforts underway to improve UAVS for the future and integrate manned and unmanned aviation under a single proponent. The future will bring the capabilities UAVS have to offer to more and more proponents and commands within the Army. UAVS will continue to do the dull, dirty, and dangerous missions, and will be critical for success from the platoon to the unit of employment. Mission capabilities will only increase as additional payload capabilities are developed for mine detection, communications relay, and weaponization.

The expanded capabilities that UAVS bring to the fight will provide support for all branches. As the proponent for the Army UAVS program, Aviation will now lead the development and integration of manned and unmanned aviation throughout the Army and the joint environment. ♦

—COL Kappenman is the TSM-UAVS at the Directorate of Combat Developments, Fort Rucker, AL. He may be reached at DSN 558-1801 (334-255-1801) or by e-mail at jeffrey.kappenman@rucker.army.mil.

UAVs—OIF Guardian Angels

CPT Kevin L. Fittz
with
CW2 Jonathan H. Daniels

MAJ Zike, Regimental Fire Support Officer for the 2nd Armored Cavalry Regiment (2ACR), could hardly hide his excitement when he told the unmanned aerial vehicle (UAV) company commander the plan for the next day. "Your Soldiers located ambush sites and an anti-aircraft artillery gun emplacement today," he said. "So here's the plan. Tomorrow we're going to make a feint like we're headed into town while your Hunter system watches from overhead. When the ambush positions fill with insurgents and the triple-A gun is manned, the AC-130 gunship that we'll have overhead will engage the threat while our troops stand off and wait to clean up what's left!" He added, "It's a good thing we postponed that patrol and waited until the Hunter checked out the area before we went in. Without a doubt, your team saved both lives and equipment."

Finding and reducing the threat

The 3-505th Parachute Infantry Regiment conducted a raid on a suspected insurgent safe house in the early morning hours of a near pitch-black night. When the paratroopers entered the house from the front, two suspects darted out the rear of the house, ran to the tree line behind it, and deposited a satchel of weapons and ammunition. Once the satchel was hidden, the two suspected insurgents ran back to the house and joined the other members of the household undergoing search and questioning. During any other raid, the satchel would've stayed hidden in the dark foliage, under cover of the dark night and camouflaged against like-colored ground. During any other raid, the members of the house couldn't be detained for lack of evidence.

But this raid was different. The paratroopers received radio transmissions from their higher headquarters that a Hunter UAV overhead had spotted the suspects and could guide the Soldiers in on the weapons. Following radio direction from the higher headquarters, the Soldiers walked right past the satchel three times, even though they were using the latest in night vision devices. Finally, on their fourth attempt, the Soldiers found the satchel and its contents, ensuring at least two of the suspects went into custody with both film and hard evidence of their attempt to hide their lethal tools.

These are just two examples of what the Soldiers of Alpha Company, 1st Military Intelligence Battalion (A/1MI) are doing to support the Soldiers and Marines risking their lives daily to put policy into practice on the ground in Iraq. A/1MI has provided first-responder coverage of downed AH-64s, adjusted aerial fires for AH-64s in Fallujah, and provided screening coverage of raid,

cordon and search, and convoy operations all over Iraq. The Hunter UAV has teamed with artillery, attack and scout aviation, Special Forces, Air Force close air support, armored cavalry, airborne infantry, and Stryker and heavy mechanized units to take the fight to the enemy. Hunter UAVs have flown counter-battery, radar-calculated back azimuths to the source of a rocket or mortar attack, found the enemy combatants, followed them silently from above as they made their way to their house, and remained overhead until a raid could be mounted.

All told, in the first 5 months of operations in Iraq, A/1MI directly contributed to the elimination of over 500 anti-coalition forces, the capture of over 200 suspected enemies, and the reduction of equivalent numbers of weapons systems. A/1MI UAVs also witnessed and tailed a kidnapping, monitored the movements of individuals on the high value target list, confirmed or denied other sources of intelligence, and performed interdiction operations against cross-border movements, arms smuggling, fuel smuggling, and improvised explosive device (IED) emplacement.

As of June 2004, A/1MI was in its first 8 months of operational existence, having integrated the General Atomics-operated, theater-contracted I-Gnat system into the unit a little over 2 months after setting up in Iraq. The company trained with the Combat Maneuver Training Center (CMTC) in Hohenfels, Germany (which is also the location of the company headquarters), and then trained the Soldiers' payload skills in Kuwait with the help of a CMTC aero scout observer/controller. Following close quarter marksmanship and convoy live-fire training, the unit convoyed up into Iraq and established its mission support capability within 2 days of arrival.

The RQ-5A Hunter is a tandem-engine, tandem-propeller air vehicle, and the RQ-1L Improved Gnat (I-Gnat) is the Army's version of the Air Force Predator on a non-satellite tether. Both UAVs are medium-range, corps-level reconnaissance, surveillance, and targeting acquisition (RSTA) assets. Company-trained data exploiters from A/1MI, 303MI, and 502MI

UAV landing with two external pilots in the foreground: SPC Robert Whites, 96U External Pilot (left) and Mr. John Hench, Northrop-Grumman External Pilot (right).

This C-130 is shown taking off in front of an RQ-5A Hunter and crew. The crew is waiting to take the runway for takeoff.

This long, dark gray UAV is the RQ-1L I-Gnat.

report on the video feed over SIPR chat and broadcast live, full-motion video out over the Global Broadcast System (GBS), posting mission products to a SIPR Web site at the end of each mission. The small company of 48 Soldiers has split-based and split-sited as necessary to provide more than 16 hours a day of Hunter support from two locations and 12 hours a day of I-Gnat support over a combined area that covers up to two-thirds of Iraq.

Requirements managers who task the UAV as an RSTA system, viewing its capabilities operationally and tying it into an existing ground operation, are successful. Managers who view the UAV as an extremely low-orbit imagery satellite aren't nearly as successful, as proven by 5 months of covering fields, power lines, and rooftops nightly without catching a single rocket or mortar in the act of firing on a U.S. installation or concern. Both 82nd Infantry Division (Airborne) and 2ACR collection managers (CMs) understood and applied the operational capabilities of the UAV well. Their CMs provided A/1MI with operational graphics for every mission possible, allowing our UAV operators to plan and conduct reconnaissance missions with the knowledge of exactly what they needed to do to support the mission.

The Hunter and I-Gnat systems give the war planners and warfighters in Iraq the ability to see the battlefield and share the same view with all who are able to access SIPR chat, the GBS, and/or a SIPR Web site. UAVs shape the fight by providing the leaders who prosecute the fight with a near real time, full-motion picture of the ground situation. To the coalition warfighter on the ground who didn't activate an IED because it wasn't successfully emplaced, didn't drive into an ambush because it no longer existed, didn't contend with anti-coalition force weaponry because it was either captured or destroyed, or who was found when lost or wounded, the UAV overhead is simply a guardian angel. ♦

—CPT Fittz is the A/1MI Company Commander, Hohenfels, Germany. He may be reached via e-mail at kevin.fittz@us.army.mil. CW2 Daniels is the A/1MI UAV TACOPS Officer. He may be reached at jonathan.daniels@us.army.mil.

Standardizing UAV Operations

CW5 (Ret) Bill Tompkins
Directorate of Evaluation and Standardization
Fort Rucker, AL

Standardization, as we have come to know it in the manned aviation community, is in its infancy in unmanned aviation. This primarily is due to the rapid fielding of systems, which outpaced development of safety and standardization programs.

Unmanned aerial vehicle (UAV) standardization is being trained at the schoolhouse in Fort Huachuca, AZ. However, this training is being conducted without a formal instructor pilot (IP) course. Currently UAV IP candidates are selected on the basis of demonstrated skill and experience. IP candidates are then given additional instruction on implementation of the aircrew training program (ATP). This instruction includes a review of Training Circular (TC) 1-210, *Commander's Guide to Individual and Crew Standardization*; TC 34-212, *UAV Aircrew Training Manual*; and Army Regulation 95-23, *Unmanned Aerial Vehicle Flight Regulations*.

At the unit level, the UAV commander appoints those personnel most qualified and proficient as the unit IPs. The UAV operators maintain individual flight records folders (IFRFs) and individual aircrew training folders just like the manned community and use standard DA Forms 7120, 7122, and 4507. Consider for a moment the difficulties we have in the manned community with properly maintaining forms and records. Now imagine the same problems in the unmanned community, only without the benefit of years of institutional knowledge and experience.

UAV units also do not have an organic flight operations section. This leaves maintenance of IFRFs to the unit's IP. This obstacle can be overcome somewhat in Shadow units if the installation flight operations section is willing to assist. Hunter units tend to have a little less difficulty due to their association with aerial exploitation battalions.

What does the future hold for UAV standardization? Beginning in Fiscal Year 2005, a formal IP course will be held at Fort Huachuca. The academics involved will reflect much of the same material taught in U.S. Army Aviation Center (USAAVNC) IP courses. To some degree, the course may put more emphasis on ATP management than the USAAVNC courses.

Another step toward UAV standardization will happen through assistance visits to fielded units, as well as units undergoing fielding. The Directorate of Evaluation and Standardization (DES), in conjunction with the Program Manager (PM)-TUAV, will send a team to monitor and assist in the training of unit IPs and provide subject matter expertise to lay a solid foundation for a successful standardization program.

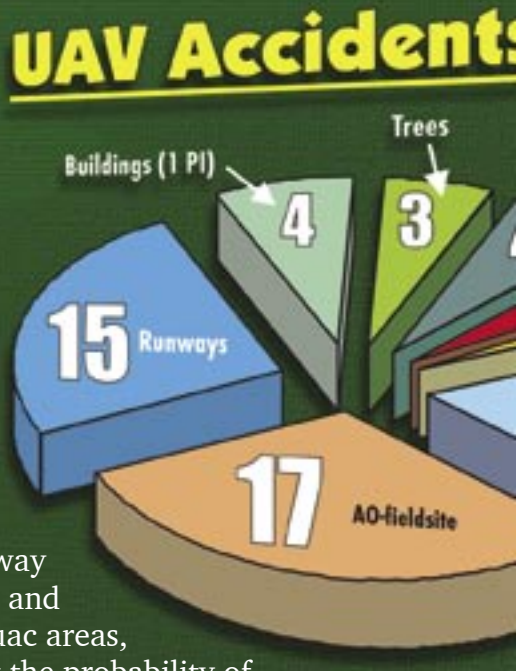
However, the real key to a successful program is a knowledgeable and supportive chain of command. Training and familiarization of ATPs at all levels of UAV command is required. This learning process will involve training at the service schools of UAV commanders. Until then, the interim solution is for DES to provide familiarization training and assistance to UAV commanders.

In closing, I make this request to aviation standardization officers: Look around you. Is there a UAV unit near you? If so, seek them out and lend them a hand in the development and maintenance of their ATPs. Not only is it in your interest—after all, they are sharing your airspace—but it's in the best interest of our Army. Just like their manned counterparts, UAV units must safely and successfully complete their missions. ♦

—CW5 (Ret) Tompkins is the TUAV PMO representative working for the DES UAV Branch. He may be contacted at DSN 558-3475 (334-255-3475) or by e-mail at william.tompkins@rucker.army.mil or wtompkins@aerodyneinc.com.

UAV Risk Management

Bob Giffin
U.S. Army Safety Center



With the current high level of publicity for unmanned aerial vehicle (UAV) tactics in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), one might think that UAVs have just arrived on the scene. The truth is that UAVs have been around since the Vietnam War.

Between 1976 and 2003, 56 UAV accidents were reported. You can see the breakdown by looking at the pie chart. The majority of these UAVs crashed into the training areas of operation. Losses are attributed to weather, maintenance, mechanical malfunction, and operator error.

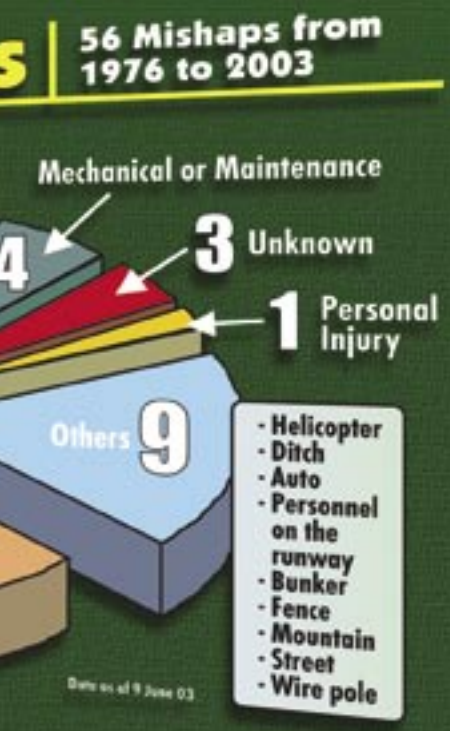
The second largest group of accidents occurred while operating in and around the recovery launch site (RLS). Regrettably, there have been two personal injuries associated with operating UAVs in and around the RLS. The first one occurred when a UAV was accidentally flown into a maintenance building, startling an employee who fell and broke his hip. The other occurred when a crew chief accidentally placed her hand into the operating arc of the propeller, receiving minor injuries to her fingers. Another incident occurred when a UAV flew into a crowd of spectators at the edge of a landing strip; fortunately, no one was injured.

The sample risk management worksheets located on the next page are intended for UAV commanders to consider when setting up an RLS. The single largest concern is for the welfare of Soldiers who are working in or around the RLS. The launcher should be set up to point generally into the wind and away from any equipment and cantonment or bivouac areas, therefore decreasing the probability of an errant UAV crashing into personnel or other equipment. The same holds true for the recovery efforts; non-essential personnel should maintain a safe distance away (minimum of 50 meters) from the RLS area.

Takeoff, landing, or low altitude operations of UAVs can be practiced on the mission simulator. Simulator training should be conducted on a routine basis. Periods of downtime or actual non-flying activities could be utilized by having the operators practice emergency-type procedures on the simulator. This can also assist with the currency problem that is plaguing the field, or perhaps when weather conditions are not optimal to allow flight operations.

Commanders, platoon leaders and sergeants, operators, and crew chiefs must follow specified training and checklists by the book. The key to a successful launch and recovery is to follow the standards already established and don't get distracted or in a hurry to accomplish the mission.

The Army has stepped up production of new UAVs to meet the demands of battlefield



Risk Management Worksheet

Page 1 of 2

U.S. ARMY SAFETY CENTER

MSN/TASK: Conduct UAV Flight & Recovery | DTG Begin: End: | Date:

HAZARDS	INITIAL RISK LEVEL	CONTROLS	RESIDUAL RISK LEVEL	DECISION MATRIX	HOW TO IMPLEMENT	WHO WILL SUPERVISE	CENTRAL EFFECTIVE YES/NO
Crash on takeoff into personnel or structures:	M (II-D)	• Orient launcher pointed away from cantonment areas & bivouac sites.	L (II-E)	Co	• Inform AVOs & crew chiefs to pay attention to detail. • Ensure by-the-book procedures are followed. • Ensure launcher is placed correctly. • Practice emergency procedures on simulator. • Ensure only mission crews are located on the runway as required.	• Company commander. • Platoon leader. • Platoon Sgt.. • Mission Cdr.	
Crash during recovery or landing operations into personnel or structures.	M (II-D)	• Orient the RLS away from cantonment or bivouac areas. • Ensure both sides of the runway are free from obstacles, vehicles & personnel in the touchdown area or beyond. • Comply with checklist procedures. • Review emergency procedures. • Practice emergency procedures on simulator.	L (II-E)	Co	• Inform AVOs & crew chiefs to pay attention to detail. • Use by-the-book operations.	• Company commander. • Platoon leader. • Platoon Sgt. • Mission Cdr.	

commanders. With this comes the realization of the tremendous value that UAVs provide the warfighter—reduced risk of human casualties. ♦

Editor's note: *Further recommended reading is the USAARL report, "The Role of Human Causal Factors in U.S. Army Unmanned Aerial Vehicle Accidents," located at* ***http://www.usaarl.army.mil/TechReports/2004-11.PDF****. A condensed version of the report follows this article.*

Risk Management Worksheet

Page 2 of 2

U.S. ARMY SAFETY CENTER

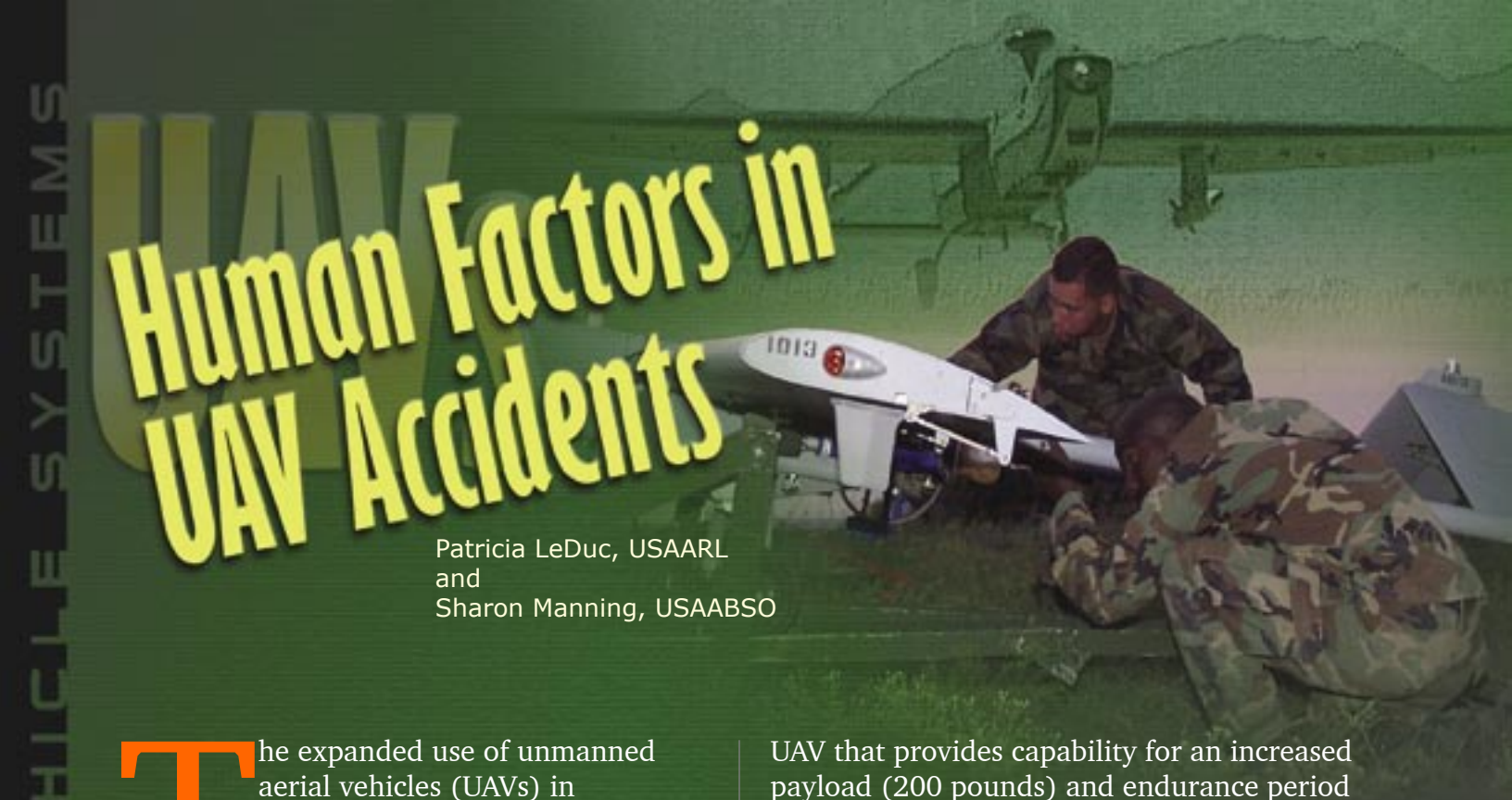
MSN/TASK: Conduct UAV Flight & Recovery | DTG Begin: End: | Date:

HAZARDS	INITIAL RISK LEVEL	CONTROLS	RESIDUAL RISK LEVEL	DECISION MATRIX	HOW TO IMPLEMENT	WHO WILL SUPERVISE	CENTRAL EFFECTIVE YES/NO
Crash onto the runway or recovery area.	M (II-D)	• Ensure non-essential personnel are clear of the intended landing area. Maintain at least 50 meters away from the designated landing area.	L (II-E)	Co	• Mission Cdr/Plt. SGT/Plt SGT must ensure that the landing area is cleared of all non-essential personnel prior to bringing the aerial vehicle into the landing pattern. • Ensure runway or landing area is set up IAW TM. • Practice emergency procedures on simulator. • Ensure an area is designated for VIPs & other personnel.	• Company commander. • Platoon leader. • Platoon Sgt.	

U.S. Army POC:
Robert P. Giffin, MS, CSHO
System Safety Manager (Aviation)
U.S. Army Safety Center
email: Robert.Giffin@safetycenter.army.mil
Ph. (334)255-3650 (DSN 558-3650)
Fax (334)255-9478 (DSN 558-9478)
website: http://safety.army.mil

Note: This risk assessment tool is not intended to provide all hazards, risks, and controls for UAV missions. It is provided as a useful tool containing examples to be used during planning and executing of those missions.

—Mr. Giffin is a USASC System Safety Manager for the UAV program. He may be reached by calling DSN 558-3650 (334-255-3650) or e-mail robert.giffin@safetycenter.army.mil.



Human Factors in UAV Accidents

Patricia LeDuc, USAARL
and
Sharon Manning, USAABSO

The expanded use of unmanned aerial vehicles (UAVs) in Afghanistan and Iraq has brought them into the public spotlight. Advocates for UAVs cite a number of distinct advantages over manned aircraft. These advantages include:

- Reduced or eliminated human loss.
- Lowered initial system development costs.
- Lowered replacement costs.
- Lowered operator training investment.
- Expanded mission time.
- Reduced detection signature and vulnerability.
- The ability to operate in nuclear, biological, and chemical environments.
- Reduced peacetime support and maintenance costs.

The Army currently fields two major UAV systems: The RQ-7 Shadow and the RQ-5 Hunter. The Shadow is a small (9 feet in length), lightweight (330 pounds), short-range surveillance UAV used by ground commanders for day and night reconnaissance, surveillance, target acquisition, and battle damage assessment. Capable of operating at altitudes of 14,000 feet, the Shadow can carry instrument payloads of up to 60 pounds. The Hunter is a twin-engine, short-range, tactical UAV that provides capability for an increased payload (200 pounds) and endurance period (up to 12 hours). It weighs 1,600 pounds and has a 29-foot wingspan.

While UAVs offer multiple advantages, they do have some disadvantages. Many are low flying and have slow ground speeds, making them easy targets for enemy ground forces. Remotely piloted UAVs require a complex and highly reliable communication link to the control station, and operators must make decisions based on sometimes-limited sensor information accompanied by a built-in signal delay. Automating some functions within a UAV control system may overcome certain remote operation disadvantages, but removing the man from the cockpit reduces the ability to make rapid decisions with maximum situational awareness.

Naturally, the increase in UAV use has been accompanied by an increased frequency of accidents. As mechanical failures decrease with the maturation of UAV technology, human error will account for a higher percentage of accidents. Knowledge of the human-related causal factors in UAV accidents can be used to suggest improvements in areas such as current flight training methods, crew coordination measures, and operational standards.
The predominant means of investigating the

causal role of human error in all accidents is the analysis of post-accident data. From Fiscal Year 1995 to 2003, a total of 56 UAV accidents were recorded. The application of both the Human Factors Accident Classification System (HFACS) and the DA Pam 385-40 approach identified 18 accidents (32 percent) as involving human error. While no single factor was responsible for all UAV accidents, both methods of analysis identified individual unsafe acts or failures as the most common human-related causal factor category (present in 61 percent of the 18 human error-related accidents).

Within the major HFACS category of "unsafe acts," four subcategories were identified: skill-based errors, decision errors, perceptual errors, and violations. The most common unsafe act was a decision error, present in 11 percent of all UAV accidents and 33 percent of all human error UAV accidents. Examples of decision errors include (a) when the external pilot hurried turns using steep angles of bank and prevented a proper climb rate, resulting in a crash; and (b) when the wrong response to an emergency situation was made by commanding idle power after the arresting hook caught on the arresting cable. The single accident categorized as "preconditions for unsafe acts" was further identified as a crew resource management issue.

Based on the DA Pam 385-40 classifications, the most represented Army failure was "individual failure" (20 percent). The second most prevalent failure category was "standards failure" (14 percent). When just the 18 accidents involving human error are considered, individual failure was present in 61 percent, and standards failure was present in 44 percent. "Leader failure," "training failure," and "support failure" were present in 33 percent, 22 percent, and 6 percent of the human error accidents, respectively.

Incidents of individual failure included (a) the operator misjudged wind conditions during landing; and (b) crewmembers overlooked an improperly set switch on the control box. Incidents of leader failure included (a) a crewmember who did not have a current certification of qualification was assigned as an instructor pilot; and (b) leadership failed to provide oversight of placing the UAV in a tent and having the tent properly secured. Incidents of training failure included (a) training was not provided to the UAV operator on effects of wind; and (b) training was not provided on single engine failure emergency procedures.

There was only one incident of support failure, which involved a contractor that did not take appropriate maintenance actions even though information was available. Incidents of standards failure included (a) written checklist procedures for control transfers were not established in the technical manual; and (b) there was no written guidance on inspection and replacement criteria for the clutch assembly.

As seen in virtually all types of accidents, human error plays a significant role in UAV damage and loss. Post-accident data analysis can provide a starting point for the design, examination, and adoption of appropriate countermeasures. While no single human factor was responsible for all accidents, these findings suggest there is a need to further develop and refine UAV training and safety programs that target individual mistakes. In demonstrating that human error plays a significant role in UAV accidents—and by identifying the type and prevalence rate of these errors—this study shows the need for emphasis on developing and implementing countermeasures that target human decision-making error. ♦

Editor's Note: *The following article is an excerpt from the U.S. Army Medical Department Journal. The full report may be found online at* ***http://www.usaarl.army.mil/TechReports/2004-11.PDF****.*

—Dr. LeDuc is a Research Psychologist for USAARL's Aircrew Health and Performance Division, Fort Rucker, AL. She can be contacted by calling 334-255-6872 or e-mail patricia.leduc@us.army.mil. Ms. Manning is assigned as a Safety and Occupational Health Specialist at the U.S. Army Aviation Branch Safety Office, Fort Rucker, AL. She can be contacted by calling 334-255-3000 or e-mail sharon.d.manning@us.army.mil.

Shadow TUAV Mission Process

CPT Matt T. Gill
Fort Bragg, NC

The end-state for all Shadow 200 RQ-7A tactical unmanned aerial vehicle (TUAV) operations is getting the right video to the right user in a timely and accurate manner. TUAV operators and leaders must establish a functional mission process to achieve this end-state. By using the Army's troop leading procedures, the TUAV platoon leader and direct support military intelligence company (DSMICO) can establish a mission process that provides timely, accurate intelligence to the maneuver unit utilizing the Shadow 200 TUAV.

Mission planning for TUAV operations is a complex system that must be maintained and administered on a constant basis. TUAV mission planning is the responsibility of the platoon leader (PL) and must be managed in accordance with the brigade S-2's reconnaissance and surveillance plan. The TUAV mission is a 3-phase process that allows the PL to conduct a plan from receipt of a mission request to production of the post-mission intelligence report.

Phase 1: Mission coordination

Shadow 200 TUAV mission coordination starts at the maneuver unit and is complete when the TUAV C2 element has produced an approved mission order. Planning is conducted between the TUAV C2 cell, division or brigade collection manager, and the requesting unit. End-state for mission coordination is the production of a document that allows the TUAV platoon to begin their internal orders process.

Phase 2: Mission planning

TUAV mission planning, conducted at the PL/platoon warrant officer (PWO) level, is performed in conjunction with the brigade S-2 and is a result of the final brigade targeting process. This phase covers all platoon internal coordination and provides them the ability to perform the requested mission. Mission planning begins with the production of the flight order and ends upon completion of the go/no-go brief.

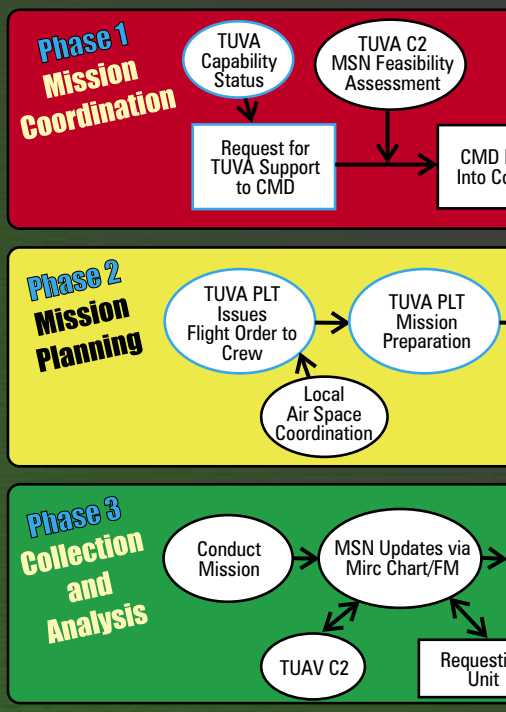
Author's note: *Proper use of time prior to conducting a mission is dependent on the platoon leadership issuing a timely, accurate mission order. See the sample TUAV pre-mission planning cycle on the following page.*

Phase 3: Collection and analysis

The collection and analysis phase is conducted at the flight crew level. Beginning with the launch of the aerial vehicle, the flight crew is in continuous contact via MircChat or FM radio with the maneuver unit and the division or brigade analysis and control element/deployable intelligence support element (ACE/DISE). This phase begins with the launch of the aerial vehicle, and ends when the post-mission intelligence report is published.

Conclusion

Proper mission planning is one of the initial keys to success for any operation, and especially applies to TUAV operations. By developing a functioning process over time, TUAV leaders and operators will be able to prepare and conduct operations that will meet the intent of the supported maneuver unit. One of the most difficult things for

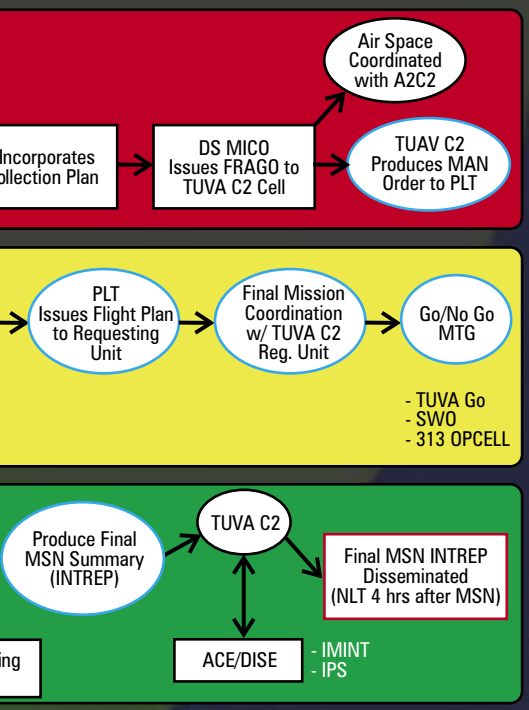


Pre-mission Planning Cycle

Proper use of time prior to conducting a mission is dependent on the platoon leader issuing a timely, accurate mission order.

junior leaders is to combine the military decision making process and troop leading procedures at the small unit level. Only through a systematic planning process will new and technically advanced intelligence assets be properly integrated into the maneuver fight. ♦

—CPT Gill is currently Commander of Delta Company for the 313th MI BN, 82d Airborne Division, stationed in Ar Ramadi, Iraq. He can be reached by calling DSN 239-1100/8500 (910-432-1100/8500) or e-mail matthew.gill@us.army.mil.



Forward and Launch Site Mission Procedures

FORWARD SITE MISSION PROCEDURES

Time		Action	Who
D-4		**Receipt of Mission**	C2
		Receive mission request from brigade (BDE)	C2
		Plot request in Falcon View to determine feasibility	C2
		Check weather for mission time	C2
		Request/research incident reports or related imagery	C2
		Provide BDE with any recommendations for mission adjustments	C2
		Update mission planner slide with flight times	C2
		Request airspace and identification of friend or foe (IFF) Codes (ACO/ATO)	C2
		Prepare mission target matrix	C2
		Update FRAGO	C2
D-3		Issue FRAGO	C2
D		**Mission Day**	
	T- 2:30	Check ATO/ ACO and published TFRs 2 hours prior to launch	C2
	T- 2:00	Brief MC on mission, provide mission target matrix	C2
	T- 1:50	Establish radio contact with LRS 1½ hours prior to launch	MC
	T- 1:50	Send weather update to LRS via FM or DVNT	MC
	T- 1:45	Brief AVO/MPO on mission	MC
	T- 1:35	Check fuel levels and equipment status	AVO
	T- 1:30	Receive risk assessment (RA) numbers from L/R site combine into decision RA	MC/C2
	T- 1:30	Plot targets in GCS	MPO
	T- 1:00	Prepare INTREP slides	C2
	T- 0:45	Establish contact with BDE in MIRCHAT, provide aerial vehicle (AV) number	MC
	T- 0:25	**Launch**	MC
	T- 0:15	Handoff procedures	MC/AVO
	T Hour	**AV on target**	MC/AVO
		Maintain MIRCHAT communications with BDE during flight	MC
		Post wind speed and temperature at altitude every hour to MIRCHAT	MC
	T+ 3:30	Post mission end time in MIRCHAT 30 prior to off station	MC
	T+ 4:15	Complete mission log/AAR	MC
	T+ 4:30	Update flight records	SP/IP
	T+ 5:00	LRS calls forward site (FS) to update slant/maintenance status	MC
	T+ 5:00	Complete and publish INTREP	C2

LAUNCH SITE MISSION PROCEDURES

Time		Action	Who
D-3		**Receipt of Mission**	C2
		Ensure personnel available for mission	PSG
		Ensure equipment available for mission	PSG
D		**Mission Day**	
	T- 3:00	Brief MC on mission, provide mission target matrix	WO/PSG
	T- 2:50	Mission brief to flight line	MC
	T- 2:40	Check fuel levels and equipment status	MC
	T- 2:30	Plot targets in GCS	MPO
	T- 2:30	Complete PMD of mission AV 2 hours prior to launch	Maint
	T- 2:00	Begin preflight 1½ hours prior to launch	MC
	T- 1:50	Establish radio contact with FS 1½ hours prior to launch, send tail number	MC
	T- 1:50	Receive weather update from FS via FM	MC
	T- 0:55	Call ATC to activate restricted operations zone (ROZ) 30 minutes prior to launch	MC
	T- 0:55	Call FS via FM 30 minutes prior to launch, verify tail number	MC
	T- 0:40	Engine starts 15 minutes prior to launch	MC
	T- 0:35	Call ATC to request permission to launch 10 minutes prior	MC
	T- 0:28	Call FS via FM 3 minutes prior to launch to receive permission to launch	MC
	T- 0:25	**Launch (25 minutes prior to TOT)**	MC
	T- 0:15	Call ATC at 5,000 feet to deactivate ROZ	MC
	T- 0:15	Handoff procedures at 5,000 feet	MC/AVO
	T- 0:15	Monitor flight, be prepared to receive mission	MC/AVO
	T Hour	**AV on target**	AVO
	T+ 4:00	Call TQ tower to activate ROZ 30 minutes prior to recovery	MC
	T+ 4:00	Handoff procedures at end of mission or approx. 9 liters	MC/AVO
	T+ 4:30	Call TQ tower when AV lands to deactivate ROZ	MC
	T+ 5:00	LRS calls FS to update slant/maintenance status	MC
	T+ 5:00	Update flight records	SP/IP
	T+ 5:00	Update mission log/AAR	MC

The Evolving Role of UAVs

Bill Coty
Aerodyne Inc.,
Huntsville, AL

Are unmanned aerial vehicles (UAVs) the future of Army Aviation? Flying in operational Army units for the past 8 years, UAVs help commanders gain situational understanding and shape the modern battlefield. In 1996 Alpha Company, 15th Military Intelligence Battalion, became the Army's first operational unit equipped with the RQ-5A Hunter. Today the Hunter is operational in XVIII, III, and V Corps. The RQ-7 Shadow now can be found in six divisions, and by Fiscal Year 2006 a projected 41 Shadow systems will be in place.

Today's role for Army UAVs is primarily reconnaissance. However, future UAV missions will include operations in nuclear, biological, and chemical detection, logistical resupply, increased communications relay, target recognition, and even attack. These versatile air vehicles are proving their worth every day in operations around the world.

Army UAVs first proved their effectiveness as a combat multiplier during operations in Kosovo. Since then, they have flown numerous operational missions both at home and abroad. Currently UAVs are playing a major role in Operation Iraqi Freedom (OIF). Both the Hunter and Shadow have been operating in Iraq for the past year, flying hundreds of missions and thousands of combat hours.

For you attack and scout pilots, don't worry about your jobs just yet—it'll be a few years before UAVs will completely be doing your job. However, UAVs soon will enhance your situational understanding of the battlefield. At Fort Polk, LA, in August 2000, the Hunter and AH-64D Apache Longbow interfaced for the first time. The Aviation Manned/Unmanned System Technology Demonstration (AMUST-D), as it was called, demonstrated the ability to control a UAV from the Apache cockpit and thus provide the crew with reconnaissance and target information well beyond the range of on-board sensors. The result is increased mission flexibility and the UAV—not you—traveling into harm's way.

As with any system, UAVs have their pros and cons. They can have vast endurance times (resulting in longer time on station without a break in coverage), near real-time imagery, targetable information, and most importantly, the ability to gather intelligence without putting the operator in danger. However, it's often difficult for UAV operators to get the situational awareness or air sense manned aircraft pilots would normally feel.

Viewing UAV imagery is somewhat like looking through a soda straw. The loss of peripheral vision can make searching for targets challenging. Communications also can be very problematic. With today's fielded UAVs, there is no direct communication with air traffic control (ATC) via the UAV. The only way to communicate with ATC is through the ground control station (GCS). Imagine trying to talk with the controlling ATC agency for a UAV that's 150 kilometers away from your GCS. It's not going to happen unless you both have non-line of sight capability.

Disseminating video to the end user is another problem. The best way to push UAV video is through the Global Broadcast System (GBS), which allows anyone with a GBS receiver to obtain the video. However, this requires equipment to transmit the video signal. During OIF, Hunter video was sent through a TRI-Band satellite transmitter, but there was only one TRI-Band system available for UAV use. The more traditional method of video dissemination is via the GCS to a remote video terminal (RVT), which requires the customer to be no further than 50 feet away from the GCS. The RVT is large and somewhat difficult to operate.

These are just a few of the UAV capabilities and limitations I experienced in Iraq. With sustained UAV operations in theater, Soldiers continue to develop new tactics, techniques, and procedures, thus making UAVs more effective every day. Both the Hunter and Shadow have participated in hundreds of operational missions and continue to be a combat multiplier in the Global War on Terrorism. As Army UAVs mature, I believe we will find they play a larger role in all types of missions. ♦

—Bill Coty is currently a UAV Senior Analyst for Aerodyne Inc., Huntsville, AL. He can be contacted at 256-880-4926 or e-mail wcoty@aerodyneinc.com.

"PULL UP!"

Anonymous

"PULL UP!" I heard those words as I grabbed the controls. Our radar altimeter was clicking down into single digits.

We were in the Kuwaiti desert after having been on alert for 2 months. The war had begun, and my commander was eager to get into the fight. The boat finally had arrived with our aircraft, but first we had to complete the sizable task of desert environmental training.

The weather seemed to conspire against us. It soon became apparent that we'd have to get current in night vision goggles (NVGs). Being an instructor pilot with several years' experience, I readily accepted the challenge of an NVG currency evaluation. Time was critical in the desert, and no one had the luxury of two flights.

The drill was routine: take off, make a turn to crosswind, then turn into the downwind leg, and finally perform a quick emergency procedure (EP). I had done it at least a hundred times back home. But I wasn't home, and I dearly missed having trees and hills to use as a height reference.

Because of the weather and dust, a 150-foot traffic pattern had become the norm for us. On some nights even lower altitudes were necessary just to keep something—*anything*—in sight. But that's what the heads-up display (HUD) is for. Height, attitude, and speed—it had never failed me back home.

The sand hung heavy in the air the night of my currency flight, creating a curtain of seemingly impenetrable darkness. My pilot was not current in NVGs, and it definitely showed. His takeoff and turns were ok, but the simulated EP taxed him. His focus was no longer on flying. I was trying to help him along when white driving lights on a parallel road illuminated the sandy haze. I lost my beloved HUD! I didn't panic, though. I thought I had a few seconds to reacquire the HUD, as was my experience back home.

But I wasn't at home. The hills, trees, and comfortably high traffic pattern were gone. My washed-out goggle display had gone from an annoyance to a deadly distraction. During the few seconds I spent to regain the HUD imagery, the aircraft had begun a slow, unnoticed descent.

One of our crew chiefs noticed the descent as our altitude decayed. He dutifully announced "check altitude" at the briefed 75-foot training area altitude. However, realizing the rate of descent had cost us precious altitude, he quickly yelled, "PULL UP!" This had never occurred at home!

So, what happened? I was in the desert, but my training and flight techniques were what I'd learned at home. My copilot needed a little time to get back into the mindset of NVG flight and adjust to this new environment. Why didn't I recognize that a task-overloaded copilot, low altitude, and poor visibility spelled trouble? Our saving grace that evening was a well-briefed crew chief. Make sure all your crewmembers are briefed on the conditions you'll be flying in, and take those conditions into consideration when handing out tasks. Fly safe and make it home! ♦

—The author's name was withheld by request. If you would like to publish a story anonymously in *Flightfax*, please call Ms. Paula Allman, Managing Editor, at DSN 558-9855 (334-255-9855) or e-mail paula.allman@safetycenter.army.mil.

Investigators' Forum

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

Another Victim of Spatial Disorientation

LTC Carroll Dexter
U.S. Army Safety Center

Spatial disorientation has contributed to several recent Army Aviation Class A accidents. The scenarios might be different, but unfortunately the results are the same. At the last moment, the pilots realized their ill-fated predicament but were unable to recover, resulting in a destroyed aircraft. The following mishap illustrates that no community is safe from this aviation hazard.

During a Joint Readiness Training Center rotation, the pilot (PI) (also the air mission commander) in the front seat of an AH-64A received a hasty change of mission. The PI directed the instructor pilot (IP) to enter and select a new single channel ground and air radio system radio frequency to initiate contact with the supported ground elements. The IP initiated a transfer of controls, and the PI accepted the controls after completing a three-way positive transfer. The PI then moved his sight select switch from the target acquisition and designation system position to the night vision system position.

After more than an hour of heads-down searching for targets, this was the first time the PI took the flight controls during the mission. The PI said he developed an overwhelming feeling of descent and saw trees rapidly rising up at him. He pulled the cyclic aft twice, putting the aircraft in a nose-high attitude. The IP rose from a heads-down position and, seeing no horizon, realized the aircraft was descending backwards. He grabbed the flight controls and tried to level the aircraft by pushing forward on the cyclic and raising the collective. The tailboom forcefully struck a tree, which severed the tail rotor driveshaft. The main rotor system disintegrated as it entered the trees. The airframe was damaged extensively, but neither crewmember was seriously injured.

Why did it happen?

The PI was performing target identification duties (i.e., 45 degree heads-down) in excess of an hour by scanning for

targets while zooming from medium to narrow fields of view. The PI raised his head to receive the controls and failed to establish a proper cross-check with both flight symbology and scene content. The PI's fixation on the forward-looking infrared scene content exacerbated the confusion between his vestibular and visual sensory systems. This spatial disorientation gave him a feeling of uncontrolled descent and a nose-low attitude when the aircraft was level. The IP didn't recognize the unusual attitude early enough to prevent the unsafe operation of the aircraft. He wasn't able to recover the aircraft quickly enough from its rearward acceleration and high rate of descent to prevent the accident.

Lessons learned and recommendations

Although the exact reason for the PI's spatial disorientation and the mechanism that triggered it isn't fully understood, it's clear that the disorientation was increased by the PI not using all of the assets available to him. That is, he should have cross-checked the flight symbology to confirm the aircraft attitude. Secondly, the PI should have "cleaned up his cockpit" by ensuring the switches were set and that he was fully oriented before accepting the flight controls.

The IP had confidence in his PI's flight abilities and conducted a radio frequency change with his head down after transferring the controls. While conducting the frequency change, he also should have monitored the PI's actions and aircraft attitude more closely. This would have increased his reaction time available to recover the aircraft in the event his copilot placed it in an unusual attitude. ♦

—LTC Dexter is the USARNG advisor at the U.S. Army Safety Center. He can be reached by calling DSN 558-9864 (334-255-9864) or by e-mail at carroll.dexter@safetycenter.army.mil.

Caveat Emptor, or "Buyer Beware"

CPT Martin Robinette
with
1LT Daniel Squyres

Anyone who receives aviation magazines and catalogs such as *Sporty's* and *King Catalog* knows there is a whole host of commercially available products advertised to make our jobs as aviators easier. Most pilots and crewmembers would agree anything that can reduce workload and/or enhance situational awareness is probably a good thing.

However, as Army Aviators we have to take certain things into consideration when presented with the option of buying that new GPS or other aviation product. While it may be fine for general aviation, can we as Army Aviators use it? This question must be asked not only because of the strict performance requirements of Army Aviation equipment, but also the potential harm or interference that could be caused by using unapproved products.

In recent years there have been several examples of aviators using items not proven to meet military specification requirements. These products include helmet liners, boots, Air Force undergarments, and softer ear pads. Items such as the unauthorized undergarments have contributed significantly to the outcome of accidents. And, in some instances, operators have suffered injury due to an unauthorized device or product.

Even something as seemingly innocuous as an extra seat cushion or softer ear cup can have a profound impact on survivability in a crash sequence. The self-stroking seats used in some of our advanced aircraft are designed to transfer a calculated amount of force to the operator's body. When an unapproved seat cushion interferes with this process, the calculated maximum force can be exceeded with disastrous consequences.

The HGU/56P helmet currently employed in the majority of Army rotary-wing aircraft also is tested to meet specific impact, retention, and noise standards. Replacing the foam lining almost certainly will have a negative effect on the impact and retention features of the helmet. It also can reduce the helmet's acoustic protection. While some features of non-approved products might perform better than military-approved products, others may be inferior. Experience has shown that the risks of using such products outweigh the perceived benefits in a critical situation. None of us wants our equipment to fail when it's needed most. Approved equipment may not always have the fancy flashing lights, glossy surface, or intriguing gadgets, but it has been tested and found to outperform the competition in the most extreme conditions.

The best way to determine if a nonstandard product is safe for Army Aviation operations is to establish if it has an airworthiness release (AWR) or safety of flight (SOF) certification. An AWR is a document produced by the U.S. Army Materiel Command or U.S. Army Aviation and Missile Command and certifies that anything from a helmet to an entire aircraft is safe for aviation operations. An SOF certification serves many of the same purposes; however, it is generally used for non-electrical personal equipment such as kneeboards. It is against regulations to use any nonstandard piece of equipment in or on Army aircraft without an AWR or SOF. This information usually can be found by talking to your ALSE shop or unit aviation safety officer.

The ramifications of using items without an AWR or SOF can be very real and potentially costly. In the event a non-approved item damages an aircraft, a report of survey can be

filed against the pilot. In cases where the item is found to have caused the accident, all injuries suffered can be considered "not in the line of duty." This means the individual Soldier might be responsible for paying for his or her own medical care. There also is the potential for private litigation brought about by injured crewmembers.

Unfortunately, some vendors do little to assist potential buyers. Crewmembers must be cautious when confronted with manufacturers that claim they are an "official supplier to the U.S. military." The vendor may supply other products to the military, but not the product being advertised. And many products are never specifically referred to as having been approved for Army flight, but give the appearance of approval. Needless to say, many of these items are not approved for Army Aviation.

There are two real hazards when using an unauthorized piece of equipment. The first is that using a commercial product not tested and approved for use in Army aircraft can result in mission endangerment and loss of life. Second, if you are in an accident with an unauthorized piece of equipment, it may be deemed a contributing factor—resulting in disciplinary action and/or a significant financial penalty. Given these facts, the costs decidedly outweigh the benefits. Remember, no matter how cheap or comfortable, the risks just aren't worth it. ♦

—CPT Robinette is assigned to U.S. Army Aviation Medical Center, Fort Rucker, AL. He may be reached via e-mail at martin.robinette@us.army.mil.
1LT Squyres is assigned to D Company, 3-58th Aviation Regiment, 12th Aviation Brigade, Grafenwohr, GE. He may be reached via e-mail at Daniel.squyres@us.army.mil.

Letter to the Editor

Dear Editor,

Please publish this in Flightfax. I have witnessed the return of two Army divisions in the last 4 weeks and everything we have heard about watching these returning warriors is very true.

There are two immediately obvious threats: Warriors returning to the American roads after being deprived of automotive freedom, and the same warriors with large amounts of excess cash burning a hole in their wallets.

Regardless of rank or experience level, there seems to be a newfound disregard for traffic laws (especially STOP signs) among our fellow POV pilots. That high-performance screamer motorcycle or hotrod car is suddenly more affordable after a year of tax-exempted combat duty.

You would not believe the parade of high-end BMWs and rocket bikes I saw in traffic going home yesterday. Who can blame them for rewarding themselves?

This is purely an observation, but I cannot encourage everyone enough to watch out for these guys. That flashing red light at the gate is on again and this is only the beginning of the fair weather driving season. Get involved and take actions as risk managers and leaders to keep these Soldiers alive and well enough to enjoy their new toys and freedom to roam.

Thanks,
Kevin E. Ivey
Facility Supervisor
Aviation Support Facility Hood (RW)
Fort Hood, TX
e-mail kevin.e.ivey@us.army.mil

Editor's note: *Next month, we will feature a special edition of Flightfax on deployment safety.*

IIMC Mailbag

Training Increases Confidence

When I went through the crew coordination program back in 1992 at Fort Campbell, KY, I remember being upset at my instructor pilot (IP) for putting my UH-60 simulator in an IIMC situation at least six times per flight. I was really mad, because my poor performance embarrassed me. IIMC training wasn't part of the program, but my IP explained it was very important to do. He emphasized how crucial the crew's actions are during the first 30 seconds in an IIMC situation—that what you do in those few seconds will probably determine whether you live or die. So I sucked it up and looked stupid for several iterations. Over the next few days, though, it pretty much became instinctive.

Within a month or two we were doing a mission on Fort Campbell. The ceilings were extremely low and visibility was poor when it happened—we went IIMC. I was inside the cockpit, and the guy flying went in the clouds. He hadn't received the extensive training I had, and his instinct was to try to come back down through the clouds (as I had in my first simulator period). My *trained* instinct, on the other hand, was to go up. I took the controls—almost forcefully, but confidently—and started the recovery procedure. While my copilot was digging for pubs I was telling him which frequency to tune to, and within a minute or so we were on a vector. Everything was tuned and identified, and the cockpit was calm.

I truly believe the training that IP gave me saved my life that night. Train, train, train in the simulator, even if it's uncomfortable or embarrassing for your students. Take them out of their comfort zones and repeat IIMC scenarios until the procedure becomes routine and their confidence level climbs. Then, when their turn comes, they'll handle the first 30 seconds and the rest of the flight with complete confidence. ♦

—CW4 Dave Hennies is an Aviation Safety Officer assigned to HSC, 3rd MI Bn. He may be reached via e-mail at david.l.hennies@us.army.mil.

Safe, Not Sorry

I was the pilot in command (PC) on an OH-58A, with about 1,000 hours. My pilot had less than 500 hours. On this particular mission weather was reported with 4,000-foot ceilings. Well, the ceiling dropped to 200 feet. I knew we were far enough away from the local airport to climb, so we were VFR at 3,000 feet in no time. I knew the area well, but it was very unnerving to climb 2,500 feet with poor visibility.

On another flight at another time, I was the PC on a -58A and had about 1,500 hours when I went into a cloud over some mountains. It was the last quarter of a 16-hour duty day, and I was very tired. There was no light and no moon. I knew I had the altitude to clear the ridge line, but how far could I make it in IFR conditions? I decided to execute an immediate 180, and I resumed VFR flight. After returning to a civilian airport I checked into a nearby hotel. I was too tired to play games! ♦

—Anonymous

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

CH-47

D Model

■ **Class B:** Aircraft was on the downwind leg of a traffic pattern flight with the instructor pilot performing a single engine failure training maneuver when the engine N_1 decreased below 60 percent and caused the operating engine temperature to over-temp above 1,200 degrees. The engine suffered Class B damage as a result.

■ **Class C:** Aircraft's aft rotor blades contacted the ground during troop insertion in mountainous terrain. A crewmember was guiding the crew into an aft landing when the blades contacted the ground. The crew immediately brought the aircraft to a hover and felt no unusual flight vibrations. The troops were dropped off at an alternate location, and the aircraft was returned to base without further incident. All three main rotor blades were damaged—one beyond repair, two repairable.

OH-58

D(R) Model

■ **Class A (Damage):** Aircraft was trail in a flight of two when its crew experienced engine out and low rotor RPM cockpit indications. The pilot in command initiated forced landing procedures and issued a "Mayday" call just before impact with the ground in a reported nose-high attitude. The aircraft came to rest on its left side. Both crewmembers suffered injuries and were extracted from the crashed aircraft by the lead aircraft's crew.

■ **Class A (Damage):** The crew experienced power loss during flight, followed by low rotor RPM and engine out indications. In response, the crew conducted an autorotation. The aircraft impacted an embankment and rolled several times before coming to rest at the edge of a waterway. A post-crash fire consumed the aircraft. Both crewmembers suffered minor injuries for which they were treated and released.

UH-60

A Model

■ **Class B:** Aircraft drifted into a hillside as the crew was slowing to a hover after entering a moderate rain shower. Damage was reported to all main and tail rotor blades and the stabilator.

RC-12

■ **Class C:** Aircraft was landing to a local airfield when a deer ran in front of it. The aircraft struck the deer, causing damage to the right propeller.

RQ-7

Shadow Model

■ **Class B:** Air vehicle crashed after control personnel lost communication with it. No other details were provided.

■ **Class B:** Air vehicle experienced generator and engine failure. The vehicle's crew deployed the onboard recovery chute, but the vehicle suffered damage after contacting the ground.

■ **Class C:** Air vehicle crashed into a HEMTT. The air vehicle experienced a right flap failure during landing, causing it to make repeated right rolls outside tolerance. After several failed landing attempts the operator deployed the chute, at which time the vehicle struck the HEMTT. Although the vehicle's fuselage was damaged, the payload is thought to be serviceable. The HEMTT suffered superficial damage.

Editor's note: **Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).**

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Coming Attractions

- ***September*—War Will Be Long and Hard...Make It Home Safe!**
- ***October*—Non-rated Crewmember Special Issue & ALSE**
- ***November*—Wire Strikes**
- ***December*—2004 Wrap-Up**

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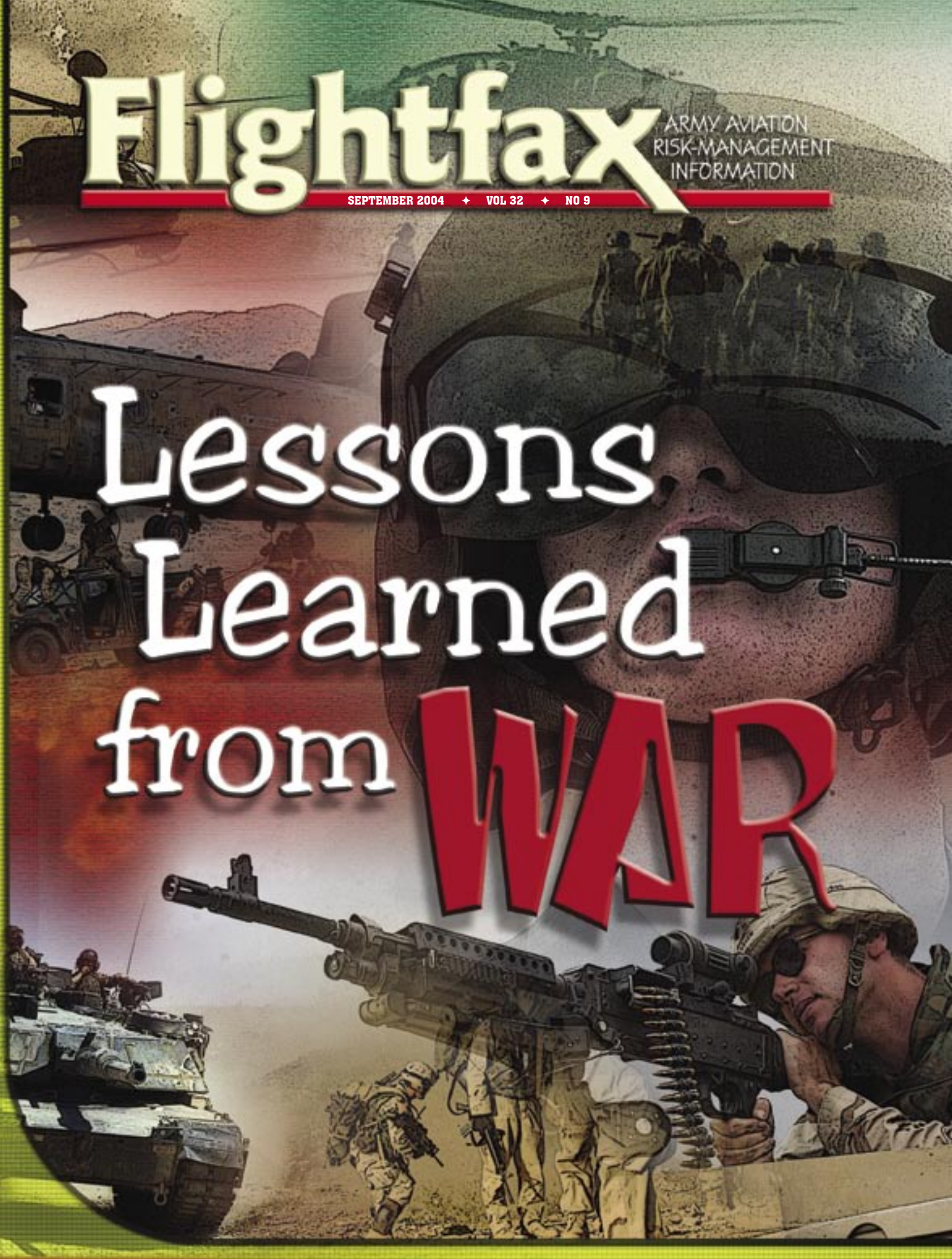
ARMY AVIATION RISK-MANAGEMENT INFORMATION
SEPTEMBER 2004 ✦ VOL 32 ✦ NO 9

Lessons Learned from WAR



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ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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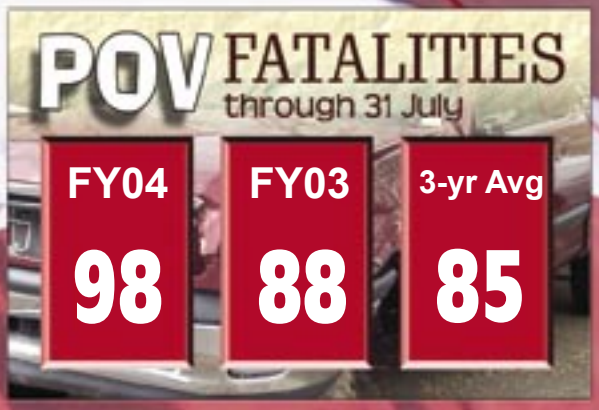

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JOSEPH A. SMITH
Brigadier General, U.S. Army
Commanding

DASAF's Corner
FROM THE DIRECTOR OF ARMY SAFETY

The Next Greatest Generation

Grasp the Knowledge, Sharpen the Skills, and Retain the Abilities

On a recent trip to Washington, D.C., the sight of the World War II Memorial brought clarity to a message I've heard in the last several weeks. The World War II Memorial honors the 16 million Americans who served in the armed forces, the more than 400,000 who died, and all who supported the war effort from home. Symbolic of the defining event of the 20th century, the memorial is a monument to the spirit, sacrifice, and commitment of the American people. On 27 May 2004, the public was invited to the unveiling ceremony to view this tribute to America's "Greatest Generation."

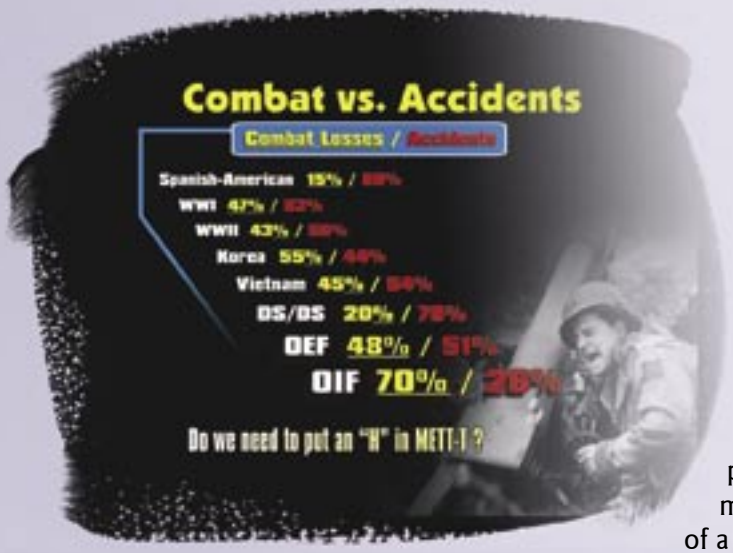
As we look to the future, the Global War on Terrorism is demanding that our 21st century Army and its Soldiers embrace the spirit of the Greatest Generation. We are an incredible Army—resourced for success and transforming to meet tomorrow's challenges. Our Soldiers are returning from battle with a degree of knowledge and experience that, at a minimum, would take years of schooling and rigorous training to match. Our duty is to grasp the knowledge, sharpen the skills, and retain the abilities of the Army's newest generation.

Grasp the knowledge of our junior leaders and coach "composite risk." By focusing energy on our current combat leaders, we can simultaneously capture lessons learned and implement control measures that will mandate how warfighting and training will be conducted in the 21st century. Specifically, we must not lose the insight of the leaders who understand tactical risk *firsthand* or those who experienced accidental risk *personally*. We are not there yet. After visiting several units in Iraq last month, it was clear that we still have a "mental barrier" to blending tactical and accidental risks into a "composite" picture. That is, to view the risk of losing combat power holistically. When you are dead, you're dead—regardless of whether a bullet or an accident took you out of play. Our Mission Ready Exercise (MRX), Pre-deployment Site Survey (PDSS), Relief in Place (RIP), and Military Decision-Making-Process (MDMP) must come together in a way that not only captures lessons learned from our junior leaders, but also coaches the art of "composite" risk mitigation.

When I ask new convoy commanders about their biggest threat, most say with great confidence "IEDs!" (Improvised Explosive Devices). When I ask new air mission commanders what their biggest threat is, they say without a doubt it's "MANPADS!" (Man-Portable Air Defense System) and "RPGs!" (Rocket Propelled Grenades). Ask a Soldier in the mess tent, he'll say "rocket attacks in tent city." Sound familiar?

Approaching Soldiers hardened by combat, I often get a different response. The seasoned convoy commander tells me "fatigue" is his number one hazard because he's mitigated the tactical risks with TTPs (Tactics, Techniques, and Procedures). The seasoned air mission commander tells me that a "mid-air collision" is his number one hazard for the same reason. **These Soldiers are adequately balancing the composite risk—"they get it!"** The weathered cook who tells me, "I've heard the rounds go off … and I'm more concerned about getting hit by a negligent discharge (ND) than shrapnel from a rocket attack," also "gets it"—there are far more NDs than rocket attacks.

We must not return home to the same old FTX and common task training (CTT). Our rising leaders are more than capable of training and risk managing with a few simplicities, such as fighter management, solid pre-mission planning, and strong troop-leading procedures. These leaders have personally experienced combat and will learn to defeat both enemies of composite risk.



Sharpen the skills of our already highly trained and hardened Soldiers. Let's get the job done and be smart about it by allowing more flexibility to deal with the less-predictable tactical risk. The Chief of Staff, Army, said, "We cannot be risk averse, but we can be smart about managing risk." The best way is to sharpen the skills of our junior leaders and provide them with expert knowledge. They are skilled, seasoned warriors who will get the job done.

We must capture the importance of pre-mission planning for every mission. Nearly all infantrymen can tell me the finer points of actions on the objective or the details of a cordon and search, but when asked about the vehicle lineup at the start point and the movement, I get the "deer in the headlights look." Time constraint is the most common cause of not following troop-leading procedures. We must institutionalize doing the basics right and make leaders aware of the online Risk Management Information System (RMIS). Refining risk management training prior to deployment will provide more flexibility to deal with the less predictable tactical risk in war. Combat is fluid and requires sharpened leader skills for both air and ground operations. How often have you flown a complex air assault mission only to come home and realize there was little or no planning to get you through the forward arming refuel point (FARP) and parking? Let's get smart about training the basics.

I'm not asking you to change focus in combat. On the contrary, I'm asking that you sharpen skills while in training to allow more planning time for actions on the objective. We need standardized battle drills, SOPs, and reporting procedures across our Army. When an organization understands the routine drills, then leadership can focus its energy on addressing variables. Training to standard the routine missions, such as vehicle movement, FARP operations, and formation flight over urban areas at low illumination will allow even more time for focused mission planning. Mission, enemy, terrain, troops and time available (METT-T) then can be focused to your actions on the objective and the variables of composite risk.

Retain the abilities of your "A" student Soldiers. Soldiers in vehicle accidents account for more than two-thirds of our non-combat losses. Units that "get it" have significantly lower losses. I Corps CSM Barry Wheeler often refers to an "A-B-C" scale of Soldier performance. I submit that the "C" Soldiers will return from deployment and go back to the old ways of driver training and risk management. The "A" NCO will understand that driving a military vehicle has evolved into a basic Soldier skill—an evaluated CTT proficiency. The "A" leaders will train to standard based upon the lessons learned and the composite risk.

The same holds true for weapons qualification/handling and aviation training. The "A" students of modern ground warfare will require the use of Individual Protective Equipment (IPE) and ARMOX® for all qualification courses and convoy live-fire exercises. The "A" student aviators will demand training standards that reflect combat flying. Zero illumination with a hard-deck altitude is common practice in war, and we must implement training at home to retain this ability. We must not return home and allow organizations to return to the old ways. Instead, we must sustain the momentum and build upon the abilities of our returning warriors.

In World War II, America's Army lost 56 percent of its casualties to accidents. When you look at the nearly 235,000 Army Soldiers who died during that conflict, it puts 2004's 26 percent accidental death rate into perspective. However, the current number of combat losses versus accidental deaths is still at an unacceptable rate. I review every reported accident in our Army… all but a handful were preventable.

During my recent travels, a captain asked **"Should there be an H in METT-T?"** He said the H would singularly examine (H)azards associated with the mission. In 15 months of his deployments, he had seen combat in Afghanistan and Iraq and knew *firsthand* about tactical risk, and had also felt the *personal* impact of accidental risk. He gets it!!! We need to retain our young leaders like this and use their experience. The Army depends upon the knowledge, skills, and abilities of its returning warriors. Balancing accidental risk and tactical risk is the future of risk management, a future that is in the hands of our young leaders – our next Greatest Generation.

Joe Smith

Flight Profiles in an Urban Environment

CPT Adib Khoury
4th Squadron, 2d Armored Cavalry Regiment
Fort Polk, LA

"Nomad 14, this is Nomad 6. Did you see that group of people behind us? Approximately 10 personnel gathered on the road, one white pickup truck, and one sedan."

"Negative."

"OK, we're going back to take a closer look. Pick up my six."

"They're scattering! One, two ... at least two personnel with AK-47s trying to hide behind the trees ... unknown equipment in the back of the truck ... four personnel running toward the farmhouse ... two running down the road ... two getting in the truck ... two getting in the sedan. I'll stay with the truck and the sedan; you stay with the guys in the farmhouse."

Trail to lead: "WIRES!"

Lead to Trail: "Thank you." (Both crewmembers were looking down at a route during a route reconnaissance.)

"Nomad 6, this is Nomad 14. We're slowing back, there's a bird in the cockpit with us."

"Did it come through the windscreen or the door?"

"Chin bubble."

"Roger, RTB (return to base) and get the backup aircraft."

Survival from the enemy

In an urban environment, manmade and natural obstacles are real threats and must be taken into consideration when developing appropriate flight profiles. Throughout the course of Operation Iraqi Freedom (OIF), helicopters have been lost to small arms fire, rocket-propelled grenades (RPGs), surface-to-air missiles (SAMs), mid-air collisions, and collisions with obstacles. The above radio transmissions actually happened and demonstrate the wide variety of threats faced during aviation operations in an urban environment.

Tactical flight in an urban atmosphere presents many challenges because, in an effort to avoid being killed by the enemy, you might end up killing yourself. This article will discuss current Army doctrine on aviation operations in an urban environment, outline the current threat in Baghdad, Iraq, and share some thoughts and tactics, techniques, and procedures we currently are using during daily aviation operations in Baghdad.

Current doctrine

Field Manual (FM) 3-06.1, *Aviation Urban Operations*, is a fairly comprehensive manual and a must-read for any aviation unit preparing for operations in an urban environment. On enhancing survivability, FM 3-06.1 states:

"Remaining unseen visually and

electronically is the most effective method of preventing an engagement by hostile forces… 'High' versus 'low' is a matter of carefully weighing the factors, making an informed decision, and remaining flexible if the situation dictates a profile change… Distilled to its most basic elements, the issue is this: Do aircrews want brief exposure to hostile weapons at close range or continuous enemy observation and exposure to weapons at extended slant range?"

From a purely tactical perspective, low altitudes mixed with high airspeeds provide the greatest chance for survivability. Aircrews should avoid true nap-of-the-earth (NOE) flight, as it exposes the aircraft to a greater potential for engagements. In other words, flying at the airspeeds associated with NOE flight as outlined in the aircrew training manual increases your vulnerability to enemy fire. However, aircrews also must consider the threat to their survivability posed by the vast hazards abundant in an urban environment (wires, towers, antennas, birds, buildings, etc.). To buffer obstacle and hazard clearance, a higher flight altitude (300 to 500 feet above ground level) over a city, day or night may be necessary. When determining an appropriate flight profile, aircrews should consider the following:

1. Mission requirements
2. Flight hazards
3. Small arms threat
4. Terrain relief and building height in and around the area
5. Density of structures
6. Accessibility and security of high, dominant rooftops
7. SAM threat

Special considerations must also be given to night vision goggle operations. To prevent the loss of visual contact with other aircraft among ground lights, a non-traditional vertical "stack-down" formation (trail flies lower than lead) may be required. Also, due to the abundance of manmade ambient light, aircrews should prepare to make frequent and rapid transitions from aided to unaided flight during urban operations.

Is the benefit of flying lower and slower worth the risk of being shot down? We re-addressed this question as the number of incidences of aircraft taking fire throughout Iraq increased in November and December 2003. The conclusion we reached is that it depends on the mission.

Enemy situation

The enemy situation in Iraq is very fluid and constantly changing. In the 9 months we've been deployed, the threat has developed from mostly criminal-type activity to organized resistance aimed at disrupting coalition forces and missions. The enemy is smart and constantly adapting to our tactics. We've seen "baited" ambushes where an initial attack against coalition forces is merely a setup to gain contact with ground or air quick reaction forces (QRFs). We've had local nationals try to "talk" to aircrews on unsecured, single-channel, air traffic control frequencies. We've experienced success detaining or killing enemy forces, confiscating their money for funding operations, and seizing their weapons caches. They, in turn, rob banks to fund new weapons purchases and anti-coalition attacks.

Specifically related to aviation operations, the majority of the attacks against aircraft haven't been in the heart of the cities but rather near airfields, over objectives, and on route structures at mandatory reporting points. The enemy has access to small arms weapons that include AK-47s and RPKs (Soviet light machine guns), RPGs, and an abundance of SAMs (over 7,000 SA-7b missiles still are believed to be in enemy hands). Most of the attacks against aircraft have been against high-payoff targets such as troop transport aircraft rather than scout or attack aircraft.

The urban environment provides many advantages to the enemy. It's difficult to fight an organized, uniformed army in an urban area, but it's much more challenging to fight an enemy that easily blends with the population. An enemy that can ambush a convoy from

rooftops along an entire city block one minute and happily wave to aircraft the next, with no weapons in sight, is extremely difficult to engage. The abundance of visual cues mixed with the fact that the majority of the population is friendly toward coalition forces also presents aircrews with a difficult task of identifying friend vs. foe.

Current aviation operations in Baghdad

The underlying assumption in current Army doctrine on urban aviation operations seems to be that steady state operations (scout weapons teams flying over the same parts of the city 15 hours a day for a year) in an urban environment will not be conducted. The recommendation is to set up base camps outside urban areas, fight the enemy at specific objectives within the city, and then return to base camp or continue to advance beyond the city.

Steady state aviation operations within a city increase vulnerability to enemy fire for a number of reasons. First, the control measures typically implemented to de-conflict aviation assets (air routes, airlift command posts, set traffic patterns and altitudes, lighting requirements, etc.) are all necessary, but lead to predictable patterns the enemy can pick up on. Second, a motivated and well-equipped enemy only has to be patient and wait for an opportunity to engage an aircraft; they are over the city every day.

Our tactics have developed continually over the course of the deployment. Before deploying, we discussed how to fly tactically in a city to minimize risk. We talked about minimum airspeeds of 60 knots to reduce vulnerability to small arms fire. We talked about flying low and fast. When we deployed we implemented a hard deck of 300 feet at night to avoid obstacles (wires, towers, antennas, etc.).

But, as we flew missions, we found that it's nearly impossible to see anything at night while flying at 300 feet and 60 knots. After about 100 hours flying over the same parts of the city, we became very familiar with where all the obstacles were and now regularly descend below 300 feet to better observe objectives, routes, named areas of interest (NAIs), etc. Also, as we realized the threat wasn't what we were expecting (one bullet hole in one aircraft in more than 3,000 hours flown on seven aircraft), we started slowing down to conduct a more thorough reconnaissance.

There has to be a continuous evaluation of benefit vs. risk. Is the benefit of flying lower and slower worth the risk of being shot down? We re-addressed this question as the number of incidences of aircraft taking fire throughout Iraq increased in November and December 2003. The conclusion we reached is that it depends on the mission. Do everything you can within the confines of the mission to make yourself a hard target. When transitioning from point to point, fly low and fast during the day and a little higher (300 feet) at night. If conducting reconnaissance, fly low and slower to ensure you're able to be thorough (again, an abundance of visual cues makes reconnaissance difficult).

Constantly vary your altitude and airspeed throughout all flights, regardless of the mission. Vary your scheme of maneuver to avoid predictability. Use different routes—a straight line might be faster but makes you more vulnerable. The nature of flight in an urban area might put you in the wrong place at the wrong time and you won't even know you're being engaged until it's too late. Do everything you can to avoid predictability.

When determining your flight profile in an urban environment, you cannot limit yourself to strictly tactical considerations. The threat from the enemy is real, but so is the threat from obstacles, both natural and manmade. There has to be a balance between the two threats. Your greatest chance for survivability when conducting operations in or around a city is to conduct a constant analysis of benefit vs. risk. You also must adjust your flight profile accordingly to accomplish your mission safely. ♦

—CPT Khoury is the commander of Nomad Troop, 4th Squadron, 2d Armored Cavalry Regiment, Fort Polk, LA. His unit conducted aviation operations in Baghdad from May 2003 to March 2004. CPT Khoury may be contacted via e-mail at adib.khoury@us.army.mil.

EMERGENCY (PROCEDURES) in the Combat Zone

CW3 Rick Heath
1-1 Cavalry Regiment, 1AD
Budingen, Germany

We all recognize that if there is one nonnegotiable area of information that all aviators must know without error, it would be the underlined steps to handle aircraft emergencies contained in Chapter 9 of all aircraft operators manuals. Most of these emergency procedures end with either LAND AS SOON AS POSSIBLE or LAND AS SOON AS PRACTICABLE. In the classroom, at the table or in flight in a simulated tactical environment the correct response to an IP's query about how to handle certain emergencies is very straightforward; that is, the correct response is in accordance with Chapter 9 underlined steps. Now shift your thinking a little and put yourself in the contemporary operating environment (COE) with a very real enemy, whose uniform and position on the battlefield is unknown and ask yourself, "What does LAND AS SOON AS POSSIBLE or PRACTICABLE mean? Or better yet, WHERE do I LAND AS SOON AS POSSIBLE or PRACTICABLE?

First, the definition … LAND AS SOON AS POSSIBLE is defined as a "landing without delay at the nearest suitable area where the primary consideration is to assure the survival of the occupants." The definition begs two questions that need to be explored in a bit more depth in the combat zone. What and where is a "suitable" area? What things other than aircraft operation are considered in "the survival of the occupants?" Let me address the first question. What does "suitable" mean? Most aircrew training manuals (ATMs) contain the same considerations for terrain flight approach.

- Suitability (i.e., dust, size, slope).
- Long axis (allows for more space and time to make decision to abort).
- Obstacles (on approach path and in the LZ).
- Wind direction (land into the wind if possible to reduce power requirements).
- Tactical situation (consider METT-TC).

The last step, tactical situation, is a step that is often glossed over and not fully discussed during training and evaluation by instructor pilots. In considering METT-TC, the "E" or "enemy" situation must be clearly understood. As well, the "T" or "troops," that is, the friendly situation must be clearly understood.

Here are two examples of real situations that have happened to me personally over the past year in Operation Iraqi Freedom.

While flying night vision goggles (NVGs) in support of ground forces conducting an urban raid, I received a CHIPS XMSN SUMP caution message. The operator's manual states the action for this is "If no successful burnoff, LAND AS SOON AS POSSIBLE." There really wasn't any physically suitable area to land in

the urban neighborhood below, and the enemy situation was unknown. The friendly situation on the ground below me was rapidly evolving and my view of friendly forces was obscured by the urban terrain. I knew there was a friendly brigade support area (BSA) that was about a 4-minute flight away, but I was unfamiliar with the LZ there and estimated it would take me a couple of minutes to find the LZ and execute an approach. The aviation BSA was about an 8-minute flight away and I was familiar with the LZ there, so I elected the latter and made that 8-minute flight. The flight path I chose included flying over known friendly checkpoints and smaller support areas. Did I do the right thing?

In this second example, I was flying trail in a team of two conducting NVG counter-mortar and counter-rocket reconnaissance in the suburban environment when my lead aircraft announced to me that he smelled fuel. Although there is no defined action for smelling fuel, I think it is obvious that you should probably LAND AS SOON AS POSSIBLE. The enemy situation below was unknown. We were about 4 minutes away from the aviation BSA, and our flight path would take us directly over a friendly maneuver BSA, but neither of us was familiar with the LZ, so we elected to make the flight to home base. During that flight, I advised the lead PC not to make any power changes and I attempted to view his aircraft for signs of fluid on the fuselage. I didn't observe any fluid, and the flight was uneventful … at least until we were hovering into parking and he turned on his anti-collision light. At that moment I could see the atomized spray of fuel around his aircraft and advised the PC to land immediately and perform an emergency shutdown. He was two steps ahead of me … as the crew was already exiting the aircraft when I made the call. Did we do the right thing?

It is fairly obvious to me now that had I been more familiar with the friendly BSA LZs, I could have landed sooner and been more in keeping with the definition of LAND AS SOON AS POSSIBLE. We had always covered the locations of the friendly BSA LZs as options during our aircrew mission briefs, but few of us had ever actually been to the LZs. The lesson learned here is to know what your options are. Even to the point of knowing where friendly strong-points are in your area of operation. If possible, make approaches to all friendly LZs when there is no emergency as this will pay off if you ever actually have one. It is also important to understand the aircraft systems associated with emergency conditions. Having a thorough understanding of these systems will help you make a more informed decision about how long you may be able to delay the landing. Each emergency should be handled in relation to the systems involved and the exposure to the risk of delaying an underlined procedure or executing slightly different emergency procedures in a hostile environment. I am not advocating that you should second guess the action steps in the operator's manual where it is clearly stated to "land without delay," but with a very uncertain enemy situation, you may have no option but to delay the landing for some period of time. After all, the enemy must be considered a role-player in the "survival of the occupants."

Overall, remember these simple points—

■ **Commanders**… Ensure that aircraft emergencies during mission execution are thoroughly covered during aircrew mission briefings.

■ **SPs and IPs**… Stop glossing over the importance of understanding METT-TC when considering a terrain flight approach—especially in a real, uncertain tactical environment—and continue to challenge aviators in their understanding of aircraft systems and sub-systems.

■ Finally, **PCs and PIs**… Make sure you know what and where your options are for "landing without delay" and take the time when there is no emergency to familiarize yourself with available LZs. ♦

—CW3 Heath is a Kiowa Warrior instructor pilot with 1st Squadron, 1st Cavalry Regiment, 1st Armored Division, Budingen, Germany. He can be contacted via e-mail at richard.heath@us.army.mil.

30mm Area Weapon System

Bob Frazier
and
Neale Bruchman

During our recent experience in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), the Apache Attack Helicopter Project Office learned of several field reports of incidents where the aircraft received damage while operating the 30mm area weapon system (AWS). A basic understanding of these malfunctions will allow aircrews and maintenance personnel to operate the weapon system with confidence.

What will occur if you experience one of these types of failures? First, let us explain the three different types of incidents we have seen: low-order in-bore detonation, hangfires, and bullet-on-bullet.

Low-order in-bore detonation

During an in-bore incident, a high-explosive, dual-purpose (HEDP) round explodes approximately 10 inches up the barrel from the breech, bulging the barrel, in some cases bursting the barrel and blowing fragments of the projectile and barrel towards the aircraft. Fragments from the detonation can puncture the aircraft fuselage.

An in-depth root cause or fault tree analysis was conducted at TACOM-ARDEC for the in-bore detonation failure modes. The results of this analysis, which were verified by testing, showed that the most likely cause for the in-bore detonation malfunction was a failure of the fuze spitback crimp due to weakening of defective crimp or a loose fuze or a combination of these defects. This failure permits metal components in the cartridge to fall back and initiate the charge within the cartridge while the round is still traveling down the gun barrel (approximately 10 inches from the gun breech).

Since 2002, five incidents have been reported where an in-bore detonation resulted in a barrel bulging or rupturing *(see photos 1 through 4)*.

Photo 1 (top). Bulged Barrel
Photo 2 (bottom). Ruptured Barrel

The ordnance community discussed the possibility that an in-bore event can occur and the gun will still function. In such a case, the barrel would bulge but no gun hardware would fail. There have in fact been five reported cases from the field in which a bulged barrel was found on a gun, and the gun was fully functional. A bulge would certainly weaken the barrel and leave it much more susceptible to rupturing if another event occurs. The technical community believes that it is likely in at least one incident, an aircraft may have experienced an undetected bulged barrel, and then suffered an additional event which resulted in the rupture of the barrel. Metallurgical analysis of the ruptured barrel shown in photo 2 determined that the barrel

Photo 3 (top) and Photo 4 (middle). Fuselage Damage

Photo 5 (bottom). Hangfire Mechanism on M230 Chain Gun

had experienced two separate, extremely high pressure events, the second likely resulting in the rupture of the barrel. Because of the potential for a bulged barrel to go undetected, Aviation Safety Action Message (AH-64-04-ASAM-02) was published 11 Mar 04, requiring an initial inspection of the barrel and flash suppressor of the M230 gun system; a thru-flight inspection of the barrel and flash suppressor when the M230 gun system is fired; a recurring inspection by armament personnel during rearming procedures when the M230 gun system is fired; and provide advance notice of pending safety-of-use message and TM changes relating to the M230 gun system.

Hangfires

Although hangfires are typically thought of as routine, there have been significant increases in the number of incidents. In the case of a hangfire, a round is inserted into the chamber by the bolt carrier, but the ballistic function is not completed within the dwell time of the weapon, thus the round pressurizes while or after the breech bolt unlocks *(see photo 5)*. Results of a hangfire can vary from case fragments moving through the barrel with no damage to destruction of receiver and possible lodged projectile in barrel. No specific technical design characteristic has been identified to explain the increase in hangfire incidents. However, engineering judgment does lead the 30mm community to believe that the age of the ammunition could be a major contributor to this issue. Most of the 30mm high explosive (HE) that was initially fired during combat operations is in excess of 15 years old. The current designed shelflife of the round, as defined in the technical specifications, is a goal of greater than 10 years. To further resolve the issue, the ordnance community has performed ammunition surveillance and test firing. No indications of problems have been technically identified to date.

The ordnance community has contracted ATK Munitions to analyze 30mm HEDP samples. Five of the M789 HEDP lots that were returned from SWA are being torn down and examined. Additionally, the Apache PMO has contracted Boeing and ATK Weapons to perform a study on the 30mm AWS.

It is likely that the hangfire incidents are also increasing due to ammunition handling problems. In photos 6 through 9 on the next page, the ammunition has either come loose or is missing. Round punctures are most likely the result of mishandling, however the loose or missing fuzes are most likely due to missing or a failure of the thread lock. At least 20 reports of punctured cartridge cases have come back from the field since 2002.

Bullet-on-Bullet

The next type of event is the bullet-on-bullet impact. There have been two separate reports of incidents involving a round-on-round high-order detonation. This type of detonation is caused when a projectile, stuck in barrel, is struck by another projectile causing a catastrophic high-order detonation that severs the barrel. The possible chain of events leading to this incident involves an extremely late, perfectly-timed hangfire, contaminated

Photo 6. Punctured rounds-Bosnia

Photo 7. Punctured rounds-Afghanistan

Photo 8. Loose and missing fuzes

Photo 9. Barrel Damage - High-Order Detonation

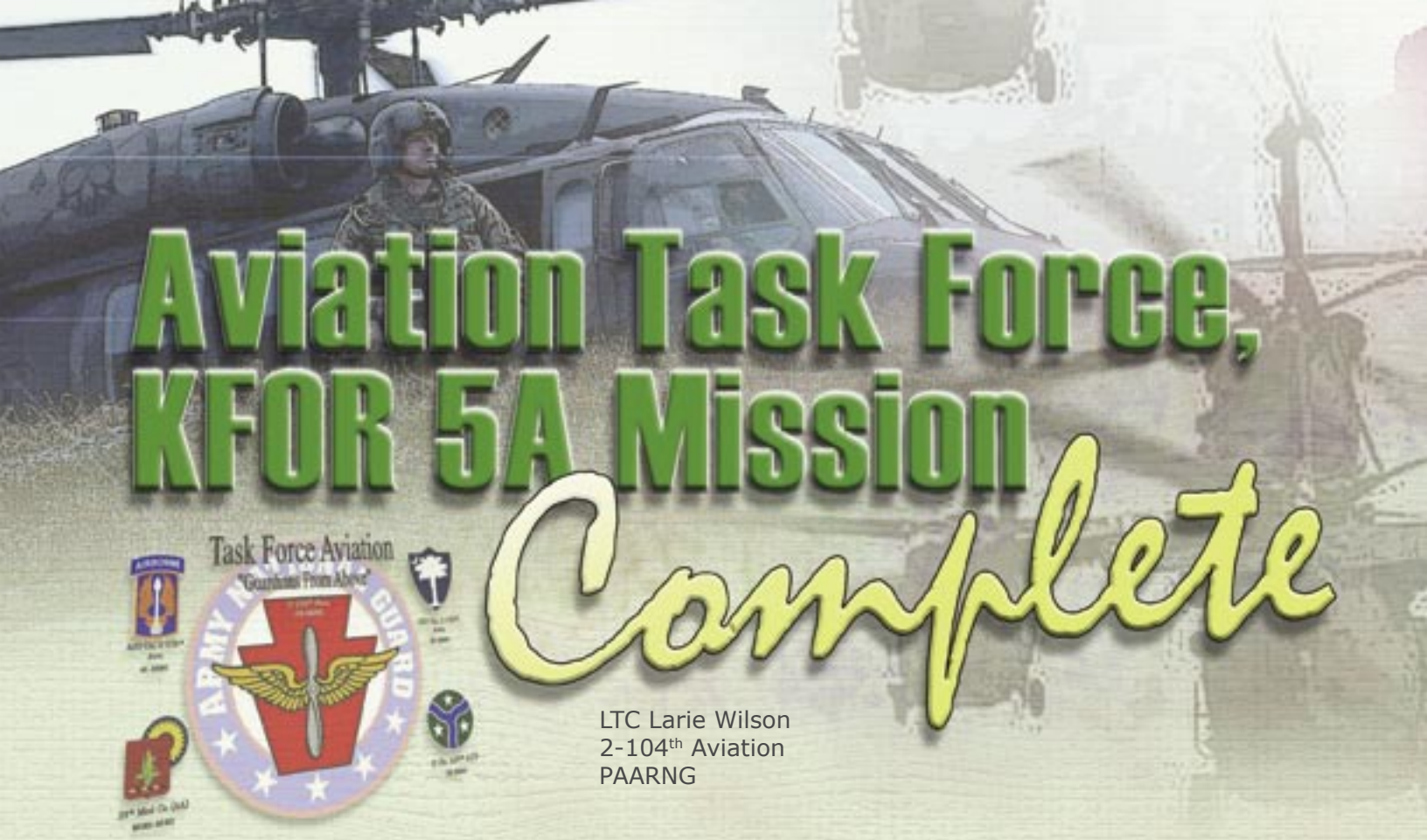
propellant (factory issue), or a punctured round case with missing propellant. Both result in a significant loss of pressure, with the projectile lacking sufficient force to overcome the engraving force of the progressive barrel twist and exit the barrel.

This high–order detonation results in a severed barrel (immediately adjacent to the location of the lodged projectile) with heavy fragmentation (shrapnel). In one incident, shrapnel went up through the cockpit and impacted some flight controls, as well as piercing the windshield. No one was injured and the aircraft was one-time flown to home base.

Several actions have already been initiated to mitigate or eliminate the risk of these events from continuing to occur. First, 30mm HE ammunition for the Apache that was manufactured in the 1980s has been reclassified to a condition that restricts it from issue unless no other suitable stocks are available. These rounds are known to have the fuze design that is susceptible to having the spitback crimp failure. Approximately 500,000 new 30mm HE rounds containing the improved fuze design have been contracted for delivery, with the initial lot delivered in March 2004. Second, an investigation is currently being conducted to isolate the cause(s) of the hangfires and the bullet-on-bullet impact incidents. Older rounds that have been in the combat theater have been recalled back to the continental U.S. and are being torn down and analyzed for any signs of deterioration that would be a possible cause for one or both types of events. An analysis of the weapon system and the ammunition shipping and handling processes is also being conducted to determine if anything being done with respect to the weapon or the ammunition uploading into the aircraft could be causing these events. Early results from these analyses have failed to find a definitive cause for the incidents, but the investigation is continuing.

Through comprehensive investigations and engineering analysis, the possibility of one of these malfunctions has been greatly reduced. The PMO is confident this problem can be virtually eliminated with cooperation from the units in the field. Unfortunately, the PMO has been informed that there may have been more incidents that were unreported involving gun damage. In order for the technical community to properly analyze these types of events, units must report these events to both the aviation and munitions technical communities. ♦

—Mr. Frazier is the System Safety Manager for the Apache Attack Helicopter Project Manager's Office (AAHPMO), Huntsville, AL. Mr. Bruchman is the Chief of Systems Engineering Division for AAHPMO. Both can be contacted by calling DSN 897-4202 (256-313-4202) or e-mail bob.frazier@peoavn.redstone.army.mil or neale.bruchman@peoavn.redstone.army.mil.



Aviation Task Force, KFOR 5A Mission Complete

LTC Larie Wilson
2-104th Aviation
PAARNG

The first pure Army National Guard (ARNG) aviation rotation to Kosovo recently completed the mission with noteworthy results. The multi-unit and multi-state task force completed 7 months of service with the Multi-National Brigade (E), Kosovo Force (KFOR), logging 4,100 hours of mission support without any reportable accidents. No Class A through D aviation accidents happened during the 1,985 missions flown. This is a first for the KFOR.

The 18-aircraft task force consisted of a headquarters from the Pennsylvania ARNG HHC, 2-104th Aviation. UH-60 support was provided by the Alabama ARNG with Company A, 1-131st Aviation. AH-64 support came from the South Carolina ARNG with Company C, 1-151st Aviation. MEDEVAC support was provided by the 24th Medical Company (AA), a split-state unit from the Nebraska and Kansas ARNG. Each state brought a slice of maintenance, and Company E, 107th Aviation of the Tennessee ARNG provided ATS services.

The experience level and professionalism of each unit were keys to the accomplishment. The deployment in Kosovo began in July 2003 and ended in February 2004. The unit provided 24-hour mission support to the brigade's command and maneuver units (two American, one Greek, and one combined Polish/Ukrainian) throughout the rotation. In-depth planning, rehearsals, and detailed risk management that was more than three deep ensured success for the task force.

Another key to the unit's success was strict adherence to a 48-hour mission planning sequence. Missions inside that window were considered high- or extreme high-risk missions and were briefed at the appropriate level. This attention to detail and risk management top cover from the brigade chain of command ensured the crews' safety was paramount in the mission process.

My personal thanks go out to each Soldier of the task force for their part in this accomplishment. ♦

—LTC Wilson is the Commander, Task Force Aviation, KFOR 5A. He may be reached at DSN 491-8960 (717-861-8960), or by e-mail at larie.wilson@pa.ngb.army.mil.

WAR Stories

There I was...

CPT Patricia Baker
Marquette University

CPT Baker recently returned from a year-long Iraq command tour. For over a year, she was the commander of a VIP aviation unit. Needless to say, she has some pretty interesting stories to tell. Here are a couple of them...

Learn from my Mistakes—*speak*

On a long cross-country flight, one of my instructor pilots (IPs) and I were flying UH-60Ls in a flight of two. We were trail, heading south from Tikrit to Doha. While en route, Baghdad Control gave us clearance for our current heading of 160 and 5,000 feet.

The emphasis is on 5,000 feet in the middle of June in Iraq. At altitude, the temperature dropped to about 23°C, and we were cooking near the earth at 38°C. As we approached the 3-hour mark of our flight, I was still flying the aircraft and started to feel "funny." When I sat up straight in my seat, it made my head spin, and I fought the controls to keep us level at 5,000 feet and 130 knots. I decided to perform a quick test: I sat stick straight in my seat and pulled the helicopter into an immediate left turn. I realized immediately that I had a classic case of "the leans." I was smack dab in the middle of a spatial disorientation episode 5,000 feet over Iraq!

Luckily at that time, the lead aircraft called Talil for instructions to descend for a landing and refuel. However, I still had the leans, and now I needed to get the aircraft into a descent headed more to the left (east) to get us into Talil. I thought about just telling the IP that I had the leans and let him take the

controls, but I didn't. For one reason, I was going to take my pilot-in-command (PC) check ride in less than a month, and this very flight was the litmus test for the company standardization IP to see if I was ready. The second reason was I knew what to do to get out of it.

So, I told myself that the instruments were correct about 50 times in a row and by the time we were short final for refuel on alpha ramp, I was back to my normal self. When we were mission complete, I told the IP about what had happened. All he had to say was, "You sure were quiet on the way to Talil."

Another example...

The executive officer and I were on the flight schedule for a simple day, cross-country, two-ship, VIP mission to one destination and return to base. That's how it looked on our board in the command post—but that's most certainly not how it ended up. This was a typical ground-fog, dew-point-meets-temperature type of January day in northern Iraq. So, like good VIP pilots, we checked the weather every hour at 5 minutes to the hour. Finally, the ceiling lifted to 700 feet and visibility went up to a mile, but with areas that were intermittent.

Our two UH-60s left, lead flying our assistant deputy chief of staff. We were chase and flying empty. We didn't make it 15 nautical miles away from the airfield when we hit a ground fog wall. It started at the Tigris River and crossed our entire flight path. We tried to go over but promptly hit the cloud ceiling at 1,000 feet. So we tried going west to get back to the south and the east, but that didn't work either. As we were chattering on the radios about returning to base due to weather, we nearly had a mid-air with our sister ships—which were flying as a flight of three for the commanding general. Then we hit another ground fog wall, but this time there was nowhere to escape. So in we went.

I let him go a few more seconds, but then I sternly said, "Put THAT bar on THAT line and pull in exactly 75 percent torque!"

The look on the lieutenant's face was a pasty mix of dismal horror and insidious lack of confidence. He had always flown steady-handed with me on other less difficult flights and seemed to keep his wits. So, I let him go for it and gave him the controls. I merely stated after radioing our sister ship of our heading and altitude that he needed to climb and hold this heading.

Well, those were some tough instructions for my lieutenant just 4 months out of flight school. He pulled in 30 percent more torque and put the aircraft in a climb that made the bars behind the artificial horizon almost disappear. I let him go a few more seconds, but then I *sternly* said, "Put THAT bar on THAT line and pull in exactly 75 percent torque!" So, slowly, he did. And slowly we broke out of the cloud layer and saw Tikrit Airfield coming into sight.

That was another day where the takeoffs equaled the landings. ♦

—CPT Baker is the Recruitment and Scholarship Officer for Marquette University, Milwaukee, WI. She can be reached by calling 414-288-2046 (800-563-7339) or by e-mail at patricia.baker@mu.edu. CPT Baker was the former commander of B/2-4 AVN, 4ID in Iraq.

NCO CORNER shop ta

Aviation NCOs are invaluable in operational theaters. If it weren't for their dedication, no aircraft would get off the ground to take the fight to the enemy. Below is a compilation of lessons learned by several NCOs that just returned from deployments to Afghanistan and Iraq. Read on and keep these stories in mind as your unit heads overseas!

Wear Gloves ... It's Hot!

Everyone knows the desert is hot, but you can't imagine just how hot it really is until you get there. We left for Kandahar, Afghanistan, from Fort Campbell, KY, where a blanket of snow covered the ground. Kandahar was the total opposite, though—hot and sunny. Everyone was told to drink water and watch out for their buddy because of the heat.

One factor got overlooked, however. An airframe exposed to sunlight can get extremely hot. I found this out the hard way while assembling aircraft parts left out in the sun.

We had put together one aircraft and were starting to assemble a second. I reached for the aircraft's stabilator, which was bubble-wrapped to protect it during shipment. After I grabbed it I quickly tried to let it go, because it was scorching hot! That definitely didn't happen in Fort Campbell in the winter. I lost about two layers of skin off my fingers from grasping the hot metal. After my injury, it became standard for personnel to wear gloves whenever touching an aircraft during daylight hours—no exceptions. We quickly forget in "real world" operations things we take into consideration during planning and training, such as the greenhouse effect on aircraft. These oversights can lead to some pretty painful lessons learned. ♦

—Anonymous

Talk To Your Leaders

During my tour in Afghanistan, I was the platoon sergeant for an AH-64A helicopter battalion. I had to put my Soldiers on 12-hour shifts because of the increased OPTEMPO. This extended work schedule really isn't a problem unless Soldiers become inundated with extraneous tasks. Every minute is precious to a crew working an extended shift, so even the smallest additional duty can set the stage for a fatigue-related accident.

My Soldiers worked two 12-hour shifts—one in the day, and one at night. They each got about 6 hours of sleep per 24 hours. Their meals took an average of 45 minutes each, including wait times. They spent about 2 hours on personal hygiene during the morning and at night. This schedule left about 2½ hours of personal time for each Soldier.

Keep in mind this was the "perfect world" schedule, with everything running smoothly and minimal distractions. But, as we all know, perfect world and minimal aren't in the wartime vocabulary. Although there were no major operations underway or bullets flying, the missions kept coming and maintenance continued to increase. A 13-hour day soon became necessary so a good handover could be conducted at the end of each shift.

Around this time, the leadership decided to begin organized PT since no one was shooting at us. But, because of the double-extended shift, my Soldiers were giving up more and more of their time already, and sleep was taking a hit. All told, PT was adding 2 more hours to the duty day. The MTOE was filled properly, but we simply didn't have enough time to fix the aircraft.

The company leadership tried different approaches, but nothing worked. The "head shed" began to see it our way after we gave them a detailed timeline. Unnecessary missions were cut, and organized PT was called off until the OPTEMPO slowed down again.

If you have a problem, come up with a solution and talk to your leaders about your concerns—they will listen! They've been there before. We didn't have to have a casualty before someone listened to us. ♦

—SFC Jason Spinner
Fort Bragg, NC
e-mail Jason.spinner@us.army.mil

Confidence in NCOs

I served as a liaison officer for the V Corps Army Airspace Command and Control (A2C2) element in support of Operation Iraqi Freedom. Our primary missions were to prevent fratricide by creating safe air routes and to communicate with our G-3 air elements. We tracked aircraft with our equipment and also maintained communication with the lower echelons that fell under our control.

I didn't have any prior experience with A2C2, so I had to learn the job hands-on. I quickly learned that coordination and communication were the keys to our success. We had to communicate with the units, and that communication had to be continuous at all times.

We wouldn't approve a fire mission if we weren't sure of an aircraft's position, no matter what the mission entailed or who told us to approve it. It was our job to make sure none of our forces got shot down because of fratricide. During the 6 months I served with V Corps, we had no known or reported cases of fratricide. Several pilots told me they felt safer without having to worry about fratricide, allowing them to focus on the missions at hand. ♦

Several pilots told me they felt safer without having to worry about fratricide, allowing them to focus on the missions at hand.

—SSG Dominique Rollins
Weisbaden, Germany
e-mail Dominique.rollins@us.army.mil

"Fire on the North End..."

CW5 R. Keith Lane
HQ, USARC

It's easy to screw up in the heat of battle—like grabbing a magazine and trying to shove it in backward or upside down, or saying your call sign is Red 26 when it's really Red 16. It's even been known that an aviator would run out to his aircraft, crank it up, and sit there waiting on his crew to catch up with him ... only to find his crew is waiting for him in the correct aircraft.

Such was the day for a young infantryman on a clear day in 1968 in the Central Highlands of the Republic of Vietnam. I know it was a long time ago, and certainly not in the desert, but lessons learned seem to bear repeating from time to time no matter where you are or what the climate is. So here's a "war story" from way back then.

We were flying a UH-1C gunship north of Ban Me Thuot, Republic of Vietnam, on a mission to support the 23d ARVN Division when the call came over the radio to contact so-and-so on such-and-such frequency fox-mike. I made the call, and a frantic voice came over pleading for some immediate assistance. We were 5 minutes away. Our aircraft could carry only 14 2.75-inch rockets and 3,000 rounds of mini-gun ammunition, and even then we had to make a running takeoff to get in the air. But this time our help was sorely needed, and we had another hour before we had to go back for fuel.

The site was a small Montagnard village of several thatched roof huts and one long house in a relatively large clearing in the middle of the jungle. The frantic voice came back: "Fire on the north end of the long house. We're on the south end. There's a bunch of VC and we're getting hit pretty bad!" We also could hear firing in the background.

Having the advantage of a compass in the aircraft, I knew which direction was north and south, but on the ground in the middle of a firefight, sometimes directional references get screwed up and he didn't have any smoke. I confirmed we would fire on the north end of the long house; I got the confirmation and fired. Since I was in the left seat I was the triggerman, and as soon as I pulled it we heard, "Cease fire, cease fire. You're firing on us! Fire on the other end!"

"Roger, we will fire on the *south* end of the long house." I adjusted the sight and pulled the trigger. "Keep it up! That's it!"

We never learned whether we inflicted any casualties on our Soldiers, but the lesson was clear: Always confirm the requested support, verify you know what you're doing, and if possible verify if the ground folks know what they're asking for. The last part is very difficult for us in the air, and overflying the target for visual verification isn't the smartest thing to do. The best thing is to ask the ground people to confirm what they asked you to do.

In those days, things were pretty lax in how we conducted ourselves on the radio and in how we flew our aircraft. Those were the days that developed the procedures we know today—the same ones that have reduced the number of incidents like mine.

In a combat situation, there are two kinds of support missions as far as the Air Tasking Order is concerned—planned and emergency. Planned missions are submitted

72 to 94 hours in advance. Everything else is emergency, but commanders need to plan for those events and schedule aircraft for emergency support. If they fly, they've fulfilled their mission requirements. If not, it means the ground guys had a good day and the unit cancels the assigned mission numbers.

Usually the attack unit's standing operating procedure (SOP), the supported unit's SOP, and the aircrew training manual (ATM) will tell an aircrew how to conduct close air support (CAS) operations (called close combat attack [CCA] by the Army), but generally the procedures are centered around those explained in this article.

The nine-line fire support request is passed from the ground troops to their battalion fire support officer and the air liaison officer, an Air Force officer in charge of the (Air Force) tactical air control party (TACP) attached to the battalion. The TACP forwards the request through the Air Force air support request network to the air support operations center (ASOC) at corps. Brigade and division TACPs disapprove of requests by exception, meaning they listen to the request and if they disapprove they will say so, as they may have another kind of support in mind, like artillery, rockets, or missiles. Or, there may be another operation in the area that requires close coordination before releasing a CAS mission. If they say nothing, they approve. The ASOC passes the request to the joint air operations center, which answers to the theater-level joint forces air components commander.

Fratricide: The employment of friendly weapons and munitions with the intent to kill the enemy or destroy his equipment or facilities, which results in unforeseen and unintentional death or injury to friendly personnel.

If the mission is assigned to an Air Force element, they must usually have clearance from an Air Force officer before release of any weapon. A few Army officers have had the training and are certified to direct Air Force CAS.

If an Army element is assigned and CCA employed when communication with the ground element is established, the attack team checks in with the requesting ground element. The ground element then makes a direct fire request, wherein the requestor uses a portion of the standard nine-line request and basically talks the attack aircraft to the target. Therein lies the problem if the correct procedures are not used. Here's how it should go:

Attack team check-in:

- Provided by attack team
- Attack team disposition
- Elements
  1) Aircraft location
  2) Team composition
  3) Munitions available
  4) Station time
  5) Night vision device capability and type

The ground element then gives the direct fire request:

- Tells the attack team what is needed
- Orients the team to the enemy
- Description
- Location
- Describes methods of marking target and friendly positions

Further broken down, the direct fire request elements are:

- Friendly location and method of marking (the ground element location)
- Heading to target (magnetic)
- Distance to target (meters)
- Target description
- Target coordinates
- Target marking method
- Remarks

The SOP dictates who has the authority to approve a fire request; generally the more urgent the request, the lower that authority goes. A risk assessment by the attack team must be made based on the information they have and what they can see, albeit a hasty one. These days the attack team usually can see better than a ground spotter calling at a distance from the target. The attack team must verify what they are told with what they can see.

The process hasn't changed a lot in 36 years, but it is much more professional and has made the difference in protecting our troops—if we use the correct procedures. ♦

—CW5 Lane is the Army Reserve Command Safety Officer at Fort McPherson, GA. He may be contacted at (404) 464-8838 or by e-mail at Ronald.keith.lane@us.army.mil.

FOD Kills

WO1 Rick Kimberlin
Kentucky Army National Guard

I was deployed to Bosnia-Herzegovina in the summer of 1996. Back then I was a Black Hawk crew chief, and our mission was to fly U.S. and foreign dignitaries. The missions were very diverse, so we had to improvise quite a bit. Aircraft maintenance, both scheduled and unscheduled, was performed wherever was convenient at the time. We would always try to do the smart thing and finish maintenance before long missions, but that wasn't always possible.

On one particular day, we had a three-ship mission to transport VIPs to several locations and then back home. These days usually were good for about 4 or 5 flight hours and a 13- to 16-hour duty day. At one of the interim stops—a heavily populated soccer field—our helicopter required gearbox oil samples. The maintenance was routine, and we were soon back to policing up children "wowed" by our machine.

Our VIPs returned, and we then transported them to an airfield well over an hour away. We dropped them off, repositioned the aircraft and shut down, ready for a break. We filled the downtime by tossing a football until we finally succumbed to our MREs.

As all Soldiers know, MRE packages are easier to open with a knife. I didn't have mine, so I asked my battle-rostered crew chief to loan me his multi-tool. He fumbled around in his flight suit for a few moments but couldn't find it. He asked if I'd seen it; I had earlier in the day, but that was when we were checking the aircraft's gearbox at the soccer field. I asked him, "You got it out of the intermediate gearbox area, right?"

I'll never forget the look on his face as my words sank in and registered. We quickly snatched the gearbox cover off and there was his multi-tool—lying next to the tail rotor driveshaft. We'd flown well over an hour across a windy and turbulent mountain pass with that multi-tool beside a MAJOR aircraft component. To our relief, the tool hadn't caused any damage. One of the pilots noticed the commotion and questioned why the cover was back off. We never told him the real reason, but we did inform all the maintenance personnel and managed to keep it "in house."

You've heard this short statement many times before: FOD KILLS. That day, I took it to heart. Don't let your complacency and drive to get the mission done compromise your quality of workmanship. Crew chiefs are probably the most overworked folks in the Army, and their job is important. I know it's hard sometimes, but take your time and have a second set of eyes look behind you. Keep up the good work! ♦

—WO1 Kimberlin wrote this article while attending the Aviation Safety Officer's Course at Fort Rucker, AL. He is a member of the Kentucky Army National Guard in Frankfort, KY. He can be reached by calling (502) 472-6546 or by e-mail at rick.kimberlin@us.army.mil.

Cold Weather Clothing and "Long Johns"

Editor's note: As the winter months approach, the days get shorter, the nights get longer, and they both get much colder. However, this does not keep the Army from training—and field training exercises are a reality for every unit, no matter how cold it is. Cold-weather operations present many hazards that, if not approached correctly, can lead to serious injuries. Fortunately, most cold injuries are preventable if appropriate precautionary measures are taken. The most important individual preventive measure is the proper wear of cold weather clothing.

All aircrew are already issued NOMEX uniforms including flight jackets, and some units are issued the aramid two-piece waffle-weave long underwear, but some are only supplied with their polypropylene polar fleece long underwear. To make the Army's position clear, if your duties are hazardous enough to wear your NOMEX uniform, then they are hazardous enough to NOT WEAR ANY NYLON UNDERGARMENTS. This includes prohibiting wear of the issued nylon base polar fleece while performing flight duties. If your unit does not issue the aramid undergarment, then we suggest a natural fiber undergarment such as wool or cotton, or a blend of each.

Issue aramid undergarments (Nomenclatures)
CWU-43/P DRAWERS, FLYER'S ANTI-EXPOSURE, ARAMID
8415-00-467-4036 (x-small)
8415-00-467-4075 (small)
8415-00-467-4076 (medium)
8415-00-467-4078 (large)
8415-00-467-4100 (x-large)
CWU-44/P UNDERSHIRT, FLYER'S ANTI-EXPOSURE, ARAMID
8415-00-485-6681 (x-small)
8415-00-485-6547 (small)
8415-00-485-6548 (medium)
8415-00-485-6680 (large)
8415-00-043-8375 (x-large)

We are well aware of the off-white color of the high collar on these and can only suggest the Army green wool scarf to wear with these to maintain the camouflage look to the entire uniform. At one time we could recommend the Army green three-button wool sweater, but that sweater is now made of nylon.

Many questions are asked about silk, and if silk is a fire hazard like nylon. No, silk does not present a hazard, but it is extremely thin and when compared to cotton, it does not provide the standoff insulative qualities desired to prevent thermal injury under the NOMEX uniform. Can it be worn in addition to the cotton undergarments? Yes.

The U.S. Air Force is the proponent for the aramid fiber undergarment and it is only contracted in the off-white color. To assist those of us that require something else, the U.S. Navy is currently in the final stages of development of a "Multi-Climate Protection System (MCP)." This is a total system, but of particular interest are the underwear layers consisting of a silk-weight NOMEX, a medium-weight NOMEX fleece, and a heavyweight 200-weight insulation layer. All of these garments are in black, but will not be ready for issue for a few years. The program will not help us this year, but this is to inform you that direct cross service coordination and progress is being made in this venue. ♦

—For more information, contact Mr. Joseph R. Licina, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL 36362-0577, or e-mail joseph.r.licina@us.army.mil.

NEWS & notes

New Course for UH-60 NCOs!

Beginning November 2003, UH-60 Aviation NCOs may attend the Non-rated Crewmember Instructor Course (NCIC) at Fort Rucker, AL. For more information, contact SFC Mike Kordonowy at DSN 558-4242. Units can also secure slots through their S-3, Course #600-F16. ♦

FY05 Course Dates

Class #	Report	Start	End
05-001	02 Nov 04	03 Nov 04	08 Dec 04
05-002	02 Jan 05	03 Jan 05	02 Feb 05
05-003	14 Mar 05	15 Mar 05	15 Apr 05
05-004	10 May 05	11 May 05	14 Jun 05
05-005	07 Jul 05	08 Jul 05	10 Aug 05
05-006	01 Sep 05	02 Sep 05	05 Oct 05

—CW4 Dan Fessler is the Flight Commander and Standardization Pilot for F Company, 1-212th Aviation, Fort Rucker, AL. He can be reached by calling DSN 558-4282 (334-255-4282) or e-mail dan.fessler@us.army.mil.

Vessel Shipment of Helicopters

Effective immediately, top deck shipment of Army helicopters on ocean and sea-going vessels is prohibited. Top deck shipment exposes helicopters to extreme environmental elements that can cause corrosion and structural damage.

When deploying by vessel, all helicopters are required to be preserved and prepared for shipment IAW the instructions of the appropriate preparation for shipment manual.

The appendix titled, "Heat Shrink Film Helicopter Protective Covering," of the appropriate shipment manual should be followed when installing the shrink wrap film. Shrink wrap protective covering must be installed on Army helicopters in preparation for vessel shipment. ♦

—For assistance contact Mr. Steve Geashel, U.S. Army AMCOM, Packaging Branch, AMSAM-MMC-MM-DP, Redstone Arsenal, AL 35898, DSN 746-9431 (256-876-9431), e-mail steven.geaschel@redstone.army.mil.

Aviation and Standardization Conference

The Aviation and Safety Division of the Army National Guard announces their annual Aviation and Standardization Conference from 30 November to 2 December 2004 at the Professional Education Center near Little Rock, AR. The target audience for this conference is Standardization Officers/NCOs and Safety Officers/NCOs. The focus for this year's conference will be on training and safety issues with emphasis on deployment lessons learned. An official conference announcement memo will be sent out prior to the end of September. ♦

—For more information, contact CW5 Gilbert Wright, NGB-AVS-SA, DSN 327-7735 (703-607-7735), or e-mail gilbert.wright@ngb.army.mil.

Joey Reassigned to Covert Unit

The "Soldier" of safety—the "roo" of risk reduction—the "magnificent marsupial of menace management"—has left the U.S. Army Safety Center.

In a surprise announcement, Director of Army Safety BG Joseph Smith stated, "We took a leap of faith in bringing Joey to the Center. We felt Joey would give the Center a 'kinder, gentler' face—one that would inspire Soldiers to send in their personal experience safety stories and any safety questions."

Despite great expectations, all has not gone as planned. BG Smith explained, "While e-mails to Joey poured in at first, they have 'tailed off' in recent months. The Army must get at least 100 percent from each Soldier, so we felt it was time for him to get hopping and approved his request for reassignment. While we can't tell you where he is, we can say he's conducting covert operations in a location where he can easily blend in.

"We will miss Joey, but every Soldier has to go where he will do the most good." BG Smith said. ♦

Accident Briefs

Information based on preliminary reports of aircraft accidents

AH-64

A Model

■ **Class A (Damage):** Aircraft experienced loss of altitude during flight and contacted the ground, landing in a ravine. The crew was able to egress before a post-crash fire began. The pilot in command suffered minor injuries and was treated and released; the pilot suffered significant injuries and was medically evacuated. The aircraft was destroyed.

■ **Class C:** Aircraft contacted terrain after experiencing loss of power during a turning maneuver at high altitude. The tail wheel strut, aft tail boom sheet metal, lower Doppler fairing, horizontal stabilator, and #2 engine secondary nozzles suffered damage. The aircrew jettisoned the aircraft's external stores (Hellfire racks and rocket pods) in an attempt to avoid impact.

D Model

■ **Class A:** Aircraft struck trees while in an undetected descent. The crew was unable to regain control of the aircraft and subsequently crashed. Both crewmembers were fatally injured.

CH-47

D Model

■ **Class C:** Aircraft was returning to the airfield when the crew heard a loud "bang" and felt the aircraft shudder. The #1 engine then caught fire. The instructor pilot initiated emergency procedures, landed the aircraft, and performed an emergency shutdown. Post-flight inspection revealed the exhaust tail cone separated in flight.

OH-58

D(R) Model

■ **Class C:** The crew reported a loss of power and smoke in the cockpit accompanied by a loud "bang" while hovering on the ramp for takeoff. The crew performed a hovering autorotation from 3 feet and executed an emergency shutdown. The aircraft experienced a hard landing, causing the skids to spread and damaging the lower wire strike protection system.

TH-67

■ **Class B:** Student pilots were performing a solo approach to a stage field and contacted the ground short of the tarmac. The aircraft's tail boom was nearly severed. Other damage included a separated transmission, spread skids, and airframe and main rotor system damage.

UH-60

A Model

■ **Class D:** Aircraft contacted a tree branch during a night vision goggle confined area approach. The aircraft was flown to the local Army Aviation Support Facility and landed without further incident. Damage to three rotor blade tip caps was discovered on post-flight inspection. Two of the tip caps were replaced.

L Model

■ **Class C:** Aircraft was trail in a flight of five during air assault mission training. The crew performed a left upslope landing with no forward airspeed and brakes locked during the third landing iteration (no troops onboard). The aircraft's cockpit airbags deployed as the right wheel touched the ground during landing. The crew landed the aircraft without further incident. Both pilot display units, the copilot's airspeed indicator, and the pilot's horizontal situation indicator were damaged.

C-12

T3 Model

■ **Class B:** Aircraft experienced a dual-engine internal turbine temperature exceedance during the final phase of climb-out at 9,000 to 10,000 feet above ground level. No other details were provided.

RQ-7

Shadow Model

■ **Class B:** Air vehicle was destroyed after initiating a nose-down dive upon takeoff, turning sharply, and inverting to impact with the ground. The air vehicle was undergoing an acceptance test flight.

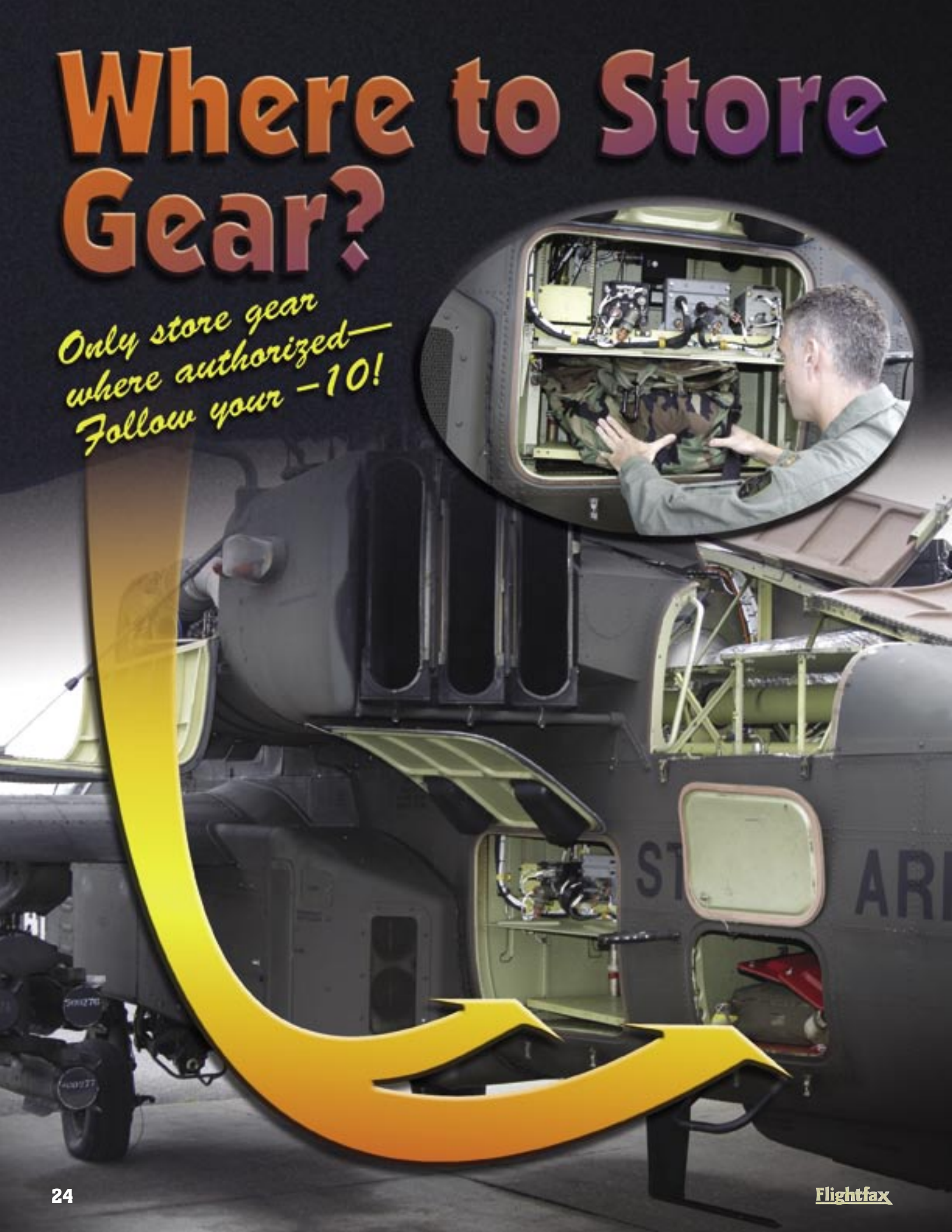
■ **Class C:** Air vehicle veered right off the runway upon takeoff. Inspection revealed additional propeller and engine component damage.

■ **Class C:** Air vehicle experienced engine failure during landing. The crew attempted to restart the engine without success and deployed the parachute. The air vehicle impacted the ground.

Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

Where to Store Gear?

Only store gear where authorized—Follow your –10!



Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

OCTOBER 2004 ✦ VOL 32 ✦ NO 10

WHAT CREW CHIEFS REALLY WANT AND NEED

SPECIAL EDITION FOR NON-RATED CREWMEMBERS

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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

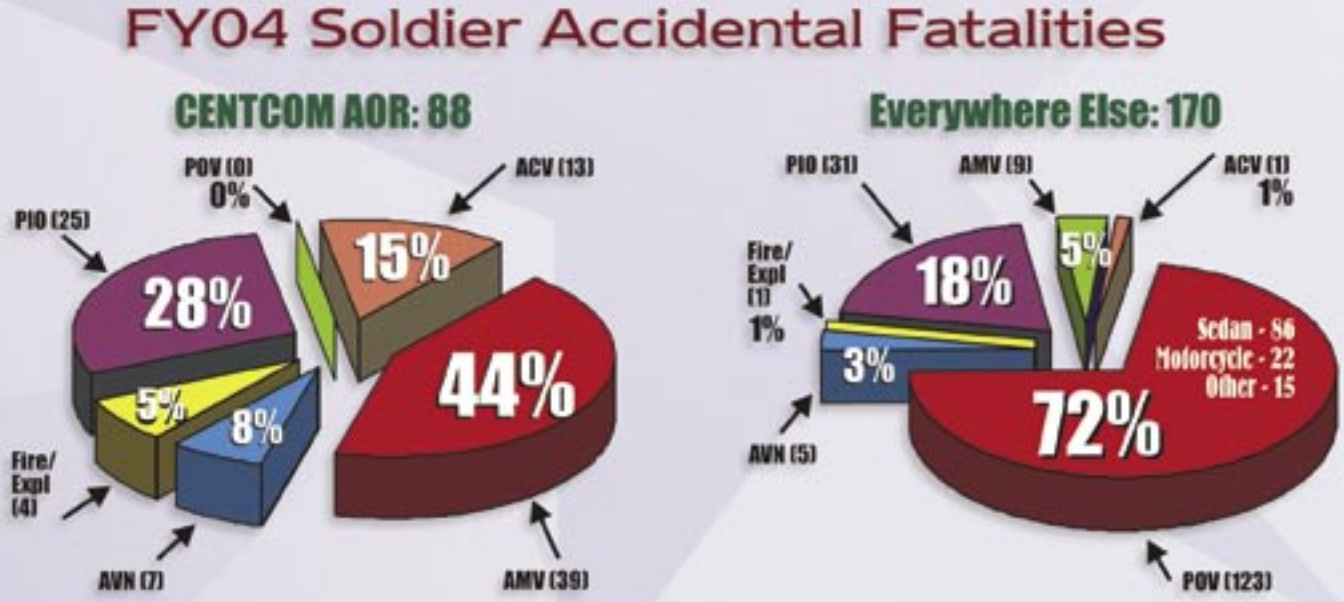
DASAF's *Corner*

FROM THE DIRECTOR OF ARMY SAFETY

What's in Store for Aviation Safety in FY05?

Our Army is at war and transforming. Army Aviation is making significant contributions in both arenas, simultaneously improving our safety record. Over the last 10 years, Aviation mishaps accounted for nearly 8 percent of all Army fatalities. As we close FY04, we've cut the number of Aviation fatalities by almost half. Out of theater, Aviation accounted for 3 percent of fatalities; in theater, Aviation accounted for 8 percent of the total fatalities. I directly contribute this success to aggressive risk management, improved pre-mission planning, and leader involvement. Most importantly, the Aviation community is shifting from lessons noted to lessons learned, and then applying those lessons to operations.

Clearly this is great work by the Aviation Team, from the bottom to the top! As we begin FY05, we need to cut our losses even further and we have the tools to make it happen. Two initiatives include the newly instituted Aircrew Coordination Training Enhancement (ACTE) program and the use of flight data recorders (FDR) as training tools. The new ACTE has nine interactive modules and is greatly improved from previous designs. The Directorate of Evaluation and Standardization (DES) started training the first unit on 24 August 2004. The use of FDRs is also moving forward. Fort Rucker is conducting a



*These statistics are current from the Safety Center database as of 21 Sep 04. Delayed reports could change these figures somewhat in the coming months.

Military Flight Operations Quality Assurance (MFOQA) test and the Safety Center will be following the progress closely. This technology already benefits our centralized accident investigations (CAIs), but its real potential exists as a training device. By downloading and viewing data from any particular flight on the schedule, we can identify training deficiencies and improve skills like power management, terrain flight, and emergency procedures. I believe this technology will have the greatest impact on trainers at the company and platoon level.

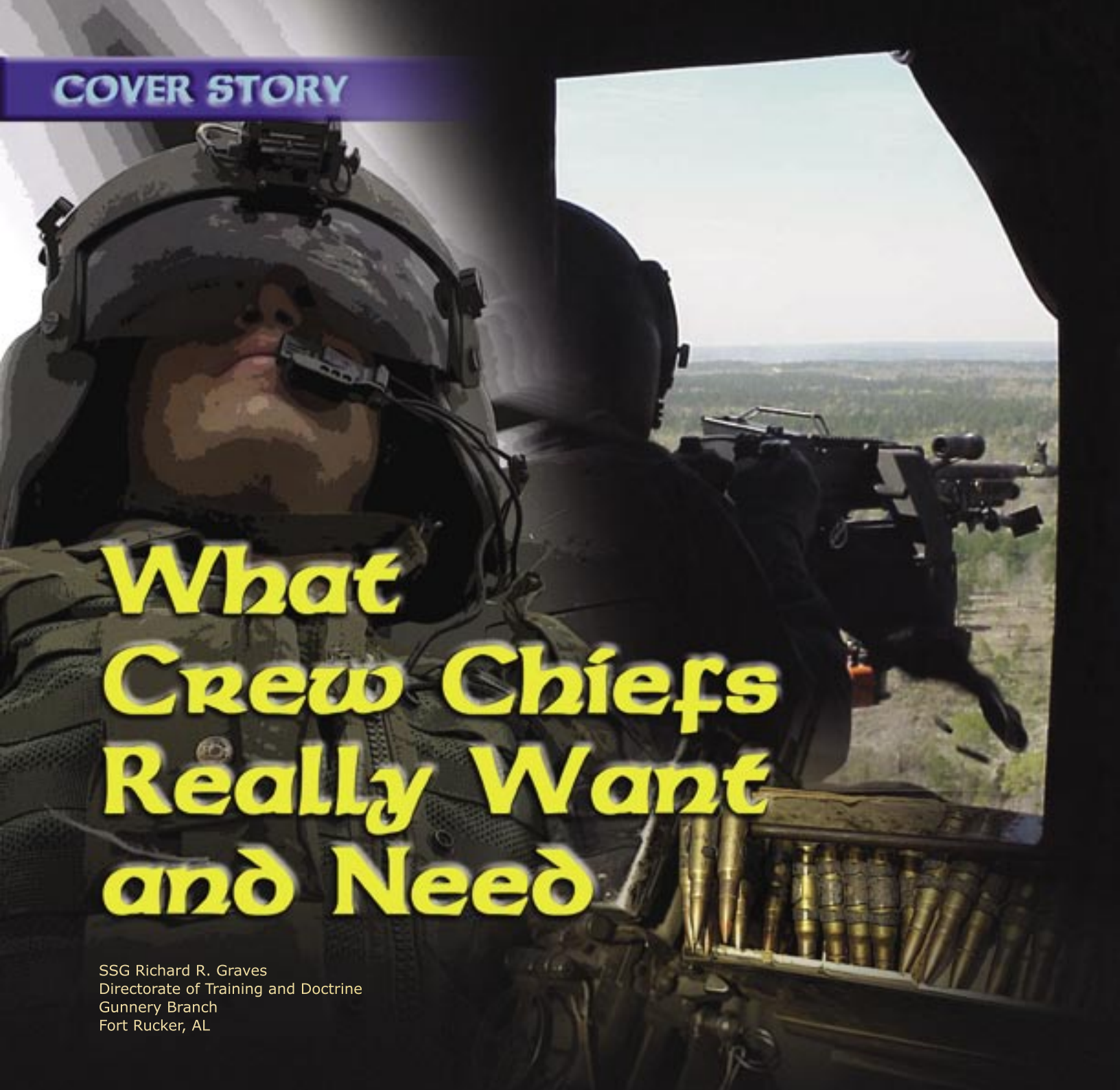
I love the quote by Albert Einstein, **"We can't solve problems by using the same thinking we used when we created them."** While sitting on NASA's Aeronautical Safety Assessment Panel, I noticed this same thinking held true during the Columbia investigation. NASA's research showed how losing shuttle foam over time eventually led to a disaster. NASA officials said, "The machine was talking to us, but unfortunately, nobody was listening."

At the Safety Center, we are listening! Since 1997, 43 percent of all Aviation Class A through C accidents involved crew coordination. Aircrew coordination training is available and we must maximize this information. Our aircraft collect large amounts of information through FDRs, we have to capture and apply this knowledge. New tools and innovative thinking are absolutely critical to the success of Army Aviation as it transforms to meet the future challenges of the Global War on Terrorism.

Aviation, you did a great job this year in the air; next year will be even better. Don't forget we also operate on the ground after those awesome flights. Almost 72 percent of our accidental fatalities involve Soldiers driving their POVs. Take the time to read my article this month in *Countermeasure* and see how we are attacking this problem. New innovations are being implemented at all levels of Army Safety.

Be Safe! Make it home and help our Army make 2005 our safest year in history!

Joe Smith



What Crew Chiefs Really Want and Need

SSG Richard R. Graves
Directorate of Training and Doctrine
Gunnery Branch
Fort Rucker, AL

The M60D machine gun has served Army Aviation since Vietnam. More than 10 years ago, the M240-series medium machine gun was fielded as the Infantry's medium machine gun. The M240 also has been fielded to all other branches of the U.S. military.

Efforts are underway to test and qualify a variant of the M240 for Army Aviation use aboard UH-60 and CH-47 aircraft. This version of the M240 will feature specific mounting configurations including ammunition storage, feeding, and collection designed specifically for aircraft use. Additionally, the aviation variant M240 will be convertible for ground use by an egress kit, which will be issued with every gun system. This kit will allow

conversion of the gun to ground use by replacing the aviation spade grip with a standard infantry butt stock and trigger assembly. The M240 will also have a newly designed bipod. The gun can be converted from aviation to ground configuration in less than 60 seconds without tools.

The M240H is a 7.62 mm belt-fed, gas-operated, air-cooled, fixed headspace weapon. Rate of fire is operator-selected and varies from 650 to 950 rounds per minute. Maximum effective range is 1,100 meters, with a maximum range of 3,725 meters. The M240H system weighs slightly more than its predecessor. The M240 family of machine guns has been cited as one of the most reliable machine gun systems in the world today.

With the support of the U.S. Army Aviation Technical Test Center (ATTC), flight testing was conducted at Molinelli Aerial Gunnery Range Complex at Fort Rucker, AL. Helicopter gunnery tables were completed in accordance with Field Manual 3-04.140, *Helicopter Gunnery*. The weapon system was test flown aboard UH-60 and CH-47 aircraft in a variety of flight regimes and profiles including ground, hover, takeoff and landing, moving, and running fire.

Before commencement of flight testing, extensive ground tests were conducted at Redstone Arsenal, AL, and Picatinny Arsenal, NJ. Data was gathered that allowed specific design criteria to be developed to respond to Army Aviation user requirements. The goal is a reliable replacement system for the M60D.

In addition, the AN/PEQ-2C Target Pointer, Illuminator, Aiming Light is being evaluated for use with the M240H. Also in use by Infantry and other ground forces, this device decreases the amount of time required to place initial rounds on target.

The mission of the M240H is to improve the self-protection capabilities of Black Hawk and Chinook helicopter crews by replacing the aging M60D. The Gunnery Branch, U.S. Army Aviation Center, and ATTC have played an integral role in the testing and development of the M240H. The end result will be a superior replacement to the M60D and a reliable and trustworthy combat multiplier for UH-60 and CH-47 crews. ♦

—For more information, please contact SSG Graves, USAAVNC Master Door Gunner, at DSN 558-1897 (334-255-1897), or by e-mail at richard.graves@rucker.army.mil. For all aviation gunnery topics and issues, see the Aviation Gunnery portal on Army Knowledge Online. From the Knowledge Collaboration Center page, select TRADOC/Aviation/Aviation Gunnery.

BSAU: Improving Aircrew Situational Awareness During Brownout

LTC Patrick Mason
Fort Eustis, VA

This past January, *Flightfax* presented some sobering statistics showing the high percentage of accidents caused by brownout. To combat this trend, BG Joe Smith, Director of Army Safety, presented three initiatives in the attack on brownout: aircrew coordination training, the Tactile Situation Awareness System, and advanced simulation. One additional initiative not discussed is the Brownout Situational Awareness Upgrade (BSAU) system. In response to input from the field, BSAU was initiated by the Cargo and Utility Program Management (PM) Offices to address brownout by creating a system to enhance crew situational awareness in a degraded visual environment. The Aviation Applied Technology Directorate (AATD) was brought onboard to develop, integrate, and test this system of sensors and displays.

With an initial scope, AATD set forth attempting to maximize the use of qualified military hardware and applying the best attributes of proven commercial technologies. Block I of the BSAU program focused on providing flight symbology for the CH-47D and UH-60A/L. As symbology systems have long flown in the AH-64A/D and various Special

Operations Aviation platforms, there was ample data on symbology layouts, sensors, and displays. Using this information, the task focused on optimizing the symbology set for landings and takeoffs in a brownout environment, something quite different from the design philosophy of previous systems. While success hinged on creating a responsive and intuitive low airspeed symbol set to combat brownout, the integration of sensors and components to drive the symbol set remained paramount.

Following an initial crew station working group, a draft symbology layout was created. Having this defined, each symbol was traced back to a sensor or input critical to drive the selected parameter with the required precision and accuracy. This linkage, from sensor to symbol and then display, formed the basis of the initial system architecture. An iterative process of test, fix, and test was then used to drive the design to a workable symbol set and final system architecture. Keys to this effort were verifying the accuracy and precision of the input data, thereby ensuring an intuitive display—thus reducing the pilot's cognitive workload and optimizing the input and symbol sensitivity to allow for smooth and precise control inputs. In the end, the original symbol set, along with several sensor inputs, had been modified significantly.

This process again reinforced how complex and difficult the transition from paper to application can be. Throughout this process, the TRADOC System Manager (TSM), Directorate of Evaluation and Standardization (DES), and the Aviation Technical Test Center (ATTC) assisted in the design and system evaluation. Additionally, these assessments addressed techniques, procedures, training requirements, and any sustainability and maintainability issues.

The final BSAU Block I system consisted of a blended inertial GPS low-speed symbology set driven by a Honeywell embedded GPS/INS and displayed on a Rockwell Collins multi-functional display (MFD), replacing the analog horizontal situation indicator in both pilot stations of the UH-60A/L and CH-47D. The BSAU symbology could also be displayed on an EFW flat day heads-up display that connects to the standard night vision goggle (NVG) mount for the HGU-56P helmet or as a selectable page on the current AN/AVS-7 heads-up display.

The real test of the system's attributes came during actual brownout landings at Yuma Proving Grounds (YPG), AZ. Using the Kofa Dust Course, noted for having brownout conditions most similar to both Iraq and Afghanistan, day and NVG brownout approaches were conducted. As shown in the sequence of photos, test cameras installed inside and outside the aircraft captured each approach. From outside the aircraft, the first set of images depicts the magnitude of the CH-47 in brownout conditions. Concurrently, the second set of images shows the view through the pilot's canopy. This clearly illustrates the degradation in the visual cueing environment and lack of outside visual references to assist with descent rate, lateral drift, and aircraft attitude.

Finally, a camera placed over the pilot's shoulder captures the symbology on the MFD. As the aircraft descended through 15 feet AGL and began to encounter the dust cloud, the symbology continued to provide those critical elements necessary to retain situational awareness. As the aircraft decelerated, the system automatically scaled in velocity, providing better resolution to the aircrew. Then, monitoring heading, velocity, lateral drift, and rate of descent, the

pilot successfully continued the approach to the ground with minimum forward airspeed and lateral drift. While the system proved its value during this and many other approaches, good crew coordination, briefing of go-around procedures, and power management remained critical tasks.

No level of technology—even the most sophisticated automated takeoff and landing systems—can be successful without proper aircrew training. Crews must not only understand how to manage the system, they must be confident in the accuracy of the information presented, their ability to intuitively and correctly assess the aircraft state, and then decisively apply the appropriate action. While BSAU Block I isn't a "silver bullet" guaranteed to eliminate brownout incidents, testing has shown it significantly increases aircrew situational awareness during degraded visual operations. Coupled with the right techniques, procedures, and training, the BSAU should prove a tremendous weapon in attacking brownout.

Planned BSAU Block II enhancements will investigate "see-through" technologies such as long-wave forward-looking infrared (FLIR) and 94 GHz radar. During the previous brownout testing, two infrared cameras were installed on the UH-60A evaluation aircraft and included in the YPG evaluation. Additionally, a fused FLIR/94 GHz radar is being considered by PM Cargo for the CH-47D. Finally, Block III upgrades could include flight control augmentation provided by a digital automatic flight control system and a hover coupler system. ♦

—LTC Mason is the Chief of Prototyping and Integration for AATD, Fort Eustis, VA. He may be reached at 757-878-2015 or by e-mail Patrick-mason@us.army.mil. Project officers for this test were MAJ David Wolons (UH-60) and MAJ Chuck Walls (CH-47).

What Drives AGSE?

CW4 James Pruitt
Directorate of Combat Developments
Fort Rucker, AL

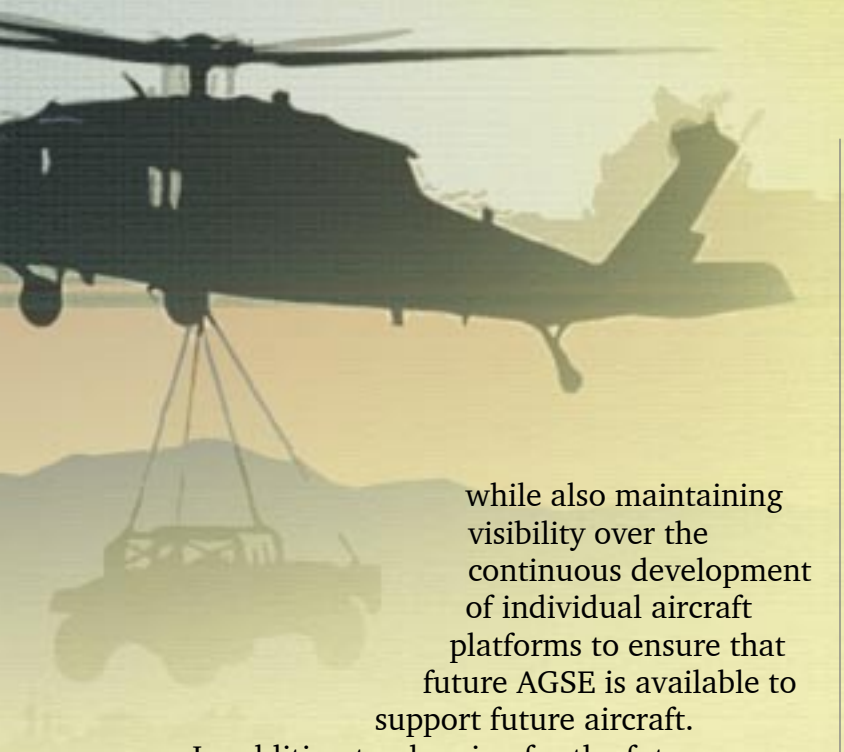
As long as there is Army Aviation, maintainers will always need Aviation Ground Support Equipment (AGSE). AGSE requirements are driven by the needs of the aircraft maintainer, and each flight hour logged requires many maintenance man-hours to achieve success. These requirements are articulated and fulfilled by the coordinated efforts of several Army offices. The first is the AGSE Branch in the Materiel and Logistics Systems Division (MLSD), Directorate of Combat Developments (DCD) at Fort Rucker, AL.

The mission of the AGSE Branch is to manage requirements for aviation logistics and ground support systems. The AGSE Branch is responsible for writing requirements and monitoring on- and off-aircraft equipment necessary to ensure the operational readiness of current and future force Army Aviation platforms. The AGSE Branch oversees materiel changes and the development and integration of systems to ensure they adequately support the safe operation of rotary- and fixed-wing aircraft.

DCD also develops and documents all AGSE requirements and monitors all related system programs throughout their life cycle to ensure currency. This includes the standardization of common tools, test equipment, and ground support equipment to minimize the logistics tail while maximizing the maintainer's capabilities in the tactical environment. The AGSE Branch serves as the Army's maintainer/user representative and the U.S. Army Aviation Center's subject matter expert for all existing AGSE systems.

To accomplish this mission, the DCD works closely with Department of the Army (G4), other Training and Doctrine Command (TRADOC) DCDs and system managers, the U.S. Army Aviation and Missile Command (AMCOM), Program Executive Office Aviation's individual aircraft product managers (PM), and the Test, Measurement, and Diagnostic Equipment Activity Program Executive Office Combat Support and Combat Service Support. The combined effort of these offices allows for the development of new systems and the sustainment of current systems, and also ensures that AGSE provided to Soldiers is reliable and supportable. Once requirements are written and approved, it becomes the responsibility of PEO Aviation's PM AGSE, product manager for all AGSE, to procure a materiel solution to meet the requirements.

PM AGSE is a newly provisional product management office officially stood up in December 2003 and was once known as the Weapons System Management Office. The PM is charged with total life cycle management responsibility for all Army AGSE and fields hardware that meets all of the DCD documented requirements. The PM AGSE works in a unique environment and faces challenges vastly different from those of a traditional aircraft PM. Unlike a platform PM whose entire effort focuses on one aircraft, PM AGSE is responsible for over 26 individual systems whose only commonality is that they all support Army aircraft. PM AGSE responds to user requirements and to rapidly changing state-of-the art needs in aviation maintenance,



while also maintaining visibility over the continuous development of individual aircraft platforms to ensure that future AGSE is available to support future aircraft.

In addition to planning for the future, DCD and PM AGSE have responded to real-world requirements associated with Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). We initiated the rapid fielding of several key pieces of equipment to assist aviation maintainers in the performance of their duties as both warriors and highly trained aviation maintainers. Some of the contributions we've made to the Global War on Terrorism include:

1. Procurement, assembly, and shipment of 11 new battle damage assessment and repair kits.
2. Accelerated fielding of 11 unit maintenance aerial recovery kits.
3. Fielding of 66 shop equipment contact maintenance equipped vehicles.
4. Complete overhauls of 32 aviation vibration analyzers (AVA) for direct return to deployed OIF/OEF units.
5. Reduction in the AVA depot turnaround time for overhaul, resulting in a quicker turnaround to the unit.
6. Completion of the RESET of 18 aviation ground power units and placement of four units in USAREUR to be used as floats for OIF\OEF units.

PM AGSE recently completed the fielding of the digital aircraft weighing system, eliminating the need for load cells, jacks, and leveling devices, as well as the fielding of modernized non-destructive testing equipment.

In looking to the future, DCD has received DA approval for the aviation turbine engine diagnostic system, which allows users the ability to rapidly troubleshoot and isolate aircraft turbine engine faults that will reduce the number of false removals due to faulty troubleshooting practices. Approval also has been received for the purchase of three test aircraft for cleaning and de-icing systems. This equipment will provide the capability to clean aircraft, as well as a means for hasty decontamination while collecting wastewater runoff, which is then filtered for re-use and meets all environmental requirements.

Aviation is relevant for the future force, providing combat support and combat service support maneuver, maneuver support, and maneuver sustainment capabilities across the full spectrum of operations. Its inherent versatility, maneuver advantage, and warfighting effectiveness will influence all dimensions of the future battle space. Highly motivated aviation Soldiers, equipped with modern systems and trained to world-class proficiency, will provide commanders at all levels an exponential increase in lethality. This, coupled with leadership, will harness the technological revolution of the digital battlefield and provide commanders the ability to achieve decisive victory.

To help ensure future mission success in developing and sustaining AGSE, aircraft maintainers are invited to provide input. To facilitate this, PM AGSE established an AGSE List Server (also monitored by DCD personnel) that is designed for units to post questions and concerns regarding AGSE and receive prompt assistance. To subscribe, please provide your name, duty position, and telephone number to either of the AGSE List Owners: Mr. Don Hamblin (don.hamblin@peoavn.redstone.army.mil) or Mr. John McGuire, (john.mcguire@peoavn.redstone.army.mil). ♦

—CW4 Pruitt is the assistant branch chief for the AGSE Branch of MLSD. He is assigned to HHC, 1/210 AVN, Fort Rucker, AL. He may be contacted by calling DSN 558-9276 (334-255-9276) or e-mail james.pruitt@rucker.army.mil.

UH-60 TROOP

Still Safeguarding Our Crewmem

Joseph Licina
U.S. Army Aeromedical Research Laboratory

The UH-60 design sought to guarantee the first truly crashworthy cabin seating for helicopters in the history of the industry. Now that the UH-60 has been in the field for more than two decades, perhaps it is time to review the effectiveness of its troop seating. During the January 2004 Aviation Safety Investment Strategy Team (ASIST) review of UH-60 accidents, it was noted by the U.S. Army Aeromedical Research Laboratory (USAARL) Aviation Life Support Equipment Retrieval Program (ALSERP) personnel that in a single aircraft that crashed, although there were no fatalities, 9 of the 12 troop seat pans in the aircraft experienced varying degrees of failure of the cloth portion of the troop seats. The most injurious trauma sustained was by a passenger who literally tore through the cloth seat pan cover (photo 1).

Although Technical Manual (TM) 1-1500-204-23-1 prescribes a 24-month service life for raschel knit seat covers in other aircraft, there are no service life criteria for UH-60 polyester seat covers. Could a 20-plus year exposure to ultraviolet rays, contamination, hangar rash, and general use be a cause for concern? The ALSERP team was beginning to look into possible fleet-wide problems when an accident in July 2003 led to the discovery of a gunner's seat with multiple problems.

The following individual discrepancies are all from a single seat involved in a 2004 mishap, with some related to serviceability that had been missed by numerous required inspection levels:

■ **Seat bottoms**. The criteria for tear or damage limits are in TM 1-1500-204-23-1. Paragraph 9-20e(2)(a) reads: "…Replace seat bottoms with damage greater than 2½ inches long x 1 inch wide." Photo 2 illustrates the accident aircraft seat in clear violation of the limits stated above. In addition, paragraph 9-20e(d) also states: "Damage that is close to the edge of the seat cover which has insufficient space to allow a complete patch pattern will not be repaired."

The location of the pictured tear, even if less than 2½ inches, would be cause for replacement. The unauthorized tape repair in the photo was in place before the mishap. The tearing was not caused by accident loads.

■ **Web retainers**. TM 1-1520-237-23 addresses the seat cover as a single unit without

Photo 1. UH-60 passenger seat bottom failure

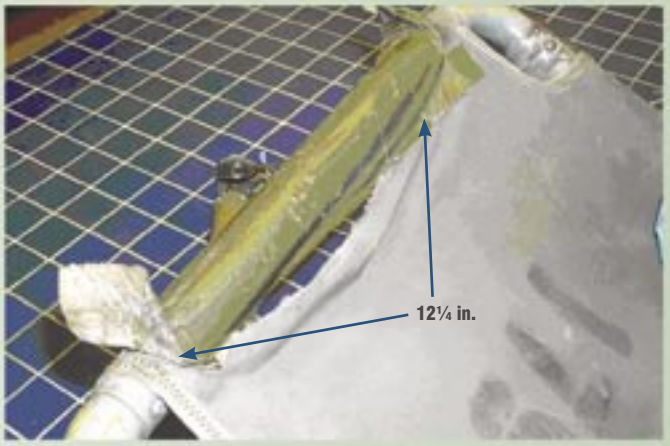


Photo 2. UH-60 crew chief seat with extensive tear and unauthorized tape repair

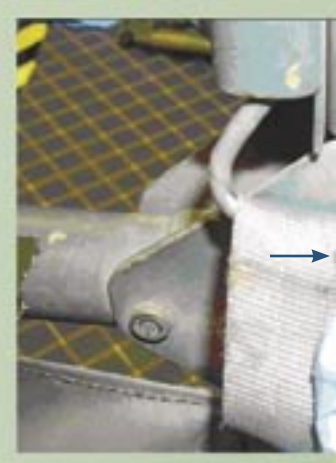


Photo 3. Web retainer with full t

P SEATS:
bers Beyond Two Decades?

delineation of the seat web retainers, etc. Paragraph 2-4-46.12.2e states: "Check fabric for tears, holes, and loose or missing stitching… ." TM 1-1500-204-23-1, paragraph 9-20e(2)(a) further articulates: "Inspect for cuts, tears, punctures, burns, and broken stitches… ." The web retainer in photo 3 shows an unacceptable full thickness hole caused by repeated wear as a result of contact with the seat back frame screw head.

■ **Fabric retaining screws**. TM 1-1520-237-23, paragraph 2-4-46.12.2e states: "Check seat pan for loose or missing fabric retaining screws. Replace missing screws… ." Photo 4 provides an illustration of loose and missing screws from this seat bottom, which should have rendered this seat unserviceable.

■ **Cable condition**. The following advice regarding cable condition is given in TM 1-1520-237-23:

(1) Para 2-4-46.12.2j states: "Check cables for broken strands. If three or more strands are broken, replace cable."

(2) Para 2-4-46.12.2k states: "Check cables for kinks. If cables cannot be straightened by hand, replace damaged cables."

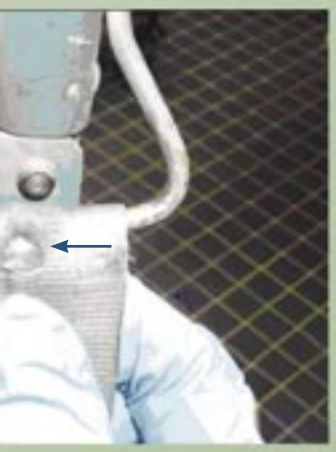
In this same seat, all the cables complied with the policy on broken strands, although one of the cables (not included in the photo) had two broken strands. With regard to kinks, photo 5 shows a cable with an area of kinking that was unsatisfactory and should have been replaced.

■ **Shoulder harness inertia reel**. The shoulder harness inertia reel on this seat would not retract adequately and was unserviceable in accordance with the daily inspection criteria in TM 1-1520-237-PMS-1, sequence 2.3, which states: "Inspect gunner's seat inertia reels for proper operation."

Any single unsatisfactory condition cited in the above listing could result in injury to the occupant during a mishap. This single seat had five violations. How do your seats look?

The USAARL ALSERP team has proposed a study to assess the condition of UH-60 troop seats in the field with limited destructive fabric testing to assess protection levels afforded by older seats. This proposal is presently in coordination with and under review by the UH-60 Program Manager's Office. ♦

—For more information, contact Mr. Licina or LTC Mark Adams, Aviation Life Support Equipment Retrieval Program, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL 36362-0577, (334) 255-6893/6815 or DSN 558-6893/6815.



hickness hole and screw head

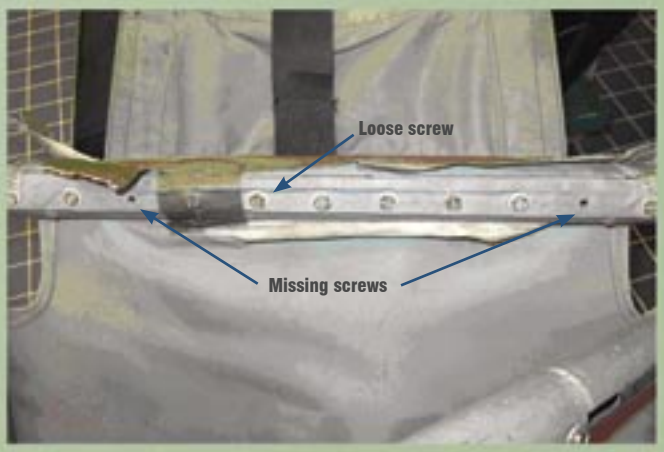


Photo 4. Loose and missing fabric retaining screws on seat bottom

Photo 5. Permanent kinking of seat cable

Air Warrior– What's Ahead?

CPT Ozzie Peacock
Directorate of Combat Developments
Fort Rucker, AL

The Soldiers who stand guardian over the freedoms we enjoy are our country's most precious asset. Our Nation, when faced with a choice, will always unequivocally choose to place the most advanced technology in the hands of the Soldier to increase survivability and enhance effectiveness on the battlefield. Rapid technological advances in weapons, weapon sighting systems, chemical and biological protection, ballistic protection, communications, navigation, and other areas all serve to complicate the picture if these capabilities are not managed properly.

The Army recognized the need to manage and integrate worn, consumed, and emerging technologies that directly impact the Soldier. The core Soldier capabilities development documents capture capabilities common to all Soldiers and serve as the baseline. The Maneuver Sustainment Soldier system captures the unique capabilities of over 100 different sustainment and service military occupational specialties. The Maneuver Support Soldier system captures the unique requirements of the Chemical, Engineer, Military Police, Field Artillery, Signal, Military Intelligence, and Air Defense Artillery specialties. The Ground Soldier system captures the unique requirements of the Infantry Soldiers, our country's premier ground capturing Soldier. The Mounted Warrior Soldier system captures the unique requirements of personnel who fight tank, scout vehicle, and Stryker systems. Air Warrior is Aviation's warfighter system and the only system currently being fielded.

The Air Warrior System is a modular, mission tailorable ensemble that places the aviator at the leading edge of integrated capabilities. Previous capabilities while wearing chemical, biological, radioactive, nuclear, and explosives (CBRNE) aviation life support equipment (ALSE) and mission equipment permitted only 1.6 hours of flight before heat stress degradation of aircrew performance. Air Warrior makes it possible for Aviation personnel to conduct their mission in complete MOPP 4 for 5.3 hours without degradation due to heat stress.

The Air Warrior ensemble is the culmination of ideas and input from the field, the Directorate of Combat Developments, and the Product Manager Air Warrior office. At the heart of the Air Warrior system is the microclimate cooling system, consisting of the cooling unit and the cooling garment. The microclimate cooling unit is mounted to the airframe and pumps a chilled liquid through the cooling garment, which is worn next to the aviator's skin. Despite the layering of survival and protective equipment, which include the chemical protective undergarment, aviation battle dress uniform, soft body armor, 30-caliber

ballistic upgrade plates, overwater mission equipment, and primary survival gear carrier (survival vest), the Air Warrior system is capable of keeping aircrews' core temperature at a level that prevents mission degradation.

Block II Air Warrior includes technology insertion of the joint protective aircrew ensemble (JPACE), the joint service aircrew mask (JSAM), the combat survivor evader locator (CSEL), aircraft wireless intercom system, and the electronic data manager (EDM). The JPACE is a flame-resistant chemical and biological (CB) protective flight garment that provides increased CB protection and wear time while reducing weight and heat stress. The JSAM is a protective mask that increases the field of view and provides a don and doff capability while in flight. The JPACE and JSAM are joint programs that are designed to be worn across 135 different DOD aviation platforms. The aircraft wireless intercom system permits crew chiefs and crew engineers to perform their duties in and around the aircraft while reducing the snag hazard associated with a communication cable.

The CSEL will replace the current survival radio during Block II. The CSEL offers numerous improvements over the current survival radio including automatic GPS reporting of position, over-the-horizon, two-way secure data communications (text messaging), waypoint navigation, a selective availability anti-spoofing module, and terminal guidance to downed aircrew position.

The EDM incorporates numerous enhancements, the most critical being fratricide prevention through its interface with blue force tracking. Through limited user testing in Iraq, the EDM has proven to be the display of choice for blue force tracking information to aircrews. Spiral two of the EDM has refined some features and added others. It makes mission rehearsals and fly ahead possible while in the tent or other waiting area. Internal software is upgradeable without going through an airworthiness release process.

Other Windows®-based applications also can be run on the EDM. The EDM is capable of displaying a moving map with map overlays that display routes, threats, and points of interest. The EDM automates the functions of the E6B flight computer. It is capable of VMF messaging, which includes automated call for fire, free-text (chat), spot reports, and position reports. The system is capable of in-flight mission changes through use of FalconView software. It is also capable of USB data exchange and storing handwritten notes.

Additionally, the EDM will compute aircraft performance planning cards, as well as aircraft weight and balance. It is capable of storing checklists, technical manuals, route cards, engagement area sketches, and .BMP or .PDF files. The EDM has an 800 GHz processor that will be spiraled to 1.2 GHz. A virtual keyboard will be added through a later spiral as well. The EDM performance capabilities are enhanced by 512 MB RAM and is capable of storing up to 20 GB of data on an internal hard drive. Cockpit efficiency and multi-tasking ability is increased for aircraft with multi-function displays (MFD) by displaying certain types of information on the EDM instead of the MFD. The ability to display information on the EDM instead of the MFD increases crew safety through cockpit efficiency.

Block III of the Air Warrior system will add day heads-up display, advanced night vision goggles with 95 x 38-degree field of view, ballistic eye protection, liquid waste disposal, and external audio reception. All the capabilities provided by the Air Warrior system increase the safety, efficiency, effectiveness, survivability, and situational awareness of aircrews on the modern battlefield. The Air Warrior system is a state-of-the-art integrated ensemble that ushers in a new era of equipping Soldiers. ♦

—CPT Peacock is the project lead for the Directorate of Combat Developments in regards to the Air Warrior System. He is assigned to HHC, 1/210 AVN, Fort Rucker, AL. He may be contacted by calling DSN 558-1456 (334-255-1456) or e-mail peacocko@rucker.army.mil.

Air Warrior– Response from the PM

John Jolly and Paul Pedersen
Senior Logisticians for Air Warrior
Redstone Arsenal, AL

Air Warrior (AW) is the first integrated Soldier system for all Army helicopter crewmembers. It provides modular life-support equipment that can be tailored for all operational and climactic environments to include overwater, as well as chemical and biological (CB) areas. The AW system provides increased personal protection while decreasing weight and bulk. In hot CB environments, AW aircrews have improved flight time in MOPP 4 equipment from 1.6 hours to 5.3 hours, a 330 percent increase in the wearing of protective gear wear over previous clothing.

The Air Warrior system and components include the following:

■ **Survival equipment** include the primary survival gear carrier with integrated extraction harness and various survival, signaling, and communications equipment, as well as flexible body armor with a hard ballistic upgrade plate providing .30-caliber armor piercing protection.

■ **Microclimate cooling system (MCS)** includes a microclimate cooling garment (MCG) that is worn against the soldier's torso, and a microclimate cooling unit on the aircraft that chills water and pumps it through small tubes embedded in the MCG.

■ **Modular integrated helmet display system (MIHDS)** includes laser eye protection, communications earplugs, and a night vision device mount.

■ **Overwater survival subsystem** includes a low profile personal flotation device, an inflatable raft (LRU-18U), and an emergency underwater breathing device.

■ **Nuclear, biological, chemical (NBC) protection** includes a modified CB protective undergarment, M48 or M45 protective mask with blower, gloves, and overboots.

■ **Electronic data manager (EDM)** or digital kneeboard provides non-bussed aircraft with near real-time battlefield information including blue force tracker, as well as a variety of other functions designed to meet the needs of specific cockpits.

■ **Aviation clothing items** include the modified aviation battle dress uniform and the aircrew cold weather system.

Air Warrior is a new generation of integrated, mission-tailorable, combat-effective life support equipment designed to improve aircrew endurance, mobility, and performance. It facilitates full-spectrum dominance by providing the capability to utilize the full performance of the aviation platform. Air Warrior counters the use of asymmetrical strategies that could prevent or disrupt aviation operations. Air Warrior addresses the seven measures of effectiveness of the objective force: responsiveness, deployability, agility, versatility, lethality, survivability, and sustainability.

In development for nearly 5 years, Air Warrior finished operational testing in 2003 and is now in full-scale production. Due to Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF), fielding of the Air Warrior ensemble and other ongoing projects has been accelerated to equip deploying units. In some instances, operational testing and fielding were completed in combat areas. For example:

Helicopter oxygen system (HOS) for wartime deployments

Within days of the 11 September 2001 attacks, the AW Product Office had to provide the 160th SOAR(A) with parts and extra helicopter oxygen systems. This system had been fielded 10 years ago in very limited numbers. The HOS allows helicopter crews to fly safely above 10,000 feet mean sea level. Without

this system, pilots and crews could suffer severely impaired performance, unconsciousness, and even death. Shortly after the 160th SOAR(A) received their HOSs, our office had to organize and get more systems for the 101st AASLT Division that activated for OEF in late Fall 2001.

Task Force (TF) Corsair, with most of their aircraft from the 2nd of the 82nd Aviation Battalion, requested 15 systems from our AW office. They also needed HOSs for their Afghanistan mission, but there was no more available. The logistics section of AW-PM took it personally and found six complete systems and rebuilt nine others in the B17 account to get the 15 systems Task Force Corsair needed. With Red River Army Depot out of funding to repair these systems, the PM-AW Logistics staff worked nights and weekends to fix the systems themselves, and then ensured they were properly cleaned and tested, all to meet the 82nd Airborne Division's very tight deployment schedule.

Deployment to Afghanistan in support of OEF

The TF Corsair commander was so impressed with the work by the PM-AW product office concerning HOS issues that he again called upon them after he deployed into Afghanistan. Once in theater, the TF Corsair commander requested that the PM-AW office assist him with HOS and other aviation life support equipment (ALSE) issues that concerned him. PM-AW rapidly deployed three soldiers to Afghanistan to assist. This team met with the ALSE officer and ALSE NCO for the Task Force for days to understand and resolve issues, review combat conditions, learn field expedient ALSE maintenance procedures in place, learn the root causes of issues, interview users in all deployed helicopter types, and fly missions with the unit to gain firsthand experience.

In addition, the PM representatives discussed current upgrades and provided samples of Air Warrior equipment for limited user evaluations. As a result of this deployment, TF Corsair and all Army ALSE maintainers benefited from the reclassification of nearly 60 lines of supply from Class II to Class IX. TF Corsair was also able to receive the latest HGU-56/P helmet and HOS data to ease maintenance procedures, while also receiving a prototype AW system. In addition, the PM-AW office received confirmation that many of the products fielded over the last 10 years in the ALSE field were basically working.

Electronic data manager

As a result of the 101st AALST Division's direct experience in OEF, the need for an electronic way to provide cognitive decision aids and a mission rehearsal tool for the 101st AASLT Division was outlined. This capability was also desired within 60 days! Meanwhile, PM-AW was developing a similar capability as part of the AW Block II upgrades. PM-AW was able to set up a limited user evaluation with 11 separate commercial off-the-shelf (COTS) devices in order to meet the tight timeline. When these devices proved not to be exactly what was needed and not rugged enough for combat conditions, the 101st AASLT Division and PM-AW teamed together to build and evaluate the digital kneeboard. In addition to the 101st, PM-AW sought all users and possible consumers of this technology for Aviation use and teamed with several other product offices and the other services to satisfy this requirement. As a result of the determination of a small cell within PM-AW, the Army and the 101st AASLT Division received 49 digital kneeboards by 30 Sep 03 in the OIF theater. The digital kneeboard provided a moving map display, electronic note pad, and displayed Blue Force Tracker (BFT) data in the cockpit. PM-AW and PM BFT personnel assisted in the training and installation of these devices. The results from the use of the digital kneeboard in actual combat conditions have been incorporated in a newer, much improved version. This upgraded version is now the electronic data manager (Spiral 2), and was tested at Fort Rucker, AL, in June 2004.

The Spiral 2 EDM provides all the capabilities of the digital kneeboard except software upgrades and in a much smaller and lighter package. In addition, the Spiral 2 EDM is NVG compatible, yet daylight readable and has a Universal Serial Bus (USB) port, which allows for mission planning on the aviation mission planning station to be easily transferred to the Spiral 2 EDM. ♦

—Mr. Jolly and Mr. Pedersen are both senior logisticians for the Product Manager's Office for Air Warrior. Mr. Jolly may be contacted by calling DSN 746-6538 (256-876-6538) or e-mail john.jolly@peoavn.redstone.army.mil. Mr. Pedersen may be contacted by calling DSN 746-6943 (256-876-6943) or e-mail paul.pedersen@peoavn.redstone.army.mil.

Laser Pointers — "Buyer Beware"

CW5 (Ret) Bill Ramsey
U.S. Army Safety Center

Today, laser pointers come in all shapes, sizes, and classes. They have become more powerful, smaller, cheaper, and very accessible. Just about anyone can go out and buy a laser pointer. Because of this, the Safety Center is concerned that aviators might be using laser pointers in Army aircraft that have not been evaluated. An example of this is the Air Commander's Pointer (ACP-2B). The online advertisement says that the ACP-2B (175mW) is an infrared Class 3b laser pointer designed for aviators and includes a shield to reduce reflections from the canopy and has a calculated range of 18km.

The ACP-2B also has a national stock number (NSN). There's the dilemma. When companies advertise that their laser pointers have an NSN and are designed for combat aviators, some crewmembers might interpret this advertisement as approval for use in Army aircraft.

On 21 July 2004, the Army issued GEN-04-ASAM-01, updating the use of hand-held lasers in Army aircraft while conducting night vision device (NVD) operations. In paragraph 7.6.3, the message states: "Any Class 1 near-infrared (IR) laser is acceptable for use in the cockpits or cargo compartments of Army helicopters, to include the infrared aiming light." It goes on to state: "At the discretion of the pilot in command (PC), lasers other than Class 1 near-IR may be used in the cargo/passenger compartment on UH-1, UH-60, CH-47, or OH-58A/C aircraft IAW unit standing operating procedures (SOP). The PC will include the use of laser pointers in the aircrew mission and passenger brief." This information was originally published in the February 1998 *Flightfax* article "What We Don't Know *Can* Hurt Us," written by CW5 Bob Brooks, who was then the night vision goggles (NVG) Systems Manager at the U.S. Army Safety Center (USASC).

Initially, the use of laser pointers in the cockpit of Army aircraft was prohibited. Because of the unknown hazards, a study was conducted to identify those hazards and their effects on NVGs. Representatives from the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Laser Program, Communications Electronic Command (CECOM), Program Manager (PM)-Night Vision, and USASC went to Fort A.P. Hill, VA, to test numerous lasers.

CHPPM conducted testing of laser pointers by measuring the amount of energy reflected when individual lasers were fired through the aircraft windscreens. CHPPM also measured the amount of energy reflected off the glass from instruments located in the cockpit. Representatives from CECOM, PM-Night Vision, and USASC measured the amount of NVG-resolution degradation caused by each of the laser pointers tested. They tested Class 1, 3a and 3b lasers. The group determined that Class 1 near-IR lasers could be used in the cockpit without degrading the NVGs and in the cargo/passenger compartment of Army aircraft. However, the test results showed that all other Class 2, 3a, and 3b lasers could only be used in the cargo/passenger compartments of the UH-1, UH-60, and CH-47.

The Radiation Safety Performance Standard issued by the Food and Drug Administration (FDA) governs laser products sold in the United States. The FDA issued an exemption in 1976 from the provisions of the FDA standard for certain military laser products. Class 3b laser pointers cannot be sold in the United States unless they are exempt from the FDA Standard. In order for these devices to be exempt, they must be classified by CHPPM and evaluated for compliance with MIL-STD 1425a. CHPPM will then issue recommendations, which will include control measures for the safe use of this laser product.

CHPPM has recently conducted a non-ionization radiation protection study of the ACP-2B laser pointer and they have recommended that this laser system NOT be used in the cockpit of aircraft. If laser pointers are to be used by Army personnel—especially in Army aircraft—they MUST be evaluated by CHPPM so they can identify the hazards associated with these devices.

As you can see, there are a lot of requirements that have to be met before the laser systems can be utilized in Army aircraft. I'm sure there are also a lot of other lasers out there like the ACP-2B being used by Army aviators.

Conclusion

CHPPM are the "go to guys" when it comes to laser pointers. You can go to their Web site located at **http://chppmwww.apgea.army.mil/laser/laser.html**. If you or your unit have purchased laser pointers and are not sure if you can use them in Army aircraft, contact CHPPM. The next time you are online or browsing through a catalog for the purpose of purchasing a laser pointer, remember "**BUYER BEWARE**!" ♦

—CW5 (Ret) Ramsey is a System Safety Manager in the Aviation Systems and Accident Investigation Division. He may be contacted by calling DSN 558-2932 (334-255-2932) or e-mail william.ramsey@safetycenter.army.mil.

NCOs Play Important Role in Risk Management

Whether a unit is planning a 4-day weekend or a deployment into a faraway desert, there is risk in almost everything, and that risk needs to be assessed. The unit leadership must identify the hazards threatening both the Soldiers and the mission, and ways to mitigate those hazards need to be found. Unfortunately, the mistake many units make is stopping their risk management process after they complete the risk assessment.

Conducting a risk assessment only covers the first two steps of the risk management process. This is where units get in trouble. They stop there because they think they've accomplished risk management.

The risk management process is a 5-step continuous process. The first step is to identify the hazards of a mission. Hazards are any real or potential conditions that can cause injury, illness, mission degradation, damage to or loss of equipment or property.

There are a number of ways to identify hazards. One is through experience. If a leader has been involved in a similar mission, he should have an idea of which hazards to expect. Using their experience to help identify hazards is one of the ways NCOs can play a big role in the risk management process. NCOs have been out in the field; they've done the missions hundreds of times, and they probably have 10 times the experience their commander does. NCOs can help by informing his commander of past hazards and recommending controls they've used effectively.

Another way to identify potential hazards is through historical data. At the end of every mission or exercise, there should be an after-action review (AAR). The AAR provides a record of hazards that occurred the last time the unit conducted a similar mission. One more way to identify hazards is through intuitive analysis, or your "gut feeling."

The best way is to use the hazard identification tools on the Army Safety Center Web site located at **https:/safety.army.mil**. Once the hazards have been identified, the second step in the risk management process is to assess the hazards—to determine the possible impact of each hazard based on the hazard's probability and potential severity. The Safety Center's Web site also provides a risk assessment matrix that helps categorize hazards according to severity and probability.

You must ask yourself how this will affect your Soldiers, because if it affects your Soldiers, chances are it will affect your mission. A suggestion might be to rate a hazard higher and have more controls in place than risk having a Soldier injured.

The third step in the risk management process is to develop controls that reduce either the probability or the severity of the hazard. An example of a control measure might be to schedule a 10-mile march for the early morning when temperatures are cooler than they would be later in the day. By moving the activity to a cooler part of the day, the likelihood of a heat injury is reduced.

At the NCO-level, it's important to be aggressive in making the chain of command aware of potential risks, Soldiers' prior injuries for example, so they can make informed decisions when putting controls in place.

The fourth step in the risk management process is to implement controls. NCOs and the Army as a whole are good at identifying and assessing hazards and coming up with controls. However, implementing controls sometimes gets pushed aside. Implementing controls is done through regulations, policy letters, standard operating procedures, orders, briefings, back-briefs, training and rehearsals. NCOs shouldn't think they don't have a role in this process because they do. NCOs are first-line supervisors. They're the ones with their boots in the mud.

The fifth step in the process is to supervise and evaluate. Supervising and evaluating is one of the most often neglected steps in the process. It means enforcing implemented controls, while evaluating, adjusting, and updating when necessary. This is another part of the risk management process where NCOs play a key role. NCOs are the enforcers of the standard. The squad leaders, platoon sergeants, and team leaders are the ones out working with the Soldiers. The commander can't always be there and the Soldiers are more apt to talk to their NCOs than to their commanders about any new hazards that might come up or which controls aren't working.

Supervising and evaluating is a continuous process because as soon as the mission starts, the situation changes. New hazards arise, the weather changes, or the controls you implemented don't' work. When the mission is over, units should always conduct an AAR. This will provide the historical data for future missions and help reduce risks. ♦

—Adapted from the Jan 04 *NCO Journal*

A Salute to NCOs

CW4 Dan Fessler
F Co., 1-212th Avn. Regt.
Fort Rucker, AL

First, I would like to thank MSG Shane Curtis for his many years of service to Army Aviation and the U.S. Army Safety Center. Second, the non-rated crewmember (NCM) standardization instructor (SI) should be recognized as a leader of troops. They have the responsibility to commanders, pilots, platoon sergeants, and crew chiefs of an entire aviation company, if not a battalion, to ensure every non-rated crewmember is prepared to perform their flight duties to win and survive. NCOs, this is a leadership position.

Third, I would like to address commanders. I am the flight commander of the UH-60 Non-rated Crewmember Instructor Course (NCIC). As a former NCO and current standardization instructor pilot, I eagerly accepted this job. The UH-60 Instructor Pilot Course (IPC), which I have taught for 2 years, has achieved success in sending qualified, competent trainers and evaluators to the line. NCIC intends to mirror that success. We need to get the word out on this course and get the number of "school trained" (N1 identifier) non-rated flight instructors and standardization instructors (FI/SIs) embedded into the line units. We provide the student a broad base of standardized instruction in 34 academic subjects; e.g., fundamentals of instruction (FOI), methods of instruction, aircrew training program (ATP), door gunnery, environmental operations, aircraft systems, and aircrew coordination, to name a few. The day, night, and NVG flight instruction, flown concurrently and interactively with the UH-60 IPC, promotes an increased emphasis on instructor qualities. Flight training focuses on properly instructing and evaluating 31 of a typical unit's base and common mission tasks, including multi-aircraft operations, internal and external loads, evasive maneuvers, actions on contact, masking, and terrain flight.

To improve survivability on today's battlefield, commanders must focus on two main areas: ATP and standardization. Upon attending LTC James Kenney's (DCoS, USAAVNC) and COL Steven Dwyer's (Commander, 1st AVN BDE) briefings on Operation Iraqi Freedom and Operation Enduring Freedom shoot-down lessons learned, it was very apparent that the crew coordination desirable to survive an engagement requires optimum communication and response from the crew. The UH-60, by design and regulation, will always be a "two-pilot" aircraft. The importance of a well-trained crew chief and door gunner cannot be overstated. The small arms rocket-propelled grenade and heat-seeking threat are paramount. Recently redeployed IPC and NCIC students have said, "Non-combatant targets in the crowd have waved and cheered as the Black Hawk passed, then leveled barrels on us from the 6 o'clock." The 4 to 8 o'clock position is one that neither pilot can observe. The well-prepared NCM is vital during combat. The "flash to bang" is minimal, requiring immediate coordination between the crew to evade the threat. We have included evasive maneuvers and actions on contact training to our program of instruction, with an emphasis on crew interaction.

ATP and standardization: These are the reasons this course was developed. For years, two standardization shortcomings on the NCM side of the house have been their inability to accurately complete forms and records (in accordance with Training Circular [TC] 1-210, "ATP") and a lack of complete knowledge of the Aircrew Training Manual tasks, conditions, standards, and descriptions (TC 1-212, "Standardization"). I have had the pleasure of working with many fine FI/SIs and even trained a few, but the fact is that Mr. IP in A Company and Mr. IP in B Company have

a different perspective on signing off an FI and the requirements entailed. Recently, we had several current unit-trained FIs coming through the course that were not trained or evaluated on FOI or the learning process. This does not comply with Chapter 8 of TC 1-212, "Evaluation." This discrepancy has led to a lack of standardization throughout the Army and even within the same unit. We learned from the success of the IPC (standardized and school-trained) to better support the commander's intent; therefore, we have the fortune of implementing a course that corrects these shortcomings.

Finally, as I continue to train future UH-60 IPs, FIs, and SIs to become advisors to unit commanders on training their Soldiers for war, let us not overlook the valuable asset and combat multiplier a well-trained non-rated crewmember adds to your unit's goal of winning and coming home alive.

FY05 Course Dates

Class	Report	Start	End
05-001	02 Nov 04	03 Nov 04	08 Dec 04
05-002	02 Jan 05	03 Jan 05	02 Feb 05
05-003	14 Mar 05	15 Mar 05	15 Apr 05
05-004	10 May 05	11 May 05	14 Jun 05
05-005	07 Jul 05	08 Jul 05	10 Aug 05
05-006	01 Sep 05	02 Sep 05	05 Oct 05

More information on the NCIC can be found at the following Web sites:

- **https://www.us.army.mil/portal/jhtml/FileLoader.jhtml?kcid=630562**
- **https://rucker-dtac.army.mil/uh60ncic/**
- **https://www.atrrs.army.mil/atrrscc/courseinfo.asp?fy=2004&sch=011&crs=600%2DF16&crstitle=UH%2D60+NON%2DRATED+CREWMEMBER+INSTRUCTOR&phase** ♦

—SFC Kordonowy is the NCOIC for NCIC and may be contacted via e-mail at micheal.kordonowy@rucker.army.mil. CW4 Fessler may be contacted via e-mail at daniel.fessler@rucker.army.mil. The NG Rep at EAATS may be contacted via e-mail at jeffrey.doyle@pa.ngb.army.mil.

If We Build It, Will You Come?

Flightfax has received many comments from the field saying it takes too long to download information from the Safety Center Web site.

We have recently solved that problem. Our Web Technology staff created a smaller and more efficient Web site for use in low bandwidth situations. They removed all images from the "frames" of the existing site and took advantage of newer coding practices to make the site smaller, yet still have dynamic navigation.

Taking these measures brought our Web site from 186K total load size to less than 70K (63% roughly). This is more acceptable for a low bandwidth (modem) user. We will continue to provide low bandwidth versions whenever possible. Check it out at **https://safety.army.mil.mil/lite**.

For more information, contact the Webmaster at DSN 558-2098 or e-mail webmaster@safetycenter.army.mil.

FIELD "FIX" for Intermittent Communication Signals in the CEP

Ben Mozo
Communications and Ear Protection, Inc.

The communications earplug (CEP) is a device that is used to improve hearing protection and speech communications in the high noise environments found in helicopters. It includes miniature transducers that reproduce speech signals from the aircraft intercommunication system (ICS). The foam tip acts as a hearing protector, providing 30dB of suppression when properly inserted in the ear canal. It contains a pathway for communication sound signals to travel from the transducer to the ear, thus permitting quality sound at safe levels to reach the user.

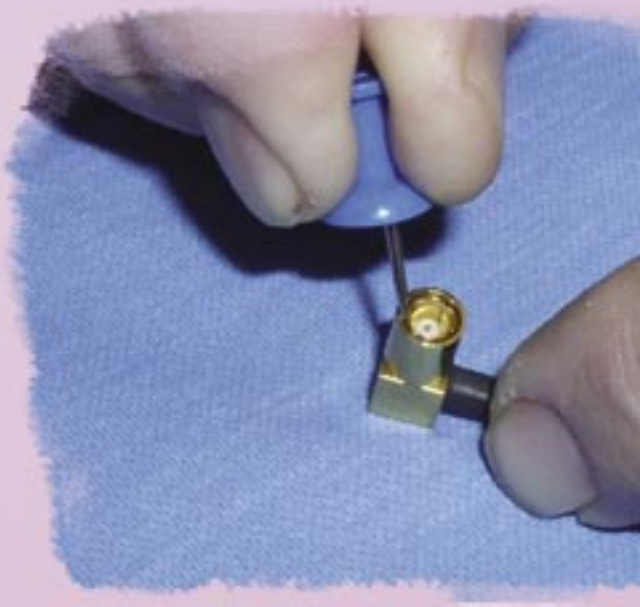
The CEP has been deployed for aviation use since 1999, when it began to be manufactured in quantity by Communications and Ear Protection, Inc. Presently, there are approximately 50,000 units in the field. The CEP has proven to be a very reliable system, and with proper care, many units have and are performing past their projected operational life of 5 years. However, with continued use and in spite of their robust design, users may experience an intermittent signal from the earplugs, primarily when they turn their heads. In most circumstances, this is caused by poor contact in the right angle connector at the point where the earplug connects to the helmet. With continued and extended use, connecting and disconnecting this interface sometimes will cause the tabs in the connector to bend away from the center, thus losing contact with the center post of the SMB jack connector on the helmet.

The easiest way to determine if this may be the cause of the intermittent signal is to insert the right angle connector into the SMB jack connector on your helmet. Holding the helmet on a solid surface, grasp the CEP wires approximately 2 inches from the right angle connector and gently move the wires up and down. From this action you should be able to determine whether the connector has a secure fit or if it has become loose due to numerous connections and disconnections. If the right angle connector wobbles in the helmet connector, the tabs need to be adjusted.

If you determine that you have a loose connection, you can make the following adjustments to fix this problem in the field. Using a push-pin as illustrated in the picture below, place the tip between the outer connector ring and one of the four leaf tabs, bending the tab *slightly* toward the center of the connector. Do this for the remaining three tabs as well. Insert the right angle connector to the helmet SMB jack connector to ensure the tabs are not bent too far toward the center to allow the right angle to be seated, but ensuring good compression of the tabs for a positive connection.

This should fix the problem of intermittent signals from your CEP during flight. You should again experience clear and continuous radio and ICS communications. If this operation does not fix your problem, please contact Communications and Ear Protection, Inc., for further assistance. ♦

—Ben Mozo, Communications and Ear Protection, Inc., Enterprise, AL, (334) 347-1688, e-mail bmozo@cep-usa.com, Web site www.cep-usa.com



Accident Briefs

Information based on preliminary reports of aircraft accidents

CH-47

D Model

■ **Class B:** Aircraft was trail in a flight of two when the crew experienced brownout conditions during touchdown. The ramp contacted the ground on the right side during touchdown. Extensive damage was assessed during the post-flight inspection. No personnel were injured.

■ **Class C:** The aircraft's center cargo hook released while in mechanical mode at a hover height of about 60 feet above ground level, causing the aircraft's load to fall to the ground. The aircrew was conducting an external load certification test.

OH-58

D(R) Model

■ **Class C:** During reconnaissance flight at 30 feet above ground level, the aircraft experienced an engine gas generator (Ng) overspeed while in a descending turn in tailwind conditions. The Ng reading was reported at 108 percent for 3 seconds. The engine was replaced.

TH-67

■ **Class C:** The crew reported instrument indication of a chip light during a landing maneuver to a pinnacle. The aircraft's engine then failed. The aircraft descended on a slope, causing damage to the tail boom.

UH-60

A Model

■ **Class B:** Aircraft crashed after losing tail rotor thrust. The aircraft was authorized to be flown/recovered following a tail strut failure on the preceding flight. The strut was secured to the aircraft with a cargo strap, but the strap failed when the aircraft was picked up to a hover. The strap worked its way between the intermediate gearbox and the tail rotor drive shaft. The drive shaft was severed. The crew executed a hovering autorotation to touchdown after losing tail rotor thrust. The aircraft landed upright on its main landing gear, and the crew conducted an emergency shutdown. In addition to the severed drive shaft and tail strut, the aircraft suffered damage to its belly, stabilator, and vertical fin. The crew chief suffered a sprained ankle, but no other crewmembers were injured.

■ **Class C:** Aircraft experienced a hot start with the instructor pilot on the controls. Engine replacement was required.

■ **Class C:** The #2 main generator failed during flight, causing fluid to stop moving to the transmission. The accessory gearbox and input module overheated.

■ **Class D:** Aircraft struck a large bird during flight. One tip cap was damaged beyond repair. The crew did not notice any unusual aircraft characteristics during flight, so the strike was unnoticed until the post-flight inspection.

L Model

■ **Class A:** Aircraft crashed during normal tactical training flight while carrying 11 Marine Corps troop passengers. The crew chief suffered fatal injuries. All other occupants were injured, three with major injuries.

■ **Class C:** Aircraft underwent engine run-up iterations in response to low transmission fluid cockpit indications. All transmission modules required replacement. A final maintenance check identified the transmission fluid had not been replaced during a prior maintenance and flush procedure.

UC-35

■ **Class C:** The aircraft encountered light turbulence about one hour into flight. The pilot reduced the power setting to approximately 96 percent. The other pilot noticed 101.5 percent on the left engine and 101.9 percent on the right engine. The pilot immediately pulled both power levers back. There were no indications of an engine overspeed, and all other indications showed normal ranges. The mission was continued without further incident. During inspection, however, the shading "key" computer showed an overspeed.

Editor's note: **Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).**

"Who's in Charge?"

It shouldn't be a guessing game...
Accountability Starts
At All Levels of Leadership!

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

NOVEMBER 2004 ✦ VOL 32 ✦ NO 11

Army Aviation ACCIDENT INVESTIGATIONS

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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

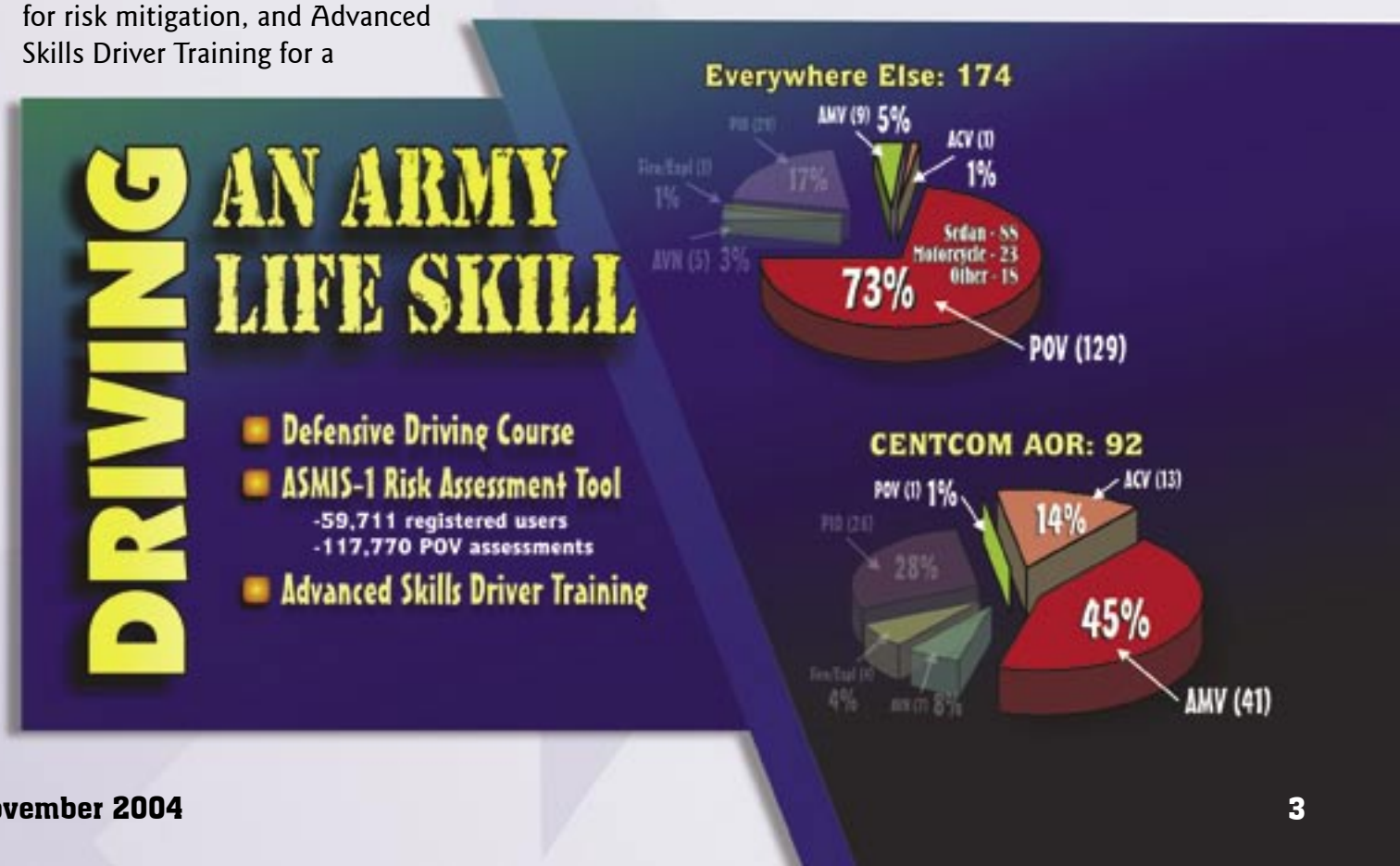
DASAF's *Corner*

FROM THE DIRECTOR OF ARMY SAFETY

So What's the Biggest Risk When You Get Home?

In the August issues of *Countermeasure* and *Flightfax*, we showed a picture that was worth a thousand words. The unnamed faces represented 216 Soldiers who had lost their lives in accidents. This was a powerful message that highlighted the personal impact of each Soldier's death and the cost to families and organizations. At the time, the accident rate was clearly unacceptable because we were losing a Soldier nearly every day. That trend continued through the remainder of FY04 and the charts below show where we lost 266 Soldiers to accidents. For those not deployed, a whopping 79 percent died while behind the wheel of a vehicle, and in-theater driving accounted for 60 percent of our accidental deaths. Clearly, our focus for FY05 must be continued emphasis on driving as an "Army Life Skill."

Our Army is finalizing a three-pronged attack on POV fatalities with distance learning, ASMIS 2.0 for risk mitigation, and Advanced Skills Driver Training for a



hands-on course of instruction. We've listened carefully to the ASMIS comments and feedback, so pay special attention to the upgrades coming your way. To date, our troops have conducted over 115,000 assessments with only one recorded fatality. Keeping safety in Soldiers' faces works! However, ASMIS works only ***IF*** you use it.

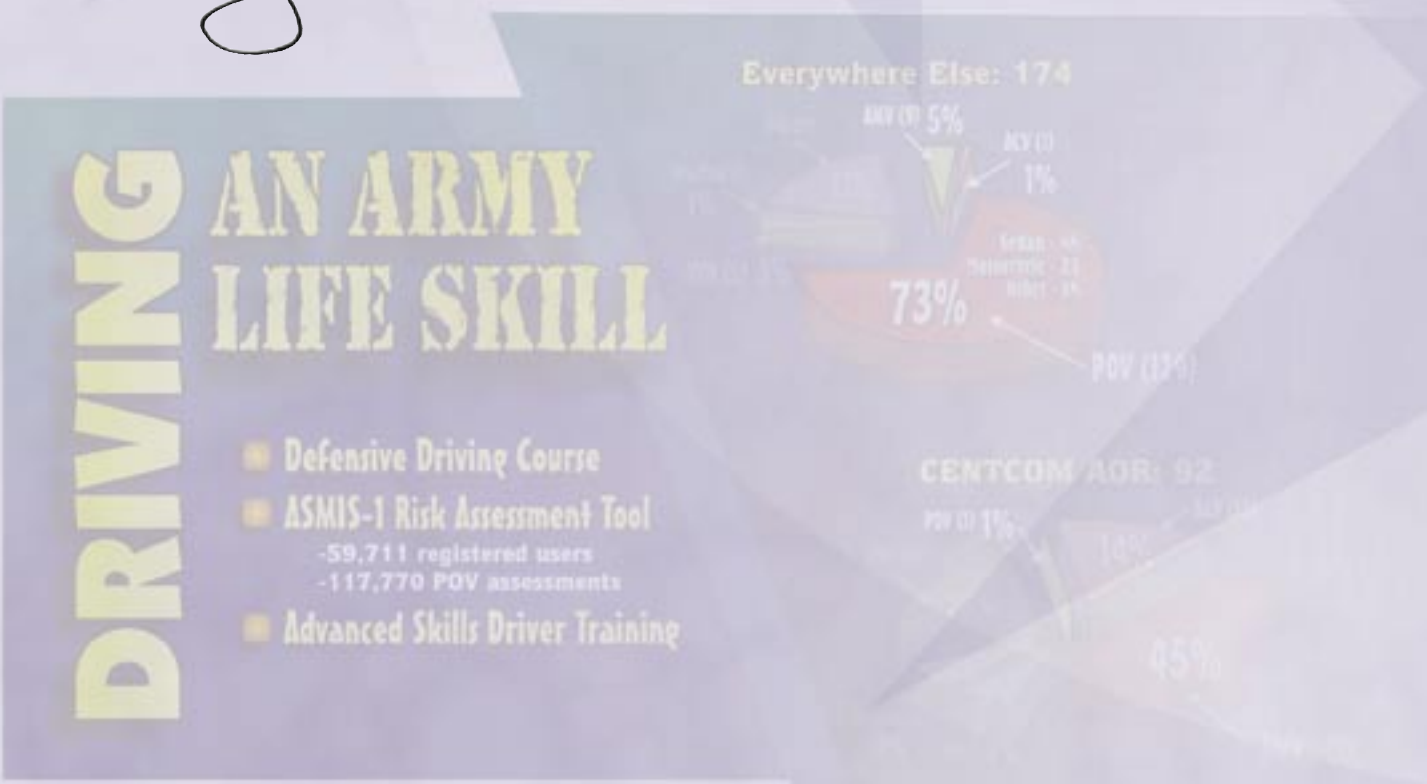
According to our mobile training teams, focus groups, and surveys, only 20 percent of the Army's population is engaged and actively mitigating POV risks. I ask you to take a moment to consider if you and your organization are part of the 80 percent not aggressively attacking our number one accidental killer of Soldiers. Come on … let's "buck up" and get after this. We are still in the mode of "lessons noted" rather than "lessons learned." We are still killing ourselves by not wearing seatbelts, speeding, and driving irresponsibly.

Just before writing this article, I sat down to review the fatalities from 15 to 18 October 2004, when four Soldiers died on their motorcycles over the weekend. Reckless driving, failure to wear helmets, alcohol, and behaving irresponsibly are the suspected culprits. There's no way to classify these deaths other than tragic and needless. Soldiers returning from war are combat-proven heroes and deserve nothing less than involved leadership and battle buddies who will speak up. Our Army is at war and transforming to meet tomorrow's challenges. We need each and every Soldier to support our Nation's fight.

Over the last 4 months we've lost a Soldier every 32 hours to an accident. Most of these deaths have occurred on the road. Our daily missions are tough and inherently dangerous, regardless of location. We are doing better with tactical risk management, so let's take the skill set one step further. Don't allow your subordinates or battle buddies to be our next fatal statistic from behind the wheel. We need a "leadership push" in off-duty activities to stop this trend. Winter driving and holiday travel season are on their way—let's beat the odds and stop POV losses!

Be Safe! Make It Home.

Joe Smith



COVER STORY

Safety Center Goes After Accidents

Paula Allman
Managing Editor

In the aftermath of a serious accident, safety professionals form an investigation team with one goal: to prevent the next accident.

The Army Safety Center has several "go" teams—both ground and air—one of which is on duty for deployment anywhere on short notice. These teams pull together the answers to many questions to come up with the cause of an accident. The what, where, when, and how of an aviation or ground accident help establish prevention plans.

The Army Safety Center Centralized Accident Investigation (CAI) approach is to examine all possible scenarios to determine the most likely cause of the accident. It's one of the Safety Center's most important jobs because of its role in accident prevention.

Through this process, begun in 1978, the Army Safety Center heads the investigations of most Class A and selected Class B accidents (both aviation and ground) Armywide. This doesn't mean that local installations and supported Army units have no role in the accident investigation; indeed, some accident investigations—including Class As—are turned over to the unit (see stories of several local investigations in this edition of *Flightfax*). The Safety Center team, composed of a field-grade officer and a senior warrant officer, is supplemented at the local level by experts such as a flight surgeon, instructor pilots, maintenance officers, and technical inspectors. When needed, the team can also call in additional experts from outside agencies including AMCOM, CCAD, and even equipment manufacturers.

The CAI process starts with a phone call to the Safety Center, whose investigators are on standby 24 hours a day for immediate deployment anywhere in the world. Arrangements between the Safety Center and the local unit are handled by the unit safety officer. He or she arranges for local board members to supplement the CAI team and also arranges for other support, such as personnel to search for missing parts of the wreckage or to crate exhibits for shipment to maintenance facilities or labs for analysis.

CAI provides many advantages, not only in determining what caused an accident but also in developing controls to help prevent future accidents from the same or similar causes. This information is also used in hazard and trend analysis. Searches of the Safety Center accident database are done on a continuing

basis to determine if there is a trend developing concerning the failure of specific parts, components, or systems.

CAI advantages

■ **Professional investigators**. CAI teams represent many years of accident investigation experience.

■ **Continuity and standardization in investigations**. A centralized process used over an extended period of time by full-time investigators establishes continuity and a base of institutional memory on which to draw. In addition, a standardized process of identifying the hazards that led to accidents produces more meaningful controls to prevent future accidents.

The team completes the formal report after returning to the Safety Center. If, at any point during the investigation, a safety-of-flight or safety-of-use issue surfaces, appropriate agencies are immediately notified and steps are taken to alert users Armywide.

■ **Impartiality**. Because CAI investigators are not members of the accident unit, they are not influenced by the command and will not be personally affected by the findings and recommendations. This gives the Board the flexibility to look both objectively and subjectively at records, policies, procedures, and command environment. It also affords the Board freedom from repercussions as a result of identifying deficiencies in the chain of command.

■ **Timeliness and responsiveness**. After 7 to 10 days at the accident site, the Board reviews the evidence and develops tentative findings and recommendations, which they staff via conference call with other subject matter experts at the Safety Center. Before leaving the site, the Board president briefs the local chain of command on the findings and recommendations developed up to that time. The team completes the formal report after returning to the Safety Center. If, at any point during the investigation, a safety-of-flight or safety-of-use issue surfaces, appropriate agencies are immediately notified and steps are taken to alert users Armywide. Subsequent actions may include issuance of a safety-of-flight or safety-of-use message, or even DA-level action to ground an entire fleet of aircraft or restrict use of ground equipment Armywide to prevent other accidents from the same or similar causes. CAIs are just one more way the Army is working to save lives and prevent accidents.

The Safety Center is here to help at *all* times—not only when an accident occurs, but in accident prevention as well. The Army Safety Management Information System-1 (ASMIS-1), found on the Safety Center Web site at **https://safety.army.mil/asmis1**, is an automated risk assessment tool that features three modules: Aviation, Ground, and POV. For those Soldiers in combat theaters or training stateside, the Aviation and Ground modules provide valuable information based on mission parameters. The user defines their mission, and the system searches the USASC database for accident cases that best match the defined parameters. The five most relevant cases, along with identified hazards, recommended controls, and an initial risk level assessment, then are presented to the user. After reading the case summaries, the user can compare those hazards to the hazards identified in their mission planning process. ASMIS-1 does not identify all possible hazards, nor does it offer all viable controls associated with a specific operation; instead, it provides junior leaders with the insights and lessons learned from experience and past accident investigations. Also check out the Safety Center's Accident Reporting Automation System at **http://safety.army.mil/aras_public/intro_aras.html**.

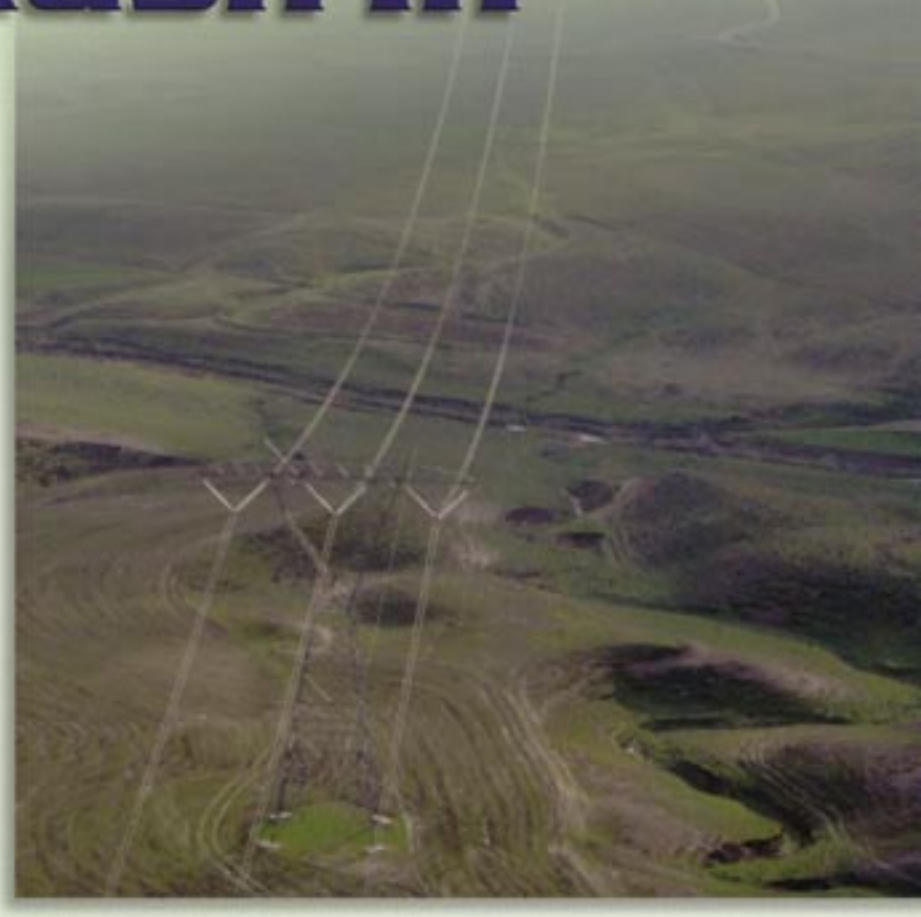
The Safety Center is here for you. Give us a call or e-mail us; let us help you build a better risk management program and further reduce the Army accident rate. Come to us now before we have to go to you later. ♦

Investigators' Forum

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

Fools Rush In

CW4 Dennis "Ed" Hosmer
U.S. Army Safety Center



Some of you may remember the old song "Fools Rush In" by Johnny Mercer and Rube Bloom. Most of you probably wouldn't. A couple of the lyrics from the song are "Fools rush in where angels fear to tread, And so I come to you, my love, my heart above my head; Though I see the danger there, If there's a chance for me, then I don't care; Fools rush in where wise men never go, But wise men never fall in love, So how are they to know?"

For as long as there have been aircraft, there have been power lines. All too often the two come together, usually with damaging and frequently tragic consequences. Here's one of them….

This was a combat mission. The crew was flying a UH-60A during a routine MEDEVAC mission in Operation Iraqi Freedom. Approximately 6 minutes into the flight, the pilot in command (PC) in the left seat said he noticed a flash at 12 o'clock. The PC changed course and flew across a road, where a set of high power lines spanned a large creek running south. The crew didn't have a wire hazards map in the aircraft, nor were they using a map to navigate because they had flown the route numerous times before and were familiar with it.

The PC began to follow a streambed, flying approximately 50 to 75 feet above ground level (AGL), making turns in excess of 40

degrees and airspeeds above 100 knots. Approximately 9 kilometers along the route, the pilot (PI) announced "Wires," and the PC responded, "I have them."

About 10 kilometers along the route the PI looked inside the aircraft to change frequencies; however, he never announced he was doing this. When he looked back outside, he suddenly saw a set of high tension power lines in the windscreen. He screamed "Wires!" and the PC initiated a cyclic climb with a corresponding right turn. But it was too late. The aircraft struck the top wire on the high tension power line and then got stuck on the wire. The aircraft flew along the power line with the wire embedded in the left strut area.

The scars and physical evidence on the aircraft indicate it flew along the wire for 5 to 10 seconds before the wire broke. The wire hit the chin bubble, shattering the Plexiglas®. The aircraft finally freed itself and flew up and away from the wires.

When the PI came on the controls, he never announced to the PC that he was on the controls. The PI relinquished the controls to the PC, who flew another 2 kilometers and then started an approach to an open field. The crew thought there could be some damage to the flight controls, so they decided to make a roll-on landing. The PC landed the aircraft with a 30-foot roll without further incident. Luckily, neither the crew nor the passengers were seriously injured, but the aircraft suffered extensive damage along its left side.

Lessons learned

■ **Lack of situational awareness**. The crew failed to conduct pre-mission planning IAW current regulatory guidance. The PC and the PI were not using a wire hazards map and were flying below the minimum altitude prescribed in Training Circular (TC) 1-212, Task 1014, "Maintain Space Surveillance"; Task 2083, "Negotiate Wire Obstacle"; Task 2018, "Perform Terrain Flight"; and the brigade SOP. The crew never received an updated weather brief, nor did they update the flight log IAW the brigade SOP. Consequently, the PC flew the aircraft into wires that were depicted on the wire hazards map (which they didn't have in hand).

"I've flown this mission a hundred times before; I know it like the back of my hand." This type attitude can lead an aviator to become overconfident in his ability, which can result in an accident.

■ **Failure to comply with established procedures**. The crew failed to properly scan and maintain proper altitude in relation to terrain and existing obstacles in the area. They allowed the aircraft to descend below the minimum altitude required by the Helicopter Procedures Guide, which would have kept them clear of the wires. The crew's actions were a result of overconfidence and complacency in their ability to fly the aircraft outside published standards. Confidence in self and the aircraft is a must for aviators, but overconfidence can lead to failure to comply with established procedures.

■ **Crew coordination**. Crew coordination is, as always, a key ingredient in accident prevention. However, as this accident proves again, the pilot on the controls must maintain awareness regarding the position of the aircraft and the location of all obstacles. The PC's actions were the result of overconfidence and complacency. He was overconfident because he had flown the mission numerous times before and complacent because he didn't use the checklist to perform the required tasks before flight (Task 1007: no crew briefing and no HIT check).

Some closing thoughts

The Army's mission is to fight and win our Nation's wars. Some might argue that OPTEMPO is the reason behind the aforementioned breakdowns. I say, having been in both the OIF and OEF theaters of operation, I have personally witnessed

the real but hidden danger—*ATTITUDE*. Over and over I hear the words, "We're in a combat zone." Yes, a combat zone requires units and individuals to use creative thinking on occasion, but that means to use your training, the regulations, and the very well-established risk management process to guide and filter that creative thinking. Nowhere in the books will you find that we do things differently in combat than we do in training. We don't throw the books out the window just because we're in a combat zone. Why is that? The regulations, the training, and the risk management process are all tried and true, well-tested, and put there for just that reason—to help you fight and win in a combat zone.

Wire hazards are exactly the same in CONUS as they are OCONUS. Mission planning, crew and passenger briefs, and crew coordination are all exactly the same at home station as they are in a forward deployed theater. If you're deploying soon, make the choice to let the system work as designed and DO NOT allow that "combat zone" attitude to lead your unit down the wrong path. If you're currently deployed, give yourself and your unit an ATTITUDE check to see if this applies to you. If you have recently returned to home station, pat yourself on the back, take a well-deserved break, and most of all make sure that "combat zone" attitude didn't follow you home. Many good people rushed into fatal consequences and they are no longer here to share their story. ♦

—CW4 Hosmer is a USASC accident investigator and may be contacted at DSN 558-3553 (334-255-3553) or via e-mail at dennis.hosmer@safetycenter.army.mil.

Investigators' Forum

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

"You're Coming in Hot!"

CW4 Michael E. Turner
C Co, 2-25th AVN

The accident aircraft, a CH-47, was Chalk 2 in a flight of two. The crew was completing the second leg of an air assault to a potentially hostile landing zone (LZ) in support of combat operations in Afghanistan. The aircraft was loaded with 28 troops and a "kicker pallet" full of water and MREs on the ramp. The ramp was positioned slightly above level for the flight and landings.

The pilot in command (PC), who was a standardization instructor pilot (SP), was flying with a readiness level one aviator with 2,000 hours' experience, but only 160 in the CH-47. This was not a training flight or an evaluation flight. The PC took the controls about 6 minutes before landing at the accident LZ. At the rally point (RP), he attempted to close the flight interval from an eight-disk separation to three disks upon landing. The PC in the left seat browned out at about 20 feet above ground level and continued to land. The PC decelerated the aircraft by placing it in a nose-up attitude greater than 15 degrees, but less than 20 degrees nose up. In the nose-up attitude, the cargo ramp struck the ground.

The crew offloaded the passengers and the pallet and departed the LZ. Approximately 5 minutes into the flight, the flight engineer (FE) noted damage to the ramp area and a severe vibration on the ramp. The crew supported the ramp with cargo straps and returned to home station. The ramp suffered major damage to the right strut mounting area. The left strut mount at station 502 broke the former and separated it from the airframe, and also damaged the external skin of the aircraft.

Why did it happen?

Several factors contributed to this accident: human error, crew coordination, standards failure, and support failure.

Human error. The PC was overconfident in his abilities to land the aircraft in its configuration in brownout conditions. The PC did not ask if the rest of the crew was browned out, but felt that he could safely land the aircraft from 20 feet in a total brownout. The PC's attempt to close the interval from the RP inbound did not support the tactical plan. The LZ was a large desert area big enough to fit six CH-47s comfortably. The attempt to close the separation led to excessive speed on the approach and a closure rate with Chalk 1 that required a large deceleration. The PC was aware of the aircraft's configuration, but was not used to landing with the ramp level. The crew positioned the pallet over the ramp hinge and was unable to raise the ramp for landing.

Crew coordination. The PC never announced

"Brownout" on the approach. The pilot (PI) didn't brownout during the approach, but had he known the PC was brownout, he would have taken the controls and leveled the aircraft for landing.

Four of the five crewmembers thought the approach was fast; however, only one of them mentioned, "You're coming in hot!" This call was never confirmed by the cockpit crew. The FE did not repeat this call nor ensure it was heard because he was making the calls for landing in an exceedingly rapid manner. The lack of standard terminology could have led to confusion in a combat environment. The lack of communicating concerns about the speed on approach could have been attributed to the professional courtesy the rest of the crew extended to the PC, who was a visiting SP and "an ex-Task Force pilot."

Standards failure. There are no written standards for go-arounds in Training Circular (TC) 1-216, *CH-47 Aircrew Training Manual*, as well as no sand, dust, or snow considerations. However, these considerations are in the draft TC 1-240, *CH-47 Aircrew Training Manual*. During interviews with several CH-47 crewmembers, there were considerable differences in opinion regarding how long aircraft would stay in a total brownout condition. The times ranged from 2 to 12 seconds.

Additionally, there is no mention of a pitch angle limit or caution associated with ramp level operations. Measurements and calculations determined that with the ramp in the level position, there is a 15-degree angle from the rear tires to the end of the ramp. In effect, with the ramp level and the nose pitched up 15 degrees to decelerate, the ramp will strike the ground.

Support failure. The environment played a minor part in this accident as the wind conditions in the area of the LZ were inaccurately forecasted. The winds were 170 degrees from the forecasted heading and contributed to the dust from Chalk 1 being blown into Chalk 2. Had the crew known of the wind direction, they might have changed the landing formation, separation, or heading to blow the dust away from the rest of the formation.

Lessons learned

Speed on the approach must be managed early in the approach to make a controlled and safe landing. Pilots should use all the terrain available to make a safe landing. Even if the goal is to amass combat power on an objective, safe separation and a safe closure rate are the keys to survival.

The draft TC 1-240 will address the concerns for sand, dust, and snow considerations for visual meteorological conditions approaches; however, units must address training and evaluation programs for these considerations until this document is official and the maneuver is taught from aircraft qualification courses (AQCs) to annual proficiency and readiness tests (APARTs). An Army standard for go-arounds should be implemented and taught from AQC to APARTs as well. Crews must understand the need for go-arounds, power required, and rotor clearance required to perform this maneuver. They also should be comfortable doing this maneuver in dusty environments.

A caution should be posted in the CH-47 Operator's Manual about landing with the ramp level with pitch attitudes in excess of 15 degrees. Currently the cautions listed are for 20 degrees pitch up during roll-on landings to avoid striking the aft rotor system on the ground. Crews must be educated to the further limitations of striking the ramp during landings with the ramp level and a pitch attitude in excess of 15 degrees.

Crew coordination should be reinforced through continuation training. All aircrews must be refreshed on the crew concept that they all have a voice in the flight. Each crewmember must be reliant upon the others to ask and offer assistance when needed and not to rely upon only one person to do the entire job.

We are recommending that higher headquarters obtain more weather observing systems to build a larger database of information to accurately model local weather phenomena. Currently there are only four weather observers in theater that report weather conditions. Giving the forecasters the ability to obtain data from each forward operating base will increase the accuracy of weather reporting for the entire country. ♦

—For more information, contact CW4 Turner at C Co., 2-25th Aviation, APO AE 09354, call DSN (318) 231-2463, or e-mail turnerme@baf.afgn.army.mil.

Investigators' Forum

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

IIMC Recovery Training

The best way to avoid inadvertent instrument meteorological conditions (IIMC) is not to fly in less than visual flight rules (VFR) weather. As Army Aviators, we all know this isn't going to happen anytime soon, and even forecast VFR weather isn't always VFR. The point is that once you have flown into IIMC, you must commit to instrument flight rules (IFR)—transition to instruments, maintain aircraft control, and fly to an airfield while executing a published instrument approach.

The mission was to conduct a night training formation flight while using night vision goggles (NVGs). Two UH-60 aircraft were to depart home station, join up at a staging airfield, and begin formation flight. The crews of both aircraft received the following weather forecast: a minimum ceiling, few at 700, scattered at 7,000, 7 miles visibility with heavy rain showers, temperature 15°C, dew point 14°C, winds 260 at 9 knots, with a weather warning for thunderstorms in the local flying area.

After hot refueling at the staging airfield, the flight departed on the planned route. Chalk 2 received a weather update for the flight of two. There weren't any major changes to the forecast. The weather began to deteriorate as the flight proceeded en route, so flight lead changed course and continued the mission. The copilot in the lead aircraft was a new aviator to the unit and was working on readiness level progression. In addition, Chalk 2 had two senior aviators who were getting night minimums.

The flight had been in the air approximately 20 minutes when trail lost sight of lead. Trail called lead and told them they would back off lead until they could regain sight of them. Trail changed course 90 degrees to the direction the flight had been flying and told lead they could see them again. Lead acknowledged and said they would come around and take up trail position behind Chalk 2. Lead called back and said they had entered a fog bank and would be out shortly. Ten seconds later, Chalk 2 called lead and asked how they were doing. Lead never responded. The lead aircraft had crashed in a heavily wooded area, and all three crewmembers were fatally injured.

Lessons learned

The preliminary investigation revealed the environment, as well as training and leader failures, contributed to this accident. Although all three factors contributed, one would have prevented this accident—IIMC recovery training.

Environmental planning

The formation flight had not been planned before the evening of the flight.

The two crews got together and decided they would fly formation later in the evening. The crews talked about formation flying, IIMC break-up, and lead changes, but no formal briefing occurred. The commander approved the risk assessment worksheet, but did not select an air mission commander as prescribed by Army Regulation 95-1. When trail lost sight of lead, neither aircraft performed IIMC break-up as they had discussed.

Training

Any type of realistic instrument training is critical in building aviator confidence when it comes to flying in the clouds. Simulator training is good for increasing your knowledge on instrument flying and emergency procedures, but something is lost in realism when you know you can't get hurt flying the simulator. The immediate fear factor just isn't the same in the simulator as it is in the aircraft. There is too much of a negative attitude in Army Aviation today when it comes to flying in the clouds. I have actually heard young aviators say they will never fly in the clouds. With this kind of attitude, it's going to be next to impossible to keep our pilots proficient in instrument flying. You will always hear aviators say, "Don't go IIMC and you won't have a problem!" However, sometimes we don't get what we want.

Leaders

Leaders at all levels should stress the need to increase training to keep our aviators proficient in instrument flying. As leaders, we know we can't predict the weather or how a certain individual will react when faced with an IIMC situation, but we should make every effort to keep our pilots proficient in instrument flying. Unit safety officers should coordinate with the unit standardization pilot and review individual flight records to help the commander identify weak instrument pilots. The commander must take the lead on instrument flying—if he is a weak instrument pilot, I guarantee you that other pilots in the unit will follow his lead. We don't need, nor can we afford, to lose another aviator because he is afraid to fly in the clouds. ♦

—Comments regarding this article may be directed to the Aviation Systems and Accident Investigation Division at DSN 558-9552/3410 (334-255-9552/3410).

Investigators' Forum

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

Wrong Place at the Wrong Time

CW3 David A. Anderson
NV RAID SP/IE

The crew had just finished a stationary surveillance for a follow-on warrant to be served for a "bust-out" on multiple felonies, and was landing at the Henderson Airport. The approach was made initially to the active runway, with a circle to land over a sod area to terminate at a helicopter parking area and taxiway. The pilot landed and initiated the normal shutdown procedures.

During rotor coast-down the co-pilot, who was left at the airport during the surveillance due to weight and balance issues, noticed insect activity about the tail rotor. Upon a somewhat closer, yet still distant look, the co-pilot identified the insects as a swarm of bees. The co-pilot then motioned to the crew to come directly towards him with some haste. The pilot informed the law enforcement agents (LEAs) that there was some kind of problem and to exit immediately in the direction of the co-pilot.

The rotor system had nearly stopped, and the pilot completed the final steps of the shutdown and exited the aircraft. By this time a small swarm of bees had landed on one of the tail rotor blades, even more swarmed around the aft section of the tail boom, and still more seemed to be flying in and circling around the aircraft.

The decision was made to remove the aircraft key and leave the aircraft at the parking pad. The crew was to attend the SWAT brief, so it was hoped that the bees would be gone by the time the crew had arrived back from the brief. Almost 2 hours later, the bees for the most part had calmed down and created a small swarm ball on one of the tail rotor blades, which covered approximately 12 inches of one side of one blade.

Calls were made to the briefing officer, fire department, and entomology departments, and the consensus was to use the Henderson Airport fire extinguishers. Authorization was given, and both crewmembers and one LEA fired the dry chemical agent at the bees. The main body of the swarm immediately dispersed; however, several residual individual bees still swarmed the aircraft. After three fire extinguisher blasts, the pilot elected to start the aircraft

despite the presence of many bees.

The pilot started the aircraft and quickly ran it up to full operating RPM. Pitch was applied to the main rotor system to allow the downwash to blow any remaining bees away. To avoid a reinfestation, the pilot air-taxied a short distance to a pre-determined point to pick up the co-pilot and LEA. The mission was then continued without further incident. Upon mission completion, the aircraft was thoroughly washed because a very light coating of fire extinguisher dust was still present.

We surmise the aircraft was inadvertently parked next to an in-ground hive located in the sod area or that the aircraft was flown though a migrating swarm of bees. In any case, the tail rotor must have killed several bees and their scent was still present on the blades well after shutdown. Late spring and early summer are possible migratory times for bees and, when provoked, killer bees sting items that are black, as opposed to items that are white. For these reasons, the aircraft and crew just happened to be in the wrong place at the wrong time.

Although it's impossible to plan for such an occurrence, prudence is recommended when dealing with killer bees. It's also recommended to wash the aircraft thoroughly if a fire extinguisher agent is used on or near an aircraft, as it is corrosive. ♦

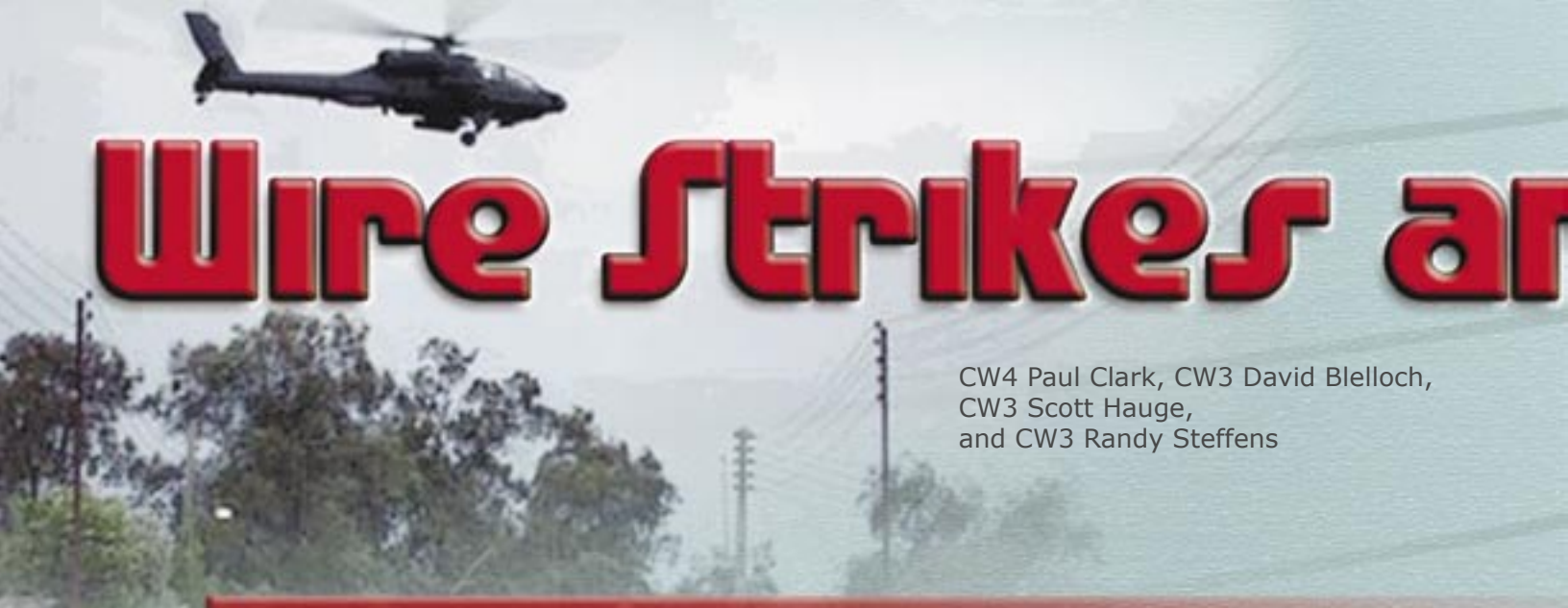
Editor's note: Many thanks to CW3 Russ Schuler, NV RAID OIC/ASO, who worked to get this article for me.

—CW3 Anderson was the PIC for this mission. His co-pilot was CW2 Kevin Keeler. Both are in the Nevada Reconnaissance Air Interdiction Detachment (RAID). CW3 Anderson may be reached by calling 702-643-4215 or e-mail dave.anderson@nv.ngb.army.mil.

Correction

In the September 2004 *Flightfax*, we mentioned an Aviation and Standardization Conference being held in Little Rock, AR, from 30 November to 2 December. The conference is actually the Aviation Safety and Standardization Conference. We apologize for this mistake.

—POC is CW5 Gilbert Wright, NGB Aviation Safety, 703-607-7735, e-mail gilbert.wright@ngb.army.mil.



Wire Strikes ar

CW4 Paul Clark, CW3 David Blelloch,
CW3 Scott Hauge,
and CW3 Randy Steffens

Collision with wires has long been recognized as one of the greatest hazards facing the aviator. Other than legislating for the removal or non-construction of above ground wires and cables—a most unlikely enactment—it seems there is no possibility of eliminating entirely this manmade threat to aviation safety. In consequence, our wire-infested flight paths must continue to be regarded by pilots as a hostile environment in which to operate aircraft at low level.

Wire strikes are bad! Wow, that's an understatement. As pilots we realize that we take risks every day. Since history proves to repeat itself, we must learn from past mistakes.

Army Aviation accidents between 1999 and 2004 involving wires resulted in 34 accidents, five fatalities, $50 million in damages and losses, and numerous crew and other personnel injuries. Of those 34 accidents, we've had 7 Class As, 1 Class B, 13 Class Cs, 9 Class Ds, and 4 Class Es. However, those are only the reported cases. Modern causation theories conclude that for every catastrophic accident, approximately 600 near-misses occur. These close calls are typically not reported other than as a "There I Was" war story.

Wires are obviously the enemy. They have been called "helicopter killers." Given that, our missions routinely take us deep into enemy territory as we fly at terrain levels. To compound our struggles, our foe has formed some formidable alliances. They include obscurations, aircraft structural limitations, mission demands, night vision device limitations, shadows, obscure terrain, and the list goes on. Our experience during the last 5 years is that 38 percent of our wire strikes occurred at night, with 51 percent during training missions, 37 percent during imminent danger missions (OIF, etc.), and 11 percent during service missions.

It is seemingly obvious that our enemy demands our focused attention and resistance to overcome. Unfortunately, we occasionally become complacent and overconfident, thus aiding the enemy and becoming our own worst enemy. This is painfully clear upon reviewing several accident cases. They are filled with

re BAD!

statements such as "crew failed to scan," "crew failed to detect hazards/obstacles," or "crew failed to perform adequate crew coordination." In fact, 61 percent of the investigations found human error to be the definite cause of the accident.

■ An OH-58D(I) was flying a search and rescue operation at night, over a river, and below published minimum altitudes when the pilots failed to detect wires that were known and depicted on the hazards map. The aircraft struck the wires and was totally destroyed. Both pilots were fatally injured.

■ An OH-58D(I) was flying a search and rescue operation at night, and again they were flying over a river. The crew failed to detect a suspended ferry cable and struck it, fatally injuring everyone on board. The investigation could find no evidence that the "known" hazard was passed to the incoming unit upon change of rotation.

■ A UH-60A struck wires while flying a day passenger drop-off mission. Flying below minimum published altitudes, the crew failed to use proper scanning techniques and was not using a wire hazards map. The aircraft was damaged extensively.

■ An AH-64A was flying a night reconnaissance mission below minimum published altitudes when the pilots failed to detect known wires. The aircraft was totally destroyed, and the crew suffered fatal injuries. The pilot was RL-3 and had not performed a local area orientation. The air mission commander in Chalk 2 did not attempt to correct the altitude of the accident pilot in command.

To support our human intervention to the fight, we have a proven ally with the Wire Strike Protection System (WSPS) on helicopters. Although the WSPS has proven very successful, its design is limited to frontal strikes on horizontal wires. The WSPS is designed to cut through 3/8-inch diameter wires with a minimum breaking strength of 11,500 pounds per inch at angles of 30 degrees. The system has demonstrated a significant reduction in wire strike damage and has saved many lives. Unfortunately, we sometimes encounter cable wires that exceed the limits of WSPS due to being grouped as clusters or those that are larger than 3/8 inch.

There are many published standards that control wire hazards. Each aircraft aircrew training manual (ATM), as either a 1000- or 2000-series task, prescribes standards for negotiating wire obstacles. Common to each ATM is the requirement to locate and estimate wire height, determine the best method to negotiate the obstacle, and then obstacle negotiation. Army Regulation 385-95 and Field Manual (FM) 3.04-300 mandate that the flight operations officer will ensure that a detailed hazards map is maintained as current with updated hazards. FM 3.04-300 also requires that this map be updated by the airfield operations officer every 30 days. Each organization must ensure that these duties and responsibilities are detailed in their standing operating procedure (SOP). Upon deployment, the SOP should be reviewed for validity. Also, it is incumbent upon the unit commander to establish procedures that ensure each aviator flies with current hazard information.

Wires are inanimate objects that indiscriminately await our inattention, neglect, and overconfidence. Wires don't care about our experience level, or if we are deployed or in our backyard training areas. And they certainly don't consider the human costs of an accident. They are just there and we need to stay focused on avoiding them. Yes, wire strikes are bad! The responsibility resides with each of us to remain vigilant, learn lessons from the past, and live to fight another day. ♦

—This article was written by CW4 Clark, CW3 Bielloch, CW3 Hauge, and CW3 Steffens as a class project while attending the Warrant Officer Advanced Course 04-505 at Fort Rucker, AL.

WAR Stories

There I was...

Trust Me, There's Fuel There

CW5 (Ret) Bill Ramsey
U.S. Army Safety Center

Stories, I am told, are to be shared so someone will learn from others' mistakes. I am not proud of what I did and I guess I could blame it on the weather, my copilot, or just bad timing. When I think about what almost happened to me, my thoughts always go back to what I did and didn't do.

It was 1990, and my unit had just deployed from Fort Bragg, NC, to Dhahran, Saudi Arabia. We'd trained our pilots in desert operations—day, night, and NVGs—in and around Dhahran and were settling in for a long wait. However, with more and more units arriving daily, space was at a premium. One day my commander said we were going to fly out to a town called Al Hasa to look at a brand-new commercial airfield that might be our new home.

I was the unit's standardization pilot and also combat-crewed with the commander, so I was tasked to plan the flight. We were to fly two OH-58D aircraft to Al Hasa, check out the airfield and surrounding area, and come back to Dhahran. Since the duration of the flight wouldn't allow us to fly out and back on one tank of fuel, I called Corps G3 Air to check if there was any fuel at Al Hasa. I had *heard* there was fuel there, but I wanted to make sure. I was ensured that, indeed, the airfield had fuel available. As I hung up the phone the last thing I heard was, "Trust me, there's fuel there!" My first big mistake was trusting that statement.

As we hovered out for takeoff, we received a radio call from operations. As any aviator knows, there is no such thing as a "routine mission." Now, instead of just checking out the airfield, we had to fly southwest of Dhahran to look for two drop tanks from a French Mirage jet. The jet had experienced an in-flight emergency and punched them off. The commander approved the mission change, and we took off for the reported drop area. Although we looked for almost an hour, we couldn't find the tanks. (We found out later they'd been painted a sand color. No wonder we couldn't find them!)

We then headed for Al Hasa and found the airfield with no problems. We landed and, as I was shutting down, I asked tower to send out the fuel truck. What I heard next gave me goose bumps. Tower reported they didn't have any fuel. How could a brand-new facility—in Saudi Arabia, of all places—have everything but fuel? There I was, in the middle of the desert with two combat killer aircraft and no fuel.

A check of the fuel gauge revealed I had 140 pounds of fuel remaining. The other aircraft had less than 90 pounds. Then matters got worse. The sheik who resided in that province—a cousin to

the prince of Saudi Arabia—owned and ran the airport. He met us at the terminal door with a firm handshake and smiling face. He asked us where we came from and who told us we could land at the airfield. Why didn't someone—namely, G3 Air—let him know about us? Pictures of me looking out across the desert through prison bars flashed through my mind.

We finally convinced him we had permission to land there, and he even invited us into his office for tea. All I wanted to do was find some fuel and get out of there. Since our aircraft had 140 pounds of gas, I talked with the commander about launching it, climbing to altitude, and calling our tactical operations center (TOC) to have fuel brought out to us. This was my second big mistake. During the search for the drop tanks we were flying at 50 feet, talking with our TOC 120 kilometers away with the FM radio. We were a lot further than that now.

The commander didn't see a problem with my plan, so we preflighted and cranked the aircraft. To save time and fuel, I elected not to nav align our navigation system. This was my third big mistake.

We departed north over Al Hasa and turned east toward Dhahran. As we climbed through 1,000 feet, I called the TOC every 30 seconds until we reached 3,000 feet. We'd been airborne about 10 minutes—still unable to contact our TOC—when I noticed our ground speed had almost doubled. I'd planned that when the aircraft reached 100 pounds of fuel, we'd return to Al Hasa whether we'd made contact with the TOC or not. Well, there it was: 100 pounds. I turned back toward Al Hasa but, as we completed our 180-degree turn, I saw that a wall of dust had moved over the city and was now coming fast toward us. Those goose bumps I had earlier were back in full force!

I figured we were fighting a 40-knot headwind, and all I had to navigate with was the map on my lap. If you remember, I hadn't waited to align the aircraft's navigation system, so I had no waypoints to follow back to the airfield. I didn't think this was a problem, however.

We continued to fly slowly toward the city, with the fuel needle dropping steadily. An eternity later, we finally were over Al Hasa with 80 pounds of fuel. We were cutting it close, but we were almost there. On the map I found a highway that went around the city, which I spotted fairly quickly. The airport was south of the city, so if I just followed the highway, I'd be sure to find the airfield. By this time the fuel gage had passed 70 pounds.

"Just look for the next big intersection, take a left, and you're 5 minutes from the airfield," I told myself. Wishful thinking! As the dust storm was getting worse, I came upon a three-way intersection with two highways turning left and one going straight. The extra highway to the left was not on the map—which one was I supposed to take? By now we were down to 60 pounds of fuel.

I could've tried to land next to the highway, but how could I let the other aircraft know where I was? I could've contacted the tower, but I wouldn't be any help to them either. I figured my only option was to pray: "Lord, if you can get me to the airfield before the fuel runs out, I will never pull a stunt like this again." My hopes dashed, I happened to notice a small sign next to one of the highways—a sign with an airplane on it, pointing the way to the airfield!

We had 50 pounds of fuel. Tower gave us our runway and reported winds of 360 at 35 knots entering downwind. If I entered downwind and then turned right base, the fuel pump would cavitate and the engine would stop running…no, we needed a different runway. Tower agreed. We landed smoothly, but I used almost all 6,000 feet of runway to stop the aircraft. I didn't want to make any abrupt turns and slosh the fuel.

We landed with less than 40 pounds of fuel. I looked over at the commander, and he returned my look. We'd barely escaped death to fly another day.

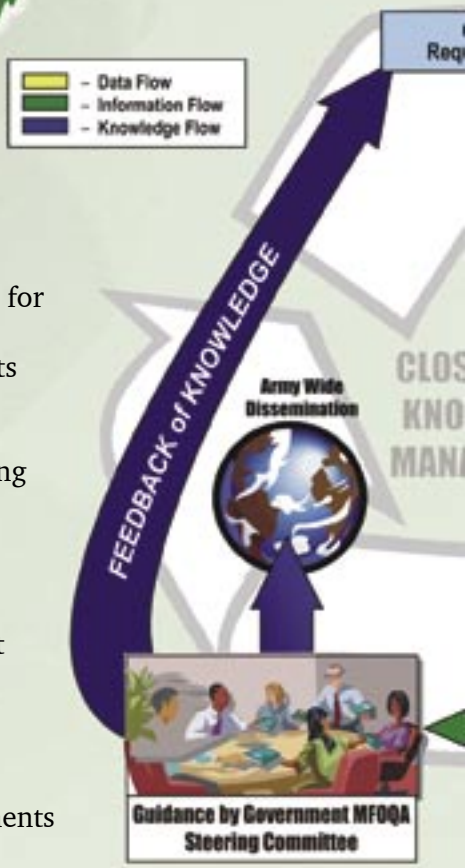
About an hour later we heard the sound of rotor blades to our southeast. There on short final were two Black Hawks carrying a fuel blivit and a FARP crew. We'd gotten through on the radio after all! The TOC had heard our first call requesting fuel and launched the Black Hawks to our location. For some reason we never received a radio reply. I didn't care—I was going back to Dhahran alive!

Situations can change very quickly. I thought there was nothing wrong with taking off for a 10-minute flight to make radio contact with the TOC. I also was frustrated that we were told there would be fuel at the airport when, in fact, there wasn't. Did this cloud our sense of *knowing* what was right and actually *doing* what was right? Changing situations affect how we process information and make decisions. If you could fly the same mission, what would you have done? Hindsight is always 20/20—trust me! ♦

—CW5 (Ret) Ramsey is an Aviation Systems Manager with the U.S. Army Safety Center, Fort Rucker, AL. He may be contacted at DSN 558-2932 (334-255-2932) or by e-mail at william.ramsey@safetycenter.army.mil.

Military Flight Operatio

Army Aviation Demonstration at Fort Rucker



The first question in your mind has to be, what is Military Flight Operations Quality Assurance (MFOQA)? Here's the short answer: MFOQA is the systematic collection and automated analysis of operational data from aircraft leading to continuous improvement in flight operations, training, maintenance, and safety (OTMS). It is a process that gives leaders and staff at all levels the knowledge necessary to anticipate problems, avoid costly surprises, and seize opportunities using the data recording capabilities that currently are embedded or may be installed in Army aircraft. Under the concept of MFOQA, data recorders may include flight data recorders, digital source collectors, health usage monitoring systems, and so forth.

In 2002, Fort Rucker's then-Commanding General, MG John Curran, recognized the potential of MFOQA to improve aviation readiness and reduce aviation accidents. He directed that a demonstration be conducted with the following objectives:

- Use recorded flight data to improve operations, training, maintenance, and safety.
- Identify resources and systems required to implement MFOQA across Army Aviation.
- Develop information flow from aircraft to all user levels.
- Define impacts on readiness.

Full support to the demonstration is being provided by the commanding generals of the U.S. Army Aviation and Missile Command (AMCOM); the Director of Army Safety; the U.S. Army Research Development and Engineering Command, Aviation Engineering Directorate; and Program Executive Office–Aviation. The MFOQA demonstration is conducted by an integrated team consisting of Army OTMS subject matter experts from throughout these organizations, with technical support and integration provided through contract with Westar. A steering committee, chaired by the Aviation Branch Safety Office and consisting of representatives of the above Army Aviation commanders, guides the program.

The benefits envisioned for Army MFOQA include:

- Prevention of accidents
- Improved cockpit discipline
- Improved flight training
- Reduced maintenance downtime
- Reduced maintenance test flight requirements
- Automation of aircraft records
- Improved aircraft operational readiness
- Identification of defective parts and components before failure
- Availability of timely after action reports, mission planning, and effective crew briefings

The MFOQA demonstration will use flight data recording devices existing in some school aircraft and will install "black boxes" in aircraft without current recorders, allowing for authentication of benefits derived from these devices to collect data that will be analyzed to influence OTMS. The initial demonstration will involve the following aviation school aircraft:

- AH-64D—10 each
- OH-58D—10 each
- CH-47D—5 each
- UH-60A—5 each

Army Aviation is not alone is developing MFOQA. In fact, evolution to the current MFOQA vision for Army Aviation began in the early 1960s with the installation of flight data recorders on British Airways aircraft to validate airworthiness criteria. Over the years, technological advances in data collection processes increased data availability

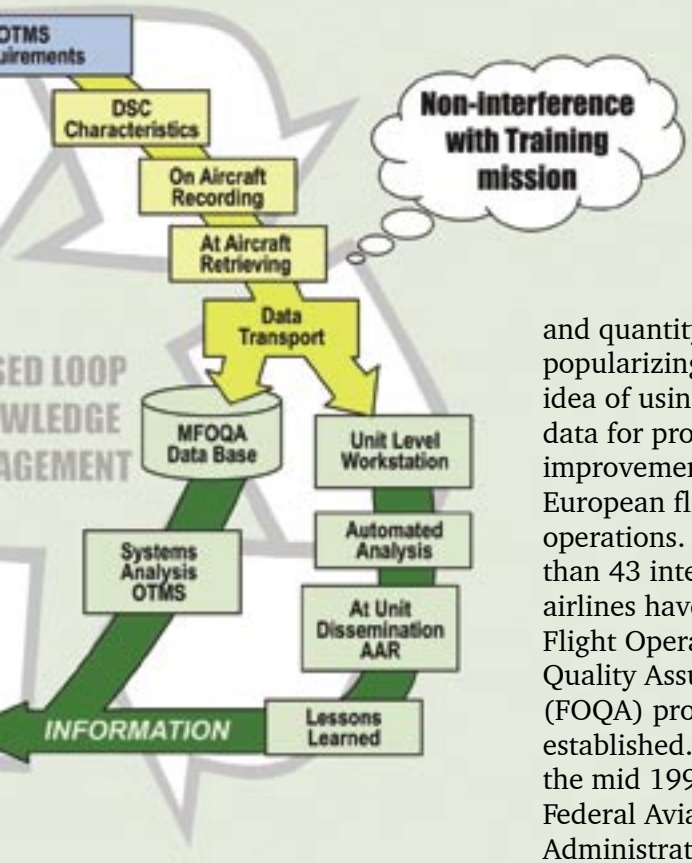


Figure 1. Overall MFOQA Process for Demonstration

and quantity, thus popularizing the idea of using the data for proactive improvements in European flight operations. More than 43 international airlines have Flight Operational Quality Assurance (FOQA) programs established. Since the mid 1990s, the Federal Aviation Administration (FAA) has encouraged U.S. airlines to establish similar programs. As a result, one regional and 12 major U.S. carriers have FAA-approved FOQA programs. In 2000 a Memorandum of Agreement between Army, Navy, Marine, Air Force, and Coast Guard safety chiefs endorsed pursuing military applications of FOQA to reap the proactive safety benefits being achieved in commercial aviation.

How will this demonstration be implemented? The overall process for conducting the demonstration is summarized in figure 1. The initial and most important point is to document and prioritize user information requirements. Using the digital source collectors available in the demonstration aircraft, data will be downloaded after each flight, run through a flight replay and analysis software program, and results fed back to instructor pilots, maintenance shops, and other Army end-users. Sample information screens from commercial off-the-shelf analysis programs are shown in figures 2 and 3. OTMS users will determine how well the results fulfill their requirements for information and prioritize additional capabilities needed. This provides a closed-loop "knowledge management" process that leverages technology to provide objective assessments to augment the aviation OTMS decisions that may be based today only upon subjective judgment and opinion.

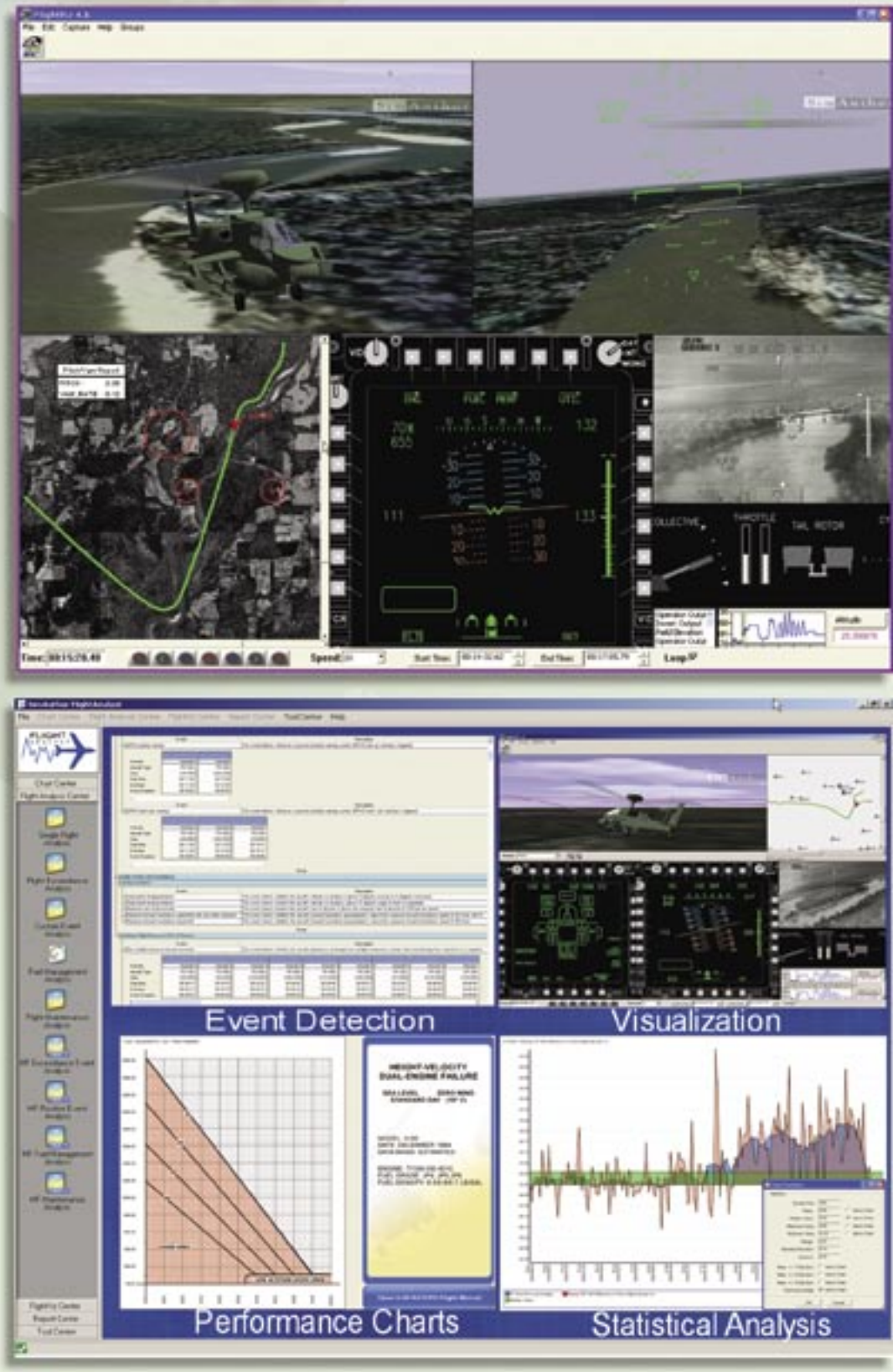
A support center will be established at Fort Rucker to complete the entire behind-the-scenes operations so users only have to concern themselves with what is happening at their MFOQA workstation. As users define changes in information requirements from the flight line, the support center will document information requirements, as well as make rapid configuration changes to meet those requirements. Changes that prove beneficial are kept; those that do not will be modified or removed as necessary to support users at the flight line.

An after action review analyst will be on the flight line to assist instructors and operations personnel. Additionally, a maintenance analyst will interact with the Aviation Center Logistics Command representatives. The MFOQA Team will demonstrate long-range benefits of an Army Aviation MFOQA Program throughout all OTMS disciplines. Users will accomplish this in operations and training by using information downloaded from actual training flights to conduct debriefings, as well as pre-mission briefings, for individual and multi-aircraft flights. Users also can use collected information for crew coordination training and assess the degree to which pilots are actually conducting operations to the standards published in Army Aviation training manuals. In the area of maintenance, users in this discipline can review and check collected information for exceedances after each flight, thus eliminating those occurrences where pilots are not sure exactly how much a limit was exceeded or for how long.

Lastly, as we know for every Class A accident, there are hundreds of instances where pilots are seconds or inches away from yet another Class A. The information captured during this demonstration will be used in the safety discipline to evaluate trends for close calls to see if there are maneuvers that need to be conducted differently, and also will look at how close to the "edge of the envelope" we are flying. As the demonstration flights kick off, policies and procedures will be implemented that establish the intended access to and use of the resulting information, and protect against potential misuse.

In short, MFOQA will help bridge the experience gap by enabling junior leaders to make wiser, more informed decisions because of the ability to store, retrieve, and analyze data into understandable information that will give them the knowledge derived from virtually thousands of aircraft flight hours and experience.

The Fort Rucker MFOQA demonstration is the stepping stone that will bring an objective, analytical process to Army Aviation OTMS. In short, MFOQA will help bridge the experience gap by enabling junior leaders to make wiser, more informed decisions because of the ability to store, retrieve, and analyze data into understandable information that will give them the knowledge derived from virtually thousands of aircraft flight hours and experience.



Figures 2 and 3. Sample infomation screens

The MFOQA Team plans to provide periodic updates as the demonstration progresses. We welcome questions and comments from the field. Please contact Walt Garner, Chairperson, MFOQA Steering Committee, at DSN 558-1866 (334-255-1866) or via e-mail at garnerw@rucker.army.mil. ♦

Accident Briefs

Information based on preliminary reports of aircraft accidents

CH-47

D Model

■ **Class B:** A crewmember was struck by lightning while in the prone position on the aircraft cabin floor while observing a sling load through the aircraft's hook hole. No other details were provided.

MH-6

M Model

■ **Class C:** The crew detected noises coming from the aircraft's rear following a standard autorotation. The aircraft was landed off the runway and shut down. All six main rotor blades were damaged and the tail boom was dented, indicative of main rotor blade contact.

MH-60

K Model

■ **Class C:** Aircraft struck another aircraft on final approach for landing. The parked aircraft suffered damage to its tail rotor blades and main rotor head.

OH-58

D(R) Model

■ **Class B:** Aircraft's main rotor blades and mast assembly were damaged during a demonstrated autorotation with a 180-degree turn. Initial collective was applied at about 35 feet above ground level, and the instructor pilot (IP) aborted the autorotation. He then applied all remaining rotor RPM to arrest the descent. Upon touchdown, the IP perceived difficulty with lowering the collective and executed a precautionary landing.

■ **Class D:** Aircraft experienced a hard landing during termination of a manual throttle approach. The crew reduced the throttle with collective application at about 30 feet, causing a reduction of main rotor RPM. The aircraft's cross-tubes spread during the landing and were replaced.

UH-60

A Model

■ **Class A:** Aircraft crashed during air taxi from the passenger drop-off point to the refuel point. The tail section impacted initially, and the aircraft overturned and came to rest on its left side. All four crewmembers suffered injuries for which they were medically evacuated.

■ **Class A:** Aircraft crashed after experiencing low rotor RPM conditions as the crew was executing a turn. No other details were provided.

■ **Class B:** Aircraft struck a fence while taxiing. The tail rotor and gear box separated from the aircraft as a result of the impact.

■ **Class C:** Aircraft's main landing gear entered a 4-inch hole on a roll-out landing in dust conditions. No other details were provided.

L Model

■ Class A: Aircraft encountered brownout conditions and experienced a hard landing in an unimproved landing zone. No other details were provided.

■ Class C: The cockpit airbags deployed as the aircraft's right wheel touched the ground during landing. No other details were provided.

RQ-7

Shadow Model

■ **Class B:** Air vehicle crashed into a cement telephone pole while conducting a reconnaissance mission. The vehicle's engine rose to 8,020 RPM, causing the ground control station to malfunction. The ground crew deployed the vehicle's chute, but the vehicle struck the pole and disintegrated upon impact.

■ **Class B:** Air vehicle crashed on short final about 300 yards short of the approach end of the runway on private property. No other details were provided.

■ **Class B:** Air vehicle crashed after its engine failed during flight. No other details were provided.

■ **Class C:** Air vehicle's arresting gear strap failed during a normal landing with the Tactical Automated Landing System. The vehicle's mission payload was damaged.

■ **Class C:** Air vehicle crashed into trees after its engine failed during flight. No other details were provided.

■ **Class C:** Air vehicle crashed after experiencing a loss of engine RPM shortly after launch. Recovery attempts to maintain altitude and descent failed.

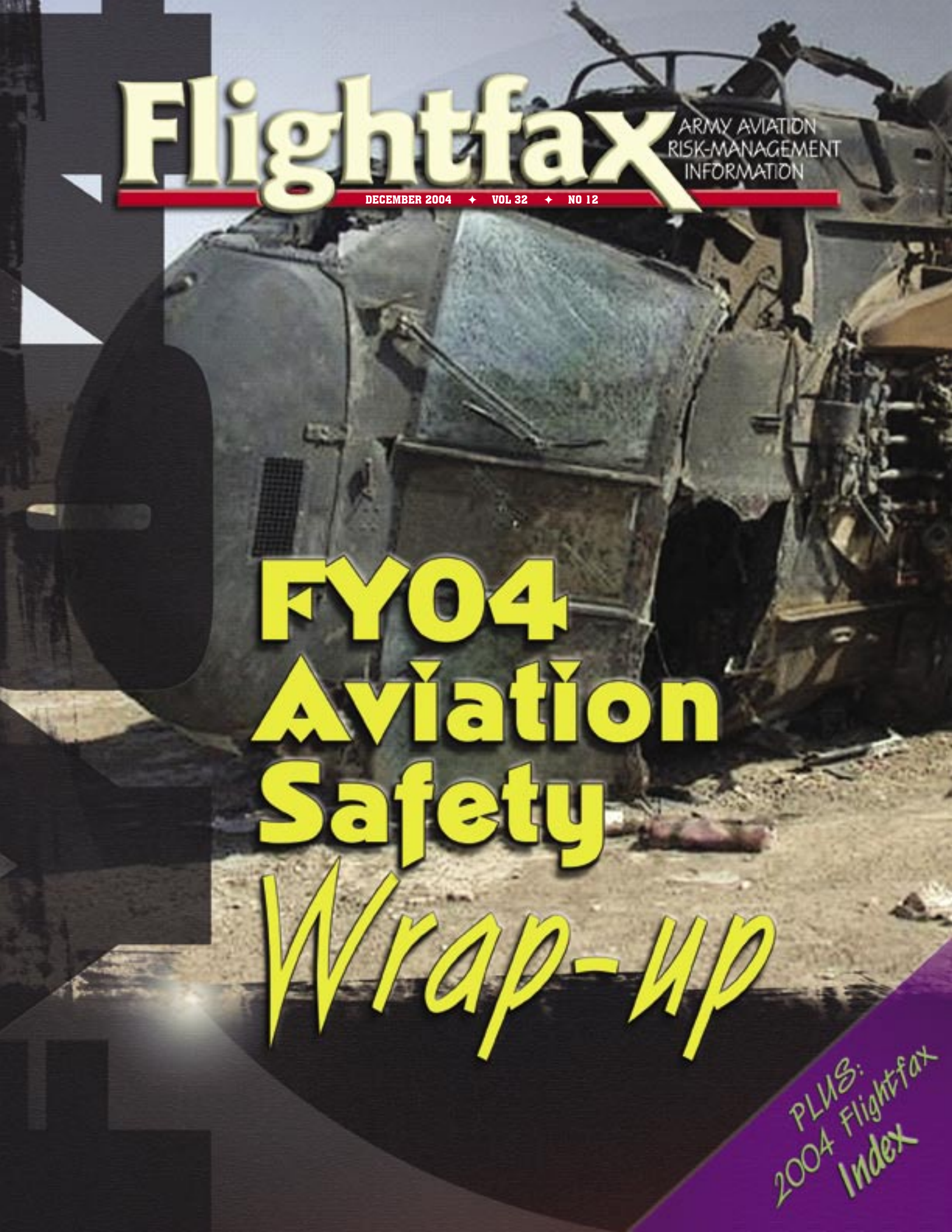
Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

Wire strikes are UNFORGIVING!

Are YOUR hazard maps current?

- Pre-mission planning of AO
- Speed control
- Adhere to established minimum en route altitude
- Ensure hazard maps are current

Flightfax
ARMY AVIATION RISK-MANAGEMENT INFORMATION
DECEMBER 2004 ✦ VOL 32 ✦ NO 12



FY04 Aviation Safety Wrap-up

PLUS: 2004 Flightfax Index

Flightfax

ARMY AVIATION RISK-MANAGEMENT INFORMATION

BG Joseph A. Smith – Commander and Director of Army Safety
COL John Frketic – Deputy Commander
Dennis Keplinger – Publishing Supervisor
Paula Allman – Managing Editor
Julie Shelley – Staff Editor
Danny Clemmons – Graphics
e-mail - flightfax@safetycenter.army.mil
http://safety.army.mil

U.S. ARMY SAFETY CENTER

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

DASAF's Corner

FROM THE DIRECTOR OF ARMY SAFETY

We're Listening!

As I travel around the Army, I continue to be impressed with the dedication and true grit of our Soldiers! We are an Army at War, transforming for the future. This means increased exposure and lots of changes. High OPTEMPO and change are the norm—not the exceptions.

Our Soldiers are mission focused. They don't want "admin or safety" to get in the way of progress. I agree and want to focus this month on how safety fits in the feedback we're getting from the field. Maybe it's the name "safety" that's getting in the way of Composite Risk Management (CRM). Performing solid mission analysis and using troop-leading procedures to reduce risk should be a good thing—not something that gets in the way.

CRM will help get us on the razor's edge and improve our chances of accomplishing tasks that appear very high risk or even impossible. So don't think safety; think CRM and get after it! My challenge to each of you: Look hard each day at what will kill you or our Soldiers and put control measures in place that will get the job done and still let everyone come back and brag about it. "See the enemy … see yourself." Before every mission, ask

"How can the enemy take me out, and what are the hazards that could cause an accident and take me out?"

There are many tools out there to help with CRM. You asked for them, and we are listening. Listed below are your comments, followed by what we are doing to respond.

"**Good tools, but poor connectivity**." Just like AKO Lite, we now have "Safety Lite" on the Safety Center homepage at **https://safety.army.mil**. The system will log on automatically with the most efficient connection based on your bandwidth. The Risk Management Information System is also now on SIPRNET. Log on and try these tools out!

"**Commander's Safety Course—not good**." An entirely new version of the course will be available online by the middle of this month. It's modular in design and easy to change based off your feedback. The initial test came back with great reviews.

"**We need an online course for additional duty safety officers**. **The Commander's Safety Course won't cut it**!" The Safety Center agrees. A new course focused on NCOs, also modular, will be available online later this month.

"**Driver's training is weak**." The Army Safety Coordinating Panel, made up of Army senior leadership and Major Command representatives, is tackling this issue head-on. A new task force is headed your way to quickly beef up both tactical and POV driving skills.

"**Negligent discharges: There are too many different standards for weapons clearing**." Sergeant Major of the Army Kenneth O. Preston recently attacked this issue to clarify clearing procedures. The July 2004 *Countermeasure* included an insert that covers all currently issued U.S. Army weapons. You can download the pamphlet from our Web site at **https://safety.army.mil/pages/media/pubs/cm/safeweaponpullout.pdf**.

"**Aircrew coordination training needs improvement**." Since 1997, 50 percent of all aviation accidents have had some causal factors associated with crew coordination. The new Aircrew Coordination Training Enhancement Program is on the street and being taught by the Directorate of Evaluation and Standardization. Aviation units—if you're not scheduled yet, ask for assistance!

"**Risk management training needs to be reviewed from the bottom up**." TRADOC will publish a new version of Field Manual 100-14 in Third Quarter 2005. By the way, all three modules of the Army Safety Management Information System risk management tool are now on our Web site. The POV version has been out the longest and with much success. To date, we've had over 120,000 assessments completed with only one POV fatality. Putting risk management in Soldiers' faces works!

There are lots of other ongoing initiatives to move us toward predictive analysis of accidents. Until then, my message is simple: Managing composite risk will move 'ya to the edge to get the tough jobs done, and now there are plenty of tools available to get after it.

Get the job done and bring 'em all back home!

Joe Smith

FY04 Aviation Safety Wrap-up

Charisse Lyle
U.S. Army Safety Center

It's time to assess how Army Aviation did in fiscal year (FY) 2004. Overall, we experienced 103 aviation Class A through C accidents, costing the Army more than $131 million. Engine overspeeds and overtemps were the most common events in these accident categories, followed by tree strikes. According to the accident reports so far, 41 percent occurred in Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF). That's a disturbing trend considering some delayed reporting will make that number go even higher. There were 26 Class A aviation accidents, slightly better than 29 last year. The FY04 Class A accident rate also was lower than in FY03 (2.4 versus 2.7 flight accidents per 100,000 flying hours, respectively).

A total of 12 Soldiers died in FY04 in comparison to last year's 34 aviation fatalities. Two of the fatal accidents involved wire strikes, two were inadvertent instrument meteorological conditions (IIMC) mishaps, and one was the result of abrupt maneuvers that caused unsecured equipment to jam the flight controls.

A total of seven aviation fatalities and 81 percent of the Class A accidents occurred in OEF and OIF. Crew coordination errors, poor mission planning, and failures to adhere to standards were manifested in wire strikes and brownout-related accidents. There were four wire strikes, two Class As and two Class Cs, all occurring in Iraq. Of the brownout-related accidents, 86 percent occurred in theater and 83 percent involved multi-ship operations. The environmental conditions directly contributed to loss of aircraft control during takeoff or landing, hard landings, or collisions with unseen hazards in the landing zone (LZ).

Airframes

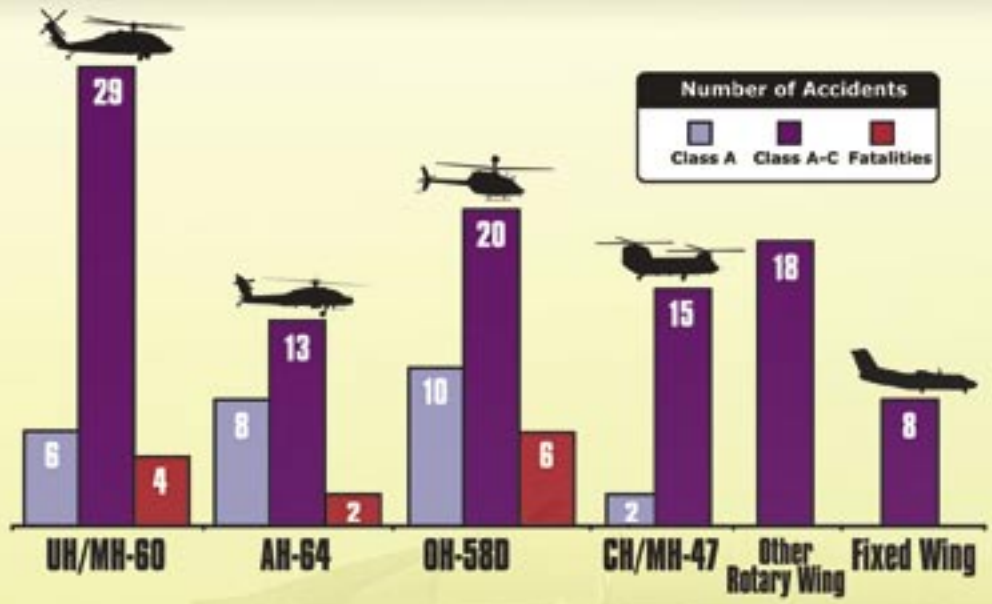
The chart on the next page depicts the accident number breakdown by accident class for each aircraft type.

UH/MH-60 Black Hawk—(28 percent)

The Black Hawk accounted for 29 Class A through C accidents, more than any other airframe, claiming the lives of four aircrew members. IIMC was a contributing factor in two accidents and three crewmembers' death. The fourth fatality occurred when a UH-60L pilot executed an abrupt cyclic maneuver that caused unsecured equipment to jam

FY04 Aviation Accidents

(Flight, Flight-Related & Aircraft-Ground)



the flight controls.

In three accidents, the main rotor blades struck the AN/ALQ-144 or tail rotor driveshaft because of a hard landing or excessive aft cyclic inputs while landing. Four engine hot starts were reported and caused Class C damage. There was also one Class C wire strike that involved a UH-60.

OH-58D Kiowa Warrior—(19 percent)

Twenty accidents occurred in the OH-58D, causing six fatalities. The loss of two OH-58Ds and the deaths of four Soldiers were attributed to poor planning and failure to conduct an adequate composite risk assessment. There were three wire strikes in Iraq, two Class As and one Class C, claiming the lives of four crewmembers. In two of these accidents, the crew was flying over a river. Two of the wire strikes occurred at night and one during the day. In the day accident, solar glare possibly degraded the pilots' ability to detect the cable. In all of these cases, the crews failed to combine the risks associated with the combat operations with the environmental hazards of terrain flight.

In another incident, while conducting a two-ship NVG mission during OIF, the crew encountered fog over an area of low contrast on a dark night. The crew failed to properly execute the IIMC procedures, became disoriented, and lost control of the aircraft, causing it to impact the ground at a high rate of descent. Both crewmembers were killed.

Four accidents were caused by definite or suspected engine failures. A Full Authority Digital Electronic Control (FADEC) failure is suspected to have caused one of the accidents. Another Class A accident occurred due to a pilot-induced rotor droop due to the aggressiveness of the maneuver, coupled with the environmental conditions and aircraft configuration. The aircraft was destroyed and the crew suffered fatal injuries. In another Class A (OIF), the tail rotor contacted the ground during a firing mission while at an in-ground effect hover.

AH-64 Apache—(13 percent)

The Apache had eight Class A, three Class B, and two Class C accidents. In one fatal accident, both pilots fixated on a passing aircraft. While both pilots were flying with the helmet-mounted display unit, voice data showed they were more concerned about why the passing aircraft was flying so high rather than noticing that their aircraft was too low. Consequently, their aircraft continued to descend into 90-foot trees.

Auxiliary power unit (APU) clutch failures caused in-flight fires and Class A damage in three

aircraft. The crews of all three received warning light indications and were able to execute a controlled landing and egress without injury. As a result of the APU failures, the Apache Project Manager released Safety of Flight Message AH-64-04-01, established new maintenance procedures to resolve the problem, and developed a more reliable clutch. For more information, see the cover story in the May 2004 *Flightfax*, "APU Clutch Failures Cause Damage in Apaches."

CH/MH-47 Chinook—(15 percent)

Chinooks had two Class A, four Class B, and nine Class C accidents. There were no CH/MH-47 fatalities. Four of the Class A through C accidents occurred in theater during OEF- and OIF-related operations, including two Chinook brownout accidents. In one Class A, three CH-47 aircraft were in free cruise formation when they entered a dust storm. As the flight slowed, Chalk 2 was forced to rapidly maneuver out of the formation. Chalk 2 descended and attempted to land while the other two aircraft initiated IIMC breakup procedures. The pilot of Chalk 2 lost visual reference with the ground due to brownout but elected to continue the approach. The aircraft drifted to the right and impacted the ground, causing extensive damage.

Another Class A accident ended in extensive aircraft damage and minor aircrew injuries. The pilot initiated an aggressive deceleration from 60 knots and, prior to dissipating sufficient forward airspeed, initiated an aggressive left turn to reverse course. As the aircraft turned through 180 degrees while descending, the pilot attempted to arrest the turn and descent without success. The rapid decelerating turn and subsequent downwind condition caused the aircraft to enter aerodynamic settling with power. The pilot's flight control inputs exacerbated the situation, and there was insufficient altitude to recover.

There were two Class Cs involving loss of a CH-47D door in flight. In both cases, the door did not strike the aircraft after it separated. Aviation Safety Action Message CH-47-96-ASAM-09 addresses the potential for failure of the aft pylon clamshell doors and provides inspection and repair procedures.

Fixed wing—(8 percent)

There were four Class B and four Class C fixed-wing accidents. Four of the accidents involved C-12 and C-35 engine overspeeds, and two were in-flight lightning strikes. Another accident occurred when an aircraft struck a deer that darted across the runway during landing. The final accident involved a tire blowout caused by a hard landing.

Summary and recommendations

The Army lost five people and two aircraft to IIMC accidents in FY04. Brownout and whiteout contributed to nine accidents. Many missions are conducted at night when terrain is often of low contrast and little definition; some flight crews find themselves in instrument flight conditions even though there are no clouds. The Army Aviation Center Directorate of Evaluation and Standardization (DES) identified poor training in degraded environmental conditions as a problem across the Army. There are basic crew and pre-mission planning actions common to all of these circumstances. Accidents occur when crewmembers are not prepared to transition to heads-up displays (HUDs) or instruments when encountering extreme environmental conditions. Ensure all flight crews are proficient in instrument flight procedures before arriving in theater.

Effective crew coordination training is essential. Every crewmember must stay actively engaged in identifying hazardous conditions. Mission planning for every flight must include pre-planned crew coordination elements. Aircrews conducting missions involving known high workload conditions, such as brownout landings, should discuss and clearly delineate each crewmember's responsibility before the flight.

Aviation units should use the AN/AVS-7 HUD with NVGs whenever possible. The additional information the HUD provides can improve overall flight crew situational awareness during limited visibility conditions. Commanders must ensure crews are trained effectively on the system using a crawl-walk-run methodology included in the unit training plan. ♦

Editor's note: These statistics are current from the Safety Center database as of 3 November 2004. Delayed reports and follow-up details on preliminary reports could change the statistics, figures, and findings.

—Ms. Lyle is a Research Psychologist in the Operations Research and Systems Analysis (ORSA) Division. She can be reached at DSN 558-2091 (334-255-2091) or via e-mail at charisse.lyle@safetycenter.army.mil.

Investigators' Forum

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

RSOI— The Importance of Proper Integration

MAJ Steven Van Riper
U.S. Army Safety Center

With increased mission tempo and ever-changing operational environments, reception, staging, onward movement, and integration (RSO&I) operations become a vital link to ensuring units are set up for mission success. In particular is the last and most crucial phase: integration.

The flight of three CH-47Ds, based at Logistics Support Area Anaconda (Balad, Iraq), headed southeast in a free cruise formation at approximately 130 knots and with an altitude of 300 feet above ground level (AGL). Approximately 1 hour into the mission, the flight encountered blowing sand, which led to a rapid decrease in visibility. Chalk 1 announced to the flight that he was slowing to 90 knots. Chalk 3 acknowledged the speed change, but Chalk 2 did not. As the flight began to slow, Chalk 2 began to overtake and overfly Chalk 1. Chalk 2 executed a right turn. The pilot on the controls lost sight of Chalk 1 during the turn, so the pilot in command (PC) took the controls. As a result of the right turn and an inadvertent climb, Chalk 2 was now at 600 feet AGL. At the same time, the flight engineers and crew chief lost visual contact with the ground and other aircraft in the flight. The PC stabilized the aircraft and descended to 200 feet AGL. As the visibility continued to decrease the PC, who still had visibility with the ground, decided to land and wait until the weather passed. Chalks 1 and 3 initiated inadvertent instrument meteorological conditions (IIMC) break-up procedures and recovered to their base airfield without incident.

At approximately 50 feet AGL, with near zero airspeed, Chalk 2 became enveloped in a dust cloud. Although the PC had no visual contact with the ground, he chose not to apply sufficient power to execute a go-around and continued for landing. The aft right landing gear struck the ground and was torn from its mounting points. The initial impact caused the aircraft to rebound upward and to drift to the rear. The aircraft struck the ground a second time within the right aft quadrant of the fuselage, in the vicinity of the ramp. The aircraft then began to roll to the right until coming to rest on its right side. The crew suffered minor injuries, however the aircraft was destroyed.

Lessons learned

The accident investigation revealed the aircrew did not receive adequate environmental training upon arrival in theater, nor did they complete the integration phase of RSO&I as outlined in the theater's Helicopter Procedures Guide (HPG).

Proper application of integration principles provides the commander with a better understanding of a specific unit's capabilities and limitations. A subordinate unit's capabilities and limitations must be known to the commander so he or she can effectively identify, assess, and control risks arising from operational factors and make decisions that

balance risk cost with mission benefits (Field Manual (FM) 100-14, *Risk Management*, Chapter 1).

The integration phase is the synchronized transfer of authority over units and forces to a designated component or functional commander for employment in the theater of operations (FM 100-17-3, *Reception, Staging, Onward Movement, and Integration (RSO&I)*, Chapter 6). There are two prerequisites for unit integration:

1. The unit must become operation and mission ready. It must be able to move, fight, and communicate at nominal levels of capability.
2. The unit must be absorbed into the joint force and be able to communicate and receive command and control from its higher headquarters (FM 100-17-3, paragraph 6-2).

When developing the commander's integration plan, the staff must provide realistic options that take into account mission tempo, the tactical situation, available time, and the operating environment. Some tactical situations may demand immediate employment of assets. In these cases, commanders may have to accept the risk incurred by the lack of formal mission and environmental training. Proposed courses of action (COAs) should include quantifiable metrics that enable the commander to track the unit's integration progress.

Examples of quantifiable metrics include status of right seat and left seat rides, academic training progress, and any number of administrative actions ranging from aircraft status reports to personnel availability. The CJTF-7 HPG spells out requirements for aircrews:

"After arrival in CJTF-7 AOR, during unit integration training, all aircrews must demonstrate flight proficiency in the following tasks: single and multi-ship VMC takeoffs, VMC approaches, low-level flight, IMC recovery procedures, and hovering flight. For newly integrating units, commanders must conduct day flight rehearsals prior to conducting multi-ship NVD missions. Commanders are not limited to these required tasks and will identify and train on tasks essential to the accomplishment of their mission prior to commencing normal operations. In addition to environmental training, CJTF-7 aircrews are to undergo the following integration tasks as determined by their particular airframe…" (CJTF-7 HPG, paragraphs 6-8).

The unit's progress during the integration process provides the commander with invaluable information. This information provides the foundation for decisions involving the unit's employment timeline, sustainability, and supportability.

The unit had been in theater only 6 days. The mission tempo was extremely high when the accident unit arrived in theater. Nearly all available CH-47Ds were required every night to complete combat and combat support missions. This constant requirement for mission crews and aircraft generation did not allow the unit to complete RSO&I, specifically integration, in accordance with FM 100-17-3 and the CJTF-7 HPG. The unit did not receive any task force-sponsored integration. The aviation task force commander did not ensure the incoming unit was fully familiarized with command organization, mission, duties and responsibilities, terrain, and logistical support. The company commander charged with performing the integration task for the new unit did not follow a structured integration plan and did not provide the task force commander with any status reports. Most notable is the lack of mission integration. Although the unit did participate in the minimum required integration training at Udairi Airfield, the task force commander did not ensure time was allotted for orientation flights, additional environmental training, and mission-specific training. According to individual records, none of the non-rated crewmembers received any documented orientation flights at Udairi Airfield or in theater. The lack of structured integration resulted in the unit conducting on-the-job training while performing missions. In tactical situations demanding immediate employment of assets, commanders may have to accept the risk incurred by the lack of formal mission and environmental training. Given this set of circumstances, time—although minimal—was available to conduct a structured integration plan.

Conclusions

Leaders who successfully integrate units within their command will employ those units at their maximum potential while applying the principles of risk management. Staffs must provide commanders with realistic integration options based on the tactical situation and operational environment. A structured and relevant integration process ensures commanders will have the ability to assess, manage, and mitigate risk while the unit becomes mission ready. ♦

—MAJ Van Riper is the Chief of Attack/Scout Branch, Investigation Division, U.S. Army Safety Center. He can be reached by calling DSN 558-2131 (334-255-2131) or via e-mail at steven.vanriper@safetycenter.army.mil.

Investigators' Forum

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

Good Crew *Mix* Essential for Mission Success

Too many times people undertake tasks they don't fully understand or for which they are not prepared. This includes aircraft crews. It is not uncommon to have two aviators flying an aircraft in which they have only a few hundred hours between them. Such crew mixes bring on a whole new challenge in the arena of crew coordination.

The mission was a "routine flight" for aircrew training manual (ATM) proficiency at night in the local training area. The crew of the AH-64 reported to work in the afternoon to meet the requirements for crew rest to fly the night mission. They preflighted the aircraft, did the performance planning during the afternoon, got the company commander's approval on the risk assessment, and then returned to the aircraft at about 2030 local. Since this was ATM training the crew calculated the risk assessment as low, when in fact it was a medium-risk mission. The company commander did not correct this mistake.

The pilot in command (PC) was selected as a PC a couple of months earlier and had moved from flying in the front seat to flying in the back seat. He had less than 500 hours total flight time. The pilot (PI) graduated from flight school about 8 months earlier and had not flown with anyone other than an instructor pilot (IP). He had just over 200 hours of total flight time.

The crew proceeded to the local flying area and began their ATM training. Shortly before 2 hours of flight time had passed, the PC decided it was time to return to the airfield. Before they departed the training area, the PI asked the PC questions about cooperative rocket firing, in which the PC had difficulty explaining the procedure. He told the PI to wait until they returned to base and he would get out the books and go over the procedure.

While on the controls, the PC made a radio call and the aircraft took off to the north to intercept the flight route off the range. The controlling agency told the crew there would be a CH-47 transitioning along the route as their only traffic. The PC responded that they would follow the CH-47 off the range.

As the aircraft proceeded north, the PC overflew the route and became disoriented. When he determined his position, he continued north and overflew the northern route, crossing in front of an MH-47 that was transitioning onto the range. The PC became confused and thought the MH-47 was the CH-47 he was supposed to be following. The route altitude was 500 feet and the aircraft was at 700 feet, so the PI told the PC to check altitude. The PC began a slow descent and turned east.

The crew continued to watch the MH-47, which they thought was the CH-47 going in the wrong direction. Unfortunately, both pilots

watched the MH-47 for almost a minute and a half, never recognizing that their aircraft was descending. Suddenly, the AH-64 struck treetops approximately 75 feet above ground level and tore off the target acquisition designation system, pilot night vision system, the left missile and rail, and part of the left wing.

The PC increased the power to above maximum power available and began a cyclic climb. At about 600 feet the PI told the PC, "Low rotor!" The PC continued to climb with power above maximum power available, and the rotor RPM continued to decay. At approximately 1,000 feet the aircraft began to spin to the right and descend. The PC did not seem to be aware of his power available, which he had predicted before the mission, and the affect it would have on the engines and tail rotor effectiveness if he continued to pull more power than was available. The aircraft continued to spin as it descended because the PC continued to hold the collective in the full-up position. The PC thought he had a tail rotor malfunction, so he told the PI to chop the engines. The PI never found the button to chop the engines. At this point, the rotor RPM had decayed beyond the point where the crew could have brought it back to a normal operating RPM. At about 200 feet the electrical power was lost due to the low rotor RPM, and the aircraft crashed in a marshy wooded area. Both pilots suffered fatal injuries.

The aircraft continued to spin as it descended because the PC continued to hold the collective in the full-up position. The PC thought he had a tail rotor malfunction, so he told the PI to chop the engines. The investigation determined the crew did not have enough emergency procedure training to recognize that this was not a tail rotor malfunction.

Lessons learned

■ **Poor cockpit coordination and instrument scan**. The crew became so fixated on the MH-47's actions that they failed to perform the required crew coordination, as well as cross-check their altitude or airspeed, their helmet-mounted display unit, or the aircraft night vision system. The crew lost situational awareness when the aircraft night vision systems were knocked out, and neither crewmember properly transitioned to night unaided flight.

■ **Poor crew selection**. The PC delayed initiating any emergency procedures because of his lack of experience and lack of knowledge of emergency procedures. The investigation determined that had he or the PI been flying with a more experienced pilot, the aircraft may not have been allowed to descend into the treetops and, if it had struck the trees, a more experienced pilot would not have overcorrected with excessive power inputs.

■ **Inadequate training**. Despite the gravity of the situation, the crew should have realized that the first thing required in either a tail rotor malfunction or loss of engine power is to lower the collective (reduce power) to regain rotor RPM and decrease torque requirements. Neither crewmember reacted to the first emergency—the tree strike—properly and flew the aircraft into an uncontrollable situation. Both crewmembers displayed a lack of emergency procedure and power management training.

Commentary

Although it did not contribute to the accident, the investigation found that the PC was not wearing his shoulder harness properly. The harness was worn so loosely that it allowed him to hit the instrument console during the crash.

Both pilots' helmets were damaged. The PC's helmet came off during the crash. His helmet was too large, and the fitting pads he had installed to make it fit possibly contributed to the helmet coming off. The PI's helmet had a hole punched through the visor and the helmet, and the PC's helmet was broken just above the right ear cup protrusion.

Was this accident caused by hitting treetops, or after everything is said and done, did the accident occur because these two pilots were not a good crew mix? ♦

—Comments regarding this article may be directed to the U.S. Army Safety Center Accident Investigation Division at DSN 558-9552/3410 (334-255-9552/3410).

WAR Stories

There I was...

CW4(P) Montie Vanlandingham
CAARNG
Mather, CA

KNOW YOUR CREW LIMITS

The mission took place on a beautiful California morning after several weeks of coordination between military and federal agencies. As pilot in command (PC) of my National Guard detachment's C-12T2, I was to transport key military and civilian personnel, including The Adjutant General (TAG), to California's southern borders. From there we were to link up with UH-60s for aerial transport along the California and Mexico border.

After pre-flight, I rechecked all the required flight information I would need, such as NOTAMs, flight plans, and performance planning and reviews (PPRs). The weather along our route of flight was perfect—except for the 98-degree heat—and after weeks of coordination it looked as though the mission would go off without a hitch.

My copilot just completed the fixed-wing multi-engine qualification course and readiness level (RL) progression within the unit. As the unit instructor pilot, I was to provide him with additional training on the performance of operational missions. Unlike most individuals who have just completed a qualification course or RL progression, my co-pilot was a highly decorated and seasoned Army Aviator. His experience had begun in early 1968 in the jungles of Vietnam flying OH-6s, and since then he had flown almost any mission imaginable in countless types of aircraft. Before flying C-12s we both had flown together in the Reconnaissance and Interdiction Detachment (RAID) program, where I found him to be a highly professional, respected pilot and friend. Today was our first flight together in many years, and we both were looking forward to it.

After the passengers were briefed and last-minute coordination was completed with staff personnel, we

departed for our destination. My copilot was at the controls. Following air traffic control (ATC) instructions, we climbed to 14,000 feet and leveled off at 17,000. While waiting for clearance to our final altitude of FL 230, we rechecked all checklist items and began settling in for the 1½-hour flight. The TAG checked with me to see what our updated estimated time of arrival would be at our first destination, since our timeline was critical. At the same time, ATC cleared our aircraft to FL 230. My copilot acknowledged the call, and I gave him the thumbs-up to begin the necessary climb and turned back to the TAG. After about 90 seconds I turned around and instinctively focused on the instruments. I immediately saw the letter "E" preceding the numerical readout, which indicated an inlet turbine temperature (ITT) exceedance and gas turbine speed (N_1) overspeed on the right engine. I quickly reached up to pull the power levers back and bring the engines within normal operating limits. My action startled the copilot, who immediately began looking over the instruments to find the problem. He still wasn't able to locate the problem after several moments, so I explained it to him.

The Engine Trend Monitoring System showed a recorded ITT exceedance of 93 seconds, approximately the same time I was focused outside the cockpit and on the passengers! After reviewing the emergency procedures and the aircraft operator's manual, we decided to take the safest course of action and return to home base from our current location. The operator's manual and checklist are vague on the appropriate course of action during this situation. We informed ATC of our intentions, and I briefed the passengers on the situation. We made it back to home base without further incident.

After 19 years in Army Aviation, it never ceases to amaze me how things can go wrong in just a matter of seconds. We were fortunate that no injuries or deaths occurred in this incident. After an in-depth debriefing of the events that occurred, the investigation brought forth several key issues. The co-pilot was unaware of the need to reduce power during a rapid climb when a high power setting was already applied. Once the aircraft was placed into a steep climb profile—therefore reducing the amount of air for appropriate cooling—the ITT temperature rose above critical operating limits and a subsequent N_1 overspeed occurred. This is more of a concern during seasonal high temperatures, regardless of altitude. This lack of knowledge, along with inappropriate scanning of the flight instruments, helped lead to the problem. The copilot also wasn't aware of certain instrument functions—a problem that could have been resolved during initial aircraft flight qualification. However, current Army contract simulator training facilities do not have these types of simulators available.

This factor I believe to be the most important: I was the PC, and my attention was diverted outside the cockpit. I was overconfident in the copilot's abilities to recognize not only the exceedance readings on the instruments, but also the aerodynamic factors that cause them. Our casual attitude in the cockpit due to the decreased workload also contributed to the incident.

As responsible and professional crewmembers, we must always be cognizant of other crewmember's abilities and limitations, as well as our own. This, along with continual training and reinforcement of the basics of crew coordination, will lead to safe and successful missions in the future. ♦

—CW4(P) Montie Vanlandingham is the Commander of Detachment 32, OSA, CAARNG, Mather, CA. He may be reached by calling DSN 466-3980 (916-843-3980) or via e-mail at montie.vanlandingham@js.ca.ngb.army.mil.

Thanks to CW2 Stephen Isle of the CAARNG who worked to get this article published.

WAR Stories

There I was...

The weather SUCKED!

CW4 Edward McIntyre
HHC, 1-168th
Camp Murray, WA
WAARNG

It was 1986 and there I was … a brand new WO1 just out of flight school having a ball on my first flight without an instructor pilot (IP). I was stationed in Germany to a corps asset company, which meant we completed a variety of missions—air assaults, long-range patrol, and general support. It was a great place to learn as a "Wobbly One."

I had just been signed off as Readiness Level 2, and one of the more gung-ho unit trainers wanted to go on a Friday instrument flight rules (IFR) training mission. We took off IFR from Schwabish Hall and headed north to a German army base to refuel and return to IFR. On the way to refuel we noticed the automatic direction finder (ADF) was inoperative, but we didn't think it was an issue since we were in and out of the clouds during the flight.

When we landed at the base, a German weather briefer told us the weather would turn bad going south, but not for at least 4 hours. Since we needed an ADF to complete any approach into Schwabish Hall due to the missed approach procedures, my pilot in command (PC) called and got the OK to return visual flight rules (VFR).

It was getting late as we departed for home and the weather was not exactly as the weather briefer briefed us. I noticed the mounting tension in my PC's voice. When I asked him why he was so tense, he responded that the weather sucked, which meant we didn't have the option of going IFR; it was getting late, it was getting dark, we were low on fuel, and did I mention the weather sucked?

I may have been a "Wobbly One," but I was smart enough to know the PC was getting in a little over his head … and I was unable to help him! I had been out of the traffic pattern only twice at Schwabish Hall,

and the European maps didn't make much sense to me yet.

On the return trip, I was flying and the PC was navigating. It soon became dark and the weather got worse. The PC, trying to read the map in a dark cockpit and navigate in bad weather, detected the autobahn ahead. He suddenly realized where we were and took the controls and gave me the map.

Things got worse. The weather deteriorated when we crossed the autobahn and we were down to about 450 pounds of fuel. Then, out of nowhere, four very large electrical lines appeared in front of our windscreen. The PC pulled the collective up, and I lost sight of the cars on the autobahn. I figured we were going inadvertent instrument meteorological conditions (IIMC). We made it over the wires and came back down through the mist until we could see the cars again.

We flew down the autobahn another 250 feet until the next off ramp and landed inside the cloverleaf. By this time rain was POURING down! During the landing, the PC's windows fogged up because the heater quit. I could still see out the window on my side, so the PC gave me the controls. We landed safely without incident soon after the rain let up. I was pretty happy to be on the ground and thought we should just stay there, but then again I was a WO1. The PC determined we were only 25 miles from home and thought we could make it since the weather cleared.

We took off toward home with the PC on the flight controls and me on the map. We hadn't been in the air long and were at about 15 feet above ground level when telephone wires appeared ahead of us. At first the PC didn't see the wires, and I was about to take the flight controls and pull the collective for all I was worth. However, he saw the wires in time and averted disaster. The PC decided to follow the wires to a small town, where we landed in a farmer's backyard. We called operations from the farmer's phone and told them we would have to wait until the next day to come home. Since we were so close to the base, the first sergeant sent us some sleeping bags and MREs. Sleeping in the Black Hawk on an extremely cold night in the pouring rain was miserable. Looking back, it was better than being in a never-ending sleep!

That night my Army Aviation career almost ended before it even started because we "had to get home." Don't fall into the same trap. Play it safe when it comes to bad weather. The alternative to being delayed is never making it home. ♦

—CW4 McIntyre may be reached by calling (360) 438-8458 or via e-mail at edward.mcintyre@us.army.mil.

2005 Gunnery Conference 25-28 January

All Active/National Guard/Reserve unit commanders, master gunners, and standardization pilots are tentatively invited (pending formal approval) to the 2005 Gunnery Conference. Conference dates are 25-28 January 2005 at Murphy Hall, Bldg. 5206, Minuteman Avenue, Fort Rucker, AL. TDY is at unit's expense. Formal invitations will follow.

—For more information, contact CW4 Mike Wells, DOTD-Gunnery Branch, U.S. Army Aviation Center, DSN 558-2621 (334-255-2621), e-mail michael.wells@rucker.army.mil.

Smoke in the Cockpit

CW4 Rick Williams and
CW4 Kerry Lambert
Fort Rucker, AL

The oxygen system in a fixed-wing aircraft is hardly—if ever—used in flight. The pressurization system maintains the aircraft cabin at a comfortable altitude. The oxygen system is reserved for certain emergency situations, including smoke or fumes in the cockpit. Let me tell you about one of those situations . . .

We were to depart Cairns Army Airfield, Fort Rucker, AL, on a cross-country flight to San Antonio, TX, in a C-12D1. The weather at the departure and destination airports was perfect; however, the en-route weather was a different story. There were significant meteorological information (SIGMENTs) and airman's meteorological information (AIRMETs) galore for low ceilings in Louisiana and lines of thunderstorms along the entire Gulf Coast. Since the destination weather was good, no alternate route was required. But we had asked maintenance to have the plane "topped off" with fuel the previous day just in case we had to deviate around the storms.

When we arrived that morning for preflight, the airplane had only a standard fuel load, leaving us with only about 4.5 hours of fuel for a planned 3-hour flight. If we'd had a full fuel load, it would've given us over 5 hours of flight time and a lot more room for the expected deviations around the thunderstorms. The preflight was fine, except for one write-up on the air conditioning (a/c). There was a problem with the associated vent blower, and the operation of the a/c was restricted to in-flight use only. Fortunately, it was pretty early in the morning and the temperatures were still

cool, so not having the a/c on the ground was not excessively unpleasant.

It was just our luck that morning that our departure time coincided with the Initial Entry Rotary Wing launch period, which is an exodus of assorted aircraft (mostly orange and white TH-67 helicopters) all trying to take off at the same time from Cairns. This led to a 30-minute delay while holding short of the runway with both engines running, waiting in line for our turn to take off. This cut our extra fuel even more, but we still had an hour of reserve fuel. We also were wishing that we could use the a/c on the ground now. Once we got into the air, we immediately "cranked up" the a/c and started getting comfortable.

We entered the area of low ceilings, poor visibility, and developing thunderstorms about 30 or 45 minutes later. At FL 240 it wasn't much of a problem, but we soon could see that we would have to deviate north of our planned route to avoid the lines of thunderstorms that were already building. As our deviation requirements increased, our extra fuel decreased. We knew now that a fuel stop in Louisiana would be wise. We started listening to the Automatic Terminal Information Service for the nearby airfields. Everyone was down to around 300-foot ceilings and visibility under a mile. We settled on Lakefront (KNEW) because they had contract fuel and were above minimums for the instrument landing system (ILS). During the descent and approach into KNEW, we thought we smelled something burning—something electrical, but we attributed this to pollution sources around the airport. Eventually the smell in the cabin dissipated, or we otherwise became used to it. Nevertheless, we made an oath to check it out while we were on the ground.

The approach and landing at KNEW were uneventful, and we picked up the runway about a mile out on the ILS. The ground checkout revealed no apparent electrical problems, so we dismissed the earlier smell, cranked up our now nearly-full-of-fuel airplane, and departed.

Not 5 minutes after departure, we were approaching 10,000 feet mean sea level when the smell returned—this time in the form of billowing white smoke coming out of the a/c vents. We were in denial; how could this be? The pilot in command (PC), who was in the right seat performing the non-flying pilot duties, shouted in sheer disbelief, "Crap! We've got smoke and fumes in the cockpit!" What he had stated was the exact name of the emergency procedure in the operator's manual that we were about to do. I was hand-flying the airplane and realized very quickly why hand-flying is a bad idea in an emergency. I couldn't let go of the controls to put on my oxygen mask! The airplane was trimmed for a 155 knots indicated airspeed climb with the power near 100 percent. If I let go of the yoke with both hands, even for a minute, the nose might rise and the airspeed would probably decay, possibly to near stall, and certainly slower than normal flying speed for a fixed-wing aircraft.

The pilot in command, who was in the right seat performing the non-flying pilot duties, shouted in sheer disbelief, "Crap! We've got smoke and fumes in the cockpit!"

In the meantime the PC was busy. He had donned his oxygen mask, changed his microphone switch so he could talk, gone through the checklist for the emergency procedure, and declared an emergency with air traffic control (ATC). I had managed, with his help, to get my mask off the hook behind my seat and hold it to my face with my right hand and fly the airplane with my left. I couldn't use my right hand to reduce the power and start a descent because I would have to drop the mask, which was out of the question since the cockpit was engulfed in the acrid smell of electrical fire. The mask was the quick-donning Emergency Respiratory Oxygen System type with the inflatable headband. All I had to do was squeeze two small levers and the headband would inflate large enough for my head to fit

through. In theory, it works fine with your headset off. But with a headset, sunglasses, and smoke in the cockpit, I couldn't get that thing to open up large enough to fit my head into and at the same time fly a multi-engine turboprop airplane. Nor could I reach up and switch my microphone over to OXYGEN MASK so I could tell the PC about my little problem.

I shouted several times, but the PC was busy coordinating with ATC for an emergency landing at New Orleans International (KMSY). Eventually he heard me and took the controls. Finally, I could put my mask on properly and I didn't have to "eat smoke" anymore. Plus I could change my microphone switch so I could communicate. Within a minute or two, I was able to take the controls back and fly an ILS to minimums at KMSY for an uneventful landing. If you haven't worn an oxygen mask before, and I hadn't, the worst time is during a real emergency. The smoke began clearing after the PC "dumped" the cabin, but the aroma remained long after we landed.

(Editor's note: For clarification, "dumped" refers to a switch on the cabin pressurization control.)

You may never need to use the oxygen system in your airplane, but then again you might. Don't wait until you see smoke in the cockpit to learn how to use the system. Preflight, practice, and plan—then you'll be better prepared for an emergency.

Lessons learned

■ Preflight the oxygen system thoroughly. Make a commitment to always check the microphones in the oxygen masks during preflight. I failed to check the microphones that morning, even though it used to be a part of my preflight. Had the microphones in the masks not worked, the situation would've been even more difficult. Putting the oxygen mask on in an emergency is not the time to discover the microphone is broken.

■ Practice quick-donning the oxygen mask during training. Determine if the style of mask will require you to remove your headset. Practice using the microphone in the mask so you'll be familiar with the switch location and how it sounds with oxygen flowing into the mask.

■ If you suspect a mechanical problem like when we first smelled the smoke, try to determine the cause and get it taken care of by maintenance before flying the aircraft again. The range of fixed-wing aircraft takes you far away from your support base; too often fixed-wing pilots think they have only themselves to rely on when unexpected events occur. Both the PC and I had personal cell phones. Once we landed at Lakefront, we should've called back to maintenance for advice. They probably would've told us not to run the a/c because it was the failure of the motor in the associated vent blower that caused the smoke in the cockpit.

■ Don't forget the passengers. Smoke or fumes do not automatically activate the passengers' masks. Most airplanes require some type of crew action to manually activate oxygen flow to the passengers. In our case we had no passengers, but if you do, don't forget to activate their supplemental oxygen after the crew completes donning their masks.

■ Have a course of action ready for any takeoff emergencies. As part of your departure briefing, discuss an emergency return plan. If the weather is instrument meteorological conditions, have an approach plate ready to go to your emergency return airfield. In our case we had discussed returning to the Lakefront airport if an emergency occurred during takeoff. ATC threw us a curve when they gave us vectors to the other New Orleans airport.

You may never need to use the oxygen system in your airplane, but then again you might. Don't wait until you see smoke in the cockpit to learn how to use the system. Preflight, practice, and plan—then you'll be better prepared for an emergency. ♦

—CW4 Lambert and CW4 Williams may be reached at DSN 558-2453 (334-255-2453).

Don't Ever Do That To My Airplane Again!

Many years ago, before I got into the airline business, I was building time as a Part 135 freight pilot. I was mostly flying multiengine Rockwell Aero Commanders in a single-pilot operation. An opportunity came for me to interview for a better position with a company owned by a TWA captain. He invited me to St. Louis, MO, for an interview, and part of the interview would include a flight with him in his multiengine Beechcraft.

All went well in the personal interview, as the owner seemed impressed that I was an Army Aviator and Army instructor pilot. He even stated that I demonstrated a professional bearing. We then proceeded to the airport for the flight interview. I demonstrated a thorough exterior preflight and flight deck inspection. After I was satisfied with the comfort level in the flight deck, we cleared the props and started the engines. I did the required engine checks and got a clearance.

I was in the rotation, lifting off the runway, when the owner reached over and pulled the left engine to idle, simulating an engine failure. I handled the emergency situation with stellar success and climbed to the en route altitude. At the en route altitude, I announced that I would attempt a restart. The owner said, "OK!" But it didn't restart. That was my cue to proceed to the instrument landing system (ILS) and land with one engine inoperative.

I nailed the ILS, keeping the flight director needles perfectly centered. As the airplane approached 300 feet above the airport, the owner told me that I now had power available in the left engine and was cleared to circle to another runway. I did the circling maneuver and found myself a little high on the visual aid, which was a visual approach slope indicator (VASI). I put the airplane into a slip to lose the altitude. I then felt pressure on the rudder, taking the slip out. The owner looked over at me and stated, "We'll talk on the ground, but don't slip my airplane!" I landed the airplane and taxied to the hangar without a word from my evaluator. I knew from the tone that my stellar performance had gone down the proverbial toilet.

Once the engines were shut down and the battery turned off, the airplane's owner exclaimed, "Don't ever do that in my airplane again! Slipping a multiengine airplane is poor airmanship!" He then went into a lesson in multiengine aerodynamics, explaining why slipping a multiengine airplane is poor airmanship.

The owner, an experienced captain in many different airframes, explained that slipping a multiengine airplane causes cavitations in any fluid-dependent systems. This could possibly cause an engine failure from fuel starvation or a hydraulic pump failure from hydraulic fluid foaming. He then pointed out that airframe stresses resulting from excessive rudder application could cause early failure of the vertical tail section attaching points, something that ran through my mind many years later after hearing of the American Airlines Airbus accident in New York City.

After the systems and aerodynamics lesson, he posed a question to me. "What the hell do you think your passengers are feeling when they're flying sideways?"

He was absolutely right. I was absolutely wrong, but until then I was unaware and uneducated. I didn't get the job, but I took away a priceless education in airmanship, which I carried with me throughout my career.

Soon after this experience I landed my first job with a commuter airline. During the indoctrination training at my new job, the systems instructor posed a question to the class. The question was: "Why don't we slip multiengine airplanes?" I raised my hand and promptly, word for word, recited what the TWA captain had told me. This time, I was absolutely correct and began my airline career, having learned a good lesson from experience. It's a lesson I wish to pass along to you. ♦

—CW4 Dunham is currently in the Indiana Army National Guard. He is an airline pilot with experience in heavy transport airplanes in international operations. He was also the Director of Safety for Vanguard Airlines. Mr. Dunham can be reached by e-mail GCDunham@cs.com.

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AH-64

A Model

■ **Class D**: The crew was conducting a weapons harmonization on the M230 after completion of a 6-month service. The aircraft was at 100 feet above ground level and had fired three 10-round bursts when the gun stopped working. Damage was found to the gun barrel, chain, bolt, and carrier assembly. The damage is suspected to have been caused by a restricted lot of M789. The gun was replaced, and the aircraft was released for flight.

D Model

■ **Class A (Damage)**: The crew was conducting day systems (bag) training with the aircraft level and at 25 to 30 knots indicated airspeed when the aircraft contacted a tree while attempting to land. The aircraft began to spin and impacted the ground. No other details were reported.

■ **Class A (Damage)**: Aircraft experienced a tail rotor failure during flight. The crew lost control of the aircraft while conducting traffic patterns at the base airfield. The post-accident investigation revealed improper maintenance on the tail rotor.

MH-6

M Model

■ **Class C**: The crew was performing a standard autorotation during series qualification when the tail stinger and tail rotor contacted the runway. No other details were reported.

OH-58

D(I) Model

■ **Class B**: The crew received a mast overtorque time limit message after applying power to avoid an obstacle. No other details were reported.

■ **Class C**: Aircraft reportedly struck a tree during flight. The aircraft was landed without further incident. No other details were reported.

TH-67

A Model

■ **Class B**: Aircraft experienced a hard landing following a standard autorotation. The impact spread the landing gear, and the aircraft's underside struck the ground. The aircraft sustained significant structural damage.

UH-1

M Model

■ **Class A**: While conducting a proficiency flight the pilot in command made a mayday call, followed by the aircraft making a vertical descent to impact with the ground. A post-crash fire destroyed the aircraft. The pilot, an Army contractor, was killed on impact.

UH-60

A Model

■ **Class C**: Aircraft's tail rotor struck trees during a hoist operation in a confined area during low-level flight. The aircraft was repositioned and landed without further incident. Damage was reported to the right-hand stabilator and all rotor tip caps.

■ **Class F**: Aircraft was on short final for landing when a large bird was ingested in the #1 engine inlet. The engine made a whining noise, and the crew landed the aircraft without further incident. The engine was removed and maintenance was performed on the GG rotors. After maintenance personnel reinstalled the engine, the aircraft was released for flight.

C-12

■ **Class C**: Aircraft's right main landing gear veered off the side of the runway, causing the right propeller to contact a runway light. The aircraft was repositioned on the runway and shut down without further incident.

■ **Class C**: Aircraft sustained a lightning strike during flight. Post-flight inspection revealed damage to the #2 engine propeller blades and exit damage to the rivets on the right wing's trailing edge.

RQ-7

Shadow Model

■ **Class B**: Air vehicle's instrumentation indicated a sharp increase in RPM, followed by the vehicle's descent and impact with the ground. The vehicle was destroyed.

■ **Class B**: Air vehicle experienced a spike in engine cylinder and rotor temperatures shortly after launch. The vehicle descended to impact with the ground without deployment of the recovery chute.

Editor's note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change. For more information on selected accident briefs, call DSN 558-9552 (334-255-9552) or DSN 558-3410 (334-255-3410).

'Twas the Night Before Christmas

'Twas the night before Christmas, and out on the ramp,
not an airplane was stirring, not even a Champ.
The aircraft were fastened to tie downs with care
in hopes that come morning, they all would be there.

The fuel trucks were nestled, all snug in their spots,
while peak northwest gusts reached 39 knots.
I sat near the fuel desk, at last all caught up,
and settled down comfortably upon my butt.

When over the radio, there arose such a clatter;
I turned up the scanner to see what was the matter.
A voice clearly heard over static and snow,
asked for clearance to land at the airport below.

He barked out his transmission so lively and quick,
I could have sworn the call sign he used was "St. Nick."
Away to the window, I flew like a flash,
Sure that it was only Horizon's late Dash.

Then he called his position, there could be no denial,
"This is St. Nicholas One, and I'm now turning final."
When what to my wondering eyes should appear,
a Rutan sleigh, and eight Rotax Reindeer.

Cleared for the ILS, down the glide slope he came,
As he passed all fixes, he called them by name:
"Now Ringo! Now Tolga! Now Trini and Bacun!
On Comet! On Cupid!" What pills was he takin'!?

The last several fixes left the controllers confused,
they called down to the office to give me the news.
The message they left was both urgent and dour:
"When Santa pulls in, could he please call
the tower?"

He landed like silk, with the sled runners sparking,
Then I heard "Exit at Charlie," and "Taxi to parking."
He slowed to a taxi and exited Three-Two,
as he came down the taxiway, the sleigh bells' jingle grew.

He stepped out of the sleigh, but before he could talk,
I had run out to him with my best set of chocks.
He was dressed all in fur, which was covered with frost
and his beard was all blackened from Rotax Reindeer exhaust.

His breath smelled like peppermint, gone slightly stale
and he puffed on a pipe, but he didn't inhale.
His cheeks were rosy and jiggled like jelly;
his boots were as black as a crop duster's belly.

He was chubby and plump, a right jolly old fool,
and he kindly informed me that he needed some fuel.
A wink of his eye and a twist of his toes,
led me to know he was desperate to powder his nose.

I spoke not a word, but went straight to work,
and I filled up the sleigh, but I spilled like a jerk.
He came out of the restroom with a sigh of relief,
and then picked up a phone for a flight service brief.

And I thought as he silently scribed in his log,
that with Rudolph he could land in eighth-mile fog.
He completed his preflight, from the front to the rear,
then he put on his headset, and I heard him yell "Clear!"

And laying a finger on his push-to-talk,
he called up the tower for his clearance and squawk.
"After departure fly heading three-two-zero," the tower called
forth, "and watch for a Luscombe inbound from the North."
Then I heard him exclaim, as he climbed in the night,
"Merry Christmas to all, the traffic's in sight."

—Courtesy of Wayne Thompson (Flipper), CE 9th ID, CO B, 9th Avn Bn, (Stingrays), Mar 67- Mar 68

Seasons Greetings!