July 2006 ♦ VOL 34 ♦ NO 7

FLIGHTfax

Army Aviation Composite Risk Management Information

"System Safety: For the Soldier"

U.S.ARMY

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VCSA's Thoughts on Aviat

Army Aviation continues to be an integral part of the combined arms team in the Global War on Terrorism. Through almost 5 years of continuous combat operations, our aviators have flown more than 1 million hours in Operations Enduring Freedom and Iraqi Freedom (OEF/OIF). As a result, our crews are reaching combat experience levels unprecedented since the end of Vietnam. However, despite our tremendous achievements, we have lost 123 aircraft since 9/11, with over two-thirds of those losses to preventable accidents. Although this equates to the loss of a combat aviation brigade worth over $2 billion, more importantly, it means we have lost far too many aviators and Soldiers to preventable accidents. The trends in these accidents are clear: insufficient leader involvement in low-risk missions, inadequate pre-mission planning, poor aircrew coordination, and indiscipline. Our Army cannot afford to continue to lose aviation crews, Soldiers, and aviation combat power, and our aviation crews owe our prime customer—the American Soldier—the best aviation support that will complete the mission safely. Therefore, I want each of you to redouble your efforts to ensure your units are following standards, managing risk, and doing the basics right.

…despite our tremendous achievements, we have lost 123 aircraft since 9/11, with over two-thirds of those losses to preventable accidents.

LEADER INVOLVEMENT IN LOW-RISK MISSIONS

As experienced combat crews return from OEF/OIF, there is a tendency to become complacent as their units transition to training and non-combat operations. Commanders must pay special attention to aviation tasks that are assessed as "low risk" and guard against complacency by aircrews and mission planners. Seemingly low-risk missions are needlessly killing our Soldiers and destroying our combat equipment. Home station resources are limited due to reset and preset of aircraft, therefore leaders must do the following:

(1) Skillfully manage your aircrew training programs and maximize the use of our combat mission simulators.

(2) Carefully scrutinize missions and ask tough questions to ensure we are not allowing complacency on low-risk missions or allowing *perceived* low-risk missions (e.g., visual flight rules (VFR) cross-country to become high-risk missions because of changes in operating conditions).

A specific area of concern is single-ship operations, which are most often categorized as low-risk operations. Multi-ship operations—the standard in combat—lower risk by adding experience, maturity, judgment, and command attention to the mission. The more aviators involved in the planning and execution of a mission, the better the preparation and decision making. When briefing single-ship operations, specific involvement by the command and mission brief authority are required to identify all hazards and have thorough, honest dialogue with crews to assess the aircrew's ability to conduct the mission and ensure the appropriate level of pre-mission planning has taken place.

PRE-MISSION PLANNING

In a previous message, I emphasized the importance of the air mission approval process as the mechanism for the chain of command's oversight to ensure proper risk management and optimal use of limited flying hours. When used properly, this process shapes low-risk operations into fully functional training events and ensures detailed pre-mission planning. Currently, it is evident low-risk operations are not getting the appropriate amount of command involvement. Mission briefing authorities have the responsibility to not only ensure proper mission planning and risk assessment requirements are met, but also that the mission meets the intent of the commander and is a proper utilization of limited aircraft hours.

A specific issue of pre-mission planning that needs increased focus is cross-country flights. All too often our crews push VFR flight into

ion Risk Management and Leadership

deteriorating weather conditions and turn a low-risk mission into a high-risk mission. Army Regulation (AR) 95-1, *Flight Regulations,* requires all Army aircraft that are instrumented for instrument flight rules (IFR) flight and flown by an instrument-rated pilot to operate on IFR flight plans with limited exceptions. Leaders must coach standards and discipline for limited visibility operations so aircrews will conduct hard, realistic training and gain the skills and confidence necessary to conduct operations in all flight regimes. Part of this coaching is supporting the pilot in command's or the air mission commander's "no go/mission abort" decision when weather en route is found to be insufficient for continued flight under VFR. Once in flight, mission-focused aircrews are hesitant to make decisions to land short of the objective, turn back to the point of origin, divert to alternate airfields, or continue the mission under IFR. Failure to file an IFR flight plan limits options while en route, and the unwillingness to commit to IFR flight exponentially increases the risk of an accident. Units and aircrews need to maintain the skills necessary to successfully accomplish all aviation missions.

In November 2004, our Army lost seven Soldiers to a UH-60 wire strike in marginal weather. The lessons learned from this accident about pre-mission planning and Composite Risk Management are highlighted in a video available through the U.S. Army Combat Readiness Center (USACRC). Due to the sensitive nature of this video, distribution has been closely managed. Due to recent accident trends, I encourage each battalion-level commander to obtain this video from USACRC and use it to train their crews. The POC is the USACRC Deputy Commander, COL George Bilafer, at george.bilafer@crc.army.mil.

CREW COORDINATION AND INDISCIPLINE

A hallmark of our Army is strict discipline and adherence to standards. When we deviate from these standards, we assume unnecessary risk. Recent accident trends indicate aircrews are all too often failing to do the most basic things right. From adhering to the mandated flight envelope, altitude selection, or power management, Army Aviation is experiencing a spike in indiscipline. Professional aviators do 100 percent of the basics right 100 percent of the time. As we continue to fight an intelligent enemy with more sophisticated equipment, no amount of technology can replace the need to do the basics right. We need to recognize there is a major difference between disciplined, aggressive combat flying and reckless, foolhardy flying. We as an Army will not tolerate the latter.

Stay focused. Your personal involvement in low-risk missions, pre-mission planning, crew coordination, and discipline will preserve our combat power. You represent the best of the warrior ethos and are a vital part of our nation's success in the war on terror. ♦

—Adapted from GEN Richard A. Cody's message to general officers, assistant division commanders, aviation brigade and battalion commanders on 23 June 2006. GEN Cody, an Army Aviator, became the 31st Vice Chief of Staff on 24 June 2004.

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Army Aviation Composite Risk Management Information

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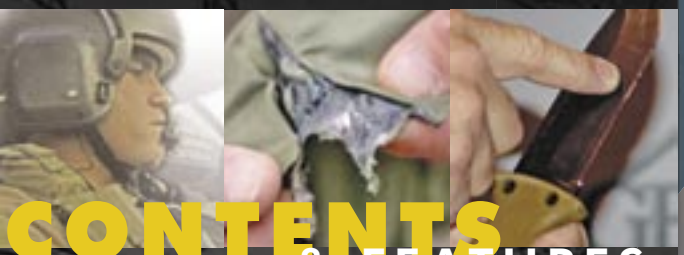

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System Safe

DR. MIKE CUPPLES
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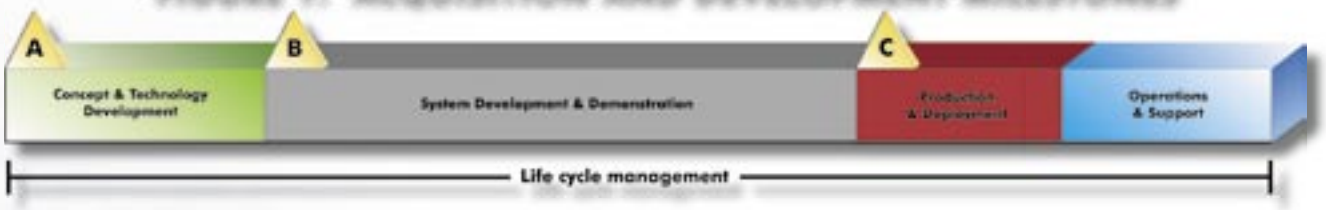
U.S. ARMY COMBAT READINESS CENTER

The U.S. Army Combat Readiness Center (USACRC) serves as the knowledge center for all losses, helping commanders connect the dots on loss prevention and providing leaders with tools to manage risk through the process known as Composite Risk Management (CRM). Most Soldiers, especially aviation Soldiers, are familiar with USACRC's accident investigation mission. However, investigation, analysis, and dissemination of accident information to field units is only one of the many ways the Director of Army Safety (DASAF) fulfills his responsibility under Army Regulation (AR) 385-10, *The Army Safety Program,* to administer and direct an effective Army safety program to reduce the occurrence of accidents. This article focuses on defining system safety and outlining the key players' responsibilities.

ty: For the Soldier

FIGURE 1: ACQUISITION AND DEVELOPMENT MILESTONES



System safety is a proactive program. It is defined as the application of engineering and management principles, criteria, and techniques to optimize safety with the constraints of operational effectiveness, time, and cost throughout the system's life cycle—from concept to disposal. The key players in system safety are combat developers, materiel developers, testers, evaluators, and Soldiers—the ultimate users of the equipment.

BACKGROUND

Department of Defense Instruction (DODI) 5000.2, *Operation of the Defense Acquisition System,* requires system safety programs for all major acquisition systems. In the Army, AR 70-1, *Army Acquisition Policy,* delineates risk management responsibilities throughout the acquisition force, while AR 385-16, *System Safety and Engineering Management,* delineates responsibilities for system safety and engineering management. The DASAF has overall responsibility for managing the Army System Safety Program and developing system safety policies and procedures.

POLICY

Army policy dictates system safety be applied and tailored to all Army systems and facilities throughout their life cycles. This policy is institutionalized through partnerships and coordination with the Assistant Secretary of the Army for Acquisition, Logistics, and Technology; Assistant Secretary of the Army for Installation, Logistics, and Environment; and other Department of the Army staff offices. The acquisition program manager is responsible for the effective implementation of system safety during acquisition and development and use by the Soldier during all phases of the system life cycle management (figure 1).

OBJECTIVES

The objectives of system safety are to—

- Maximize operational readiness and mission effectiveness by ensuring appropriate hazard and control measures are identified and designed into systems in a timely manner.
- Ensure hazards associated with new technology or operations are identified for consideration in later applications.
- Ensure hazards eliminated or controlled through design and risk associated with residual hazards are formally identified, accepted at the appropriate management decision level, and documented.
- Identify hazards and manage the risk associated with these hazards for each system or facility throughout its life cycle in all possible configurations and all mission variations.

THE COMBAT DEVELOPER

The combat developer is the user's representative. System safety is introduced early into the development process by combat developers in the concept definition stage. Safety is infused into systems based on user experience with previous systems and analysis of future operational capabilities. To design safety into a system, the combat developer—

- Identifies safety requirements in the capabilities development document, which defines system performance.
- Monitors program development and makes recommendations on all identified hazards.
- Has formal concurrence/nonconcurrence for CRM decisions at program and milestone decision reviews.

The combat developer is involved informally in the identification, assessment, and recommendation process, as well as through formal day-to-day monitoring of system progress as a member of the System Safety Integrated Product Team (SSIPT). Additionally, as system safety risk assessments are coordinated, the combat developer formally concurs or nonconcurs with risk mitigation methods proposed by the program manager or decision authority.

THE MATERIEL DEVELOPER

The materiel developer is the point man for system safety. Materiel developers manage safety issues through production to fielding to the Soldier. The materiel developer identifies hazards throughout the entire life cycle to prevent losses. Early identification of hazards and designing safety into the system ensures optimal mission effectiveness and minimizes the costs associated with losses. Effective system safety provides long-term benefits in combat readiness and cost-effective use of Army resources.

THE PROGRAM MANAGER

The program manager (PM) ensures identified system hazards and risks are validated, assessed, and controlled in a timely manner. The risk impact consists of the cost and effect of identified risks in terms of mission capabilities and economic factors. The System Safety Management Decision Authority Matrix provided by the Program Executive Officer-Aviation is used to assess risk categories (see figure 2 below).

The PM charters an SSIPT of technical experts to assist in managing the safety program. One of the SSIPT's first tasks is to develop a system safety management plan, which establishes management policies, objectives, and responsibilities for execution of the system safety program for the life cycle of the system. The plan outlines government and contractor responsibilities, ensures hazards are identified and composite risk assessments and decisions are documented, outlines tasks of SSIPT participants, and lists milestones for safety actions with respect to system development.

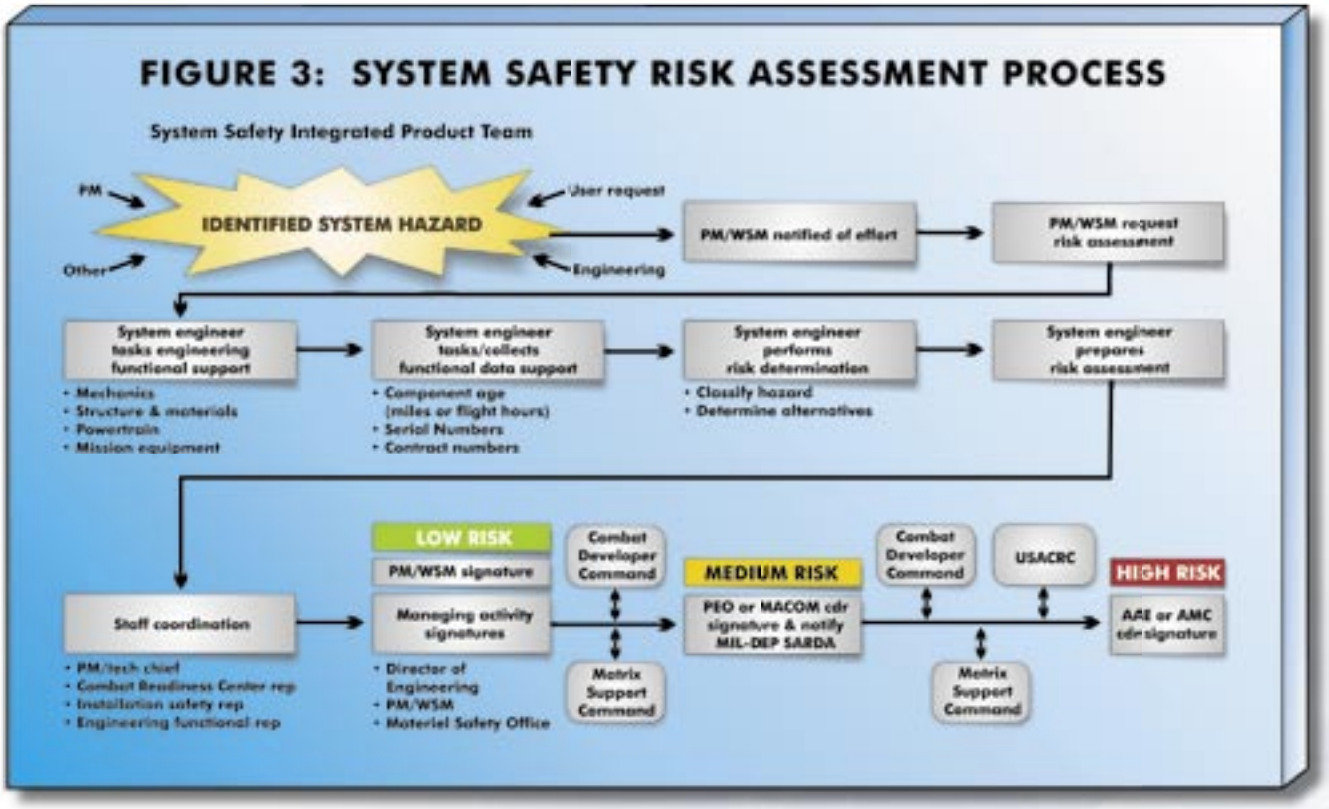
After fielding, the PM is responsible for tracking worldwide accident and incident data, improvement recommendations, deficiency reports, and other data to correct safety hazards as they arise. Through system safety risk assessment, the severity and probability of hazards are determined and presented to the appropriate level decision authority for CRM (figure 3). The control selection process ues the following order of precedence to reduce residual risk:

1. Design for minimum acceptable risk.
2. Incorporate safety devices.
3. Provide warning devices.
4. Develop procedures and training.

FIGURE 2: PEO AVIATION SYSTEM SAFETY MANAGEMENT DECISION AUTHORITY MATRIX

Probability (per 100,000 flight hours)

SEVERITY (Most Credible)	FREQUENT >100 A	PROBABLE <=100 BUT>10 B	OCCASIONAL <=10 BUT>1 C	REMOTE <=1 BUT>0.1 D	IMPROBABLE <=0.1 BUT>0.01 E
CATASTROPHIC Death or >= $1M I					
CRITICAL >=$200K II		HIGH RISK AAE			
MARGINAL >=$20K III			MEDIUM RISK PEO		
NEGLIGIBLE <$20K IV				LOW RISK PM	



THE USER

Users contribute early in the system development process through the combat developer, who is the user's representative in the acquisition and development process. Users also participate in operational testing of systems as part of the materiel development process and have an opportunity to evaluate and identify system safety deficiencies. Once a system is fielded, efforts focus on discovering safety deficiencies that were not identified during the development process. As users, Soldiers have direct input to system safety by identifying safety deficiencies through actual system use. They also provide insight into unforeseen hazards and new mission requirements. Soldiers may submit equipment improvement reports, quality deficiency reports, and DA Forms 2028, or coordinate with logistics assistance representatives to document and fix specific safety hazards.

SUMMARY

System safety provides the accepted level of safety attainable through engineering efforts to achieve optimal mission capability, enhanced combat readiness, and prioritization of Army resources. Hazards and risks are identified, assessed, and monitored throughout the life cycle and eliminated by design where possible; those that cannot be eliminated are reduced to the lowest acceptable level possible.

Few Soldiers probably realize the magnitude of safety efforts to provide safe and reliable equipment for Army operations. Regulations, policies, and key organizations are in place to field and sustain you, the Soldier, with the best possible equipment available. ♦

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From the Combat

MAJ TIM WILLIAMS
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FORT RUCKER, AL

The Aircrew Integrated Systems (ACIS) Branch of the Directorate of Combat Developments (DCD) at Fort Rucker, AL, is the aircrew members' representative for articulating and documenting aircrew capabilities for items worn, carried, or consumed during aviation operations. The ACIS Branch works with various materiel developers and research agencies to develop realistic requirements which will eventually result in materiel solution enhancements for the Aviation Soldier.

A2CU

One program that has generated interest among aircrew members is the new Army aircrew combat uniform (A2CU). The A2CU is an aircrew variant of the new Army combat uniform (ACU) issued to Soldiers. It is designed to replace the current Army battledress uniform (ABDU) (both woodland and desert patterns) and will have the same digital pattern as the ACU, the universal camouflage pattern (UCP). The new design and possible new fabric solutions are currently undergoing laboratory and initial testing to ensure compatibility, flame resistance, and durability. Once the design is finalized and validated, the Program Manager-Clothing and Individual Equipment will begin full-rate production and fielding. National stock numbers (NSNs) for the A2CU are in the system now; however, there are none available for issue. Availability is projected for Fiscal Year 2007. Units will be notified

when to place orders after all testing is completed and production rates are sufficient. In the meantime, production of the ABDU will transition to the UCP. The switchover will be complete by the time this article is published.

GLOVES

Other developmental items of interest include the adoption of the Southwest Motorsports Max Grip NT® and Friction Fighter® gloves (both made of Nomex®) as authorized alternatives to the issued Summer Weight Flyers Glove for aircrew members. The Max Grip NT® and Friction Fighter® gloves have been tested by Natick Laboratory and meet or exceed the protection provided by the current issued glove. These gloves now have NSNs (see the February 2006 *Flightfax*) and may be purchased direct from Southwest Motorsports **(http://www.southwestmotorsports.com/).** At some point, we expect them to be issued to all Soldiers as the Army combat glove.

BOOTS

A new, lightweight, tan non-all-leather hot-weather boot also has been evaluated and approved for inclusion in a waiver with the temperate weight boot for all flight operations—the Belleville model 340DES. It is available as a direct purchase from Belleville **http://www.bellevilleshoe.com/.**

COLD WEATHER CLOTHING

ACIS is also working cold weather clothing requirements. We're looking at several products to meet this need. One version that looks promising and is expected to undergo testing in the near future at Natick is a wind- and water-resistant, snug-fitting, stretchable Nomex® blend. This system will increase warmth, comfort, and reduce bulk.

SOLDIER ENHANCEMENT PROGRAM (SEP)

Two items were recently approved by the SEP board for funding: a finger-mounted laser pointer and a fire-retardant, antimicrobial, moisture-wicking underlayer system. These items will be included in the Air Warrior capabilities production document (CPD) currently in staffing. In addition to these two items, the CPD includes an unencrypted aircrew wireless intercom system (AWIS), a portable oxygen system, a tactical helmet "go-bag," and a helmet-mounted hear-through external audio capability.

AIR SOLDIER SYSTEM

To articulate future needs, we are converting the Air Warrior operation requirements document to the new Air Soldier System capabilities development document (CDD). This CDD will capture current and projected future capabilities needed by the air Soldier. One of the capabilities includes a multiple integrated helmet display system, which will integrate aircraft instrumentation and targeting symbology with improved night vision sensor technologies into a single helmet solution for Army Aviation. This will help improve situational awareness in degraded visual conditions above that which is available with current tube technology. The CDD will also include upgrades to the electronic data manager, providing non-bussed aircraft a moving map display and interface with Blue Force Tracking.

Other programs we are currently working include the new chemical and biological protection suit, joint protective aircrew ensemble, and the joint service aviation mask. It is vital we provide crews with the right equipment, maintained to standard, so they can "Own the Edge" when they need it most. ♦

—The author is the chief of the Aircrew Integrated Systems (ACIS) Branch, DCD, and can be contacted at DSN 255-3271 (334-255-3271), or by e-mail at timothy.williams@rucker.army.mil. For more information on these systems, as well as future combat systems, contact CPT Jay Maher, Assistant TRADOC System Manager-Soldier, at 334-255-1456 or e-mail john.maher@rucker.army.mil; CW4 Bob Carnahan at 334-255-1103 or e-mail robert.d.carnahan@rucker.army.mil; or John Popovich at 334-255-9130 or e-mail john.popovich@rucker.army.mil.

From the Product

DON HARP
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The Air Warrior (AW) Product Manager's Office rapidly responds to feedback from the field to ensure the Army aircrew member has the best aviation life support equipment possible. As a result, the AW ensemble has been updated three times in the past 2 years based upon lessons learned and suggestions from deployed Soldiers. These changes are numerous and range from the nearly transparent to the obvious.

All three versions of the ensemble are currently in the field and known as either AW Generation (Gen) 1, 2, or 3. At this time, only Gen 3 is being issued to units deploying to Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF). Units that are presently in country have either the Gen 2 or Gen 3, and any unit redeploying in the future will be retrofitted with the Gen 3.

▲GEN 1 ▲GEN 2 ▲GEN 3

The AW concept was originally designed to allow a one-size-fits-all ensemble and was based upon an unalterable minimum essential survival equipment list. The Primary Survival Gear Carrier (PSGC) can be tailored for any mission environment, including chemical/biological, overwater, or desert combat. The driving forces behind these requirements, such as flame-retardant holsters and room for more ammunition, resulted from lessons learned in Somalia.

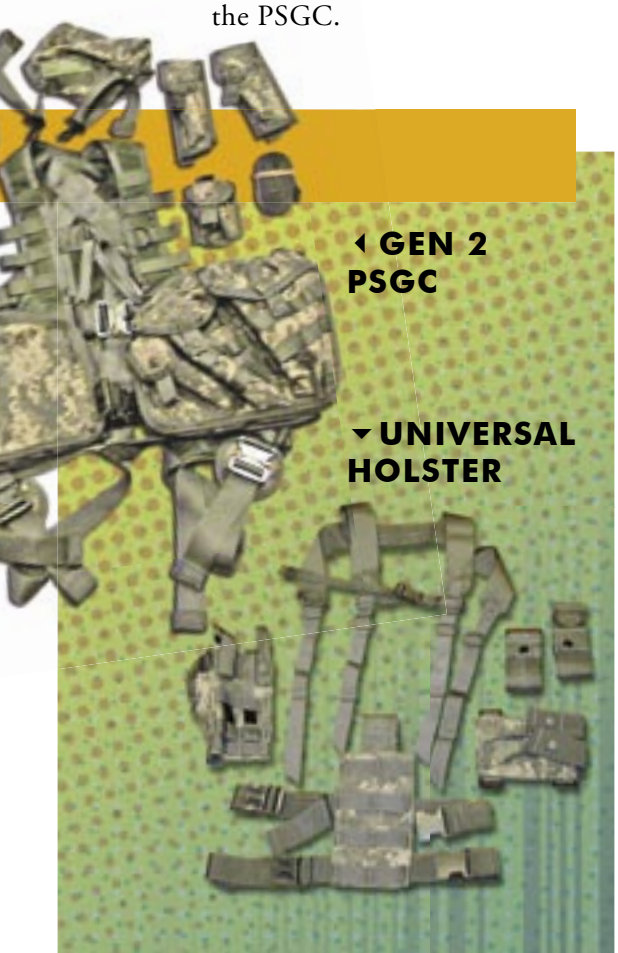
In 2004, Gen 1 was in production at the start of the present conflict, manufactured in the traditional woodland camouflage color with two large pockets on the front of the PSGC with zippered closures. These pockets were the primary survival equipment carriage devices and attached to the PSGC with an integrated extraction harness featuring quick-release buckles, which allowed a multitude of accessories to be fastened to the PSGC. The primary tailorable components of the ensemble were an overwater gear carrier with a personal life raft, a low-profile floatation collar, a mask blower pouch for the M-45 protective mask, Sea Mark II (underwater breathing device), and a thigh-mounted pistol holster.

Gen 2 was introduced in 2005 as a result of feedback from the field and the introduction of the universal camouflage pattern. As stated in the beginning of this article, numerous improvements were incorporated in Gen 2, many not apparent to the user. Changes included adding Modular Lightweight Load-carrying Equipment (MOLLE) loops on the shoulder straps and left pocket to increase user options for attaching a tourniquet, flashlight, knife, gun, and ammunition. The

Manager's Office

pocket liners were replaced with a material known as Cordura® to increase durability and reduce bulk.

The flashlight pocket was redesigned to accommodate either the "Phantom light" or "Mini Mag" flashlight, and the radio pocket was redesigned to accommodate the Combat Survivor Evader Locator (CSEL) radio or two M-4 magazines. The back panel of the PSGC was redesigned to reduce neck abrasion, and the extraction harness interface to the PSGC was changed to reduce stress at the attachment point, improving fit and reducing stitch breakage. A new ambidextrous holster was also developed and can be worn on the thigh, mounted to the PSGC, or worn separately as a shoulder holster without the PSGC.



◂ GEN 2 PSGC

▾ UNIVERSAL HOLSTER

▲ AW GEN 3 SYSTEM

As feedback from the field continued, so did the need for ongoing improvements, resulting in the fielding of the AW Gen 3. The large outer pocket zippers were eliminated to improve durability and repairability and replaced by two inner pockets and a series of MOLLE attachment points. A set of standard pockets are now provided to each crewmember to allow greater tailorability, and a center front zipper is included to increase the overall available storage area at the front of the PSGC for attaching additional pockets. MOLLE attachments were added to the back panel of the PSGC for future growth (e.g., water storage), straps on the center front buckles were redesigned to reduce bulk and increase strap adjustment, the signaling pouch was redesigned to be similar to the first aid platform in order to reduce bulk and improve accessibility, and the back panel was improved to enhance comfort and fit adjustment. The Gen 3 also eliminated the Extended Equipment Pouch, the lower retention and multi-tool straps, and numerous snaps and grommets.

It's important for all aircrew members to note survival items must be transferred from their existing vest when they are issued the AW PSGC, including the survival radio, compass, flares, strobe, tourniquet, and whistle. Also included in the New Equipment Training by the PM AW fielding teams is a warning that failure to transfer these items upon receipt of the new PSGC can cause a delay in rescue, which could result in death to injured personnel.

When transferring items, remember that placement of items should allow full freedom of flight controls.

Are we through improving the AW ensemble? Probably not; for as the mission changes—so will Air Warrior. ♦

—For more information, you may either contact the author via e-mail at donald.b.harp@us.army.mil or Jim Isaacs at james.r.isaacs@us.army.mil at the PM Air Warrior Office.

FIGURE 1.
Example of melted synthetic clothing

Commercial O

CHRISTOPHER TRUMBLE
SYSTEM SAFETY ENGINEER
U.S. ARMY COMBAT READINESS CENTER

Soldiers continue to use unauthorized commercial off-the-shelf (COTS) equipment. Our troops are saturated with advertisements from manufacturers claiming their products do great and wonderful things, but the real test comes when the item is put to use. Then it could be too late.

Army program managers (PMs) and TRADOC system managers (TSMs) assist in developing and integrating items into the Army's inventory, missions, and operating environments. These individuals support Soldiers operating in Southwest Asia, as well as those preparing to deploy, with state-of-the-art ballistic protection and safe, durable, and operationally effective individual and unit equipment.

However, some Soldiers are not willing to wait for the testing and evaluating of items to determine if the risks from using unauthorized equipment are too great. These COTS items are not only limited to "ground pounders"; Army Aviators are also using unauthorized COTS items. Items of concern include:

• **Polyester underclothing manufactured by companies such as Under Armour®, CoolMax®, and Nike®.** Undergarments manufactured from synthetics such as polyester or acrylic can melt and fuse to skin when exposed to high temperatures and flames (figure 1). This warning also applies to novelty undergarments such as underwear with cartoon characters, jokes, etc. Burns from these garments melting against your skin can be disfiguring and even fatal. Military doctors have reported an increased difficulty in burn-related wound treatment from the necessity of removing melted clothing from the wound. Natural fibers such as cotton, wool, or Nomex® are the best materials for aviation undergarment use.

• **Hush Kits and Zeta Liners.** Many commercial aviation helmet liners and ear cups are not approved for Army Aviation HGU 56/P helmet use, yet they are often marketed as "military approved." The Oregon Aero Company's Hush Kit and Zeta Liners are examples of COTS items some Army Aviators may be tempted to purchase but are not authorized for Army Aviation use. The Hush Kits have been tested by the U.S. Army Aeromedical Research Laboratory (USAARL) for sound attenuation, and findings indicate the kit does not improve the degree of protection beyond that provided by the Army's current issue. The USAARL report warns retention and impact protection performance evaluation also needs to be conducted on aviation helmets fitted with Hush Kits prior to acceptance. These tests are necessary because of possible helmet rotation that may expose portions of the head during impact if retention ability is reduced, resulting in reduced energy absorption from lateral impacts, which may place aviators at an unacceptable level of risk from head injury.

NOTE: The Gentex Thermoplastic Liner® is authorized for use by Army Aviators while the Gentex Super Comfort Liner® is still being studied for long-term effects; however, they are issued on a limited basis.

• **"Dragon Skin" body armor.** The direct marketing of unauthorized COTS ballistic protective body armor called Dragon Skin has resulted in issuance of Safety-of-Use Message (SOUM) 06-017, *Discontinue Use of Unauthorized Body Armor, Dragon Skin.* The Army tested Dragon Skin and showed it was not certified to defeat several of the small-arms threats Soldiers are currently encountering in Afghanistan and Iraq. The Army has issued statements warning Soldiers not to purchase COTS body armor because it was not manufactured to military specifications and is unable to defeat the threats encountered in Iraq and Afghanistan.

FIGURE 2.
BE Meyers GBD-III laser pointer

• **Laser pointers.** Commercially procured laser pointers may become a greater hazard to aircrews than a benefit. A hazard may occur if a laser is selected without considering the power level or by using it improperly within the aircraft. There is a potential eye injury hazard from certain classes of lasers. Also, laser misuse within an aircraft can

ff-the-Shelf Items

FIGURE 4. Truck seat used as ramp seat for Chinook CH-47 Helicopter

compromise the safety of the crew during night missions. There are a wide variety of lasers available, ranging from powerful military pointers (figure 2) to lower-powered, presentation-style pointers (figure 3).

FIGURE 3. Typical presentation style laser pointer

• **Unauthorized modifications of Army aircraft.** The unauthorized modification of Army aircraft is dangerous. Examples include the locally manufactured gun mounts on aircraft and using passenger vehicle seats (figure 4) as door gunner and ramp seats. Fabricated gun mounts may not take into consideration appropriate traverse and elevation limits, allowing the operator to inadvertently shoot the rotor blades. Automobile seats are not designed to the same crashworthiness standards of aircraft seats and may pose a real health hazard in a crash. Something as simple as modifying individual flight crew seat cushions could result in serious injury during an emergency.

• **M16/M4 series rifles.** There have been unauthorized modifications to Army M16/M4-series rifles, resulting in a warning on the rear cover of *PS* magazine, Issue 637: "Unauthorized modifications hurt your weapon and put you and your unit at risk."

WHAT TO DO

Units and program managers are encouraged to use COTS items when possible. The operative phrase in the previous sentence is *when possible.* This means the product must perform the task without endangering the mission or personnel and without detrimental logistical support issues. This can be difficult to determine for a commander or Soldier because they want to do the right thing and acquire the proper equipment to support the mission. Oftentimes they inadvertently create a hazard—potentially a greater hazard than the one posed—by not having the equipment.

According to Army Regulation 385-16, *System Safety Engineering and Management,* commanders who authorize their supply personnel to order COTS items not managed by the Army logistics system effectively become the PMs for those items. COTS items have no lifecycle materiel support, causing commanders to expend additional funds to provide, for example, repair part support and maintenance. Commanders also are responsible for publishing usage instructions and inspection criteria, establishing safeguards, and providing suitable training on the equipment.

Commanders must ask themselves if they really need that piece of equipment. Is that item really necessary to accomplish the mission and bring everyone back home alive? Here are some questions to think about before purchasing any COTS item:

• Is there another item in the current Army inventory that performs the same function?

• How will the unit maintain the COTS equipment—serviceability inspections, obtaining repair parts, etc.—in a combat zone? (It is often difficult to obtain support from manufacturers that have no real tracking or notification system to relay problems with their products back to the purchasing units.)

• Who will be the subject matter expert on the equipment, and who will train, maintain, and certify them?

• Does the item require special batteries that are only available in certain regions?

• How much time will it take to train my Soldiers on the equipment?

• What safety features or hazards have been identified?

• Have the risks been properly documented and accepted at the appropriate level?

• What effect will this item have on other equipment (radio interference, different plug configurations, etc.)?

• What additional injury or damage will the COTS equipment cause in an accident?

Commanders might not realize they're assuming some high risks when they acquire COTS equipment. They assume if they can purchase COTS items advertised in military publications, the equipment is safe and without risk. Unfortunately, this often isn't the case. If the PMs and TSMs believed all COTS gear was worthwhile and necessary, they'd be working hard to get it to the field. Losing a Soldier to a preventable accident and excusing it as the cost of doing business is unacceptable. Keep your Soldiers ready and equipped so they can Own the Edge! ♦

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Force XXI Battle Command Brigade and Below

FBCB2: ALWAYS IMPROVING

CHRISTOPHER TRUMBLE
SYSTEM SAFETY ENGINEER
U.S. ARMY COMBAT READINESS CENTER

The importance of effective communications capabilities has increased greatly since the beginning of the Global War on Terrorism, particularly regarding interaction between ground Soldiers and aircrews. The ability to receive intelligence from the air and verification from the ground in real time is just one benefit of a highly mobile communications system. The Army's Force XXI Battle Command Brigade and Below (FBCB2) is one such system paying dividends for Soldiers in theater.

Known in its latest iteration as Blue Force Tracking, FBCB2 features integrated computer hardware and software that forms a wireless, tactical Internet. The system is designed to phase out and replace paper maps and voice radio communications with more secure and timely digital information. A quick overview of the program's development follows.

In the initial phase, information was uploaded from other systems such as the Forward-Area Air Defense Command, Control, and Intelligence System; the Combat Service Support Control System; the Battlefield Combat Identification System; the Guardrail/Common Sensor; tactical operations centers; certain unmanned aerial vehicles; and other Army systems. Warfighting experiments were conducted to verify the system could provide improved tactical decision-making information to Soldiers through increased situational awareness by means of timely battlefield data.

The second phase of development involved enhancing the FBCB2's functionality. This step was performed in Bosnia, Kosovo, and Italy in 2002 while the Army was assisting with NATO peacekeeping missions. Soldiers there received a detailed picture of their surroundings on a computer information network that tracked vehicles and displayed their locations on a digital map.

The next phase expanded the program to collect, integrate, and display a common picture of the area of operations on each user display. Locations and the identities of threats such as enemy forces, improvised explosive devices, and impassable roads were correlated and automatically transmitted to each group user and displayed as an icon on the screen. The Blue Force Tracking element includes the linking of sensors, communications devices, aircraft, and weapons into a seamless network using satellites, as well as line-of-sight transmissions.

The development of a companion system for international military force partners, dubbed "Coalition Force Tracking," is the latest improvement. In April 2005, the Pentagon's Office of Force Transformation determined use of the interconnected Blue Force Tracking system with the Coalition Force Tracking system improves operational effectiveness.

Our Soldiers benefit from these joint communications capabilities in many ways, including the proven ability to execute decisive combat operations with greater confidence. This unique command and control capability promises to be a decisive technology for 21st-century warfare that will allow our Soldiers to Own the Edge! ♦

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AVIATION SAFETY MESSAGES

Recap of selected aviation safety messages

GREG KALTZ
LIFE-CYCLE SYSTEM SAFETY MANAGEMENT-AVIATION DIVISION
U.S. ARMY COMBAT READINESS CENTER

SAFETY OF FLIGHT

SAFETY OF FLIGHT (SOF)

• **C-23-06-SOF-01, 012115Z Jun 06,** Immediate Grounding of all C-23B Aircraft, Emergency. On 30 May 2006, a routine maintenance ground run was performed on an SD3 Sherpa aircraft. During shutdown, the field service representative (FSR) noted the No. 1 engine propeller lever did not feel right. Upon investigation, the FSR found the No. 1 engine propeller control cable broken at approximately flight station 180 in the cabin ceiling area. The break occurred in the cable fitting on the cable side of the hole used for holding the cable while tightening the turnbuckle. A vinyl sleeve is located at this spot on the cable, and it is suspected this vinyl sleeve trapped moisture, causing corrosion and pitting at the area of the break. Further investigation revealed corrosion on the No. 2 engine propeller control cable in the same area. This same condition has been found on several other aircraft. The purpose of this message is to immediately ground all C-23B aircraft pending further investigation.

• **C-23-06-SOF-02, 061810Z Jun 06,** Control Cable Inspection, C-23B/C-23B+ Aircraft. On 1 June 06, an emergency SOF message, C-23-06-SOF-01, was released to immediately ground the C-23B fleet. However, this initial SOF did not include the C-23B+ fleet. Subsequent to the release of C-23-06-SOF-01, inspection procedures have been developed to verify the airworthiness of the C-23B fleet. The inspections of seven C-23B+ aircraft have revealed no significant corrosion issues. However, the Fixed-Wing PM Office has elected to require this inspection for all remaining C-23B+ fleet aircraft to ensure safety of that fleet, as well. This message requires a one-time inspection of all C-23B and C-23B+ aircraft for control cable corrosion. Upon completion of the required inspections, the C-23B fleet will be released from grounding status.

• **CH-47-06-SOF-04, 261130Z May 06,** Suspect Aft Rotor Blades, H-47-series Aircraft, Technical. CH-47-06-SOF-03 was issued on 8 March 2006 to place flight limitations on all H-47-series aircraft due to a structural abnormality in the aft rotor blades. Following the release of CH-47-06-SOF-03, Boeing reviewed some aft rotor blade build records (X-rays) and determined all but 63 blades are serviceable without any flight restrictions required. The purpose of this message is to rescind the temporary flight restrictions imposed by CH-47-06-SOF-03 and to prohibit flight operations for those aircraft with a suspect aft rotor blade installed.

AVIATION SAFETY ACTION MESSAGES (ASAMs)

• **UH-60-06-ASAM-03, 121212Z Jun 06,** Swashplate Duplex Bearing, Maintenance Mandatory, all H-60-series Aircraft. Sikorsky Aircraft Corporation has notified the Army of a discrepancy found during final aircraft assembly whereby the bearings inside the main rotor swashplate assembly were inadvertently damaged during installation. This condition was found during a follow-on flight control rigging check where an unusual grinding noise from the swashplate assembly was noticed when the flight controls were exercised along with excessive axial movement between the rotating and stationary swashplate. The swashplate assembly was disassembled, and ball bearings from the duplex bearing were found in the grease cavity between the upper and lower bearing race. Although this discrepancy was discovered on the assembly line, the potential exists for fielded aircraft to have a defective swashplate assembly installed. The intent of this message is to perform a records inspection to determine swashplate installation time, require inspection of the swashplate duplex bearings for discrepant bearing installation, and initiate manual changes to require bearing wear inspection for all subsequent installations.

• **AH-64-06-ASAM-10, 081315Z Jun 06,** Tail Rotor Swashplate Inspection, Maintenance Mandatory, all AH-64-series Aircraft. There have been several reports of tail rotor (TR) swashplate assemblies found with six loose lock-wired socket head cap screws. This condition allows movement between the bearing housing assembly and TR deice slip ring assembly, which may result in the elongation of the associated six screw holes. This message requires initial and recurring inspection of the TR swashplate hardware to verify proper security.

For a complete listing of all published safety messages, go to the AMCOM Web site at **https://ams14.redstone.army.mil/safety/sof/index.html.** This is a secure Web site and requires an Army Knowledge Online (AKO) ID and password. ♦

—For more information on aviation safety messages, contact Greg Kaltz, Life-Cycle System Safety Management-Aviation Division, U.S. Army Combat Readiness Center, DSN 558-9377 (334-255-9377), or e-mail Greg.Kaltz@crc.army.mil.

A Cut Above

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SYSTEM SAFETY ENGINEER
U.S. ARMY COMBAT READINESS CENTER

The knife is probably one of the first and most important tools man has invented and used in the development of our society. Since 1940, the Army has issued a pilot survival knife that has essentially remained unchanged. This knife has served the aviation community well, and while there was nothing wrong with it, the Army wanted to know if improvements in knife technology could contribute to a better survival tool. This progressive thinking resulted in the Army issuing the current Aircrew Survival Egress Knife (ASEK).

After finalizing the list of desired attributes the knife should include, the Army issued an operational requirements document (ORD) for an ASEK in August 2001. A number of companies presented samples, but only the Ontario Knife Company's submission (figure 1) successfully met the requirements of the ORD. As a result, an NSN was assigned to Ontario Knife Company, and funds were procured for approximately 25,000 ASEKs for direct issue to Army Aviation units. Between June 2004 and May 2005, 11,881 Army ASEKS were purchased by Defense Supply Center–Columbus, OH, and the knife has been making its way onto aviation life support equipment (ALSE) vests ever since.

RECENT DEVELOPMENTS

In May 2005, Gerber Legendary Blades entered into a Cooperative Research and Development Agreement (CRDA) with the U.S. Army Aeromedical Research Laboratory (USAARL). The CRDA was to test and evaluate the Gerber LMF II knife (figure 2) against the Army-issue ASEK produced by Ontario Knife Company for the purpose of determining whether the Gerber knife met the same standards as outlined in the ASEK ORD. Testing and evaluation was conducted, and a report was published detailing the results.

The Gerber candidate met all requirements listed in the ORD. Interestingly, one area in which the Gerber knife outperformed the Ontario Knife Company's knife was in the ability to protect the user against electrical shock via an insulated handle. The authors of the USAARL report considered the inability of the Ontario Knife Company knife to pass this test a Category I catastrophic failure as per Military Standard 882D. The rationale for this was the possible hazard of the user sustaining a potentially fatal shock should the blade be used to cut through electrically charged wires.

During initial evaluations of contenders for the Army ASEK, the insulated handle was considered a desired item rather than a mandatory performance capability. Since the evaluation of the Gerber ASEK,

‹ **Figure 1.** Ontario Knife Company part number 1400, NSN 1095-01-518-6832.
▴ **Figure 3.** Gerber Legendary Blades LMF II with finger pointing to burns in blade just above serrations.
› **Figure 4.** Arrows pointing to areas where charged electrical cables burned the blade.

Figure 2. Gerber P.N. 22-01400 LMF II knife in Coyote Brown and part of the GERBER ASEK system tested.

the Ontario Knife Company has provided an insulated handle version of its ASEK to PM-AW for evaluation. As a result of testing, Gerber is pursuing an NSN for its ASEK system, which includes a knife in a new foliage green for compatibility with the Army combat uniform (ACU). PM-AW has indicated the authorization for aircrews to use the Gerber knife with their ALSE vests is in process. The ability to cut through electrical wires may not seem like a critical feature; however, as one Soldier found out, it did make the difference between life and death.

RECENT REAL-WORLD EVASION

SFC Dillard Johnson was a platoon sergeant with the cavalry in the 3rd Infantry Division when he was deployed in October 2005. He and his spotter were operating as a sniper team, overlooking a section of road well known for improvised explosive device activity. There was zero moon illumination, and conditions were perfect for employing night vision goggles for surveillance of the road. After some time, an enemy mortar team was spotted and neutralized. Unfortunately, a larger enemy support group present in the area initiated counter sniper operations.

The process of Composite Risk Management (CRM) often evolves into an intuitive act, as evidenced by SFC Johnson and his spotter pulling back and calling for evacuation. They then moved to a bombed-out compound and set up a defensive position to wait for helicopter pickup. While waiting, they received word that the aircraft was diverted for a MEDEVAC mission, so M-2 Bradleys, which were 10 to 15 minutes away, would have to execute the evacuation. In the meantime, two terrorists entered the compound and were closing in on the sniper team's location. As the sniper team was lining up targets in their crosshairs, the enemy suddenly turned on a generator. Instantly the area lit up like a football field during a night game.

The spotter noticed two 220-volt power lines running along a wall close to their position, feeding the floodlights. SFC Johnson was carrying a Gerber LMF II knife, which had an electrically insulated handle, and wedged the blade under the wires, turned his head away, closed his eyes, and used his bodyweight to successfully cut through the power lines. Darkness immediately fell over the area and gave the advantage to the Soldiers. They managed to remove the threats and eventually were evacuated.

SFC Johnson and his spotter were able to return home and share this story. The only damage to the knife was some slight blade edge burns (figures 3 and 4). It should be noted cutting charged electrical wires is potentially fatal and should not be attempted. As SFC Johnson stated, "I wasn't exactly thrilled about having to cut hot lines, but in battle, you do what you have to do."

Gerber has manufactured a knife capable of performing all ASEK tasks using the application of system safety in the design and considering the knife as a system. Soldiers should remain cognizant of the abilities and limitations of their equipment so CRM can be applied to safely accomplish any contingency in a mission.

Table 1. Ontario Knife Company Components National Stock Numbers

	NSN	Ontario Knife Company part #
Complete knife system	1095-01-518-6832	1400
Knife only	1095-01-518-6868	1401
Sheath only	1095-01-518-6875	1402
Strap cutter	1095-01-518-6877	1403
Strap cutter replacement blade	1095-01-518-6879	1404

As of this writing, the Ontario Knife Company knife is the only ASEK approved for Army Aviation (see Table 1 for a listing of NSNs for the Ontario Knife Company ASEK and components). When the Gerber Legendary Blades knife receives an NSN and becomes an additional issue item, this information will be printed in an upcoming issue of *Flightfax*. ♦

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FY06 Aviation Mid-year Review

CHARISSE LYLE
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U.S. ARMY COMBAT READINESS CENTER

It's time for us to take a look at how we're doing as an Army regarding aviation accidents thus far in Fiscal Year 2006 (FY06). Army Aviation experienced 13 Class A accidents the first half of FY06, a decrease from last year's 17. There were 12 Soldiers and 4 civilians killed in these accidents, which cost over $59 million. Over two-thirds of the accidents (9) occurred in the Central Command (CENTCOM) area of operations (AO). The chart on page 19 compares the number of accidents and fatalities for each aircraft type involved.

UH/MH-60 Black Hawk

The UH-60 was involved in 54 percent of the Class A accidents and 75 percent of the fatalities during this timeframe. All of these accidents occurred in theater.

• One accident accounted for the majority of the fatalities. The accident aircraft was Chalk 2 in a two-ship formation, performing a passenger transport mission under night vision goggles (NVGs) when, for unknown reasons, it struck the ground at 105 knots indicated airspeed in a nearly level attitude. Eight Soldiers and four civilian contractors were killed. Prior to the accident, the sky was overcast with zero natural illumination. The flight had deviated south of the planned route to take advantage of towns that were well lighted. Immediately before the crash, the accident aircraft was in a right trail formation and moved from the right side to the left side of Chalk 1. While the aircraft was not equipped with a flight data recorder or cockpit voice recorder to reveal the actions of the crew, it is possible when Chalk 2 moved from the right side to the left of Chalk 1, he lost sight of Chalk 1 in the ground lights. The crew might have become distracted looking for Chalk 1 and failed to notice their descent.

• Two accidents involved Soldiers falling to their deaths from a Black Hawk in flight. Both occurred in Iraq during combat missions, one during the day and the other at night. In the former case, the Soldier fell approximately 50 to 100 feet to the ground during a go-around for landing. Reportedly, the aircraft door had been opened in preparation for passenger exit. In the other case, the Soldier fell out of the aircraft while in flight.

• There were three Black Hawk accidents, all in theater, in which the aircraft crashed while landing in brownout conditions. In

...How'd We Do?

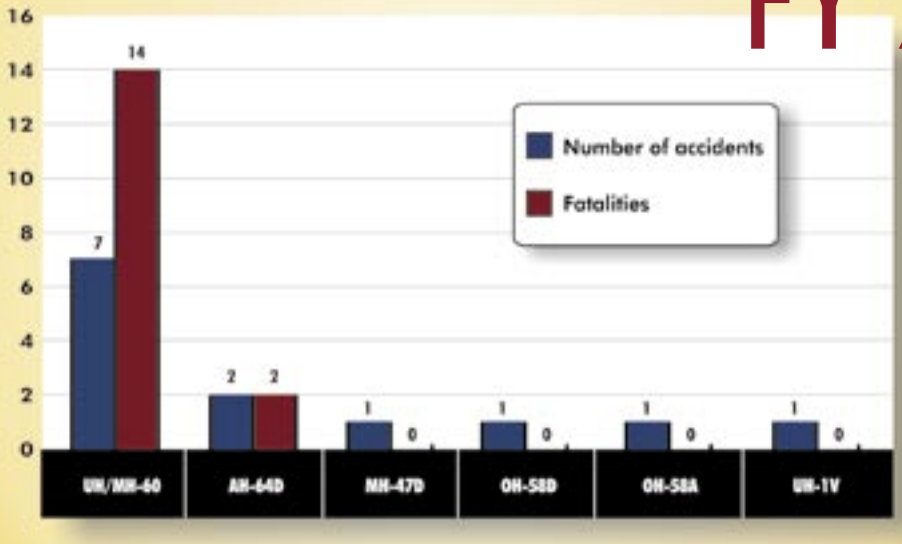
two cases, the aircraft rolled over. In the third accident, the aircraft landed hard, rolled forward, and struck an obstacle. Two of the accidents involved aircraft on MEDEVAC missions.

• During a day visual meteorological conditions approach in high-altitude mountainous terrain for a combat troop insertion, the UH-60L descended onto an unsuitable landing area approximately 50 meters short of the intended landing point. The bottom of the aircraft impacted a rock, the left main gear became a pivot point as it wedged between rocks, and the aircraft rolled left and downhill. The aircraft was destroyed, and five passengers and four crewmembers suffered minor injuries. A Soldier, who had released his seatbelt 1 minute prior to the landing, was ejected during the crash sequence and suffered serious injuries.

The pilot in command (PC) had intentionally increased his final approach speed in order to minimize exposure time to a perceived ground threat to the right of his inbound course. He realized the aircraft was descending too quickly and elected to make a go-around. He leveled the aircraft and added some power. He reportedly did not use the maximum power available because he believed this would have drooped the rotor and increased the rate of descent.

The PC was experienced in the local flying environment. He had successfully conducted over 20 deliberate combat missions at altitudes over 8,000 feet mean sea level (MSL) under similar combat conditions. It is suspected mild hypoxia could have influenced the pilot's actions. During the mission, the flight crew had operated at altitudes above 10,000 feet MSL with temperatures 8 to 12 degrees above freezing without supplemental oxygen.

CLASS A AVIATION ACCIDENTS
During First Half of FY 2006



AH-64 APACHE

Apaches were involved in two Class A accidents during the first half of FY06, a fatal midair collision in Iraq and a rotor wash-induced foreign object damage (FOD) accident in Germany.

• The midair collision occurred at night under night vision goggles as the wing aircraft of a two-ship AH-64D team was attempting to reestablish position with lead in a combat spread formation. As trail converged on lead, trail's tailboom struck lead's main rotor system. The lead aircraft crashed, destroying the aircraft and fatally injuring both pilots. The trail aircraft sustained significant damage to the tailboom but was able to land safely. Although not deemed contributory in this case, the existence of city lights degraded trail's ability to visually acquire lead because the trail aircraft was stacked above the lead aircraft. A technique that prevents possible confusion with ground lights is stacking down while flying in the presence of city lights under NVGs. This places the lead above the trail aircraft and enables trail to see lead against the sky.

• In the FOD accident, metal siding separated from the exterior of a hangar and was ingested into the main rotor system while the aircraft was at a hover.

MH-47D CHINOOK

The Chinook was involved in one Class A accident, which occurred in theater at night. The aircraft became unstable during a pinnacle landing, overturned onto its right side, and descended down a slope. All crewmembers onboard were able to egress with survivable injuries. The aircraft was destroyed in the post-crash fire.

OH-58D KIOWA WARRIOR (KW)

The KW was involved in one Class A accident during this timeframe. The aircraft impacted the runway during a manual throttle operation demonstration, resulting in significant aircraft damage.

OH-58A KIOWA

An OH-58A descended into a pecan grove during a night reconnaissance and interdiction detachment mission. The aircraft was destroyed and the crew and a law enforcement officer passenger sustained survivable injuries.

UH-1 IROQUOIS

A UH-1 crashed during night MEDEVAC training. All four crewmembers sustained survivable injuries.

SUMMARY

Over half of the accidents occurred during the landing phase. In two accidents, unbuckling seatbelts prior to landing caused one passenger to fall out of the aircraft during a go-around and another passenger to be ejected from the aircraft during the crash sequence. There were two Class A brownout accidents involving aircraft on MEDEVAC missions. MEDEVAC crews, by virtue of their mission, must often land in unfamiliar, unimproved areas where brownout controls have not been implemented. Ground light misinterpretation is a potential hazard for multi-ship formation flights at night. Position lights of other aircraft in the formation can be mistaken for ground lights when another aircraft is at or below the altitude of the observer. A technique that prevents possible confusion with ground lights is stacking down while flying in the presence of city lights under NVGs. This places the lead aircraft above the trail aircraft and enables trail to see lead against the sky. ♦

(Editor's note: These statistics are current from the USACRC database as of 13 April 06. Delayed reports and follow-up details on preliminary reports could change the statistics, figures, and findings.)

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CORRECTION

CW2 Joseph Rosamond, G Company, 140th Aviation, wrote to let us know about the safety violations in our graphics for the lead story in the May 2006 *Flightfax*. He is absolutely correct, flight gloves are required in the cockpit and the left-seat pilot should have had them on. In addition, the window shades are definitely a no-no. Thank you for pointing this out. Even though our graphics are checked by technical experts before sending to the printer, sometimes this type of error slips by us.

LITEfax What Were They Thinking?

CHRIS FRAZIER
STAFF WRITER/EDITOR

NOT-SO-FRIENDLY FIRE

Pilots expect the enemy to shoot at their aircraft. Pilots don't anticipate, however, their own passengers filling their bird full of holes. While we may typically associate negligent discharges with ground operations, incidents occurring hundreds of feet above ground level are not as uncommon as you might think. In fact, the two mishaps below occurred within just 2 days of one another in the same area of operations.

In the first incident, about 1 minute before touchdown on an air assault, passengers of the CH-47D were given the command to lock and load their weapons. At the command, a Soldier opened the feed tray of his semiautomatic assault weapon (SAW), loaded the ammunition, and then "slammed" the feed tray closed. Immediately thereafter, the crew smelled gunpowder and realized four to five rounds of 5.56 mm ammunition had been accidentally discharged from the serviceman's weapon and into the floor of the aircraft, causing damage to the sheet metal. Fortunately, there were no injuries or damage to the aircraft's critical components, and the mission was completed without further incident.

So how did it happen? Units being airlifted receive a 10-, 5-, and 1-minute warning to touchdown. At the 1-minute warning, the unit leader gives the order to lock and load. The Soldiers do so, but—in most cases—they keep the weapon safety on. Investigators speculate this accidental discharge was likely due to the crowded conditions inside the aircraft. There were 31 troops in the seats and four or five sitting on the floor—along with troops' heavily loaded rucksacks.

The Soldier believes the safety on his SAW was inadvertently pushed to the "off" position due to the weapon being "jostled" while in between rucksacks. Although this doesn't explain the accidental discharge, investigators believe it's possible the excitement and apprehension surrounding an airlift into a possible hostile situation caused the Soldier to inadvertently pull the trigger immediately after slamming the feed tray closed.

To prevent future incidents from occurring, it was recommended the order to lock and load not be given during operations where the landing zone is expected to be "cold." As an alternative, the command also should be altered to "check safeties on, lock and load."

Whereas the anticipation of heading into battle may have led the Soldier above to accidentally fire his weapon, it was a failure to follow procedures that nearly led to a deadly situation for this UH-60L crew.

With the aircraft flying about 300 feet AGL at 100 KIAS, the left crew chief (CE) experienced a weapons malfunction while conducting a test fire on the M-60D machine gun. When informed of the malfunction, the pilot in command (PC) instructed the CE to attempt to clear the weapon.

The CE was unable to clear the malfunction, so the PC told him to safe the weapon and bring it inside the aircraft. However, the CE misinterpreted the PC's instructions and, instead, rode the bolt forward, brought the weapon inside the aircraft, and removed it from the pintle mount. The CE had just placed the gun's barrel on the floor when it discharged, sending the jammed round through the floor and out the bottom of the aircraft. Luckily, no Soldiers were injured.

As for the cause of the incident, investigators said the PC failed to communicate clearly to the CE regarding how to handle the weapon. Furthermore, the CE didn't follow the procedures for a weapons malfunction, resulting in the weapon being brought inside the aircraft and its subsequent discharge. By doing so, the CE endangered the safety of the crew and passengers.

For their failure to follow procedures, the crew was given a remedial lesson on how to properly clear a malfunction from an M-60D, as well as the importance of crew coordination and the use of clear and concise terminology. Let's hope it sinks in this time. ♦

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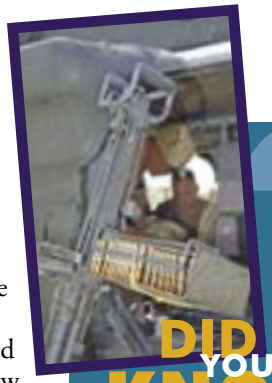


DID YOU KNOW?

- In 2001, 422 males and 281 females in the United States died from negligent discharge of firearms (National Vital Statistics Report, U.S. Centers for Disease Control, 2003)
- In 2003, 10 Soldiers died from negligent discharge of firearms; in 2004, 9 Soldiers died from negligent discharges (U.S. Army Combat Readiness Center statistics, 2005)

Approximately 600,000 Soldiers and 125,000 Reservists served during the years 2003 and 2004. When you do the math, there are 10 times more negligent discharges reported annually in the Army than in the U.S. civilian population, despite the fact many civilians aren't properly trained in firearms handling. Today's well-trained warriors can eliminate these deaths and save about 10 Soldiers every year by practicing safe weapons handling.

Accident Briefs

Information based on preliminary reports of aircraft accidents

Class A

AH-64
A Model
• Class A: The aircraft crashed during a security patrol mission. Both crewmembers suffered injuries and the aircraft was destroyed.

CH-47
D Model
• Class A: Two crewmembers and eight passengers suffered fatal injuries when the aircraft crashed during a passenger transport mission. The post-crash fire destroyed the aircraft. A USACRC centralized accident investigation is ongoing.

AH-6
M model

Class E: A bird flew into the aircraft flight path and struck the lower-right windscreen. The aircraft was flown to the recovery airfield and shut down without further incident. The windscreen was replaced and the aircraft returned to service.

AH-64
A Model

• **Class E:** During auxiliary power unit runup and prior to engine start, hydraulic fluid began to leak out of the bottom of the aircraft, near the 30 mm ammunition bay. The crew shut down the aircraft and contacted maintenance. The hydraulic motor was replaced. *Late Report*

• **Class E:** The nose gearbox (NGB) No. 2 caution light flickered throughout the flight but did not remain illuminated. The aircrew continued to the destination airport and reported the problem to maintenance. A maintenance contact team deployed to the site and replaced the No. 2 NGB. The aircrew continued the ferry flight to home station. *Late Report*

D Model

• **Class E:** The pilot in command (PC) heard a crackling noise coming from the right-rear section of the pilot's station. Shortly thereafter, the PC smelled the odor of an electrical fire. The PC notified air traffic control, and crash rescue was alerted. The PC instructed the copilot/gunner to egress the aircraft while he conducted an emergency engine shutdown. Both crewmembers completed the emergency egress without further incident. The aircraft was inspected and power-on checks were completed. No damage or evidence of an electrical fire was found, and the aircraft was released for flight.
Late Report

• **Class E:** During landing under the night vision system, the aircrew lost electrical power. The upfront display read "GEN 1 FAIL." Approximately 6 seconds later, the No. 2 generator picked up the load, and electrical power was restored. The aircrew performed a go-around and landed without further incident. Maintenance replaced a wire harness, and the aircraft was released for flight.
Late Report

CH-47
D Model

• **Class E:** The No. 2 engine oil filter housing began leaking. The crew returned to the airfield and shut down the aircraft without further incident. A crack was found in the oil filter housing. Maintenance replaced the oil filter housing and element, and the aircraft was released for flight.
Late Report

• **Class E:** During hot refuel, the flight engineer noticed fuel leaking from the heater drain. The aircrew shut down the aircraft without further incident. Maintenance replaced the heater ignition plug and cleaned the drain. The aircraft was released for flight.
Late Report

MH-6
C Model

• **Class C:** Aircraft experienced a governor failure and autorotated to a hard landing.

OH-58
C Model

• **Class B:** While on approach to the landing zone, the aircraft fuselage contacted the main rotor system of a UH-60. Both aircraft sustained damage but landed without further incident.

• **Class C:** During startup, the aircraft experienced a turbine outlet temperature spike (1,000 °C).

D(R) Model

• **Class C:** During landing, the aircraft's forward momentum caused it to tip forward at touchdown, resulting in damage to the lower wire strike protection system and chin bubble.

• **Class D:** After refueling operations were completed, the instructor pilot (IP) back-taxied off the refueling pad to the middle of the taxiway and transferred controls to the pilot (PI). With the aircraft in a stable 2-foot hover, the IP announced a "simulated engine

failure" and retarded the throttle to the engine idle position. The pilot on the controls responded to the simulated emergency by misapplying the collective control, and the aircraft impacted the taxiway with enough force to spread the landing gear.

UH-60

A Model

• **Class C:** While conducting a MEDEVAC mission, the crew flew over an unmanned aerial vehicle (UAV) in a restricted operating zone. The rotor wash from the helicopter disrupted the airflow over the UAV, causing the UAV to make an uncommanded descent and impact the ground. The UAV was destroyed upon impact. *Late Report*

• **Class D**: After landing and just before coming to a complete stop, the crew heard a loud bang. The aircraft tire had struck a piece of pipe sticking out of the ground. After shutdown, the PC discovered the tire rim had also been damaged.

L Model

• **Class C:** During taxi, the aircraft's main rotor blade tips contacted the tail rotor of a parked aircraft.

• **Class D:** The aircraft experienced a left yaw during flight. After landing in refuel, the crew chief noticed the left-hand engine inlet barrier filter (EIBF) system had come open and was bent back 180 degrees from its normal position. The aircraft was shut down without further incident, the EIBF system was replaced, and some sheet metal damage was repaired. *Late Report*

• **Class D:** The PI attempted to maneuver away from a flock of birds, but it turned into the aircraft. One bird struck the center windscreen, causing damage. The mission was continued and the windscreen was later replaced. *Late Report*

CAS 212

• **Class D:** During approach to landing, a bird impacted the right wing, near the root. Damage was limited to a removable inspection panel. *Late Report*

C-12

R Model

• **Class E:** Aircraft experienced engine shutdown due to an engine overspeed while cruising. The aircraft landed without further incident.

U Model

• **Class E:** On vectors to final approach, the crew smelled fumes in the cockpit with no visible fire. The crew donned oxygen masks and completed the approach and landed without incident. It took about 4 minutes to get the aircraft on the ground, and the fumes were determined to be gone after approximately 2 minutes. Upon inspection, the mechanic found a burned-out dual bus diode. *Late Report*

• **Class E:** While conducting a readiness level progression training flight, the IP initiated an engine failure on the No. 2 engine in cruise flight. The crew then performed an engine restart, and the No. 1 generator failed. The crew consulted the technical manual and completed the emergency procedure for generator failure after the No. 2 engine was restarted. The crew noticed a synthetic burnt odor and returned to the airfield. The engine shutdown was completed without incident. Maintenance was notified and replaced the No. 1 generator. A maintenance operational check was completed, and the aircraft was released for flight. *Late Report*

UNMANNED AIRCRAFT SYSTEM

RQ-11

• **Class C: The UAV failed to respond to the aerial vehicle operator's (AVO) landing instructions and video contact was lost. The UAV could not be located.**

• **Class C: The AVO lost contact with the aircraft during flight. The UAV could not be located.**

• **Class C: The AVO lost video/control link with the aircraft during a reconnaissance flight. The UAV could not be located.**

• **Class C: The AVO lost altitude control for the aircraft at approximately 300 feet AGL in the vicinity of power lines. The UAV could not be located.**

• **Class C: The AVO lost video/control link with the aircraft during a reconnaissance flight. The UAV could not be located.**

• **Class C: The AVO experienced a connectivity loss with the aircraft during flight. The UAV could not be located.**

• **Class C: The AVO lost the command link with the aircraft. The UAV could not be located.** ***Late Report***

RQ-7B

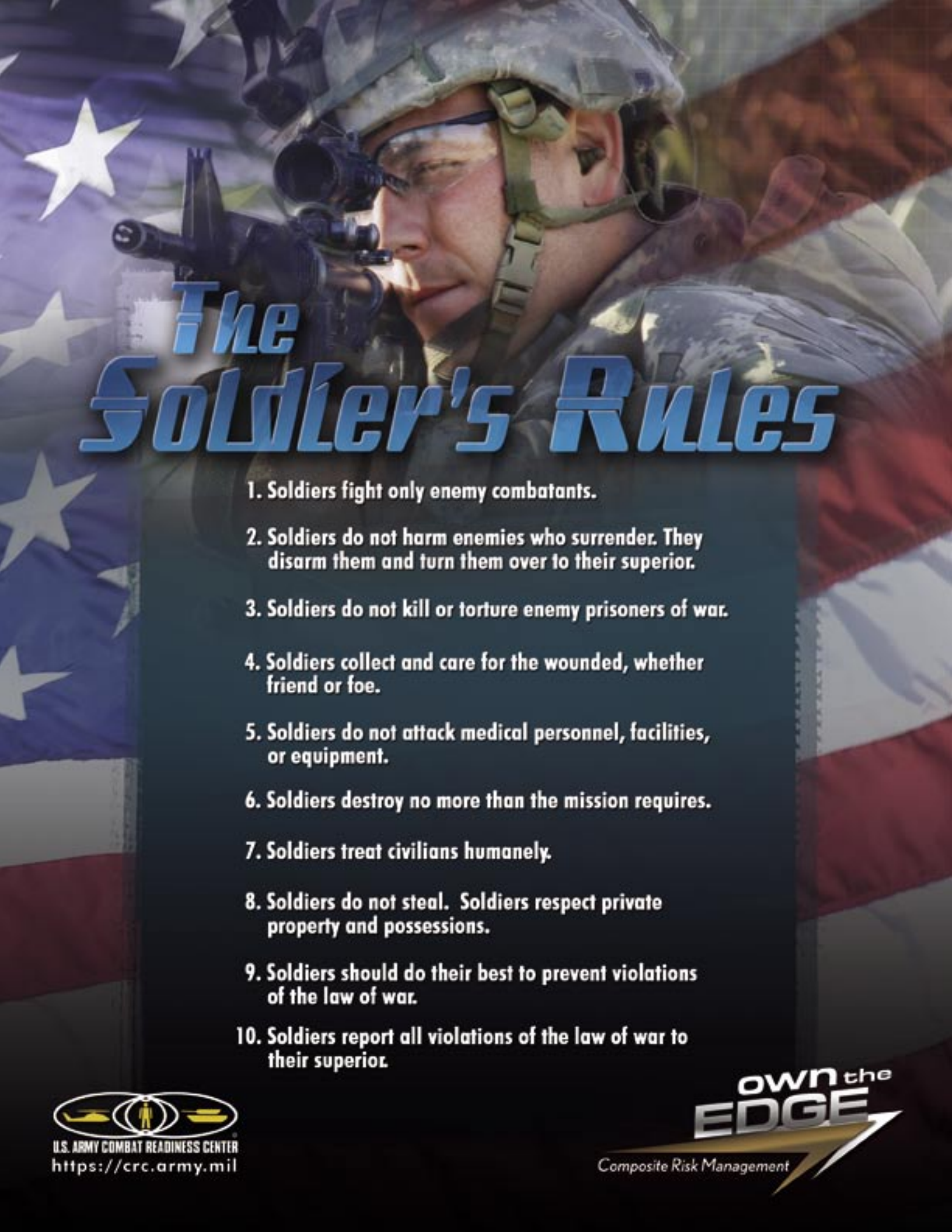
• **Class C: The UAV was flying straight and level at 5,000 feet AGL when the engine failed. The AVO guided the aircraft to an open field, where the chute was deployed. The UAV landed in the field and was recovered by ground forces.** ***Late Report***

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, contact the USACRC Help Desk at DSN 558-1390 (334-255-1390) or by e-mail at helpdesk@crc.army.mil.

ARMY AIRCRAFT LOSSES FY02 TO PRESENT*

	HOSTILE/NON-HOSTILE	COST
AH-64A/D	8/44	$1.091B
U/MH-60L	6/22	$191.8M
C/MH-47	5/13	$656.5M
OH-58D	8/21	$181.2M
Total	27/100	

*As of 5 July 2006



The Soldier's Rules

1. Soldiers fight only enemy combatants.
2. Soldiers do not harm enemies who surrender. They disarm them and turn them over to their superior.
3. Soldiers do not kill or torture enemy prisoners of war.
4. Soldiers collect and care for the wounded, whether friend or foe.
5. Soldiers do not attack medical personnel, facilities, or equipment.
6. Soldiers destroy no more than the mission requires.
7. Soldiers treat civilians humanely.
8. Soldiers do not steal. Soldiers respect private property and possessions.
9. Soldiers should do their best to prevent violations of the law of war.
10. Soldiers report all violations of the law of war to their superior.

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own the EDGE
Composite Risk Management