FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
October 1994 ◆ Vol 23 ◆ No 1

Force protection is working!
Because of you, the Army aviation team, we were able to reduce the number of fatalities from 22 in FY 93 to 11 in FY 94. We won't be satisfied until not a single soldier dies in an accident that could have been prevented, but thanks to you, we're moving in the right direction.

FY 94 in review

As a result of their risk-management skills, self-discipline, leadership, professionalism, focus, and dedication to force-protection initiatives, aviation units were able to capitalize on the safety momentum that was regained during the last half of FY 93 and reduce accidental losses even further during FY 94.

We were 77 days into the first quarter of FY 94 before we lost a crewmember in an aviation flight accident. While the FY 94 Class A accident rate of 1.72 is an accomplishment that every member of the team can rightly be proud of, the truly remarkable achievement is that during FY 94 we were able to reduce the number of aviation fatalities to 11.

Recap of FY 94 Class As

Although the safety accomplishments of FY 94 are praiseworthy, accidents that should have been prevented still claimed the lives of our crewmembers and destroyed our equipment. The following is a recap of the 22 FY 94 Class A accidents:

■ *UH-60L*. The aircraft was Chalk 4 in a flight of six during an NVG air assault training mission. During the multiaircraft approach to a field site with trees on each side, rotorwash began blowing dust from the freshly graded dirt strip. The pilot of Chalk 4 selected a slower, steeper approach than the first three aircraft had used during their landing. The crew chief of Chalk 4 notified the pilots that a dust cloud was forming and moving forward from the rear of the aircraft as Chalk 4 descended to about 15 feet AGL, short of the intended landing point. The pilot on the controls continued the approach. Prior to reaching the intended landing point and prior to the main landing gear touching the ground, Chalk 4 became engulfed in blowing dust and the pilot elected to initiate a go-around. The aircraft was observed moving to the right until the main rotor blades contacted trees on the right side of the landing strip. The main rotor blades severed the tops of several trees at about 20 feet AGL. The aircraft descended vertically onto a 3-foot-high bank that paralleled the right side of the landing strip, rolled left off the bank, and came to rest on its left side. The pilot received minor injuries.

■ *OH-58C*. After refueling, the crew flew back to the mission area and continued their screening mission. Shortly after arriving on station, the crew began to experience geographic orientation problems. The PC elected to land the aircraft so he could assist the pilot in determining their exact location on the map. The PC selected a touchdown point and initiated an approach. The approach was from about 35 feet AGL and continued until the aircraft touched down in a right drift. The right skid contacted the ground first, and the aircraft encountered dynamic rollover and rolled onto its right side. The aircraft was destroyed and the pilot received minor injuries.

■ *AH-64A*. At about 150 feet AGL and 35 to 40 knots after a night formation departure in marginal VFR weather, the PC on the controls of Chalk 2, the trail aircraft, lost sight of the lead aircraft. The Chalk 2 PC initiated a deceleration, placed the aircraft in a decelerative attitude, reduced some collective, and directed the pilot to ensure the landing light was off. When the pilot looked back out, he perceived trees moving forward on the left side of the aircraft and the aircraft descending rearward. He immediately informed the PC and then noticed a rearward vector of one-half to two-thirds saturation and a radar altimeter altitude of 23 feet in his helmet-mounted display. The pilot reached for the flight controls, but the aircraft struck the ground while moving rearward. The aircraft continued to the rear for about 90 feet during which time the tail pylon separated. The fuselage became airborne, spun right about 4 turns, and impacted a large oak tree. The aircraft came to rest in a nose-low, left- roll, left-yaw attitude. Both pilots sustained injuries.

■ *OH-58C*. While in cruise flight at approximately 50 feet above a forested area, the aircraft experienced an

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engine failure/malfunction. The low-rotor RPM light illuminated, followed by an abrupt left yaw and activation of the low-RPM audio. Due to the lack of a suitable landing area, the pilot initiated an autorotation to the tops of the trees as the IP took the controls. The IP zeroed airspeed prior to the aircraft entering the trees. The aircraft descended through 50- to 60-foot-tall trees, impacting upright and sustaining major damage. Both pilots received major injuries.

■ ***UH-1H.*** During a night VFR approach to a known severely dusty area, the crew encountered brownout prior to touchdown. At below 10 feet AGL, the crew lost visual ground reference but elected to continue the approach. The aircraft made ground contact with the aft portion of the skids, impacting initially upright, bounding, and impacting a second time. The aircraft rolled right, coming to rest almost inverted with major aircraft damage and minor injuries to the three occupants.

■ *OH-58C.* During an NVG training mission involving formation flight at an altitude of 500 feet AGL and 90 knots, the crews encountered deteriorating weather conditions. Chalk 2 lost sight of the lead aircraft, executed a rapid deceleration, and ascended in altitude. The PC made an immediate right turn, then entered a left turn, which resulted in a near collision with Chalk 3 as a result of Chalk 2's initial deceleration. The Chalk 3 PC warned Chalk 2 by radio not to descend on them. Chalk 2 was observed to continue the left turn, and no radio response was received by the other flight crews. Chalk 2 subsequently crashed when it encountered IMC and the PC lost aircraft control. Both the PC and left-seat aerial observer were fatally injured.

■ ***OH-58A.*** While hovering in a tactical training area during an NVG training flight, the unit trainer was discussing with the pilot how to make pinnacle and ridgeline approaches and the different scanning techniques that could be used. The aircraft drifted forward into the wreckage of an abandoned vehicle. The toe of the aircraft's left landing gear caught on the wreckage. The aircraft began to yaw and roll left, and the low-rotor RPM light came on. The aircraft continued left about 100 feet before coming to rest on its side. One crewmember received major injuries.

■ *OH-58A.* During a night tactical terrain flight with NVGs (AN/AVS-6), the lead OH-58 in a flight of three entered IMC as they crossed over a ridgeline. The crew initiated inadvertent IMC recovery procedures with a climbing left turn to 4,000 feet. During the climb, the crew squawked emergency on the transponder and were monitored by radar. At 4,000 feet, the pilot allowed the airspeed to drop to near zero and allowed the aircraft to enter into an uncontrolled rate of descent. The aircraft impacted in a 20- to 30-degree nose-low, 30-degree roll and 15-degree yaw attitude with a forward airspeed exceeding 60 knots. The aircraft was destroyed, and both pilots received fatal injuries.

■ *UH-1H.* While at a stable 8-foot hover in preparation for an external load operation, the IP instructed the student pilot in the right seat to arm the cargo hook. The student moved his legs away from the controls, set his intercom switch, and reached for the overhead cargo hook arm switch. The student pilot in the jump seat was pointing at the switch to assist in identifying the proper switch. As the right seat student

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was reaching for the switch, the aircraft rolled left with some pitchup of the nose. Within 3 to 5 seconds, the aircraft made contact with the ground. During the roll sequence, the cyclic moved rapidly to the left rear quadrant. The IP was not able to correct the left roll and had insufficient time to take emergency action. The aircraft came to rest on its left side with extensive damage. Two occupants received minor injuries.

■ ***AH-64A.*** During cruise flight at 1,400 feet AGL, the No. 1 main rotor blade separated from the hub assembly. The aircraft crashed inverted in a nose-low attitude. Both contractor pilots were fatally injured, and the aircraft was destroyed.

■ ***UH-60A.*** While making a day VFR pinnacle departure at a low altitude over the ground and at an airspeed below single-engine capability, the aircraft experienced a dual-engine loss of power, making continued flight impossible. The crew leveled the aircraft as it impacted some large rocks and the ground before coming to rest on its right side on the downslope of the ridgeline. The crew of four experienced only two minor injuries, but the aircraft received major damage. The specific cause of the engine power loss could not be determined. However, elimination of other conceivable variables indicates a fuel flow interruption probably occurred, which resulted in an in-flight dual-engine flameout.

■ ***AH-64A.*** During a night VFR formation flight using FLIR, the crews realized the poor TADS/FLIR picture was resulting from freezing rain and snow. The air mission commander in Chalk 1 instructed the flight to follow him in a left 180-degree turn for return to base. While in the left turn, Chalk 3 descended and crashed into rising terrain at an airspeed of 20 to 30 knots. The aircraft came to rest among trees at an elevation of 6,650 feet MSL. The crew received only minor injuries.

■ ***AH-64A.*** During hot refueling, the fuel handler had some minor difficulty in the hookup and had to shift and reposition the fuel hose on his shoulder to properly connect the nozzle to the aircraft refuel port. As he turned to activate the aircraft refuel switches located in the aircraft refuel panel, pressurized JP-8 fuel started to spew from between the emergency breakaway connector and the D-1 nozzle. Initially, a stream of fuel—roughly the diameter of a garden hose—shot from the assembly into the rotor system, vaporizing the fuel. The fuel handler, now soaked by the spraying fuel, knocked the hose loose from the aircraft, threw it to the ground, and exited the area. The vaporized and liquified fuel was ingested into and ignited by the engines. As the fuel handler exited the area, he and the fire guard attempted to alert the crewmembers of the fire. The fire guard attempted to control the fire with the available fire extinguisher to assist the crew in egressing. Fed by the flood of fuel from the refuel hose and the vaporized fuel, the fire rapidly spread to the fuel-soaked areas, creating a fireball that engulfed the aircraft and the immediate area. The IP executed an emergency shutdown of the aircraft engines. Initial attempts by the crew to egress were unsuccessful due to the extreme heat. As the aircraft became further engulfed in flame, they exited the aircraft through the crew door and moved clear of the burning aircraft. The soldier operating the refueling pump at the tanker released the "dead stick" and shut off the fuel supply to the hoses. Both crewmembers sustained major burn injuries.

■ ***OH-58C.*** At 80 knots and 50 feet AGL during a day VFR two-aircraft mission in mountainous terrain, the Chalk 2 PC was heard to declare a mayday. The Chalk 1 aircraft reversed course and found Chalk 2 crashed on the side of a ridge. Both crewmembers sustained fatal injuries. The cause of the loss of engine power could not be determined. However, the loss of power is suspected to have been the result of air in the fuel system.

■ ***OH-58C.*** The aircraft was flying at 200 feet AGL and 90 to 95 knots during a day VMC cross-country training flight. The pilot, who was using the PC's map, was experiencing some problems with navigation and at least once required assistance from the PC in pinpointing their location. As the aircraft entered a valley, the crew noted a set of wires which were marked with orange balls across their route of flight. As they progressed along the valley at an altitude below the trees on the adjacent high ground, the pilot told the PC to turn left as they approached up the stem of a "Y" in the valley. The pilot also alerted the PC to some power lines that were located beyond the "Y." As the PC was acknowledging the wires, the pilot discovered a smaller set of lines much closer to the aircraft and was unsure which wires the PC was acknowledging. Almost simultaneously, the PC applied aft cyclic and increased collective pitch to avoid the wires.

The aircraft struck the wires while in a nose-high attitude. The wires made contact with the tail boom, left horizontal stabilator, and tail rotor. The left horizontal stabilizer and the tail rotor gearbox separated from the aircraft. As the PC attempted to regain airspeed and maneuver the aircraft toward an open field to their right, the aircraft entered a nose-low attitude and started an accelerated right spin. Realizing he could not control the spin, the PC attempted to zero out the forward airspeed and vertical rate of descent as the aircraft settled into the trees. One of the pilots received minor injuries, and the aircraft was destroyed.

■ *OH-58C.* The aircraft was lead in a multiaircraft formation flight, and the crew was conducting RL 1 NVG progression training. While in a turn to the downwind leg from 200 feet AGL and 30 knots, the pilot of the lead aircraft lost visual reference due to visible moisture accumulation on the windscreen and low illumination without the aid of his infrared light. The pilot allowed the aircraft to enter an unusual attitude from which recovery was unsuccessful. The aircraft lost airspeed, began drifting to the left rear, and impacted the ground on the left rear side and rolled over. Neither pilot was injured.

■ *UH-60.* At 200 feet or below during an NVG gunnery training mission, the crew heard a loud whining sound, followed by a loud pop. The crew assessed the sounds to be a malfunction of the No. 2 engine and pulled the No. 2 power control lever to idle. The aircraft impacted the ground hard with low rotor RPM and was destroyed. Both front-seat crewmembers sustained injuries.

■ *AH-1.* While conducting aerial gunnery training using NVGs, the aircraft was hovering in battle position during a target engagement when it descended and drifted rearward. The aircraft tail rotor and tail skid contacted rising terrain, resulting in a loss of tail rotor control. The aircraft spun right, coming to rest almost inverted. The aircraft was extensively damaged, and both pilots received minor injuries.

■ *OH-6J.* After completion of firing during aerial gunnery, the pilot initiated a right turn away from the target. The aircraft continued in a right descending turn and impacted the ground, followed by an immediate explosion/fire. The PC was fatally injured.

■ *CH-47D.* Shortly after departure, the crew deviated from their planned flight route and entered low-level flight over a river. While flying upstream below treetop level at about 60 to 80 knots, the aircraft struck a series of four high-tension wires. The aircraft crashed into the river, and all four crewmembers sustained fatal injuries.

■ *OH-58A.* At 15 feet AGL while proceeding into the wind, the pilot declared a precautionary landing. The aircraft was observed to make a 180-degree right turn and strike the ground nose first. The aircraft lost its landing gear, rebounded, and struck the ground a second time before coming to rest on its right side. Both crewmembers received minor injuries

■ *CH-47D.* During a day VFR mission, aircraft landed at a field site for passenger pickup. While on the ground, rear of aircraft ascended and it rolled onto its right side. One crewmember (ARNG technician) was killed, and the pilots sustained minor injuries.

A word of caution

In 43 B.C., Publilius Syrus, a Latin epigrammatist, said "He is safe from danger who is on guard even when safe." It is possible to squander investments in safety. A moment's disregard for by-the-book operations is all it takes to wipe out a safety record that has taken years to build.

As we begin FY 95, the potential to focus our attention away from our day-to-day operational business remains high. People are on the move, working new assignments, or trying to do the same good job with fewer resources. We must keep the emphasis on safety. There is no time to rest on the accomplishments of FY 94. If we do, the elation over the successes of FY 94 will soon turn to despair over the losses we will suffer in FY 95.

Without constant focus, the safety momentum will fade quickly and lives will be lost in accidents that should not have happened. The heart of the Army is its people, and we cannot afford the tragic loss of even one soldier. Maintaining a high level of self-discipline and professionalism and making an even greater commitment to integrating risk management and force protection initiatives into every task are key to reducing accidental losses even further in FY 95. □

The safety successes achieved in FY 94 were the direct result of soldiers who had the self-discipline, dedication, and courage to make safety their first priority.

While all the members of the aviation team deserve a "Well done" pat on the back, no one will be satisfied until we stop losing people in accidents that should have been prevented.

ASO CORNER

SOPs and things

The Aviation Branch Safety Office (ABSO) receives many requests for copies of "the best SOP" seen during assistance visits. In the past, ABSO has provided several examples from units that have put a tremendous amount of effort into developing excellent SOPs and Commanders' Accident Prevention Plans (CAPPs). Theoretically, this is a good policy. After all, if someone has found a good idea, then it should be shared with others. Well, maybe.

A good idea at one unit or installation may not be appropriate at another. Copying an SOP from another unit does not really do the job of stating how you do business in your unit. The moral is to look at other SOPs for ideas and concepts that may assist your unit in doing its mission but don't plagiarize another unit's SOP just to save time and effort.

Basic concepts

When developing the written safety program in your unit, there are two concepts to keep in mind. First, safety should be integrated throughout the entire SOP. Sure, that's what AR 385-95: Army Aviation Accident Prevention says, but what does that really mean?

The intent is to have risk countermeasures in place where the person doing the task will be readily aware of them. For example, it is not very productive to write into the safety annex of the SOP that all personnel doing preventive maintenance inspections will use a checklist. It is unlikely that the person doing the task even knows the safety annex exists. The requirement should be written into the task description of the appropriate functional area. In this case, the countermeasure should be written in the maintenance SOP that is used by the person performing the task.

This concept should make it obvious that the safety officer is responsible for reviewing *all* of the unit SOP to ensure that risk countermeasures are included where they will be seen by the right person and followed.

The second concept is a natural product of the first. If all risk countermeasures are integrated throughout the unit SOP, do you still need a "safety" SOP? Yes, you need a safety SOP.

The safety SOP should concentrate on how the safety program is managed in the unit. For example:

- How do you conduct your accident prevention surveys, safety council meetings, and safety awareness meetings?
- How does a soldier earn a safety award?
- What is an OHR (operational hazard report) and how can one be submitted?
- How are accidents reported to higher headquarters?
- What are the duties of the safety NCO?

Obviously, the list goes on to include everything that the safety staff does. In other words, if the safety officer leaves today, the SOP should tell the replacement exactly how all parts of the program work.

Your goal in developing the written safety program should be to get the right information to the right person in the unit. If you are primarily concerned about what the next inspector wants to see, you need to readjust your focus.

Integrating safety into operations plans and orders

You should apply this same concept to written operations plans and orders. For years now, we have been trying to exterminate the idea of a safety annex or a paragraph 6, but it still persists in some units. The only way to kill this dinosaur is for you, the safety officer, to make your commander understand that you should be involved in the total planning process of every operation. Safety in the form of risk management needs to be involved in every step of the operational planning process and should therefore be incorporated in every section or paragraph of the written plan.

This is not as easy to accomplish as it is to tell you to do it. You, as the safety officer, must develop and nurture a relationship with the commander and the entire staff to the point that they *expect* you to assist them in identifying hazards, assessing risks, and developing countermeasures during the planning process. If you are currently in the habit of reviewing the operation order *after* it is published, then you are attempting to close the proverbial barn door after the cows are long gone.

If you are successful in developing and nurturing a relationship with your commander and fellow staffers, you will find the rewards tremendous. No soldier wants to be involved in an accident or to be unsafe, especially aviators. Therefore, eventually you will get past the "Oh no, here comes the safety geek!" syndrome and get to the point where the staff thinks, talks, and does risk management even without your prodding. This will give you the satisfaction of knowing that you're working as a team and preventing accidents.

Aviation force protection! □

Commander's Accident Prevention Plan

As an ASO, you are probably acutely aware of the confusion and controversy over the Commander's Accident Prevention Plan (CAPP). At the risk of adding to the confusion, I believe some explanation of where we are going with the CAPP is needed.

(NOTE: CURRENT REGULATORY GUIDANCE HAS NOT CHANGED. COMPLIANCE WITH AR 385-95: ARMY AVIATION ACCIDENT PREVENTION IS STILL REQUIRED. AND THE FOLLOWING PROPOSAL MUST STILL BE APPROVED THROUGH CHANNELS.)

Original CAPP concept

The original concept of the CAPP was to create a stand-alone document that emphasized the commander's dedication to safety. This was a laudable objective and, in its time, had some validity. In spite of a certain amount of conflicting guidance, many commanders and safety officers understood the intent and created some excellent plans. Unfortunately, many did not.

In an attempt to comply with AR 385-95, some units made the CAPP little more than an index of where to find things in the SOP. Some made the CAPP a description of safety responsibilities for the staff.

Attempting to standardize the CAPP during Aviation Resource Management Surveys (ARMS) did little more than increase the frustration level of the field ASO. We ended up concentrating on what the CAPP should look like. How thick should it be? What color? What format? Is it an SOP? What part of my program is in the CAPP? What part is in the SOP? What goes in both?

Obviously, none of this is the least bit productive in the prevention of accidents. So why not just do away with the CAPP? After all, we integrate safety into all areas of the SOP. So why have a separate document just for safety? Good question.

If we indeed integrate safety into all functional areas of the SOP and the SOP is reviewed and updated regularly, we don't need to duplicate it in another document. But there are some good reasons to hold on to the concept of a "commander's plan."

New CAPP concept

Every unit faces a changing future. Missions change, personnel change, equipment changes, budgets change, and so forth. Each of these changes brings new hazards that the commander should anticipate and counter with accident-prevention plans. The CAPP should be exactly what the title says, a *plan* developed by the commander that gives the commander's perception of where the unit has probability of mission failure, equipment loss, or personnel injury (the risk) and what he or she intends to do about it (the countermeasure).

Used in this manner, the CAPP becomes the commander's written guidance to staff and subordinate leaders on where risk countermeasures should be focused. The staff uses this guidance in mission planning and the development of policy. When countermeasures are proven effective for long-term application, they are integrated into the SOP. Subordinate commanders use the guidance in the development of their own CAPP.

The advantage of this concept of the CAPP is in its short-term focus and true reflection of the commander's intent. The CAPP should be reviewed during every meeting of the unit safety council, updated *at least* annually, dated, signed by the commander, and widely disseminated throughout the unit. Obviously, the safety officer and other staff should assist the commander in developing the CAPP. But its value comes from the commander.

The CAPP must be the commander's plan. The content and appearance of the CAPP is up to the commander. Format, size, shape, or color does not matter. What matters is that the CAPP functions as a valuable part of the risk-management process.

Expect to see this change in the concept of the CAPP in the next revision to AR 385-95. □

Editor's note

Articles for this "ASO corner" were written by CW5 Bob Williams, ABSO, Fort Rucker, DSN 558-3000/3210. These articles are in agreement with Army Safety Center philosophy.

Among his duties at the ABSO, CW5 Williams is responsible for conducting evaluations of unit safety programs during ARMS inspections. He is the primary point of contact for Aviation Branch safety issues and is currently the primary agent for rewriting AR 385-95.

Summary of ALSE messages

The Aviation and Troop Command issued an aviation life support equipment (ALSE) advisory message (ALSE-94-01, 142357Z Jul 94) listing all messages transmitted by PM ALSE from 1 January 1988 through 31 December 1993. To assist units in checking to see if they have received all applicable messages, PM ALSE plans to publish an annual update of messages. Contact your next higher headquarters to obtain a copy of any message you have not received.

Msg No.	Date/Time Group	Status	Subject
88-1	081630Z Jan 88	Current	Relocation of components for the SRU-21/P survival vest and standard individual kits
88-2	251330Z Feb 88	Expired	Cartridge, carbon dioxide, NSN 4220-00-543-6693 for LPU-2/P,-3/P, and -10/P
88-3	011030Z Apr 88	Expired	Extension of potency expiration date
88-4	131500Z Jul 88	Expired	Signal kit distress, foliage penetrate, SRU-21/P survival vest
88-5	261130Z Jul 88	Current	Thermoplastic liner (TPL) conversion kit for SPH-4 flyer's helmet
88-6	271230Z Oct 88	Superseded 021638Z Jan 89	Delayed implementation of para 7-6b, AR 95-3: General Provisions, Training, Standardization, and Resource Management
89-1	021638Z Jan 89	Superseded 141100Z Nov 89	Delayed implementation of para 7-68, AR 95-3: General Provisions, Training, Standardization, and Training Resource Management
89-2	121030Z Jun 89	Expired	Signal kit, foliage penetrate, (L-119), NSN 1370-00-490-7362 used in SRU-21/P survival vest and Mohawk survival vest
89-3	301330Z Jun 89	Current	AN/PRC-90-2 preventive maintenance check and services
89-4	1330Z Aug 89	Expired	Water purification tablets NSN 6850-00-985-16615 extension of potency expiration date/suspension: 19 Sep 89
89-5	141100Z Nov 89	Superseded 021130Z Jan 90	Delayed implementation of para 7-6b, AR 95-3: General Provisions, Training, Standardization, and Resource Management
90-1	231300Z Jan 90	Expired	Signal kit, foliage penetrator,(L-119), NSN 1370-00-490-7362 used in SRU-21/P survival vest and Mohawk survival vest
90-2	021130Z Feb 90	Superseded 171630Z Oct 90	Delayed implementation of para 7-68, AR 95-3: General Provisions, Training, Standardization, and Resource Management
90-3	071530Z Feb 90	Current	Used flight helmet visors
90-4	141430Z Feb 90	Current	Problem fit program for Army flight helmets
90-5	28110Z Mar 90	Current	Authorized substitution for Lomotil NSN 6505-00-118-1914
90-6	051800Z Apr 90	Current	Thermoplastic liner (TPL) conversion
90-7	071345Z May 90	Expired	Critical shortage of 20-man life raft cylinder NSN 4220-00-595-3698
90-8	071330Z May 90	Current	Water purification tablet, iodine, 8 mg, NSN 6850-00-985-7166
90-9	171630Z May 90	Current	Hydrostatic testing for high pressure CO^2 cylinder for 20-man life raft
90-10	041700Z Jun 90	Current	SPH-4 flyer's protective helmet retention assembly NSN 8415-01-056-0700
90-11	061330Z Jun 90	Current	AH-1 helmet sight subsystem (HSS)
90-12	281230Z Jun 90	Expired	Signal kit, flare foliage penetrator with launcher and 7 flares NSN 1370-00-490-7362

Msg No.	Date/Time Group	Status	Subject
90-13	031100Z Oct 90	Expired	New retest date for water purification tablets, Iodine NSN 6850-00-985-7166
90-14	161430Z Oct 90	Current	Salvaging parts and turn-in of SPH-4 helmet shells
90-15	171630Z Oct 90	Expired	Delayed implementation of para 7-6b, AR 95-3: General Provisions, Training, Standardization, and Resource Management
90-16	311530Z Oct 90	Expired	"Desert Shield" fitting Army aircrews with contact lenses for use with M-43 mask and M-24 mask
91-1	131400Z Jun 91	Current	Incompatibility of FV2 type laser eye protection (LEP) spectacles/clip-ons with the OH-58D aircraft cockpit displays
91-2	081530Z Aug 91	Current	Survival kit, individual, tropical, tactical aircrewmember NSN 6545-01-120-2638
91-3	071530Z Aug 91	Current	Care, use, and inspection of flight helmet SPH-4 and SPH-4B
91-4	301030Z Sep 91	Current	Substitution of Imodium for Lomotil
92-1	11530Z Jun 92	Expired	Water purification tablets NSN 6850-00-985-7166 extension
92-2	101100Z Jul 92	Expired	Signal kit distress, foliage penetrate, (L-119) NSN 1370-00-490-3762 used in the SRU-21/P survival vest and Mohawk survival vest
92-3	311130Z Jul 92	Current	Vest, survival small NSN 8415-01-173-8098 and vest, survival large NSN 8415-00-177-4188 components of SRU-21/P vest, survival

To receive a computer disk containing these messages (Windows Notepad format), send one formatted (3.5 or 5.25) high-density disk to Department of the Army, Project Manager, Aviation Life Support Equipment, ATTN: SFAE-AV-LSE (SSG Marmuziewicz), 4300 Goodfellow Blvd, St. Louis, MO 63120-1798.

POC: SSG Stan Marmuziewicz, Office of the PM ALSE, DSN 693-3573 (314-263-3573), FAX DSN 693-9078 or E-mail Marmuzie@St-Louis-PEO3.Army.Mil.

More ALSE information

Since the release of ALSE-94-01, which provided a list and the status of all PM ALSE messages from 1988 through 1993, one additional PM ALSE message (ALSE-94-02) has been issued:

Msg No.	Date/Time Group	Status	Subject
94-02	142357Z Jul 94	Current	Availability of PRC-90 series survival radios

In addition to the PM ALSE messages, the following are ALSE-related messages:

Originator	Date/Time Group	Status	Subject
CDR USAAVNC	201103Z Mar 94	Current	Information on ALSE being developed
CDR USAMMA	082101Z Apr 92	Current	Extends povodine iodine solution, NSN 6505-00-914-3593, Sherwood Medical, lot No. 84820 to 31 Jan 95
CDR CECOM	201405Z Apr 94	Current	Ground precautionary message (CECOM GPM-93-004) AN/PRC-112 radio, NSN 5820-01-279-5450, LIN: R82903
CDR USAMMA	222105Z Apr 94	Current	Povodine iodine solution, NSN 6505-00-914-3593, Sherwood Medical, Lot No. 9P81, not extended; destroy upon expiration
CDR USAMMA	172102Z May 94	Current	Disposition of medical material/dressing first aid field camouflaged

POC: CW5 Daniel W. Medina, Operations and Investigations Division, DSN 558-9857 (205-255-9857)

Map datums: a note of caution

In a recent briefing by the Defense Mapping Agency (DMA) for the Chief of Staff, Army, the importance of map datums was a major item of concern and discussion. Datums are mathematical models of the Earth used to calculate the coordinates on maps, charts, or systems.

Currently, many different datums are used throughout the world to produce maps. The standard datum for U.S. forces is World Geodetic System 1984 (WGS 84). It is also the standard that has been adopted by the International Civil Aviation Organization and the International Hydrographic Organization. The default output coordinates from the Navstar Global Positioning System (GPS) are on WGS 84. However, many U.S. and foreign maps based on other datums are still in use.

The use of different datums creates a problem. The coordinates for a point on the Earth's surface in one datum will not match the coordinates from another datum for that same point. For example, on the Korean Peninsula, current maps used by U.S. and Republic of Korea forces were developed using the Tokyo Datum. Converting these maps to WGS 84 causes an average horizontal displacement of 755 meters. Not all disparities resulting from using two different datums are as large as this one. Disparities were also discovered for the Desert Shield/Desert Storm area of operation. This problem could exist within our own forces but occurs more frequently when U.S. forces are conducting combined operations.

In the past, we didn't worry too much about datums because our weapon systems usually didn't require highly accurate point positioning. Because of the inherent high accuracy of WGS 84 and the fact that it is the standard, many current and developing weapon and navigation systems have been "hardwired" to use only WGS 84 coordinates. With today's technology, precise coordinates are vital for mission success and WGS 84 provides the precision necessary to meet our most stringent requirements.

The bottom line is don't ignore the fine print at the bottom of maps. Be certain the maps being used in a given operation were produced using the same datum. If this is not possible, make sure the datum information is passed along with coordinates. Also be sure the datum is addressed in the operations order.

For additional information, contact either of the following POCs:

- HQ DMA, Command Support Division, DSN 356-9329 (703-285-9329).
- Defense Mapping School, Geophysics Department, DSN 655-3206 (703-805-3206).

Hand-held laser pointers

Advances in technology are having a definite effect on the aviation community. One area where this advancement is finding its way into Army flight cockpits is with hand-held lasers. These gadgets are small, lightweight, and relatively inexpensive. For as little as $70, anyone can purchase a hand-held laser in the form of a laser pointer. Aviators are by nature problem solvers, and some aviation warrant officers have come up with fairly innovative ways to use these lasers in everyday aviation operations. For example, the lasers may be used to—

- Enhance crew communication by pointing out specific areas of interest or concern.
- Identify hazards along a route of flight during a night vision goggle mission.
- Point out the next slingload hookup point.

On the surface, applying laser technology in this way appears harmless enough, and in the long run, using lasers for such purposes makes sense. But for the present, there may be some problems that should be considered. The effects of these "eye-safe" lasers on NVGs, direct-view optics, and on the operators of such vision-enhancing equipment need to be further explored and some questions answered. For example: "What would happen if a laser beam were inadvertently directed at a soldier on the ground while the soldier was looking at the aircraft through a set of binoculars," or "What sort of degradation is there in the ANVIS when these lasers are being used?" Most of the lasers are within the ANVIS spectral response, and overall resolution of the goggles could be significantly reduced without the aircrews being aware of what is happening. The laser doesn't even have to be pointed at the NVGs to degrade their resolution.

A working group has been formed to resolve some of the questions and concerns that are being raised about the use of hand-held lasers. Among the organizations represented by this working group are the Army Safety Center, PM for Night Vision, Electro-optics, Night Vision Electronic Sensor Directorate, CECOM Safety, and the Army Environmental Hygiene Agency.

Until these concerns are resolved and techniques and procedures developed, it is recommended that hand-held laser devices **not** be used in Army aircraft.

While use of hand-held lasers in cockpits is not recommended at this time, if you have ideas on how these devices might be used in the future, contact CW5 Rodney Rowe, Army Aviation Center Night Vision Device Branch, DSN 558-9545 (205-255-9545).

Questions regarding this article should be addressed to the USASC Aviation Branch, CW5 Robert A. Brooks, DSN 558-3703 (205-255-3703) or LTC Robert Johnson, DSN 558-3756 (205-255-3756).

Editor's note

*The proliferation of hand-held lasers calls for warnings about the hazards involved in the use of such devices. See article "Hazard alert: pen-like and other laser pointers," in the December 1993 issue of **FlightFax.***

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-60 Class C

A series - While conducting medevac mission, crew encountered heavy dust during landing to field site. Aircraft landed hard on tail wheel.

Attack

AH-1 Class C

S series - During cruise flight, chip detector caution lights flickered. During approach for landing, power loss occurred at about 40 to 50 feet AGL. Aircraft landed hard, damaging landing gear and underside of fuselage.

S series - Crew initiated tactical dash during training mission and pulled in 68 PSI torque. Aircraft landed and crew performed normal shutdown. Drive train was overtorqued.

AH-64 Class C

A series - During takeoff to exit tactical training area, crew felt a bump. As crew increased airspeed, they felt an increased vibration and elected to do a precautionary landing. Postflight inspection revealed damage to three of four main rotor blades.

A series - During night tactical mission, aircraft departed holding area en route to battle position. During flight, transmission chip caution light came on. Crew was unable to find suitable landing area. Aircraft continued circling at 50 feet and 30 knots. Pilot then initiated a climb and observed landing site at his 9 o'clock position, made a 90-degree left-pedal turn, and began approach to landing site. Prior to touchdown, pilot made left-pedal turn to align aircraft with touchdown site. Crew completed landing and normal shutdown procedures. Postflight inspection revealed tail rotor blade damage due to striking small tree.

Cargo

CH-47 Class A

D series - During day VFR mission, aircraft landed at field site for passenger pickup. While on the ground, rear of aircraft ascended and it rolled onto its right side. One fatality.

CH-47 Class C

D series - Aircraft was trail in a flight of six on a VFR service mission. During postflight, crew noticed clamshell doors had separated during flight.

D series - During cruise flight, aircraft lost hardware for shock assembly and bungie cords. Ski rotated to a nose-low attitude and aft portion of ski caused damage to outboard portion of ramp exterior surface.

CH-47 Class D

D series - Crew was performing water drop operations for forest fire suppression. While crossing a ridge on approach for water drop, crew failed to maintain adequate clearance. Water bucket was damaged when it hit the ridge.

CH-47 Class E

D series - During preparation to conduct fire bucket standby, crew lifted full 1,000-gallon bucket for third of three prechecks. As aircraft climbed to a hover, center hook inadvertently released. Fire bucket fell to ground and sustained damage.

D series - During external load operations, crew placed Sheridan tank on ground. As slings slackened, load rolled down slope. Crew chief was told to release load and did so with normal release. When hook opened, load broke tip off central cargo hook.

D series - While increasing RPM from minimum beep to 100 percent during runup, No. 2 engine began uncommanded increase that could not be reduced with normal beep trim. Crew moved ECL to ground and RPM decreased. RPM reached 102 percent.

Observation

OH-58 Class A

A series - At 15 feet AGL while proceeding into wind, pilot declared precautionary landing. Aircraft was observed to make a 180-degree right turn and strike ground nose first. Aircraft lost its landing gear, rebounded, and struck ground a second time before coming to rest on its right side.

OH-58 Class C

A series - Aircraft was operating at 90 percent N2 RPM while being washed down with water hoses before redeployment by ship. PC observed reduction in engine RPM and shut aircraft down. Unit MTP told PC to restart aircraft after engine TOT dropped below 200 degrees. During restart, engine TOT rose to 900 degrees at normal rate and then began rising rapidly. PC executed emergency shutdown. TOT exceeded 1,000 degrees. Investigation continues.

Fixed wing

C-12 Class C

C series - While taxiing for takeoff, pilot veered aircraft off taxiway to give additional clearance between C-12 and two F-4s. Left main landing gear struck concrete housing of taxiway light that protruded out of ground. Aircraft forward momentum and obstruction caused left main landing gear to collapse to rear. Aircraft pivoted left and left wing and lower nacelle contacted ground, while left propeller struck ground several times. Aircraft came to rest on its left wing and nacelle and its front and right main landing gear.

F series - Isolated thunderstorms were briefed as possible for route of flight. Several deviations were made to avoid buildups en route. Crew completed uneventful flight. During PMD inspection, maintenance found small nick on left propeller and hole in aft end of right elevator.

C-12 Class E

C series - Pilot was closing air stair door when door latching handle apparently sheared in fully locked position, rendering handle inoperative. PC noted cabin door caution light was still illuminated and asked pilot to check door. Pilot noted door handle had broken and checked position of four lock bolts and locking mechanism to determine if they were properly positioned to indicate door was secured. Crew rechecked and determined door latch was secure for flight and received clearance to proceed with normal takeoff. At about 300 feet, crew heard loud muffled noise from rear fuselage door area. Pilot saw that door had come open. Crew aborted takeoff and returned for uneventful landing.

C series - When main landing gear was lowered during landing sequence, crew noticed right main landing gear position indicator light failed to illuminate. Light remained out after bulb from transponder was used to replace gear position indicator light, and crew performed manual gear extension. Aircraft landed safely.

OV-1 Class E

D series - After takeoff, PC placed gear handle up in order to retract landing gear. PC noted that gear indications fluctuated but did not show "up" indications even after PC recycled gear several times. PC placed gear handle down and got a good "down" indication. PC flew by tower to confirm gear was down and completed normal landing without further incident. Malfunction was caused by air in hydraulics system and dump valve failiing to reset.

Messages

■ Safety-of-flight emergency message concerning immediate grounding of H-47 aircraft assigned only to the 160th SOAR (CH-47-94-01, 092243Z Sep 94). Summary: Inspection has revealed that the electrical connector for the fuel pump inside the HM-020-800 tank could have a faulty connector and could cause the pumps to fail. The fuel control panel for the HM-020-800 fuel system for the H-47 aircraft assigned to the 160th SOAR (Abn) may have a faulty relay, causing an excess amount of voltage to the intake fuel transfer pumps, and causing them to fail. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Safety-of-flight technical message concerning rescission of safety-of-flight message CH-47-94-01, grounding H-47 aircraft assigned only to the 160th SOAR (CH-47-94-02, 161800Z Sep 94). Summary: A review of inspection procedures regarding the electrical connector for the fuel pump inside the HM-020-800 has revealed an error in the inspection process used. The electrical connector is not, repeat is not, faulty and the pumps will not fail. Further investigation of the fuel control panel for the HM-020-800 has revealed no problem, repeat no problem, with a relay capable of causing an excess amount of voltage to the fuel transfer pumps. Therefore, safety-of-flight message CH-47-94-01 is rescinded. The red "X" required by CH-47-94-01 may be cleared on all H-47 aircraft assigned to the 160th SOAR (Abn).Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Safety-of-flight technical message concerning restriction of hydraulics-off maneuvers and one-time inspection for loose main rotor hub worm gears on all UH-1H/V aircraft (UH-1-94-04, 151829Z Aug 94). Summary: The worm gears that are used to adjust the twist on the UH-1 main rotor hub tension torsion straps have been found loose on hubs in service and in stock. To prevent loss of adjustment of the tension torsion straps, these worm gears are secured in place by means of proper shimming of the hub spring plate assembly to the main rotor yoke. Loose worm gears may not be noticeable by the crew during operation of aircraft with hydraulics on; however, with hydraulics off, a significant lack of collective control will be noticed should the tension torsion strap lose the preset adjustment. In addition to loose worm gears, the bolts that mount the hub spring plate assembly to the main rotor yoke were found to have lost torque in some of these cases. Loose worm gears and lost torque on the mounting bolts can be attributed to either improper shimming of the hub spring plate (too many shim), use of excess adhesive (EA934) during assembly of the plate to the yoke, or the improper application of the adhesive (wrong location). The corrective procedure is the same regardless of the cause. Removal and reinstallation of the hub spring plate assembly must be accomplished per the instructions in this message and in TM 55-1520-210-23-1. Aircraft are restricted from hydraulics-off maneuvers, except for emergency operations, until the maintenance requirements of this message are completed. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action informational message concerning approved engine cleaners for Army turbine engines (GEN-94-ASAM-11, 311532Z Aug 94). Summary: Because of Environmental Protection Agency restrictions, several units have requested that an engine cleaner be identified that has no hydrocarbon solvents. The appropriate military specification for turbine engine gas path cleaning components, MIL-C-85704, has been revised to include Type II and Type IIA cleaners which are aqueous cleaners that do not contain hydrocarbon solvents. Type II cleaners require dilution with water, while Type IIA cleaners are ready for use with no dilution required. The purpose of this message is to inform users of an approved cleaner (Type II and IIA) for all turbine engines. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

FOR MORE INFORMATION ON SELECTED ACCIDENT BRIEFS, CALL DSN 558-2119 (205-255-2119).

In this issue:

Class A Accidents *through September*

		Class A Flight Accidents		Army Military Fatalities	
		93	94	93	94
1ST QTR	October	6	2	2	0
	November	2	3	6	0
	December	0	2	0	2
2D QTR	January	1	1	0	2
	February	5	2	8	0
	March	1	0	5	0
3D QTR	April	4	5	0	2
	May	1	1	1	0
	June	0	0	0	0
4TH QTR	July	0	4	0	5
	August	1	1	0	0
	September	2	1	0	0
	TOTAL	23	22	22	11

U.S. ARMY SAFETY CENTER

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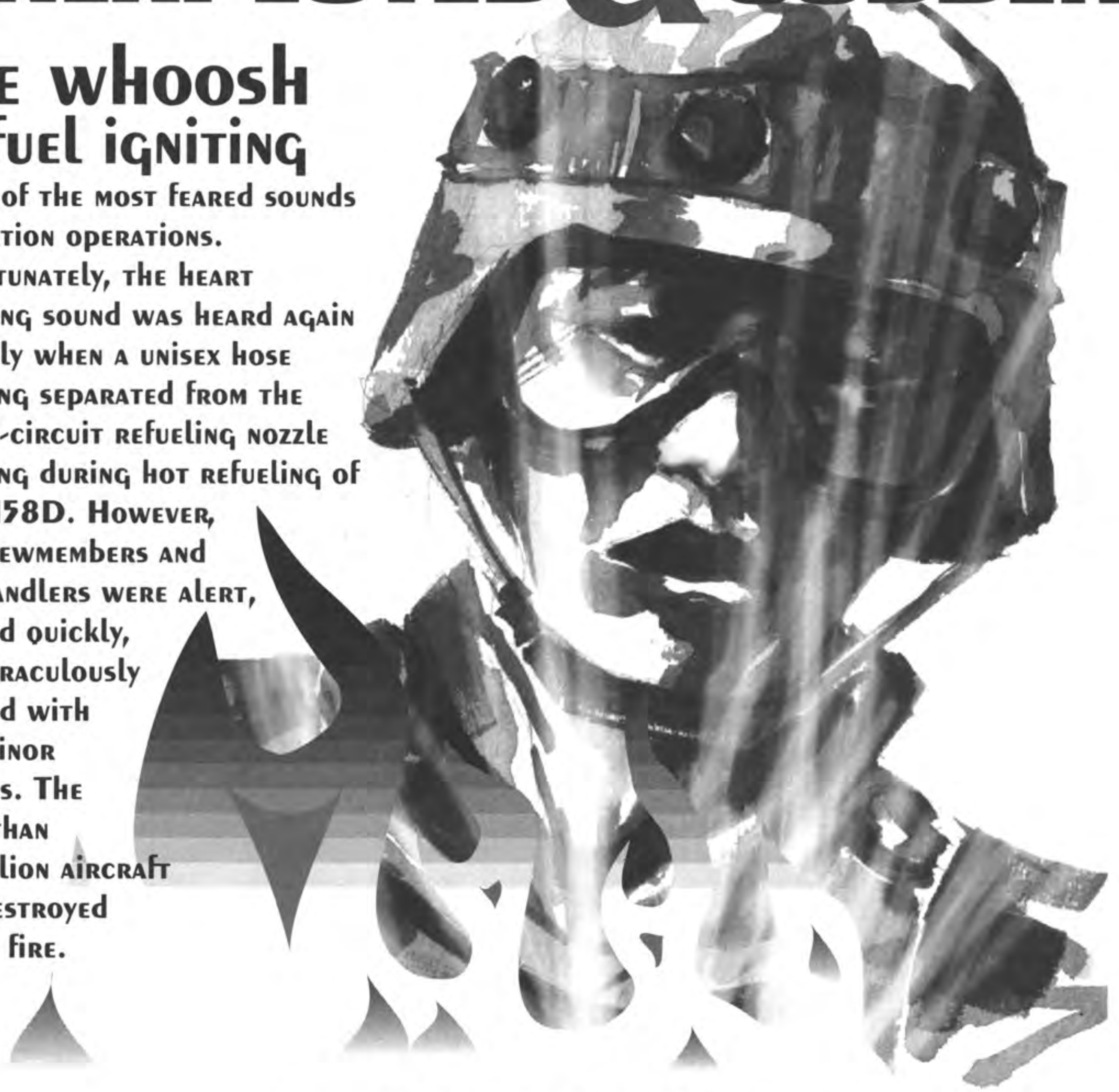
REPORT of ARMY AIRCRAFT ACCIDENTS

July 1995 ◆ Vol 23 ◆ No 10

UNEXPECTED & SUDDEN

The whoosh of fuel igniting

is one of the most feared sounds in aviation operations. Unfortunately, the heart stopping sound was heard again recently when a unisex hose coupling separated from the closed-circuit refueling nozzle coupling during hot refueling of an OH58D. However, the crewmembers and fuel handlers were alert, reacted quickly, and miraculously escaped with only minor injuries. The more than $6 million aircraft was destroyed by the fire.



A UH-60, which was sitting where the vehicle in the photo is located, was refueling two OH-58D aircraft. At refuel point 1, the fuel nozzle separated from the hose coupling. Pressurized fuel sprayed over the refueler and the aircraft and ignited.

Another refueling fire

Spraying fuel, an operating aircraft give new meaning to the words "hot refueling."

The Army has dedicated a lot of effort and money to overcoming the hazards of postcrash fire or igniting fuel during refueling. Development of crashworthy fuel systems has greatly reduced the risk of fire in survivable crash impacts, and the use of closed-circuit refueling has greatly reduced the dangers of hot refueling. But the destructive and devastating results of fire remain an ever-present danger. We must never forget the inherent hazards of fuel handling and be prepared to react if the unexpected happens.

Various aircraft operators manuals list emergency procedures for dealing with fires on the ground and in the air. But manuals cannot provide for every eventuality. And sometimes no amount of procedures in a regulation can get you out of a bad situation. Some situations require quick use of common sense, recall of previous training, determination of the proper course of action, and a whole lot of luck.

The February issue of *FlightFax* highlighted an AH-64 pilot's very vivid account of the horrifying 18 seconds from the time he knew his aircraft was on fire until he bailed out and ran from the inferno that had ignited during refueling operations. Recently another fire occurred during hot refueling of an OH-58D Kiowa Warrior. Again, quick reaction and previous training saved the lives of the crews and refuelers.

"Fat Hawk" refueling accident

Six OH-58D Kiowa Warriors were to conduct a night mission during which refueling would be required. The aircraft would refuel at a FARP site that used UH-60 aircraft as the fuel source. This rapid refuel operation, commonly referred to as a "Fat Hawk," basically means defueling the UH-60 to refuel the OH-58Ds. The refuel system was made up of components from the heavy expanded mobility tactical truck (HEMTT) tanker aircraft refueling system (HTARS) and a Robertson Micro-Fare Pump Module, which was bought off-the-shelf.

At 2200, two UH-60L aircraft departed the intermediate support base to conduct the refuel mission. Thirty minutes later, they arrived at the refuel site, and the system was set up and operational in less than 4 minutes. Each UH-60 aircraft fed two refuel points.

Before beginning refuel operations, the NCO at each site checked the FARP layout IAW a FORSCOM checklist, followed by an inspection by an aviation safety officer. No deficiencies were noted. The refueler at each point also checked the equipment. As the refueler for refuel point No. 1 in the first FARP was checking her hose connections, the CCR (closed-circuit refueling) nozzle separated from the hose coupling. Unfamiliar with the type of coupling being used, the refueler called her NCOIC for assistance. He reconnected the hose and CCR nozzle and then turned the pump on, pressurizing the system.

At 2250, the first Kiowa Warrior arrived for fuel and landed at refuel point No. 2 of the first FARP. Because of problems with the refuel port on the aircraft, the crew shut down the aircraft for cold refueling. At 2303, the second Kiowa Warrior arrived and landed at refuel point No. 1. During refueling, the aircraft remained at full operating RPM with both pilots inside.

The refueler grounded the aircraft, bonded the nozzle to the aircraft, and inserted the CCR nozzle into the aircraft's fuel port. As she tugged on the nozzle to ensure it was properly seated, the nozzle separated from the hose coupling, and pressurized fuel sprayed upwards over the aircraft and the refueler. As the fuel ignited at the engine exhaust stack area, the refueler instinctively pulled the hose against her stomach in a futile attempt to staunch the fuel flow.

The fire quickly spread, engulfing the refueler and the aircraft in flames. Almost immediately, the NCOIC, who was standing nearby, pulled the refueler to the ground extinguishing the flames only to have his BDU shirt catch fire. Realizing he was on fire, he dropped and rolled to extinguish the flames on his uniform.

The crew shut down the aircraft and egressed uninjured. The UH-60 crew disconnected all hoses and electrical connections and departed the area without incident. As they left, they activated the crash alarm system. The installation fire department responded and extinguished the aircraft fire. Except for the tail boom and tail rotor, the aircraft was destroyed. Miraculously, the two fuel handlers received only minor injuries.

What happened?

The original design of the unisex hose coupling (P/N AE88050R) allowed for adequate clearance of the grenade-style pull pin in the unisex nozzle coupling (NSN 4930-01-214-2909). But the design had been changed. The new design did not allow for adequate clearance of the pull pin, and the coupling separated from the nozzle.

The FARP NCOIC had failed to detect an inoperable interlock pin in the unisex hose coupling. The pin could not seat when the coupling was properly seated to the nozzle. He also failed to detect that the grenade pull pin in the unisex CCR nozzle did not seat when the coupling was properly connected to the nozzle. Even though the refueler had specifically informed the NCOIC of an uncommanded separation of the nozzle and hose coupling, he failed to detect these deficiencies.

Note: The Aviation and Troop Command has issued a safety-of-use message (SOUM-ATCOM-95-006, 091818Z Jun 95) concerning removal from service of Aeroquip Corporation aircraft CCR nozzle assemblies (NSN 4930-01-214-2909) and pressure fuel servicing nozzles (RDF nozzle) NSN 4930-01-214-0991 with non-valved unisex inlet couplings. (See sidebar for summary and purpose of the message.)

Be prepared for the unexpected

Fortunately, fire doesn't happen often in aviation operations. But when it does, it has the potential to be deadly—quickly. As we've seen in these recent refueling accidents, seconds can mean the difference between living and burning to death. In both of these recent accidents, the individuals involved were alert to potential hazards and reacted quickly and instinctively even in unusual circumstances.

Long after the specific details of these refueling accidents have faded from your memory, remember that even a familiar, stable situation can deteriorate into a life-threatening emergency in a surprisingly short length of time. A lack of situational awareness and attention by any one of the individuals involved in these accidents could have used up precious seconds that could not be spared. Anticipate contingencies by planning actions and priorities if your situation deteriorates while you're in hot refueling. Doing so can save you seconds and aid in your survival should an unexpected fire occur.

POC: CW4 Gary D. Braman, Investigations Division, DSN 558-9855, (334-255-9855)

Safety-of-use message

Recently, an OH-58D helicopter was consumed by fire during hot refueling operations using an Aeroquip Corporation CCR nozzle assembly, NSN 4930-01-214-2909. Preliminary examination of the refueling components indicates that incompatible unisex couplings may have caused the nozzle to separate from the hose at the unisex coupling.

To preclude recurrence of this incident, SOUM-ATCOM-95-006 requires removal of refueling nozzles and nozzle assemblies with potentially incompatible couplings from service. The potential incompatibility results from the location and angle of entry of the interlocking pin on the non-valved inlet coupling. In addition, a separate message will be issued to reiterate the importance of ensuring only properly functioning equipment is used for aircraft refueling.

The purpose of this SOUM is to require units to inspect CCR nozzle assemblies and RDF refueling nozzles for incompatible couplings and remove them from service in accordance with this message.

Points of contact

- Technical, Mr. Charles Bright, DSN 693-3888 (314-263-3888).
- Logistical, Mr. Jack Shortridge, DSN 693-2618 (314-263-2618).
- Safety, Mr. Brad Meyer, DSN 693-2258 (314-263-2258).
- Foreign military sales, CW5 Jay Nance or Mr. Ron Van Rees, DSN 693-3826/3659 (314-263-3826/3659).
- After hours, contact ATCOM command operations center, DSN 693-2066/2067 (314-263-2066/2067).

What would you do?

My duties as the Utility Aircraft Systems Manager at the U.S. Army Safety Center include reading the abbreviated aviation accident reports to identify potential trends. Recently, the Safety Center received two reports that I thought would be good topics for risk-management discussion around the flight planning table in operations. They could also serve as the basis for writing a "There I was" type of article, which we hope many of you will begin doing (see February 1995 issue of *FlightFax* for more information on our requests for "There I was" stories).

Although I have communicated with the organizations involved and given them an opportunity to review this article prior to publication to ensure that nothing was taken out of context, I do not know all of the circumstances involved in these two reports. I have used these two excellent examples simply to generate a discussion on risk-management procedures and the decision-making process. I do want to commend the aircrews for submitting the reports.

Apply the risk-management process and continue applying the principles until the mission is completed—including sharing of lessons learned.

The intent of this article is not to second-guess or judge the aircrews' actions but to generate discussion among aircrewmembers and to encourage each reader to do a self-evaluation by answering the question, "What would I have done in that situation?"

First scenario

A UH-1H aircraft departed under visual flight rules (VFR) for a planned day VFR service mission with en route weather forecasted to be 1500-foot ceilings and 2 miles' visibility. Destination weather was forecasted to be above VFR minimums at estimated time of arrival (ETA) through 1 hour after ETA. Ten miles out from departure, the aircrew encountered unforecast weather of ceilings less than 500 feet and visibility less than 1/2 mile. The crew aborted, returned to home station, and canceled the mission.

Second scenario

A UH-1H aircraft departed under instrument flight rules (IFR) with 100-foot ceilings and 1/16-mile visibility on a service mission with destination weather forecast for 600 foot scattered, 1,200 foot overcast, and visibility of 2 miles with fog. Upon contacting approach control on departure, the aircrew was informed that destination weather was zero-zero. Upon inquiry, approach control stated that the closest airport where they could expect to "break out" was 140 nautical miles west. The aircrew requested vectors for a precision approach radar (PAR) procedure to a nearby Air Force base. The PAR was successful, and the crew canceled the mission.

Analyzing the scenarios

With the stage set, let's look at the scenarios from both a regulatory and risk-management perspective.

■ *Applying regulatory requirements.* In the first scenario, the en route portion of the flight was going to be conducted in Class G, uncontrolled, airspace. In accordance with AR 95-1: Aviation Flight Regulations, paragraph 5-2.d.(4), for day flight, outside of controlled airspace, forecast en route weather must permit flight clear of clouds and 1/2-mile visibility. For this flight, the above minimums were easily met.

Based on the forecast, the crew should not have had any problems with maintaining these minimums. The aircraft was not IFR equipped. The local SOP requires that aircraft be equipped for instrument meteorological conditions (IMC) flight for VFR operations below a 1,000-foot ceiling and 3-miles' visibility. Upon identifying and assessing the hazard of less-than-forecasted ceilings and visibility, the aircrew elected to control the hazard by choosing a course of action that included aborting the mission and returning to home station.

Now, let's look at the second scenario. One of the crewmembers was an instrument examiner. The crew also met the criteria in AR 95-1, paragraph 5-4.a. requiring 50 hours of instrument flight time, which meant that they had no takeoff minimums. The departure airfield has a non-precision approach with weather minimums of 500-foot ceiling and 1-mile visibility. There were airfields in the local area with precision approach radar and weather minimums as low as 100-foot ceiling and 1/4-mile visibility. However, these fields were affected by the same local weather. The weather forecaster on duty had the least amount of experience at the facility and attributed the weather phenomenon (fog) to the close proximity of large bodies of water.

The service mission was a VIP pick-up and transport for linkup with a fixed wing aircraft. The pick-up point had been changed from the original heliport to an airfield because of approach planning criteria and the forecasted weather. Additionally, the aircraft was equipped with auxiliary fuel and had sufficient fuel on board to fly to the airfield 140 miles west to "break out" with a 1-hour reserve.

The purpose of AR 95-1 is to establish responsibilities, procedures, and rules for aircrew training, standardization, and the operation of Army aircraft. AR 385-95: Army Aviation Accident Prevention states that professionalism means complying with all of the set standards and that by-the-book, disciplined operations are mandatory. Does this mean that if we meet the criteria set forth in the regulation that we are obligated to launch even if we feel it exceeds our own capabilities or limitations?

■ *Applying risk management.* I feel confident that the crew flying the second scenario applied risk-management techniques to their mission, implemented controls, and made the risk decision at the appropriate level. For example, the original pick-up point was changed due to weather, plus they had auxiliary fuel capability on board which gave them sufficient fuel to fly to an alternate airfield. In this case, we had an experienced crew, the aircraft was mission capable, and they launched with a favorable destination weather forecast.

But what is a weather forecast? One of Webster's definitions of forecast is to predict weather conditions by analysis of meteorological data. Once we have the weather forecast, we can start our planning and risk management. But how many times has the weather forecast or prophecy been missed in your aviation career? I can count mine on one hand. For example, after being airborne for more than an hour and upon contacting approach control, the weather we received was the minimum for the planned instrument landing system (ILS) approach and now required an alternate. Needless to say, we did not have fuel for one, nor could we divert to another destination. The aircraft ahead of us reported breaking out at minimums, and fortunately, we did as well. But we had an alternate plan in the event we had to execute a missed approach. Since we were committed to our destination, we were going to request sequencing for additional ILS approaches in hopes the conditions would improve. When fuel became critical, our plan was to execute the approach at 60 knots and at a 300-foot-per-minute rate of descent to the ground. In essence, we were going to do a controlled crash. My other incidents were under VFR conditions and involved encountering special VFR. Airspeed and altitude were adjusted, and we were able to continue the mission. As I look back, I am not sure I would make the same decisions using the risk-management process we are taught to use today. But enough about my experiences—I'm sure you've had yours too.

Back to our two scenarios. The current regulations allow operations in VFR when IFR recovery is not possible, and one may also be able to depart IFR in zero-zero conditions. What would you do? Would you depart IFR from an airfield with less than approach minimums at the point of departure? What would your course of action be if a master caution light flickered during climbout?

Changing perceptions

Sometimes we perceive that mission accomplishment is paramount—no matter what the risk—and that mistakes or failures are not tolerated and will reflect adversely on evaluation reports. As we restructure the force, our "can do" attitude is becoming one of "can't fail." This could set the stage to reverse the downward trend in accidents that we have experienced over the past 4 years.

Risk management is the tool to change these perceptions. It is being taught in both officer and enlisted leadership development courses throughout the Army. Today, commanders and soldiers are gaining an understanding and appreciation of the risk-management process and know that if the risks outweigh the benefits, the mission should be a no-go.

Risk management truly is a force multiplier and plays a key role in force protection. Remember that once the mission is received, start applying the risk-management process and continue applying the principles until the mission is completed—including sharing of lessons learned.

—MAJ James F. Dunn, USASC Aviation Branch, DSN 558-3756 (334-255-3756)

Aviation units needed to support Ranger training at Camp Merrill

Like to spend some time in beautiful mountain scenery in the company of rugged outdoorsmen? No, this isn't an ad for a macho hunting weekend; but you can have this and more—an opportunity to fly day and night air assault missions—if your unit provides aviation support to the Army Ranger School.

Camp Frank D. Merrill is located in the North Georgia mountains and is the home of the 5th Ranger Training Battalion and the location of the mountain phase of the Army Ranger School. About 200 ranger students come to Camp Merrill each month. During the 10-day field exercise, students conduct numerous day and night air assault operations, aerial resupply missions, and cadre airborne operations.

Normally, the 5th Ranger Training Battalion receives its aviation support, which consists of two UH-60s, from Fort Benning's Directorate of Operations and Training (DOT). The support provided by DOT aviation has been outstanding; however, due to crew shortages and required crew-rest policies, they cannot support the night air assault operations that are being incorporated into the program of instruction.

For units interested in providing this support, the 5th Ranger Training Battalion will be able to provide a tactical scenario, missions, billets, mess, and most logistical needs. Due to mission requirements and fuel capacity at Camp Merrill, the ideal number of UH-60s to support a ranger class is four. Supporting the ranger school would provide aviation units an opportunity to conduct actual day and night air assault missions in mountainous terrain.

For further information, please call MAJ Richard Kemp, DSN 797-5770 (706-864-3327) ext. 184; CPT Dan Knight, ext. 122; or SFC Ramon Bual, ext. 199.

ASOL CORNER

Abbreviated aviation accident report

LESSONS LEARNED

I hope that most of you have already read the revised AR 385-40: Accident Reporting and Records and DA Pam 385-40: Army Accident Investigation and Reporting, which introduces and explains DA Form 2397-AB-R: Abbreviated Aviation Accident Report (AAAR).

Testing the AAAR form

In 1992, the U.S. Army Safety Center (USASC) selected Fort Hood to test the DA Form 2397-AB-R. In the past 2 years, we have used the form to document numerous Class C through Class E aviation incidents. With each use of the AAAR form in an investigation, we provided our comments and suggested improvements to Forces Command (FORSCOM) and the USASC. As FORSCOM and the USASC processed the AAAR, they too identified needed improvements. In all, we used four different versions of the AAAR form at Fort Hood. The AAAR form contained in the new DA Pam 385-40 is the result of considerable coordination between the USASC, FORSCOM, and Fort Hood.

Lessons learned

The USASC asked us to share our experiences and lessons learned using the AAAR form. Now that you have begun using the AAAR form in your units, you should not have a lot of the same problems that we experienced during the development of the form. However, we would like to offer the following suggestions that we believe you might find helpful.

■ **Document supporting information**. Commanders and personnel selected to investigate aviation incidents need to understand that the AAAR is designed to streamline administrative requirements not investigative requirements. The need still exists to do an indepth investigation to enhance accident prevention.

During the USASC's quality review of our Class C AAARs, they called on numerous occasions and requested additional information or clarification of information on the form. Several times, we had failed to either collect or document enough information to support the form. It was very difficult to go back and try to get the information after the accident investigation board had been dismissed. Although you may be able to get some of the information from historical records, other information may be permanently lost. Board presidents must continue to collect and document all supporting information, not simply check or fill in the blocks on the AAAR form.

■ **Collect MACOM-specific information too**. Another thing to keep in mind is that your MACOM safety office may require information that is not included on the AAAR. For example, on the AAAR there is a block for total flight hours in the aircraft mission, type, design, and series. However, FORSCOM Safety requires us to also provide the crewmembers' total flight hours. FORSCOM also requires the ages of the crewmembers, the type of crew coordination training they had received, and the mission risk assessment. These items are not required on the AAAR form.

■ **Decide what supporting documents to attach.** Since the purpose of the AAAR is to streamline administrative requirements, you must determine what additional supporting documents to attach to the AAAR form. At Fort Hood, we prepare and stack the file copy report as if it were a Class A or B accident. In the copy that we provide to FORSCOM and the USASC, we extract and attach only the documents that support the findings and recommendations of the investigation board. Although they are in our copy of the report, we rarely attach orders appointing the board, weather reports, estimated cost of damages, weight and balance, flight plans, and negative toxicology reports. Each report and circumstance is different; we try to retain everything but only provide what is required to support the findings and recommendations.

■ **Provide a copy of recommended corrective action to appropriate headquarters**. On Class D, E, and F incidents, the unit will prepare and send the AAAR form as directed by their command to the USASC. However, if the unit addresses a recommended corrective action to higher or another headquarters, you must provide a copy of the AAAR to that headquarters and the installation-level safety manager (see AR 385-40, paragraph 5-1a and b). At Fort Hood, we had a case where a unit completed an AAAR for a Class E incident and recommended that HQ, III Corps and Fort Hood take corrective action but sent the AAAR directly to the USASC. It was several weeks later and by accident that we learned of the recommendation.

Our experience with the new AAAR form has been very positive. The III Corps and Fort Hood chain of command has easily adapted to and accepted the new AAAR form. Our next challenge is the Abbreviated Ground Accident Report form.

POC: MAJ Wendell W. Blair, III Corps Aviation Safety, DSN 737-3338 (817-287-3338)

Aviation Safety Officer Refresher Course gets thumbs up

It was an exciting week seeing old friends, meeting new friends, and being able to exchange ideas on safety to make the Army of the future a safer force in its warfighting role. I think everyone would agree that the first Aviation Safety Officer Refresher Course was a resounding success.

This course—developed and taught by the Army Safety Center—has long been overdue and much needed by all of us in the safety field. It was time to clean out the cobwebs and rejuvenate our systems. This old soldier heard many excellent suggestions and comments during the week-long course that we in the aviation community can use to ensure mission accomplishment while protecting the force.

The first class included 42 aviation safety officers from the attack, cavalry, medevac, air assault, medium lift, general support, special operations, and military intelligence communities. The class included safety officers from company, battalion, brigade, division, corps, installation, and Army level. The National Guard and Reserve components were also well represented. The class included one lieutenant colonel, two majors, and several CW5s, CW4s, CW3s, and CW2s, and civilians. The safety experience level ranged from about 4 years to more than 20.

As you can see, there was a wealth of knowledge and experience represented in this first refresher course. All provided excellent feedback on the safety programs used in their units. The chance to talk lessons learned and how to improve our force protection efforts is something you can't put a price on.

Aviation Safety Officer Refresher Course schedule

Course Number	Dates
95-3	28 Aug — 1 Sep 95
96-1	4 — 9 Dec 95
96-2	18 — 22 Mar 96

Assignment to the course is through the ATARS. This is a computer-based system wherein the soldiers selected to attend training are entered into the system by their personnel manager at the U.S. Total Army Personnel Command or by the appropriate National Guard or Reserve training manager. Requests for attendance should be made via DA Form 4187 or direct coordination with personnel managers.

The Aviation Safety Officer Refresher Course is one professional development course that all safety officers need to put on their schedule to attend. If you haven't scheduled yourself to attend the next class, see the sidebar for future course data and details on how to apply through the Army Training Requirements and Resources System (ATARS). You need to do it **today**!

POC: CW4 Scott Johnson, Aviation Branch Safety Office, DSN 558-3000/2388 (334-255-3000/2388)

The unit "Safety Bulletin"

We all know that National Guard units generally drill one weekend per month and spend 2 weeks or so together during annual training each year and that individual aircrewmembers have a fixed number of additional flight training periods available for aircrew and unit collective flight activities. What we sometimes forget is that time with the troops is very limited.

As the assistant aviation safety officer of a UH-60-equipped combat assault helicopter company in the Alabama Army National Guard, I am well aware that the unit safety office does well to comply with regulatory requirements regarding quarterly safety briefings, quarterly safety council meetings, and semiannual safety surveys given the finite number of drill weekends during a training year. Simple math reveals that accomplishing one of these mandatory tasks per drill weekend would account for 10 of the 11 weekend drill periods normally available without taking into consideration the fact that several drills per year are spent in the field.

Training schedules during drill are tightly packed and routinely filled to the brim with attempts to meet mandated training requirements and provide the flight time required to maintain proficiency in combat assault tasks.

Guard soldiers also face limited access to unit library materials. Field manuals, Army and National Guard regulations, training circulars, technical manuals, and so forth are all available in the unit library, but individual soldiers simply don't have the time to search out and read all of the materials we would like for them to be familiar with.

Getting safety information to soldiers

In an effort to maximize soldier exposure to safety information in an efficient manner, our unit safety office decided to publish a local "Safety Bulletin." This one-sheet (front and back) publication—with reproduction of the company logo and a sketch of the UH-60 at the top to make it more eye-catching—is prepared monthly and distributed during weekend drills to all unit members.

The bulletin does not take the place of the quarterly unit safety briefing. While our bulletin may not be a novel idea, it is a reminder that "keeping it simple" (especially when time is a factor) is sometimes a good way of accomplishing the mission. The bulletin puts safety matters in front of the soldier in an easy-to-read format that can be tucked in a pocket and taken home for a relaxed reading later.

The bulletins are also posted on the unit's safety bulletin board, distributed to other companies in the battalion by the battalion ASO, and sent to the safety officer at the Army Aviation Support Facility where we fly.

Articles—usually four to six per bulletin—are brief, edited versions of materials extracted from other sources, safety tips, and discussions of matters of particular concern to the unit and its operations. The article on high-density altitude shown in the sidebar is a sample of the kind of timely reminder we publish in the bulletin.

Other examples of recent topics include developing a safety philosophy, hearing conservation, crew coordination, firefighting facts, FOD, OSHA and Army safety, hangovers and flying, avoiding gun accidents, and of course, risk management. Our command places strong emphasis on the integration of risk management into all unit operations, the accomplishment of our assigned missions within the framework created by the proper application of risk management principles and techniques, and the inclusion of all unit members as active participants in the Unit Safety Program.

Our bulletin is simply one small part of the safety program in a unit whose doctrinal goal is force protection and whose motto is "Train as you'll fight; fight as you've trained; train safely so you'll be there."

POC: CW3 Frank B. Angarola, Company B, 1/131st Aviation (Assault Helo), Alabama Army National Guard, 5700 East Lake Blvd., Birmingham, AL 35217-3597, (205-536-9645)

COMPANY B, 1/131ST AVIATION
SAFETY BULLETIN

HOT, HIGH, AND HUMID

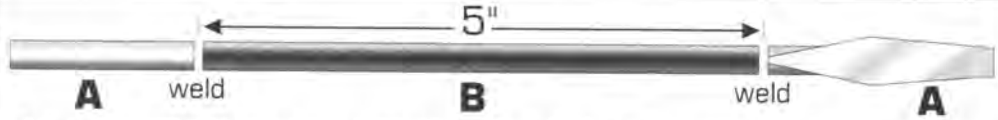
These are the ingredients for high-density altitude situations. During these summer months, let's be especially mindful of our aircraft's limitations, particularly when called upon to operate out of confined areas or from pinnacles and when loaded with more than a basic aircrew.

What can we do to protect ourselves and get the mission done?

- Do an accurate performance planning card (PPC) for the conditions that we'll be operating in.
- Update the PPC when significant changes in conditions or gross weight occur.
- When in doubt, perform an out-of-ground effect hover check before departing from a confined area or pinnacle. Go ahead and pick the aircraft straight up to an altitude that clears the barriers, check to ensure that you have sufficient power and control available to make the appropriate type of takeoff, descend back to a hover or to the ground, and then make the takeoff.

It's a little late to discover you don't have enough power to clear your barriers when you're 75 feet AGL and moving forward at 20 knots with trees in your face. Let's give ourselves an extra margin of safety by not pushing our limits or the limits of our aircraft.

"Train as you'll fight.
Fight as you've trained.
Train safely so you'll be there."



Cut the shank of the screwdriver blade bit (A) in half, then weld 5 inches of 3/32-inch stainless-steel rod (B) between the two halves.

STACOM

Night vision goggle maintenance

Recent DES assistance visits have shown that many units have not complied with the requirement to fabricate a special tool (screwdriver) that is necessary to properly torque purge ports on the AN/AVS-6(V)l and AN/AVS-6(V)2 night vision goggles. Instead of using the required fabricated tool, maintenance personnel are using standard screwdrivers, pocket knives, and other implements, resulting in distortion and disfigurement of purge port screws.

The root problem is that some NVG maintainers did not post the changes to TM 11-5855-263-23&P: Aviation Unit and Intermediate Maintenance Manual, Including Repair Parts and Special Tools List, AN/AVS-6(V)l and AN/AVS-6(V)2 as required by TB 1-1500-346-20: Updated Information on Night Vision Goggles, paragraph 8e(3), dated 5 January 1994. Unfortunately, a new TB 1-1500-346-20, dated 20 January 1995, that superseded the 5 January 1994 version was distributed and the reference to the changes was omitted. (TM 11-5855-263-23&P, dated 15 May 1995, is scheduled for distribution in the near future and will incorporate these changes.)

To assist those maintenance personnel who missed the changes and discarded the superseded TB 1-1500-346-20, the changes as they appeared in paragraph 8e(3) are as follows:

(3) TM 11-5855-263-23&P shall be changed to include the following corrections. Implement these corrections immediately.

(a) Tools and test equipment, Appendix B, Section III. Torque wrench, NSN 5120-01-618-4433 replaces item number 16. It is used to perform tasks on the AN/AVS-6 using the tube retaining wrench with the 1/4-inch drive.

(b) Tools and test equipment, Appendix B, Section III. Soldering iron NSN 3439-01-183-4623 replaces the currently listed NSN.

(c) Page C-2-1, item 2 (Part 1-1/2 SC). The correct NSN for "eyepiece lens cap" is NSN 5340-01-058-5930.

(d) Page C-2-1, item 11. The correct NSN for "objective lens cap with light interference filter (LIF) adapter" is NSN 5340-00-558-4962. Change part number listed to EC-23.

(e) Page C-2-1, item 11. The correct NSN for "objective lens cap without light interference filter (LIF)" is NSN 5855-01-152-5849. Change part number listed to SF-10. This part must be altered before use by cutting out the inside ridge. This is authorized at the unit level.

(f) Appendix E. Add the following fabricated tool to use as the screwdriver bit to accomplish the torque of the AN/AVS-6 inside the purge ports: "Fabricate screwdriver blade bit (NSN 5130-00-021-2015) by cutting the shank in half and welding 5 inches of 3/32 stainless steel rod between the two halves."

(g) Page 2-36, paragraph 2-14. This paragraph describes the AN/AVS-6 power pack test. Clarification is required for the low battery indicator test. The -Gl (P/N 66868300680) version power packs cannot be tested using this method on the TS3895A/UV (not the TS3895/UV) for test set serial numbers 1001-1999. For these power packs, use the alternative power pack test listed in paragraph 2-15, page 2-39, during the 180-day service. TS3895A/UV with test set serial numbers 2000 and subsequent can be used to test any power pack.

As previously stated, the required tool is to be used to accomplish the torque of the AN/AVS-6 inside the purge ports. The illustration shown may help with the local fabrication and will appear as Figure E-3 in the soon to be distributed TM 11-5855-263-23&P.

Questions concerning any aspect of night vision goggle maintenance may be directed to any of the points of contact listed in paragraph 16 of the current TB 1-1500-346-20: Updated Information on Night Vision Goggles.

Logging of NVG time

There is significant confusion in the field concerning which flight condition symbol "NG" or "NV" to use when logging AN/AVS-6 NVG flight time on the DA Form 2408-12: Army Aviator's Flight Record. Even though FM 1-300: Flight Operations Procedures and DA Pam 738-751: Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A) list "NV" as the flight condition symbol for AN/AVS-6, the use of "NV" is not authorized by AR 95-1: Flight Regulations, paragraph 2-6c. Consultations with the proponents for FM 1-300 and DA Pam 738-751 confirm that the reference to "NV" as a flight condition symbol will be eliminated from the next editions. Only the flight condition symbols listed in AR 95-1 are authorized for use.

Points of contact are CW5 Meline or CW4 Estrada, DES, DSN 558-2442.

HIRTA

DES has determined that many units with UH-60s are not aware of the new HIRTA message dated 231600Z Mar 95, CDR ATCOM, Subject: UH-60A, UH-60L, EH-60A HIRTA Standoffs. This classified message must be reviewed by all operational UH-60 aviators.

Points of contact are Mr. Reed or Mr. Albright, ATCOM, DSN 693-1634/1638/1648.

STACOM 164 **July 1995**

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-1098/3504. Information published here generally precedes the formal staffing and distribution of Department of the Army official policy. This information is provided to all commanders to enhance aviation operations and training support.

William H. Bryan
Colonel, Aviation
Director of Evaluation and Standardization

ShortFAX
Keeping you up to date

Bulletin board link to ATCOM

The Maintenance Data Management Support bulletin board system (BBS) is now available from 0800 to 0600 CST Monday through Friday and 24 hours per day on Saturday and Sunday. The Maintenance Data Management Support BBS provides—

- Easy on-line, step-by-step *new user* registration.
- Electronic transfer of data.
- Electronic message conferencing between registered users.
- SOF and ASAM messages available on-line for downloading.

You may reach the BBS at DSN 693-9057 (314-263-9057), voice extension -3493 or -1955, FTP - m3388f-bbs.army.mil 'guest'. In use: Universal Data Systems, error correcting external modems: 1 200/2400/9600 8/N/1.

For more details, call Mr. Jack Harris, system operator, or Mr. Allan Journey, co-system operator at DSN 693-1955 (314-263-1955) or register today and leave them a note.

Avn safety additional skill identifier

If you are an MOS 68B, 68F, 68G, 68N, or 68P who has completed the Aviation Accident Prevention Course (AAPC) (regardless of when you completed the AAPC), you are authorized and encouraged to request that the A2 aviation safety additional skill identifier (ASI) be awarded to you. Requests for the A2 ASI should be made through normal personnel channels, and you must submit your AAPC completion diploma along with your request.

DA Circular 611-94-2: Implementation of Changes to the Military Occupational Classification and Structure dated 27 January 1995 authorized MOS 68B, 68F, 68G, 68N, and 68P personnel to be awarded the ASI A2. With this change and the restrictions outlined in AR 611-201: Enlisted Career Management Fields and Military Occupational Specialties, Table 6-1, all soldiers in Career Management Field (CMF) 67, which includes 67 and 68 series MOSs, and MOS 93P are authorized the A2 ASI provided all other requirements are met. Rank and pay grade prerequisites outlined in DA Pam 351-4: U.S. Army Formal Schools Catalog, Table 2-1 are not affected by this MOS change.

POC: MSG Keith A. Gallion, USASC, Training Division, DSN 558-1154 (334-255-1154)

Accident briefs
Information based on preliminary reports of aircraft accidents

Aviation flight accidents

Utility

UH-1 Class C

H series - During RL 3 refresher training, crew was performing emergency governor operations. Engine experienced overspeed exceeding 7200 RPM. Crew landed aircraft without further incident. Engine change is required due to overspeed.

UH-1 Class E

H series - At 80 knots and 100 feet AGL during FTX service mission, aircraft was flying west into setting sun with high glare from snow when it struck 1-inch cable strung across small valley. PC landed aircraft immediately. Inspection revealed cracked left windscreen. Maintenance officer noted no further damage and authorized aircraft one-time flight back to field site. Wire was not marked on hazard map and not noted during recon prior to flight into valley.

UH-60 Class E

A series - During NVG landing to an unimproved/unmarked LZ, aircraft entered brownout. During landing, aircraft rolled forward, traveling through a ditch. Crew suspected ERFS made contact with ground. Postflight inspection revealed that two main rotor blades received small nicks in trailing edges. Damage caused when main rotor blade contacted AN/ALQ 144.

Attack

AH-1 Class B

F series - Aircraft rolled while at 3-foot hover. Blades contacted ground, skids collapsed, and tail boom separated. No injuries.

AH-1 Class C

F series - During PMD, crew discovered lightning strike damage to one K747 blade. Crew from previous flight remembered strange noise during flight, but all cockpit indications had been normal.

F series - While exiting range following completion of Table 7 aerial gunnery, aircraft incurred blade strike. Crew landed aircraft without further damage.

AH-64 Class A

A series - During night training mission, aircraft was en route to home base from deep attack battle position when it struck wires. Aircraft entered left yaw, made two 360-degree right spins, descended, and struck warehouse and semitrailer. Crew extinguished postcrash fire. Minor injury.

AH-64 Class B

A series - Engine and rotor noise increased significantly during night vision system traffic pattern flight. Cockpit readings revealed No. 1 Np and Nr rapid increase (more than 100 percent) with No. 2 Np at zero. Crew increased collective to maintain Nr within limits and retarded Np 2 power to equal engine output. Inspection confirmed main rotor blade damage.

AH-64 Class C

A series - As night shift personnel were about to ground handle aircraft into hangar, they discovered damage to three tail rotor blades. Contract personnel had previously flown aircraft on maintenance test flight for balancing main rotor system and upon completion had failed to postflight or secure aircraft.

A series - No. 1 engine incurred overspeed condition. Three main rotor blades sustained damage.

Cargo

CH-47 Class C

D series - Aircraft was slingloading disabled UH-60A to home station when sling blade tiedown broke, allowing UH-60 blades to flap. First blade snapped 2 feet from rotor hub, and second blade also flapped and sustained damage.

CH-47 Class E

D series - During cruise flight, crew chief noticed imploded sides of ERFS tank. Crew discontinued use of ERFS and continued to destination. Postflight inspection revealed ERFS vent cap was installed.

Observation

OH-6 Class C

F series - Flight of two aircraft were en route to destination when trail aircraft experienced loss of engine power. Pilot autorotated to nearby field. Aircraft landed hard. Initial inspection revealed damage to tail boom.

A series - Aircraft was at 10 knots and 6 feet while performing ATM mission as No. 2 aircraft in flight of two. Aircraft entered uncontrolled flight, pitching forward and aft and spinning counterclockwise with erratic changes in altitude. Pilot regained partial control. Aircraft landed hard, bouncing 2 to 3 feet off ground. Aircraft landed hard a second time with left skid low and sustained significant damage.

OH-58 Class C

A series - Evidence of blade strike was discovered during postflight inspection. One main rotor blade sustained tip cap damage. Transmission is being inspected for sudden stoppage.

A series - During night low-level autorotation demonstration, pilot was attempting power recovery at 8 to 10 feet AGL when aircraft experienced excessive right yaw. Aircraft touched down level, but hard landing inspection confirmed drive train and tail boom damage.

D series - During termination phase of touchdown autorotation, pilot failed to lower collective pitch. IP failed to take corrective action, and excessive blade conning occurred. All four main rotor blades were damaged beyond repair.

D series - While in cruise flight, crew experienced warning, caution, and failure cockpit readings, followed by burning odor. Crew observed fire in left avionics compartment. Pilot executed precautionary landing and emergency shutdown procedures.

Fixed wing

C-12 Class C

D series - During startup procedures, No. 2 engine experienced hot start when starter switch failed due to defective generator control unit (GCU). During start sequence on previous day, No. 2 engine would not start. Maintenance replaced faulty GCU. Crew started No. 2 engine and departed on first leg of mission. On morning of hot start, No. 1 engine started normally. When crew attempted to start No. 2 engine, they heard loud chattering noise being emitted from starter generator relay. Pilot placed starter switch in off position, then attempted another start of No. 2 engine. Crew again heard chattering noise. PC decided to make third attempt to start No. 2 engine. As No. 2 engine N1 stabilized above 12 percent for 5 seconds, pilot moved condition lever to low idle. Turbine gas temperature (TGT) rose rapidly. When TGT passed 750 degrees, PC called for abort start. Pilot pulled condition lever to fuel cutoff and placed starter switch to starter only. However, starter switch had failed and could not provide cooling air to engine. TGT rose to peak of 1,200 degrees for 2 seconds before beginning to cool. Maintenance discovered that No. 2 GCU replaced on previous day had shorted.

F series - Aircraft was struck by lightning at 16,000 feet as it was descending through clouds for landing.

Training

TH-67 Class C

A series - Pilot was executing standard autorotation and pulled initial pitch too early/excessively. IP got on controls and attempted to complete maneuver. Aircraft touched down with low rotor, resulting in mast bumping and pylon whirl that damaged mast, swashplate, striker plate, isolation mount cover, and cowling.

Messages

■ Aviation safety action operational message concerning Hydra-70 rocket motor suspension and information for all AH-64A/D, OH-58D, AH-1S/P/E/F, A/MH-6, and MH-60 series aircraft (GEN-95-ASAM-04, 021818Z Jun 95). Summary: A system safety risk assessment (SSRA) has been staffed. As a result of the SSRA, the U.S. Army Materiel Command (AMC) has released some lots of 2.75-inch Hydra-70 rockets with the MK-66 rocket motors with Indian Head-produced propellant grain. This message is released by ATCOM to assure affected aviation units are aware of the release of specific lots of rockets and operate IAW the restriction listed in this message when training. AMC has conducted an extensive investigation into the MK-66 early motor blow hazard. The restrictions listed in the message represent a conservative approach to mitigate the risks associated with firing the 2.75-inch FFAR with motors containing propellant grains extruded at the Indian Head facility. The primary suspected cause of the early motor blow on the Indian Head rocket motors is mishandling of the rocket motor. Changes to the handling procedures have been implemented and should reduce the risk of this hazard. The purpose of this message is to provide a listing of the usable lots of MK-66 rockets to the aviation community and to provide to the user the following operational restrictions that have been agreed to by AMC, Program Executive Office (PEO) Aviation, U.S. Army Special Operations Command (USASOC), U.S. Army Training and Doctrine Command (TRADOC), and the U.S. Army Aviation Center (USAAVNC) in the SSRA:

- No unpackaged (bare) rockets are to be transported in ground vehicles.
- Do not use rockets if dropped.
- Pending completion of evaluation of vulnerability assessment test results, aircrewmembers firing the rockets from A/MH-6, MH-60, and AH-1 series aircraft will wear aviation body armor. Aircrewmembers firing the rockets from AH-64A/D and OH-58D aircraft will wear aviation body armor; have their helmet visors down, unless wearing night vision goggles; and have doors and seat armor side panels installed.
- In addition to normal reporting procedures, report any future rocket motor blowups to Dr. Mohsen Mahmound at ATCOM, E-mail MMAHMOUD%ADAS@ST-LOUIS-EMH7.ARMY.MIL, DSN 693-1631 (314-263-1631).
- In the event of an incident, it is essential that all information related to the incident be reported to assist in the followup investigation to determine the cause. The desired information is as follows:
  - ☐ Distance from the aircraft/launcher.
  - ☐ Approximate range and time after launch.
  - ☐ Details of incidents such as size and type of fragments and unusual flight characteristics or noise.
  - ☐ Rocket lot number.
  - ☐ Atmospheric conditions.

Contact: Mr. Brad Meyer, DSN 693-2258/2085 (314-263-2258/2085).

■ Aviation safety action informational message concerning maintenance procedures for all AH-1 and UH-1 aircraft equipped with oil debris detection system (ODDS) and aircraft using Army oil analysis program (AOAP) sampling (UH-1-95-ASAM-03/AH-1-95-ASAM-03, 051235Z Jun 95). Summary: Many UH-1 and AH-1 aircraft have the ODDS installed. This system operates and is maintained the same on both aircraft. Since ODDS has been fielded, there has been uncertainty and confusion regarding its operation and maintenance. This ASAM summarizes operating characteristics and maintenance requirements for ODDS installed on AH-1 and UH-1 aircraft. In addition, it provides maintenance requirements for aircraft that are not equipped with ODDS that are using the standard AOAP procedures. **Note**: CDR

ATCOM message 122100 Oct 93 (AH-1-94-ASAM-01/UH-1-94-ASAM-01) is rescinded by this message. The purpose of this message is to provide user operating and maintenance requirements for ODDS-equipped aircraft and AOAP aircraft. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning procedure to inspect/replace three stop check valves in the fire extinguishing system on all AH-64 aircraft (AH-64-95-ASAM-03, 071443Z Jun 95). Summary: A recent AH-64 incident disclosed a defective fire extinguisher stop check valve, P/N 7-11721003, for the No. 2 engine. This may cause the fire extinguisher system to be inoperative. The purpose of this message is to require inspection and replacement, if necessary, of three stop check valves (No. 1 engine, No. 2 engine, and APU) in the fire extinguishing system. This is to assure proper location of the positioning pins. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning inspection and lubrication of flight control rod end bearings on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-95-ASAM-05, 251420Z May 95). Summary: A CH-47 operator experienced the following incident during ground checkout of the aircraft. Prior to engine start, unusual movements of cockpit controls were noted. During single boost controls motion checks, controls exhibited abnormal cross couplings between the various axes and in some positions required abnormally high forces to move. When the collective mag brake was released, the thrust control lever rose to above its normal detent position. Subsequent inspection revealed that a flight control rod end bearing housing had separated. The purpose of this message is to require inspection and lubrication of bearing listed in this message at the next phase inspection and every third phase inspection thereafter and inspection of pedal box bearings at the next phase inspection and lubrication each time they are removed from the aircraft. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning inspection of bolt, shear, NSN 5306-00-944-7540, used in the pylon installation on all OH-58A/C aircraft (OH-58-95-ASAM-07, 311218Z May 95). Summary: A Cat I deficiency report stated that a piece of a bolt with the nut attached was found under an OH-58, leading to discovery that a bolt in the upper controls was broken. The broken bolt was examined by Corpus Christi Lab and by U.S. Army Research Lab. The bolt was improperly processed at manufacture, causing hydrogen embrittlement. The purpose of this message is to require inspection for and removal of all defective bolts by type and manufacturer. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action operational message concerning windshield anti-ice operating instructions for all C-12F3 (Air Force) and C-12R aircraft (C-12-95-ASAM-02, 311246Z May 95). Summary: In the past, there have been incidents of cracked windshields in the RC-12H aircraft when the windshield anti-ice has been activated. It has been determined that this is not a systemic design problem; it is an operational problem. The Army aircraft manuals are presently being drafted. The purpose of this message is to provide the field with advance instructions on operation of the windshield anti-ice. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action operational message concerning flight limitations when operating C-12F3 (Air Force) and C-12R model aircraft in icing conditions (C-12-95-ASAM-03, 311321Z May 95). Summary: The U.S. Army icing test of an RC-12/C-12 airframe (RC-12N) was completed by the Airworthiness Qualification Test Directorate of the Aviation Technical Test Center. The results are different from those obtained during FAA icing certification. The most significant observations were—

- Accumulation of ice on the pitot tube assemblies and unprotected airplane surfaces caused vibrations from the indicated airspeed (worst case—loss of pilot and copilot indicated airspeed) and significant increases in parasitic drag.
- Ice formations on wing surfaces immobilized the stall warning vane and obstructed the heated/unheated fuel vents.

The purpose of this message is to place flight restrictions on C-12F3 and C-12R aircraft in icing conditions, alert aircrews of possible hazards due to ice accumulations, have this message placed in the pilots reading file and included as part of the crew briefing, add the changes to C-12F3 and C-12R operators manuals, add a warning to the operators manual, and align these aircraft with the rest of the C-12/RC-12 fleet. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

In this issue:

Class A Accidents through June

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	0	0	0
	March	0	1	0	0
3D QTR	April	5	1	2	5
	May	0	2	0	2
	June	0	2	0	0
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	21	8	11	8

U.S. ARMY SAFETY CENTER

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Thomas W. ...
Brigadier G...
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FlightFax

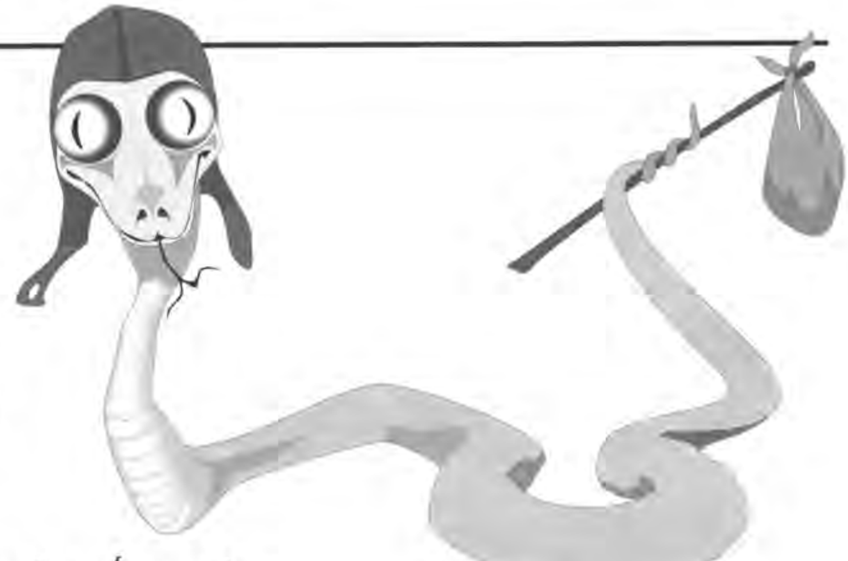
REPORT of ARMY AIRCRAFT ACCIDENTS
August 1995 ◆ Vol 23 ◆ No 11

We often publish stories by aviators in FlightFax that begin "It was a routine mission," but the end is anything but routine. Far too often in fact, the story ends with a fatal injury or a destroyed aircraft. Maybe it's time for a change of pace. In this issue, a UH-1 pilot relates the story of a "routine" mission that turned into quite an adventure, an adventure not many of us would want to share. We are glad to say, however, that it ended okay.

From this crew's unique experience comes a powerful reminder that if you're just sitting there enjoying the ride on a "routine mission," you might want to rethink the way you do business. Something totally unexpected could happen, and if you aren't prepared, you could get hurt. The lesson is: Never get too comfortable; if you do, something could be waiting out there to bite you.

There's a WHAT in the cockpit?

An unwelcome, unauthorized passenger and an illuminated caution light turn what should have been a routine mission into a fright flight.



"It was a routine flight," or it was supposed to be routine.

We took off at about 0900 in a Huey on a flight from one Army airfield to another. I was in the left seat; my copilot in the right seat was on the controls. About 10 minutes into the flight, I thought I saw something move around my feet. Seconds later, a **large** black snake raised its head between my legs. Obviously not very happy about having its territory invaded by a couple of black-booted humans, the agitated snake jerked and flailed from side to side. Or was it me who was jerking and flailing about? If it wasn't, it sure wasn't because I didn't feel like it.

I quickly, and probably not nearly as calmly as I would like to think, told the copilot that I had a large black snake around the pedals and crawling up my legs. If there is standard aircrew coordination terminology to describe such an event, I certainly couldn't think what it was. But somehow I guess I was able to communicate this unusual turn of events to my copilot. Making a cryptic comment, he glanced over to the left side of the cockpit just to make sure I hadn't lost control of my senses.

Applying risk management

Spotting the large reptile, he instantly assessed the hazard and requested that I implement control measures to keep the snake on my side of the aircraft. Remembering that there is no ejection capability (for me or the snake) in a Huey, I was desperately trying to think of a suitable control measure when the snake noticed the opening in the center pedestal. Apparently deciding that it might like this other guy better, the creature slithered over to the anti-torque pedals and feet of the copilot in the right seat.

We all know that the cardinal rule is to **fly the aircraft**, but I do not hesitate to say that my copilot quickly lost interest in flying the aircraft. However, thanks to ingrained aircrew coordination techniques, we were able to transfer the controls successfully. Now it was my turn to take care of the flying as he wrestled with our unwelcome passenger.

Without hesitation, I applied everything I knew about risk management and how to do a hasty risk assessment. I instantly came to the conclusion that the safest place for this aircraft was on the ground. And I intended to get it there as quickly and safely as I could. Fortunately, I was able to land in a confined training area. After landing, I wasted no time in retarding the throttle to flight idle and probably set a record for exiting an aircraft. In other words, we **gave** that aircraft to the snake while we considered our options.

Getting rid of the hazard

Obviously, that aircraft wasn't going anywhere with the same number of creatures on board as when it landed. That meant somebody had to remove the snake. I picked up a 3-foot stick and attempted to gently lift the reptile away from the right anti-torque pedals. Annoyed and immediately suspicious of my intentions, the snake began striking at me. A lot braver now that I knew I could quickly move out of the snake's way, I managed to catch it behind its head with my left hand as I tried to disentangle it from the right set of pedals with my other hand. Whatever my good intentions, the snake was having none of it. It wrapped itself firmly around both anti-torque pedals and could not be pulled loose.

Unwilling to give up on removing the snake from the cockpit and not about to get back in the aircraft with it still aboard, I continued to try to unwrap the snake from the pedals. I'm not sure if I finally did something right or if the snake just gave up and decided it really didn't want any part of such hostile hosts, but after several failed attempts, I was eventually able to remove it without injury to the snake—or myself.

Now that I felt I was in charge and not the snake, curiosity got the best of me. Before turning it loose, I held the snake up to measure its length by my own height. To my surprise, it was as tall as I am with plenty left over. We did a quick best-guess estimate of its length—at least 6½ feet—and released the unauthorized passenger unharmed.

On with the mission and another turn of events

After a quick debrief (I suppose you could call it a moment to gather our wits and reorganize), we climbed back into the UH-1 and continued our journey to the nearby airfield. After refueling, we settled in and started our return flight.

thinking that surely this would be the routine portion of the flight. Not to be.

The direct route between the two Army airfields is over a small town (population about 50) that just happens to be only 5 miles from my farm. I was attempting to describe the "highly populated area" below us to my copilot when the emergency master caution panel light illuminated, indicating an engine chip light. By-the-book procedures required an immediate landing. Since the town is actually too small to accommodate a UH-1 landing, I selected a field at the "edge" of town.

What a sight for the townspeople. Most of them thought their long-awaited helicopter ride had finally arrived and immediately began convening at our impromptu landing site. While I knew everyone on the scene, the copilot must have thought that he had been time-warped back to the set of the once-popular "Green Acres" television sitcom. As we were waiting for the maintenance chief to arrive in another UH-1, we gave the population a ground tour of the Huey (we didn't say a lot about our recent passenger).

The maintenance officer determined that the chip light was caused by lint on the filter and declared the aircraft airworthy. At last, we were again on our way back to home station. This time we made an uneventful flight and landed without further incident.

Learning from this "routine" mission

Although we know the term "routine" mission is a misnomer, we use it often and frequently caveat its use with a reminder that there are no truly routine missions. Even if you're a relatively new member of the Army aviation team, you've probably already been drilled to remember that even the most routine training mission can be full of surprises. So prepare for the unexpected and hope there are no nasty surprises just waiting for the unwary aviator.

In addition to reminding us that there are no routine missions, this little adventure also reminded us of several other safety issues that need to be continually reinforced.

■ Crew coordination is essential to safely handle an emergency situation, especially if you have a 6-foot black snake who is determined to make himself a part of the crew. There is no substitute for solid crew coordination and situational awareness when subjected to a situation that is not covered by published procedures. Communication in the cockpit is crucial. It allows each pilot to understand what the other pilot sees in and out of the aircraft. With good crew coordination, a potentially dangerous situation can be sorted out with relief, not regret.

■ Respect the hazard involved even if the hazard is a natural enemy. All hazards require assessment and control.

■ Risk management principles can be applied quickly when necessary.

■ A regulation cannot control human responses in difficult situations. The regulation didn't say to land immediately if you have a black snake wrapped around the pedals. Sometimes common sense just has to kick in.

■ Flying is too unforgiving an occupation to take anything for granted. It may be trite, but it's true: Anything can happen at any time but always when you least expect it. Be ready for anything, stay calm, and know your emergency procedures (if there are any) cold.

■ An unfamiliar situation that you are not mentally prepared for may lead to undue concentration on the problem. Don't let surprise or frustration cloud your judgment and distract you from the immediate task at hand—like flying the aircraft.

■ Above all, remember that there is no such thing as a routine mission. Every mission has some risk associated with it and has the potential to become complicated and hazardous when you least expect it.

POC: MAJ Don Brand, 1105th Aviation Classification Repair Depot, Springfield, MO

While we certainly don't expect incidents like the hitchhiking black snake to become commonplace, this crew's experience proves that we share the environment with any number of other creatures that don't necessarily respect our space. For example, insects build nests in pitot tubes and birds attempt to set up housekeeping in engine compartments or under drive shaft covers. And there is always the chance of bird strikes in the air and collision with animals on the ground.

During the season of the year when wild creatures are active, be aware during preflight checks of the potential for FOD caused by wildlife. This is especially true if helicopters sit on the ground for long periods of time. And while you're checking the aircraft, you might want to take a look around for any unauthorized passengers.

. . . if you have questions about the appropriate uses of accident data and other safety-related information

Question: I recently got access to the Army Safety Management Information system (ASMIS). Why can't I call up data from the ASMIS if I know the names and social security numbers (SSNs) of the crewmembers? If I could, it would seem to make retrieval of the data I need a lot easier.

Answer: You're right. It would be easier if you could use name or SSN for retrieving information on a particular accident. But you can't for two reasons. First, a password protection system on the ASMIS prevents your access by that means. As I will explain later, the Safety Center can make this retrieval for certain purposes. Second, allowing you access would violate the Privacy Act, which might lead to loss of the safety privilege. As I am sure you are aware, it is the safety privilege that protects confidential witness testimony and other privileged safety information from disclosure.

The Privacy Act is a federal statute that controls how the Government collects and maintains information on individuals. Because the Safety Center files aviator mishap information in its system of records (data base) in such a way that it can be retrieved by the person's name or SSN, the Safety Center is required to tell the public what kind of individual information is in the data base. We do this in a Privacy Act Systems Notice that is published in the *Federal Register*. It tells what the information is used for and where to write to ask for individual aviator mishap data. This gives the individual aviator a right to ask for a copy of the information and, if he or she disagrees with the information, a right to ask to have the information corrected.

Information on individual aviator mishaps in the ASMIS is limited to certain parts of Abbreviated Aviation Accident Reports (AAARs) and does *not* include any privileged information. If individual ASMIS users were able to call up privileged information by using a name or SSN, then we would also have to give individual aviators a right to that same privileged information. Once privileged information is released to an individual aviator, there is nothing to prevent its use for any purpose, including private civil suit for monetary damages. This would probably end our ability to promise confidentiality or keep findings and recommendations privileged.

If there is a need for an individual aviator's mishap record, the Safety Center has the authority under the Privacy Act Systems Notice to make an ASMIS retrieval of the AAAR data on that aviator. However, the retrieval is limited to one of the following purposes:

- Determining aviator or soldier mishap experience for increased duty responsibility or training programs.
- Evaluating suitability of National Guard applicants for appointment.
- Determining eligibility for safety awards.

Use of AAAR data for any purposes other than those discussed or allowing access by an unauthorized person would violate the Privacy Act and would give individuals concerned a right to sue.

Question: I am a safety officer/manager. I've been contacted by a military liaison officer of an allied nation who wants access to safety information on a piece of military equipment purchased by the allied nation. May I provide this information? It's for safety purposes.

Answer: No. You should inform the liaison officer to make the request through his or her embassy's military attache. If the liaison officer is from a NATO country, the request will also be processed in accordance with a standard NATO agreement (STANAG).

The regulation for handling this type of request is AR 380-10: Disclosure of Information and Visits and Accreditation of Foreign Nationals, which treats safety report information as "controlled unclassified information" (CUI). The reason for controlling information in this category is to further various national interests. Privileged safety report information is CUI because statutory laws such as the Privacy and Freedom of Information Acts and case law exempt it from release to the public.

The purpose of the safety privilege is to protect vital manpower and equipment to further national defense. To control the release of this information, AR 380-10 requires Army personnel who receive such requests to return the request with an explanation that the information can only be released on an official government-to-government basis.

The military attache (assigned to the embassy of the allied nation) is normally the appropriate person to make such an official request. When such a request is submitted, it is processed through the Deputy Chief of Staff for Intelligence Technology Transfer, who refers it for evaluation and response by the U.S. Army Safety Center's Command Judge Advocate. Sometimes NATO requests come through separate channels. If it looks like that kind of request, contact the Command Judge Advocate directly. Even when the request is from a NATO country, the privileged information is taken out before the report is released.

If you have further questions concerning the appropriate release or use of safety information, ***ask the judge***.

POC: MAJ Frank Young, U.S. Army Safety Center Judge Advocate, Building 4905 5th Avenue, Fort Rucker, AL 36362-5363, DSN 558-2131 (334-255-2131)

Making the right decision

How soon is "land as soon as practicable"? The way you answer this question could kill you.

It was a beautiful summer day. We had completed our mission and were in cross-country flight over scenic mountains back to our home base. Everyone was looking forward to the trip home. I was on the controls of the UH-60 when I noticed a master caution light come on and the pilot announced "master caution." There was a slight yawing motion as the No. 1 tail rotor servo was isolated and the backup pump and No. 2 tail rotor servo were activated. I began a turn away from the mountains, looking for a suitable landing area.

During my recon, the pilot said, "There's an airport about 8 miles north of here. We can land there. Everything seems to be working fine, and the procedure says to land as soon as practicable." I considered this for a moment, then elected to land to the field I had reconned. After landing, we opened the control access to look at the No. 1 hydraulic pump. It was very hot.

This incident prompted a discussion about the meaning of "land as soon as practicable." Either continuing to the airfield or landing to an open field could be interpreted as landing as soon as practicable. However, if we had elected to continue flight to the airfield, the pump may have caught fire with catastrophic results.

I asked the pilot why he would consider continued flight. His reasons seemed logical: it would be easier for maintenance to get to the site, the precautionary landing location would be hard to find, nightfall was coming and they would not have any light to work on the aircraft, and a few others. The factor that was overlooked was that this was an **emergency**!

As crewmembers, our first responsibility is to land the aircraft safely. Maintenance will find a way to recover the aircraft. Making it to a more convenient site is not worth risking lives.

Although continued flight may not have violated the operating procedures, it just didn't pass the common sense test. We must always try to "stack the deck" in our favor. Oftentimes, the most conservative decision will cause inconvenience, discomfort, ridicule, and sometimes even a trip to the old man's office. However, none of these factors should be involved in the decision-making process when lives and the safety of the aircraft are at stake.

I think of this incident often. It taught me a valuable lesson. Perhaps it may help others in making more responsible decisions. How do **you** factor implied pressure into the decision-making process? Does compliance with a procedure alone guarantee your safety? Take a look at the way you do business. The way you answer these questions could kill you.

—CW3 Daniel L. Kotowski, HSC 1/151 Aviation Battalion, Eastover, South Carolina, DSN 583-8298 (803-776-8298)

INVESTIGATORS' FORUM

Lessons Learned

From recent accident investigations

The "Investigators' Forum" is a new feature in FlightFax. Written by U.S. Army Safety Center investigators, it will provide an accident synopsis and major lessons learned from recent centralized accident investigations.

OH-58. During night qualification training, the crew had just finished a slope landing in a confined area. As the student pilot transitioned the aircraft to an inverted Y for takeoff, the aircraft began to drift. The right skid contacted the ground, and the aircraft rolled right and came to rest on its right side. The IP was fatally injured.

• ***What happened.*** The IP did not alert the student pilot of his intentions to alter the circumstances of the flight by turning off the searchlight. Sudden, unannounced changes caused the student pilot to lose control of the aircraft.

• ***Lessons learned.*** IPs should always keep students informed. Never assume your students will understand what you are doing. ***Practice good aircrew coordination; it's a safe practice.***

AH-64. While conducting a night, low-level deep attack, the lead aircraft in a flight of five struck 200-foot power lines. The aircraft descended, struck the side of a building, and was destroyed. The crew was uninjured.

• ***What happened.*** The front-seat pilot had been provided accurate overlays before conducting a night tactical training mission. He marked wires that crossed his flight path for the first half of the flight and successfully navigated that leg of flight without difficulty. However, he neglected to mark the wires for the return leg, believing that he could recall where all the wires were because he knew that all the roads had wires. He may have known where the wires were, but as he approached the 200-foot wires, he diverted his attention inside the cockpit to perform navigation and communication duties and neglected to tell the pilot on the controls that they were approaching wires.

• ***Lessons learned.*** This accident reconfirms the absolute necessity of posting all known wire hazards on tactical maps before conducting low-level/NOE flight (especially at night). Had the front-seat pilot posted his tactical map as required by several references, he would have been looking for the hazard and would have alerted the pilot on the controls and this costly accident could have been avoided. It is easy to train that all roads and railroads have wires, but with all the things that go on in the cockpit, you need that ready reference to catch your eye. ***Post those wire hazards!***

AH-1F. The unit completed a field exercise and was preparing to return to home station. The crew completed preflight requirements and prepared to reposition the aircraft from parking to the runway for formation lineup. During runup, the pilot stood fireguard while the PC started the engine. The pilot entered his station and strapped in while the PC continued the runup procedures. As the pilot continued to get set up, the PC brought the aircraft up 2 to 3 feet above the soft sod with a right rolling moment. The aircraft continued to roll until the main rotor struck the ground, resulting in Class B damage to the aircraft but no injuries to the crew.

• ***What happened.*** The crew's motivation to move into formation lineup took precedence over the requirement for smooth, coordinated flight control inputs and adequate crew/cockpit coordination. The aircraft skids had settled 1 to 2 inches into the soft sod while it was parked. The soft sod combined with the gentle right upslope was a setup for dynamic rollover.

• ***Lessons learned.*** The primary concern for the pilot on the controls is aircraft control tempered with caution. All other concerns must be secondary. Evaluation of the parking surface, slopes, wind direction, and aircraft center of gravity provides information the pilot needs to determine control inputs.

The importance of crew coordination is highlighted once again in this accident. Each crewmember's life is at stake when the aircraft leaves the ground. That means each has a stake in how the aircraft is handled. The PC is responsible for ensuring that the crew is prepared for takeoff and prepared to perform their respective tasks to ensure mission success. ❑

Electronic bulletin board service for technical publications

Information superhighway speeds technical publications updates to the field

Receipt of current changes, revisions, and new technical publications is critical to the safe maintenance and operation of Army aircraft. Every effort is made to ensure these technical publications reach the field as quickly as possible, but the combined impact of volume, distance, and available assets leads to occasional breakdowns in the publications system.

To help alleviate these breakdowns, the Aviation and Troop Command (ATCOM) Pu'·'ications Division offers a bulletin board service (BBS) that contains a list of current changes, revisions, and new technic. blications. The BBS can be reached via modem at DSN 693-9057/2522/2523/9448 (314-263-9057/2522/2523/9448). .e voice mail number for problems or questions is DSN 693-3493, and the POC is Ms. Donna Rich.

The following is a list of the current aviation changes, revisions, and new technical publications posted to the BBS. As new changes, revisions, and technical publications are added to the BBS, we will provide an update in *FlightFax* as well.

Publication Number	New (N), Revision (R), or Change (C)	Subject
TB 1-1520-237-20-160	N	UH-60 Reduction of Torque Self-Retaining Pivot Bolts
TB 1-1520-237-20-162	N	UH-60, Inspection of Tail Rotor Gearbox
TB 1-1520-237-20-163	N	UH-60, Chg in Ret Life for Servo Beam Rail
TB 1-1520-238-20-60	N	AH-64, O/T M/R Strap Pack Teflon Removal
TB 1-1520-238-50-03	N	AH-64, O/T M/R Strap Pack Teflon Removal
TB 1-1520-248-20-28	N	Dir Cont Tubes, OH-58D
TB 1-1520-250-20-2	N	Pivot Bolts, MH-60K
TB 1-4920-328-50	R	Calibration Procedures
TM 10-4930-246-13&P	N	D-1 Nozzle
TM 55-1520-240-23-8	C13	CH-47D Helicopter
TM 55-1520-234-23-2	C25	AH-1S (Mod) Helicopter
TM 55-1520-236-MTF	C6	AH-1P/E/F Helicopter
MWO 1-1520-238-50-33	N	Main Rotor Lead-Lag Link
TB 1-1520-210-20-26	N	Fuel Boost Pump
TB 1-1520-248-20-31	N	Tail Boom Insp and Fwd IAS Restriction on All OH-58Ds
TM 55-1520-240-10	C5	CH-47D Helicopter

Publication Number	New (N), Revision (R), or Change (C)	Subject
TM 1-1520-237-23P-3	C1	UH-60A Helicopter, EH-60A, and UH-60L
TM 1-1520-237-23P-4	C1	UH-60A Helicopter, EH-60A, and UH-60L
TM 1-1520-237-23P-1	C1	UH-60A Helicopter, EH-60A, and UH-60L
TM 55-1520-240-23-6	C18	CH-47D Helicopter
TM 55-1520-248-23-3	C11	OH-58D Helicopter
TM 55-1520-248-23-6	C9	OH-58D Helicopter
TM 55-1520-248-23-5	C8	OH-58D Helicopter
TM 55-1520-248-23-9	C3	OH-58D Helicopter
TB 1-1520-237-20-161	N	UH-60
TM 1-1520-237-S	R	UH-60 Shipping Manual
TM 55-1520-345-23	C6	Painting and Marking Army Aircraft
TM 55-1520-238-23-4	C5	OH-58D Helicopter
TM 55-2840-251-23	C1	Turboprop Aircraft Engine, Model T74-CP-700
TM 55-1520-248-23-7	C7	OH-58D Helicopter
TB 43-0142	C2	Safety Inspection and Testing of Lifting Devices
TB 1-1520-237-20-153	N	Tail Rotor Pitch Beams

If your unit is not receiving these technical publications or changes in a timely manner, check your local or in-country distribution system first. If that fails to resolve the problem, you may call the U.S. Army Publications Distribution Center in St. Louis and they will attempt to track your order. The Center maintains records of orders for 90 days after shipment.

The Customer Service Department can be reached at DSN 693-7305, ext. 266 or 268 from 0600 to 1600 central time Monday through Friday. You may also send inquiries by FAX to DSN 693-7395, or write to U.S. Army Publications Distribution Center, 1655 Woodson Road, St. Louis, MO 63114-6181.

For all correspondence with the Center, include your account number, publication or change number, order date, and the number of copies or changes ordered.

POC: CPT Peter Newell, Engineering Programs Branch, USASC, DSN 558-1235 (334-255-1235), FAX DSN 558-9528 (334-255-9528)

ASOL CORNER

Army aviation safety professional development seminar

The FY 96 Army Safety Conference (ASC) is scheduled for 6 through 9 November 1995 in Dallas, TX. The theme of this year's conference is **SafeForce21**. Workshops related to its implementation are scheduled to begin on Monday evening, 6 November. Included as part of the conference will be the second annual Army Aviation Safety Professional Development Seminar.

The Army Aviation Safety Professional Development Seminar will begin on Tuesday, 7 November at 0730 and end on Wednesday, 8 November at 1700. (See below for complete schedule of ASC events.) Last year's seminar was very successful in updating participants on aviation safety training, aircrew coordination, National Guard programs, risk management, new accident reporting procedures, and providing an exchange of information.

SUNDAY (5 Nov 95)

0600	Fitness Walk/Run
1300-1900	Army Forum Opens (Operations Center/Registration)

MONDAY (6 Nov 95)

0600	Fitness Walk/Run
0800-1900	Army Forum (Operations Center/Registration)
0800-1600	National Safety Congress (NSC)
0800-1200	Forces Command Safety Conference
0800-1200	Intelligence and Security Command Safety Conference
0730-1500	Army Medical Command Safety Conference
1030-1700	Federal Safety Conference (FSC)
1300-1700	SBIS Core Team (invitation only)
1300-1700	U.S. Army Corps of Engineers Safety Conference
1800-2000	Army SafePlaces Workshop

TUESDAY (7 Nov 95) Election Day—Plan Ahead—Vote Absentee

0600	Fitness Walk/Run
0730-1130	Army Medical Command Safety Conference
0730-1700	Army Aviation Safety Professional Development Seminar
0800-1900	Army Forum (Operations Center/Registration)
0800-1700	NSC Division Sessions/Workshops/Exhibition Hall FSC Workshops and Seminars
1300-1700	Army Safety & Occupational Health Advisory Council (invitation only)
1730	OSHA & the Army (OSHA Federal Agency Program Officers join Army conferees)
1830-2030	Conference Opening Social — No Host

WEDNESDAY (8 Nov 95)

0600	Fitness Walk/Run
0730-1700	Army Aviation Safety Professional Development Seminar
0800-1900	Army Forum (Operations Center/Registration)
0800-1700	NSC Division Sessions/Workshops/Exhibition Hall FSC Workshops and Seminars
0800-1700	Career Program Planning Board (invitation only)
1700	DINNER BREAK—No Host
1800-2030	SafeForce21 Workshop

THURSDAY (9 Nov 95)

0600	Fitness Walk/Run
0800-1200	Plenary Session........ Director of Army Safety .... CW5 Mock, Moderator
0800	Welcome/Admin/Conference Overview
0810	SafeForce 21 Progress Report........ COL Hyatt
0850	Functional Area Assessment Benefits........ Mr. Gibson/Dr. Hicks
0930	Control of Privileged Information .... MAJ Young
0950	Complete Conference Feedback Surveys
1000	BREAK— Conference Surveys Collected
1015	Safety System Three: A View of SafeForce21....... Mr. Dierberger
1100	Career Planning Board Report
1120	Conferee Questions/Comments
1200	FY 96 Army Safety Conference Concludes
1300-1700	Post Conference Seminar: Career Program 12 Career Managers' Responsibilities (open invitation)

FY96

Army Safety Conference (ASC)

5-9 November 1995

Dallas Grand Hotel, Dallas, TX

SafeForce21

The seminar also included open forum discussions that allowed participants to ask questions and identify problem areas that were either addressed by other participants or taken as projects for further research by the U.S. Army Safety Center, one of the MACOMs, or a subject matter expert.

In addition to the ASC events, the 50th Annual Federal Safety and Health Conference and the National Safety Congress will also be held in Dallas from 6 through 8 November 1995. Separate registration is required for these events, and fees are required for some.

Registration

We encourage aviation commanders and aviation safety officers to make plans to attend the ASC. Army participants may begin registering at 1300 on 5 November at the Dallas Grand Hotel. There is no fee for Army events.

Rooms may be reserved by calling the Dallas Grand Hotel at 1-800-421-0011. A government rate of $71 for single or $81 for double occupancy, taxes included, is available on a first-come first-served basis.

Points of contact

POCs for the Army Aviation Safety Professional Development Seminar portion of the ASC are—

- CW5 Steve Rauch, U.S. Army Safety Center, Building 4905 5th Avenue, Fort Rucker, AL 36362-5363, DSN 558-9868 (334-255-9868).
- CW5 Bob Williams, Aviation Branch Safety Office, U.S. Army Aviation Center, Building 6801B Andrews Avenue, Fort Rucker, AL 36362-5000, DSN 558-3000 (334-255-3000).

ShortFAX

Keeping you up to date

Address verification

Because of new postal regulations, we are updating our distribution lists for FlightFax. The post office now requires building numbers, street addresses, and 9-digit zip codes. APO addresses should include unit, box, and CMR number as appropriate. Please review and update your current mailing label and return the corrected label to us. If your address is correct, please return the existing label and so state. Return your label to Commander, U.S. Army Safety Center, ATTN CSSC-IM, Bldg 4905 5th Avenue, Fort Rucker, AL 36362-5363, or FAX requested information to DSN 558-2266 (334-255-2266).

More on fire extinguishers

According to the Director of Army Fire Services, all forms of Halon fire suppressants will be reduced by 50 percent by October 1995 and completely eliminated by October 2000. It is now unlawful to intentionally vent Halon 1211 or 1301 into the atmosphere when checking or performing maintenance on installed equipment. As of now, the only place Halon will continue to be allowed to be used is in crew compartments of tracked vehicles.

Aviation hand-held fire extinguishers (Halon 1301) will be replaced by carbon dioxide extinguishers as each current hand-held Halon extinguisher is turned in for replacement. The permanent replacement chemical for most Halon 1211 and 1301 extinguishers within the Army is being studied and will be announced at a later date.

Paragraph 7-11b of AR 420-90: Fire Protection dated 25 September 1992 requires using ABC multipurpose dry chemical or equivalent wheeled fire extinguishers for flight lines. There is no one extinguishing agent that is the best for all fires. But the basic reason dry chemicals are used is that they do not present an outside storage temperature exposure problem and the discharge stream characteristics are not adversely affected by normal outside conditions. Dry chemicals are also very effective agents on hydrocarbon fires, which often occur on flight lines.

The downside is the corrosive effects of ABC dry chemicals on aluminum-skinned aircraft. When a phosphate base (ammonium phosphate) agent used in ABC fire extinguishers is exposed to high temperature (300°F), it will soften and adhere to the surfaces of the material involved in the fire. The monammonium-phosphate chemical also found in ABC extinguishers melts and flows when it contacts heat, which is good for fighting aircraft fires; however, it is highly corrosive to aluminum. Once it flows into structural cracks and crevices on an aircraft, it cannot be washed out like BC multipurpose dry chemical agents can. If the residue is not cleaned off, it in conjunction with moisture can cause aluminum to corrode.

The alkaline base agents (sodium bicarbonates and potassium bicarbonate), the dry agents found in BC fire extinguishers, do not melt and stick to hot surfaces, which allows cleaning and is less corrosive to aluminum than the phosphate base agents in ABC extinguishers.

Based on this information and until revision of paragraph 7-11b of AR 420-90, flight line extinguishers will be Class BC type (sodium bicarbonate and potassium bicarbonate base) per National Fire Protection Code 10 (NFPA 10) for portable fire extinguishers. If you have replaced your Halon extinguishers with the multipurpose ABC type, continue using them until they become unserviceable, then replace them with BC dry chemical fire extinguishers.

POC: Mr. Richard H. Lovely, Engineering Programs Branch, USASC, DSN 558-9863 (334-255-9863)

ATCOM maintenance advisory message

Unisex couplings used on HTARS

An OH-58D was consumed by fire during hot refueling operations using an Aeroquip Corporation closed-circuit refueling (CCR) nozzle, NSN 4930-01-214-2909. Preliminary examination of the refueling components indicates that two separate and unique discrepancies existed to permit the CCR nozzle to separate from the hose at the unisex coupling. A safety-of-use message (SOUM-ATCOM-95-006) was issued to remove CCR and RDF nozzles with potentially incompatible couplings from service.

The purpose of this maintenance advisory message is to provide information regarding maintenance actions necessary to ensure that unisex couplings are functioning properly prior to their use for aircraft refueling operations.

Unisex couplings used on the heavy expanded mobility tactical truck (HEMTT) tanker aviation refueling system (HTARS) and any other application must be inspected for damage and proper operation. Units must—

- Visually inspect all unisex couplings for damage, paying particular attention to the locking tangs, mating surface, and seal.
- Ensure the coupling interlocking pin moves freely when the split ring is pulled and released on nonvalved couplings.
- Ensure the valve moves freely and that the coupling interlocking pin extends when the actuating handle is moved from the closed to the open position on valved couplings.

Note: Never use tools of any type to move the flow actuating handle on valved couplings. Excessive force will cause damage to the safety interlocking mechanism, rendering it inoperative.

TM 5-4930-237-10 and TM 10-4930-247-13&P will be revised to incorporate these specific before-use inspection requirements.

Remove any improperly functioning unisex couplings from service and dispose of them in accordance with normal supply procedures. A QDR is not required.

Points of contact

- Technical, Mr. Charles Bright, DSN 693-3888 (314-263-3888).
- Logistical, Mr. Jack Shortridge, DSN 693-2618 (314-263-2618).
- Safety, Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).
- After hours, ATCOM command operations center, DSN 693-2066/2067 (314-263-2066/2067).

Aviation vibration analyzer upgrades

All U.S. Army units should inspect their aviation vibration analyzer (AVA), NSN 6625-01-282-3746, to confirm that they have the current 6.01 software/hardware version. All units, except CH-47 units, with versions other than 6.01 should immediately return their AVAs to the contractor, Scientific-Atlanta, for upgrade. CH-47 units will receive instructions at a later date.

Units can confirm the software version currently being used in their AVA by turning on the AVA and looking at the second line displayed on the control and display unit. Upgraded hardware has a small white sticker on the data plates that states "Version 6.01."

Returning AVAs

When returning AVAs, the equipment must be complete, no missing or nonstandard components. Do not return aircraft adapter kits. The contractor will perform a complete inventory and test the AVAs to determine operational status. If the AVA requires repair, it will be repaired before it is upgraded. For defective/missing components that are available through the supply system, the contractor will advise the owning unit that it is their responsibility to replace these items. The AVA components and replacement parts with NSNs can be found in Table 1-1 on page 1-5 of TM 1-6625-724-13&P.

Scientific-Atlanta is responsible for upgrading all AVAs. Units should call Scientific-Atlanta at 619-679-6013 to receive a request manufacturer's authorization (RMA) number for scheduling and tracking purposes.

Keeping Nicad batteries charged

A recurring maintenance problem has been low or no charge in the Nicad batteries. Units should charge the Nicad batteries periodically to maintain a full charge. Many AVAs have been returned with Nicad batteries needing replacement because the units were not charging them. See TM 1-6625-724-13&P, page 2-1, paragraph 2-2 for charging instructions. The Nicad batteries are available through the supply system and will no longer be replaced by the contractor.

POC: MSG Larry Quinton, Aviation and Troop Command, DSN 693-1347 (314-263-1347), FAX DSN 693-2296 (314-263-2296)

Flyer's gloves

The aviator flight gloves are a required and valuable component of the flight uniform. And aircrewmembers know they should DX old, worn-out, holey, oil-stained gloves. Lessons learned from accidents involving fire reinforce the fact that gloves must be serviceable to provide the protection they were designed to provide should a fire occur. But what do you do when replacements are not available through the flight clothing issue facility?

Following recent field reports of a shortage of flight gloves at issue facilities, the U.S. Army Aviation Center (USAAVNC) Directorate of Combat Developments (DCD) discovered that the shortage resulted from a glitch in the procurement program. Unfortunately, the problem will not be resolved until after October 1995.

As an interim solution, the Defense Personnel Support Center (DPSC) in coordination with USAAVNC DCD has authorized the use of the combat vehicle crewman's (CVC) summer-type glove, NSN 8415-01-074-9428, as a substitute for the flyer's summer-type glove, NSN 8415-01-029-0109. The CVC glove may be worn until the flyer's glove becomes available or until the CVC glove is unserviceable. (Refer to CDR USAAVNC message dated 241901Z April 1995, subject: Flyer's Glove Shortage.)

The characteristics of the CVC glove are similar to the flyer's glove. The CVC glove is .5 ounces heavier, is made of olive green Nomex and black leather, and is treated for water resistance. The flame protection provided by the CVC glove is equal to the protection provided by the flyer's glove.

Back orders for the flyer's glove will be filled immediately with CVC gloves. However, back orders for sizes 10 and 11 cannot be filled with either glove at this time.

Questions concerning the fielding of the CVC glove and its characteristics should be directed to Mr. B. Roberson, USAAVNC DCD, DSN 558-9507/9130 (334-255-9507).

POC: CW5 Daniel W. Medina, U.S. Army Safety Center, DSN 558-9857 (334-255-9857)

Accident briefs

Information based on preliminary reports of aircraft accidents

Aviation flight accidents

Utility

UH-1 Class C

H series - While conducting emergency governor training, IP inadvertently increased throttle and RPM exceeded 7200. Engine and main rotor assembly will be replaced.

UH-60 Class C

A series - During MTF, crew noted tail rotor vibration, landed, installed vibration kit, and continued flight. Following takeoff, tail rotor gearbox caution light illuminated. Tail rotor gearbox seized just before touchdown during precautionary landing. Gearbox and tail rotor assembly sustained excessive damage.

UH-60 Class D

L series - Following multiship air assault live fire demonstration, postflight inspection revealed four main rotor blades had sustained damage from striking top screws on ALQ-144.

L series - While crossing ridgeline, tail wheel and fork struck ground.

L series - While performing NVS nose-up slope operations, extended searchlight sustained damage.

Attack

AH-1 Class A

F series - While crossing ridgeline at 9,300 feet MSL, Chalk 1 in flight of four encountered cloud layer. Crew executed abrupt decelerating right turn. Chalk 2 crew attempted to follow, and aircraft impacted slope in level attitude and rolled. No injuries.

AH-64 Class C

A series - Postflight inspection following MTF for rotor smoothing revealed hole on bottom of main rotor blade. Bolt on drive plate had sheared; head of bolt was missing.

Observation

OH-58 Class B

D series - While on downwind leg of traffic pattern, IP initiated simulated engine failure. Engine failed to respond to power recovery, and aircraft impacted in field. Tail boom, main rotor assembly, and WSPS separated. No injuries.

OH-58 Class C

A series - While hovering over ridgeline during battalion battle drill, aircraft main rotor blades struck trees. When PC applied power, aircraft yawed and tail rotor also struck trees. Crew immediately landed in open area. Aircraft sustained damage to rotors and drive train.

OH-58 Class D

A series - IP was demonstrating low-level autorotation and initiated recovery procedures, but aircraft impacted lane hard in level attitude. Aircraft sustained broken crosstube and damage to tail boom and isolation mount.

D series - During takeoff from tactical FARP on live fire exercise with 700 pounds of fuel, 7 rockets, and 1 Hellfire missile, pilot on controls in right seat noted high torque (107 percent) caution audio and display on the multifunction display. Pilot reduced collective below 100 percent and continued gunnery live fire exercise, recording 1.5 hours of flight. At termination during engine monitor check, crew noted engine torque had registered high of 126 percent. Accessory gearbox was removed and sent for teardown analysis.

D series - While conducting simulated engine failure at altitude, pilot allowed deceleration to become abrupt and descent became vertical. Rotor drooped to about 92 percent. During initial collective application, aircraft continued to descend until skids contacted ground, spreading aft crosstubes.

FOD incident

AH-1 Class F

F series - Maintenance removed aircraft engine to complete 150-hour CPM and reinstalled N2 accessory gearbox over red plastic cap on oil feed line. At flight idle during postphase runup, chip light illuminated. Engine oil pressure began to decrease, engine oil bypass light illuminated, and engine oil temperature began to increase. During shutdown, large white puff of smoke was observed coming from engine exhaust pipe. Maintenance removed engine and sent it to AVIM for replacement of No. 2, 3, and 4 bearing seals. AVIM completed work and stored engine for future use. Engine oil system was drained. Engine was later installed in another aircraft. On initial runup, engine chip light illuminated. Maintenance drained engine oil system, flushed it, and did second runup. Engine chip light illuminated again. Maintenance took engine oil samples and results were normal. During ground run of engine, engine chip light again activated. Engine was sent to AVIM for evaluation. When N2 gearbox was removed, remnants of plastic cap were discovered. Engine shipped to depot for repair.

Messages

■ Safety-of-flight technical message concerning tail rotor head assembly installation inspection on all AH-64 aircraft (AH-64-95-01, 212344Z Jun 95). Summary: A recent AH-64A mishap investigation revealed the presence of an improperly installed (incorrectly indexed) tail rotor fork assembly. The interface between the tail rotor fork (curvic coupling) and the gearbox output shaft was so designed that it should only be installed one way. The studs are in a triangular pattern but not equally spaced (that is, 115 degrees, 120 degrees, and 125 degrees of separation). An anomaly that allows the curvic coupling and fork assembly to be incorrectly indexed during installation was discovered with this design. If incorrectly indexed, binding of the studs occurs, stress levels increase, and the fatigue life of the studs is greatly reduced. Improper installation of the fork could lead to failure of the tail rotor. The purpose of this message is to direct a one-time inspection of the—

- Three tail rotor gearbox output shaft stud nuts for torque. If any of the nuts have lost torque IAW paragraph 8A of this message, all three studs must be replaced at OLR sites prior to the next flight.
- Tail rotor fork assembly alignment to ensure it is properly indexed and has never been incorrectly indexed in past installations.
- Condition of the tail rotor gearbox output shaft studs. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning inspection of engine bipod mount assembly on all UH-1H/V series aircraft (UH-1-94-ASAM-04, 121236Z Jul 95). Summary: The aft leg of an engine bipod mount has failed due to corrosion and operational vibration. The corrosion initiated in the area beneath the clamp that attaches the brace to the aft tube. The clamp may not have been tight and movement/vibration occurred, wearing off the protective coating (paint) on the tube. The area under the clamp is not normally inspected during routine maintenance. Due to the age of the UH-1 fleet, it is likely that other bipod assemblies may also exhibit this problem. The purpose of this message is to require a one-time inspection of the engine bipod mount for damage and corrosion. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning inspection of stabilizer bar pivot bolt on all UH-1H/V series aircraft (UH-1-95-ASAM-05, 121257Z Jul 95). Summary: A stabilizer bar center frame pivot bolt has been found cracked on a UH-1 aircraft. Investigation of the crack revealed it to be a manufacturing defect or a quench crack. The crack was visible with the naked eye and extended over halfway across the face of the head, across the wrenching flat, down the back side of the head to the shank, and the length of the shank into the threads. There is a possibility that other bolts manufactured by this particular manufacturer may exhibit this defect. The purpose of this message is to require a one-time inspection of the stabilizer bar assembly center frame pivot bolt for cracks. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time inspection for cracked main transmission beams, upper deck skin cracks, frame cracks, and implementation of a 100-hour recurring inspection for all H-60 Black Hawk helicopters (UH-60-95-ASAM-06, 201716Z Jun 95). Summary: Several H-60 helicopters have experienced cracks in the right and left side main transmission support beams. The cracks initiate fore and aft of the main transmission mount pad and progress down through the web and along the top skin outboard of the beam. Cracks have been found on the upper deck skin in the vicinity of the Gusset doublers and web stiffener that splices both station 343 frames to the left and right side transmission beams. Cracks have also been found on the aft beam (station 360 frame) upper cap and the Gusset doubler that splices the frame to the rear upper deck. These cracks initiate aft of the main transmission mount pad and run parallel to the beam in the cap area and the Gusset doubler. The purpose of this message is to require units to perform a one-time inspection for cracks and incorporate a recurring 100-hour special inspection. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory and informational message concerning revised replacement criteria for troop/gunner seat attenuation wires and explicit shimming procedures for attenuator rollers on all H-60 series aircraft (UH-60-95-ASAM-07, 222650Z Jul 95). Summary: Deficiency reports have cited failed troop/gunner seat attenuation wires and unrotatable troop/gunner seat wire rollers due to excessively tightened retention bolts and galvanic corrosion. The purpose of this message is to revise the damage and replacement criteria for troop/gunner seat attenuation wires and revise attaching procedures for the ICS cable routing on Simula/Norton pilot/copilot crew seats. The purpose of the message is also to require units to add crescent bushings under all the upper attenuation wire radii and ensure that the attenuation wire roller assemblies have the required freedom of movement. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message for all AH-1 aircraft modified in accordance with MWO 55-1520-244-50-9: Inspection Criteria for Main Rotor Pitch Change Link Rod End Bearing, Including Manual Changes (AH-1-95-ASAM-04, 131750Z Jun 95). Summary: Recent reports from the field indicate a higher than normal rejection rate for rod end bearing, P/N 209-310-401-101. This problem is further aggravated by the lack of suitable inspection/replacement criteria. The purpose of this message is to establish a 25-hour recurring inspection for the improved pitch link elastomeric rod end bearing and provide advance notification of a publication change for the improved pitch link bearing. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning faulty fire pull handle assembly switches on specific AH-64A aircraft (AH-64-95-ASAM-04, 071357Z Jul 95). Summary: A product alert issued by the manufacturer of the fire pull handle assembly indicates there is a discrepant lot of microswitches found in certain AH-64A fire pull handle assemblies. The discrepant microswitches, which must be replaced, are found in auxiliary power unit (APU) No. 1 and No. 2 engine fire pull handle assemblies of newer aircraft. The purpose of this message is to require inspection of fire pull handle assemblies and replacement of microswitches as necessary. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

In this issue:

Class A Accidents through July

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	0	0	0
	March	0	1	0	0
3D QTR	April	5	1	2	5
	May	0	2	0	2
	June	0	1	0	0
4TH QTR	July	4	3	5	0
	August	1		0	
	September	1		0	
	TOTAL	**21**	**10**	**11**	**8**

Report ... by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Address questions about content to DSN 558-3770. Address questions about distribution to DSN 558-2062. To submit information for FlightFax, use FAX DSN 558-9478/3743, Ms. Jane Wise.

S. W. Hyatt

Scott W. Hyatt
Colonel, USA
Acting Commander
U.S. Army Safety Center

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS

September 1995 ◆ Vol 23 ◆ No 12

New Chief of Staff of the Army General Dennis J. Reimer's thoughts on risk management

"As an institution, we demand responsible action, which includes protecting our soldiers as they accomplish their mission. Training accidents bring this responsibility into sharp focus. I want to share with you my thoughts on this important subject.

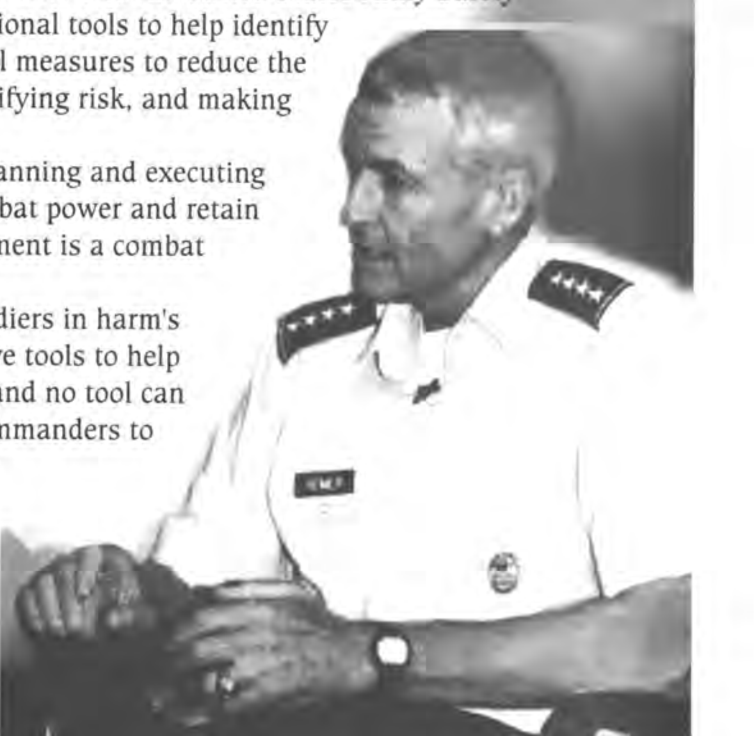
"Every day as we respond to the Nation's needs, we expose our soldiers to hazards in uncertain and complex environments. We do this with the full knowledge that there are inherent risks associated with any military operation. The nature of our profession will not allow for either complacency or a cavalier acceptance of risk.

"The purpose of risk management is to identify operational risks and take reasonable measures to reduce or eliminate hazards. Risk management allows us to operate successfully in high-risk environments. Leaders at every level have the responsibility to identify hazards, to take measures to reduce or eliminate hazards, and then to accept risk only to the point that the benefits outweigh the potential losses. The Army's doctrinal manuals articulate the risk-management process, our principal risk-reduction tool. Risk management is not an add-on feature to the decision-making process but rather a fully integrated element of planning and executing operations. The United States Army Training and Doctrine Command and the United States Army Safety Center are working together to provide commanders with additional tools to help identify and assess risk with greater precision, while suggesting control measures to reduce the level of risk. However, articulating risk—collecting data, quantifying risk, and making a decision—is a command responsibility.

"Our goal is to make risk management a routine part of planning and executing operational missions. Risk management helps us preserve combat power and retain the flexibility for bold and decisive action. Proper risk management is a combat multiplier that we can ill afford to squander.

"Ultimately, leaders will make decisions that place our soldiers in harm's way. That is inherent in the responsibility of command. We have tools to help you, and I expect you to use them—but they are tools at best, and no tool can substitute for the exercise of responsible judgment. I expect commanders to create an environment in which the lives and well-being of our soldiers are an integral part of the accomplishment of the mission. Our soldiers deserve no less.

"Soldiers are our credentials!"



Risk Management

key to safe winter operations

You don't have to be assigned to a unit in Alaska to feel the harshness that winter will soon bring upon us. While the hazards associated with winter operations certainly aren't new and may not be as severe in some areas as others, many of you haven't flown in snow and icy conditions or had to perform maintenance in sub-zero temperatures for many months. Regardless of where you're stationed, the colder temperatures can make even the simplest tasks more difficult. Continuing to operate as if the warm breezes of summer were still blowing can be a setup for disaster.

Don't put yourself in a mishap-waiting-to-happen category. Before winter's freezing winds, snow, and ice arrive, review the hazards associated with cold-weather operations and proceed with caution until you again become proficient in operating in the harshest environment of the year. And most of all, don't take any unnecessary risks such as giving in to the temptation to shortcut a preflight or maintenance procedure or any other procedure just so you can hurry up and get in out of the cold.

Remember that the risk-management process and rules aren't seasonal. While we can't eliminate the environmental hazards associated with winter, we can prepare ourselves and develop control measures to reduce the risks so that operations even in the bitter cold will be as safe as possible.

Another unit's views on operations in blowing snow

One of our goals in FlightFax *is to encourage aviation units to share with other units ways they have solved problems. In the April 1995 issue, LTC Marshall T. Hillard, commander of the 4th Battalion, 101st Aviation Regiment, presented his unit's approach to helicopter operations in dust and blowing snow conditions. In addition to describing a new technique (including a sample SOP) that his unit had researched and experimented with for operations in blowing dust, LTC Hillard encouraged others to use a similar aggressive approach to solving some old problems such as brownout and whiteout. The following is one unit's response.*

LTC Hillard's article got the desired response in D Company, 4-123d Aviation Battalion at Fort Wainwright: it generated a lot of discussion. Since we operate in Alaska and spend a majority of our time flying in blowing-snow conditions, the references LTC Hillard made to blowing-snow operations were of particular interest to us.

The 101st presented some great research and data regarding operations in dust conditions, but the article seemed to assume that blowing dust and snow were essentially the same. Operations in snow conditions appeared to be almost an afterthought. All of the research and training was done in the desert; there is no mention of conducting research on operating in snow conditions or experiments with various techniques in snow environments. We thought that other units might like to hear our ideas on operating in a snow-covered environment since that is where we operate most of the time.

A different approach to snow operations

In the interior of Alaska, we are exposed to extremely dry snow conditions. Contrary to FM 1-202: Environmental Flight and the theory proposed by the 101st, we have found a different approach to multiship operations in UH-60s that has proven safer and more effective in our particular environment. After conducting similar research into blowing-snow operations, our unit found that straight trail is the best formation for UH-60 multiship takeoffs and landings. In fact, we use this formation exclusively when executing missions.

Before you scoff at this idea, please consider that many of our aviators have experience in dust conditions and have come to recognize that operating an aircraft in dust and snow can be very different. However, allow us to caution that the technique that has proved effective for us may not be appropriate for all airframes or under all conditions. But through experimentation and experience, we have found that it works best for our unit's Black Hawks in Alaska.

In a trail formation, the induced flow down through the rotor system of the previous aircraft actually blows the snow cloud out to the sides of the aircraft, in essence creating a tunnel for the next aircraft to fly through. In reality, the theory is similar to that proposed by the 101st in dust, except that the snow cloud is actually blown clear of follow-on aircraft as opposed to echelon or staggered formations where the other aircraft are engulfed in whiteout by the induced flow of the preceding chalk. Surprisingly enough, the trail formation can be as loose as two rotor disks under most conditions and still be totally effective in allowing the following aircraft to maintain visual contact with the previous chalk.

Find new solutions

It seemed worthwhile for us to warn against lumping snow and dust into the same category when limited testing in the snow environment had been conducted. Like LTC Hillard, we also feel it is important to encourage other units to take the same aggressive approach to problem solving that we undertook for blowing-snow operations and the 101st undertook for blowing-dust operations.

Apply risk management concepts and don't be afraid to try something different from the techniques addressed in the FM, particularly when it is an older manual and is geared towards an outdated airframe. However, we must stress the importance of completing your risk assessment first and then experimenting with techniques in a controlled environment. At the same time, it is important to stress that as conditions vary and airframes differ, other techniques may have to be experimented with to determine the best formation for a given situation and set of conditions.

By generating discussion and taking the initiative to solve both old and new problems alike, we will all benefit from increased combat effectiveness and superior aviation safety.

POC: CW2 Regan G. Plath, DSN 317-353-7008 (907-353-7008), D Company, 4-123d Aviation Battalion, Fort Wainwright, Alaska

The facts are . . .

FlightFax needs your help. Aviators, maintainers, air traffic controllers, refuelers, firefighters—we need your input to help us meet readership demands. Our No. 1 reader request is for more "There I Was" stories and lessons learned. But it sure is hard to print information that we don't have.

No one can give a better first-person account of an event than the individual involved.Tell us about your close calls, near misses, and the safety lessons you learned from the experience. If you want your story to be anonymous, we'll do it that way.

Don't have any "war stories" to tell? Then tell us about the good things that are happening as a result of your safety programs. What are you doing in your unit to lower accident rates? What are you doing to spread safety awareness? Has your unit or soldiers within your unit won any safety awards? Accident rates across Army aviation are down, so obviously something good is going on out there. Tell us about it.

In future issues of *FlightFax*, we plan to address recurring safety issues such as FOD prevention, ALSE, risk management, severe weather, and so forth. If you would like to see a specific safety issue addressed or readdressed, let us know. If you are a subject matter expert on or have information related to these topics or know someone who is a subject matter expert, we would like to hear from you. And remember, you aren't limited to these topics.

We also get lots of requests for posters. Recently we promised to provide black and white posters in FlightFax as space permitted. We're living up to our promise. Included in this issue is a double-sided poster you can remove and post on your bulletin board. Better yet, if you have access to a copier that can be adjusted to accommodate this size paper, you can copy one side and have the benefits of two new posters available at the same time. A reminder: This is another area where you can help. If you have poster ideas, please let us hear from you.

The facts are clear: To keep *FlightFax* customer focused, we need your expertise and input. Let's form a partnership, and together we can develop informative, up-to-date articles (posters too) on both old and new aviation safety issues.

Send your written material or even a cassette tape (if you absolutely hate to write) to Commander, U.S. Army Safety Center, ATTN: CSSC-PMA *(FlightFax)*, Building 4905, 5th Avenue, Fort Rucker, AL 36362-5363. If you prefer, you may FAX the information to the attention of Ms. Jane Wise at 558-3743/9478 (334-255-3743/9478) or send it by e-mail to wisej@rucker-safety.army.mil. Send your poster ideas to ATTN: CSSC-IM (Ms. Rebecca Nolin), FAX 558-2101 (334-255-2101) or call 558-2073 (334-255-2073).

Be sure to include a telephone number, a FAX number, mailing address, or an e-mail address where we can contact you. ❑

INVESTIGATORS' FORUM

Lessons Learned

The "Investigators' Forum" is written by accident investigators to provide an accident synopsis and major lessons learned from recent centralized accident investigations.

OH-58D(I). While flying straight and level at 500 feet AGL as the trail aircraft in a formation flight, the engine surged, causing a significant yaw, a drop in engine noise, and loss of power. The PC autorotated to an open field. After an almost perfect touchdown, the aircraft slid 10 feet into a ditch. The pilots were uninjured, but the aircraft sustained significant damage.

- ***What happened.*** The electronic supervisor control (ESC) malfunctioned and caused the engine surges. When the crew switched to the analog/backup mode, the ESC continued to fail, giving unexpected results to the crew. Instead of momentary increases in engine performance, all parameters decreased and did not recover. The PC felt the engine was unreliable and elected to close the throttle and autorotate.

This is a case where the quip, "I ran out of time, altitude, and ideas all at the same time" is true. The crew had only 30 seconds from the onset of the malfunction until they impacted the ground.

- ***Lessons learned.*** A lesson to be learned or relearned here is the importance of making a decision and following through with the procedure. The PC correctly analyzed and reacted to the primary emergency: an engine surge. When the correct procedure failed to produce the expected and publicized results, he determined that the engine was unreliable and instead of troubleshooting, committed to an autorotation and concentrated on that procedure. Had the ditch not been located where it was, this crew would have received a Broken Wing award instead of a broken aircraft.

A second observation made during this investigation and supported by previous investigations indicates that problems with poor record keeping are widespread. Reviews of maintenance logbooks and historical records indicate that the number of errors is increasing. These are errors that should be caught by pilots, crew chiefs, platoon sergeants, and quality control personnel. Either a lack of training, understanding, or attention to detail is allowing this poor record keeping to occur. Fortunately, failure to keep accurate records has not resulted in a serious accident yet. But if we don't tighten up on proper record keeping, eventually a critical inspection will be missed or an aircraft will be flown with an existing deficiency that could result in disaster!

CH-47D. During slingload operations, the crew heard a loud pop, followed by the onset of a lateral vibration in the flight controls. The pilot announced he had a flight control malfunction. The crew elected to continue to the landing area, set down the load, and shut down the aircraft. During shutdown, the aft red rotor blade depatterned, striking the tunnel cover, and in turn was struck by the forward green rotor blade.

- ***What happened.*** The aft red shock absorber (lag damper) lug failed at the pitch housing assembly due to corrosion fatigue. The failure resulted in the lateral vibration felt by the crew. With the fractured lag damper, there was no restriction on forward blade motion. As the rotor slowed during shutdown, the blade continued to sweep forward and down, striking the tunnel cover.
- ***Lessons learned.*** Effective crew coordination resulted in the crew electing not to release the load. The aircraft responded to control inputs, and the crew was able to land it safely.

A lag damper fracture is not a safety-of-flight condition. With a fractured lag damper, it is safe to continue flight if vibration is not excessive and maneuvers are minimized. On a CH-47D with a fractured lag damper, the aft rotor blade tip may approach or contact the fuselage tunnel cover as rotor RPM approaches zero. And with a fractured lag damper, a blade-to-blade collision can occur in the rotor overlap region as rotor RPM approaches zero.

AH-1F. While repositioning from one airfield to another during an administrative flight, the crew attempted to circumnavigate a cloud layer at an altitude of more than 9,000 feet MSL. At the 9,400-foot level, the aircraft entered a right descending turn and continued until it struck the side of a mountain, rolled downslope, and came to rest inverted.

- ***What happened.*** In addition to their failure to accomplish appropriate preflight planning, the pilot and PC directed their attention outside the aircraft, failed to monitor their instruments (the airspeed indicator), and allowed their airspeed to bleed off to the point that it went below ETL. At this point, they were approximately 50 feet AGL and were not able to regain forward airspeed. When the crew demanded additional power by applying full left pedal to stop the right turn, it was not available. The application of left pedal aggravated the descent, and the N2 and rotor RPM continued to decay until the aircraft could no longer maintain flight.

Safety has a GO-TO-WAR MISSION

Ensure the only threat is from the enemy. Risk management—the key to protection.

THIS CO

ISN'T OVER

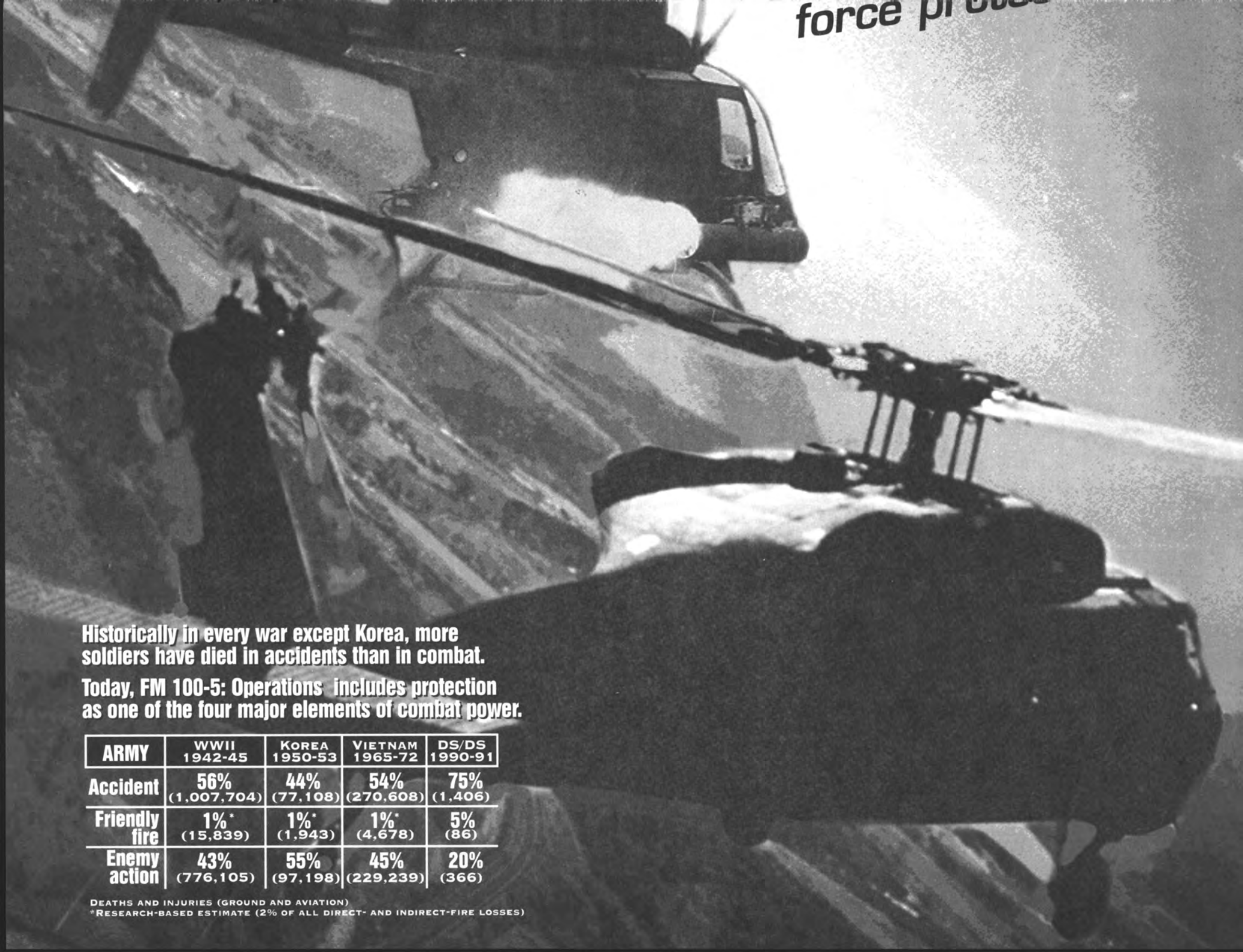
*Ready or not,
here comes winter.
Control the risks
of cold operations
by being prepared.*

WINTERIZE YOURSEL

OLD WAR

K MANAGEMENT
N'T SEASONAL

F AND YOUR AIRCRAFT



Historically in every war except Korea, more soldiers have died in accidents than in combat.

Today, FM 100-5: Operations includes protection as one of the four major elements of combat power.

ARMY	WWII 1942-45	KOREA 1950-53	VIETNAM 1965-72	DS/DS 1990-91
Accident	56% (1,007,704)	44% (77,108)	54% (270,608)	75% (1,406)
Friendly fire	1%* (15,839)	1%* (1,943)	1%* (4,678)	5% (86)
Enemy action	43% (776,105)	55% (97,198)	45% (229,239)	20% (366)

DEATHS AND INJURIES (GROUND AND AVIATION)
*RESEARCH-BASED ESTIMATE (2% OF ALL DIRECT- AND INDIRECT-FIRE LOSSES)

• *Lessons learned.* This accident is an example of the value of thorough preflight and en route planning. Had the aircrew accomplished the appropriate preflight planning, they would have known that they did not have sufficient power to operate below ETL in an OGE situation. In addition, this accident demonstrates the importance of establishing and maintaining an effective cross-check of aircraft instruments and not allowing yourself to fixate.❑

ASO Corner

Standardized enlisted safety meetings

Aircrew safety meetings provide an opportunity to present information, discuss and solve problems, and increase communication between the commander and flight crews. Meetings also provide issues to be addressed by the safety council and allow crewmembers to learn from each other's experience. Similar benefits can also result from aviation maintenance safety meetings.

Developing a program

Our Apache squadron saw a need to improve our aviation maintenance safety meetings and expand the system to include all enlisted personnel. We wanted meetings that would meet regulatory requirements, support the commander's METL (mission essential task list), improve soldier proficiency, increase readiness, and broaden safety awareness.

To accomplish this goal, we first determined what regulatory requirements we had to meet. We found that this varies, depending on your MACOM and unit guidance. Several regulations, including AR 385-95: Army Aviation Accident Prevention, paragraph 1-6, address requirements for safety meetings, briefings, and training. FORSCOM units will find more specific guidance in FORSCOM Regulation 385-1: Forces Command Safety Program, paragraph 12 3c, which requires monthly meetings for aircrewmembers and aviation maintenance personnel. The regulation also requires a synopsis of the meeting and establishment of a makeup system for people who didn't attend the monthly meeting.

Other sources require safety training in such topics as hearing conservation, respiratory protection, driver safety, and fire prevention. Most of these subjects fall into the realm of ground safety, and some are covered in briefings given at unit formations, safety days, or during classes set up for the specific topic. There are advantages to presenting information this way, but there are also disadvantages. Often such formats do not allow for discussion by those attending or provide a means for makeup by personnel who are absent.

We then looked at several programs and found that one or more of the following problems exist:

- Meetings not being held.
- Meetings not being documented (no synopsis).
- Attendance rosters not being completed.
- Makeup training not being conducted.
- Safety meetings for aviation maintenance personnel sometimes included ground safety topics (such as use of seat belts) but nothing related to aviation safety.
- No meetings scheduled for personnel in nonaviation MOSs.

We decided to conduct standardized enlisted safety meetings that allowed for discussion and feedback. Because of several factors, including workload, maintenance flow, and the number of people involved, we couldn't just get everyone together in the squadron classroom or in a room at the club for lunch.

It became obvious that we needed more flexibility and a different approach to that used for our crewmember meetings. The solution was to move the meetings down to the troop level. This would allow us to conduct meetings with a manageable group of people, but we also needed to ensure that all of our soldiers were briefed on the same material. To do that, we came up with a briefing packet that could be used by the troop safety NCOs or other designated NCOs to conduct the meetings.

Briefing packet

In the month before the meeting, the squadron aviation safety officer and aviation safety NCO (ASO/ASNCO) prepare a five-part packet for review and approval by the squadron commander. They then distribute the approved packet to the troop ASNCOs and the Headquarters and Headquarters Troop ground safety NCO (GSNCO). The packet consists of a cover sheet and four enclosures.

- *Cover sheet.* This includes instructions and assigns suspense dates.
- *Enclosures.*
  - ☐ General safety briefing material for all personnel, for example:
    - Hearing conservation.
    - Eye protection.
    - Field safety.
  - ☐ Material to be briefed to aviation maintenance personnel, for example:
    - Foreign object damage.
    - Flightline procedures.
    - Hangar hoist training.
  - ☐ Material of a specific nature that is briefed to all personnel, for example:
    - Recent mishap experience.
    - Accident trends.
    - Commander's concerns.

- Discussion topics. These are topics for which briefing material is not necessarily provided but are brought up for discussion at the monthly meetings. This is a brigade-specific requirement and is key to making the meetings work. Topics include—
  - Hot- and cold-weather injuries.
  - Fire prevention.
  - Vehicle safety.
  - Flightline/hangar safety (aviation maintenance personnel only).
  - Other topics as appropriate (motor pool, field, and so forth).

The meeting

The troop safety NCO or other designated NCO briefs the material to the soldiers, asks for discussion on the standard topics, and then opens the meeting for further discussion.

The troop safety NCO records what was discussed and this, along with the briefing material provided by the squadron ASO/ASNCO, becomes the synopsis of the meeting. The troop safety NCO also compiles an attendance roster of those who were present **and** notes those who were absent.

Makeups

Makeups should be completed not later than the last day of the month following the meeting. This allows time for people who were on leave, TDY, or absent for other reasons to read the synopsis and sign the makeup roster.

The troop safety NCO marks the names of soldiers on the roster who were unavailable to attend or unable to make up the class by this time. The troop safety NCO notes the reason they were unable to attend and the expected date of compliance with the makeup requirement. All assigned personnel must be accounted for as either "attended," "makeup," or "unavailable."

Copies of the discussion synopsis and attendance rosters are then sent to the squadron ASO. The squadron ASO reports compliance to the commander within 4 working days.

Further makeups

The troop safety NCO keeps the original copy of the briefing material, the discussion notes, and the attendance roster. He or she uses these to complete makeups of personnel who were unavailable previously. Each month when the troop safety NCO forwards copies of discussion notes and attendance rosters to the squadron ASO/ASNCO, an update to previous makeup rosters is included.

Keeping the meeting size manageable

In larger maintenance companies, the process can be further broken down to allow platoon or section sergeants to hold the meetings. This allows more flexibility in scheduling and keeps the meeting size manageable.

Advantages of the program

- Standardized program for the squadron.
- Integrates ground and aviation safety.
- Includes all enlisted personnel.
- Allows for discussion.
- Allows for tailoring by the troop safety NCOs.
- Has a makeup system.
- Builds a file of briefing and training material.
- Addresses current mishap trends.
- Keeps the commander informed.

Disadvantages of the program

- Requires considerable initial work in preparing briefing material.
- Requires continuous review and update of material. Outdated or inaccurate briefings will harm the program.
- Takes time to educate participants on how the program works and overcome any initial resistance to a new system.
- Failure of troop safety NCOs to encourage discussion will decrease the meeting effectiveness.

Lessons learned

- Keep the briefings accurate and concise.
- Keep the discussion focused.
- Place the meetings on the troop training schedules.
- Include ground safety topics such as desert, mountain, night, and continuous operations. This approach allows soldiers to become familiar with the associated hazards, and if you're deployed next week, you'll have a head start on training. When possible, conduct these briefings before a field exercise, NTC rotation, or other similar event.
- Involve commanders and subordinate leaders. ASOs/ASNCOs should monitor the presentations but should not be expected to do all the presentations.
- Forward unresolved meeting issues to the enlisted safety council.
- Review the discussion notes for trends.
- Keep the command sergeant major, first sergeants, troop commanders, and troop ASOs involved and informed. The first sergeant may want to lead the discussion portion of the meeting.
- Ask for feedback. Your briefing material may not be as brilliant as you think it is.
- Get the packet to the people responsible for the meetings early so they can become familiar with the material. They may want to invite a guest speaker for a particular topic or show a tape that covers the same subject.
- When possible, put a briefing in the context of something the unit is doing or is going to do.
- Focus on—
  - Performing to standard.
  - Maintaining situational awareness.
- Use pre-printed attendance rosters. The troop safety NCOs can have soldiers initial next to their names, and it's easy to glance at the roster and see who is present—or absent.
- Rely on available material from Army sources: technical manuals, field manuals, installation safety bulletins, *FlightFax*, *Countermeasure*, and so forth. Don't necessarily copy or read the material verbatim from the source. Pick out the key points, and customize the briefing material and the presentation to your audience and your unit's mission.
- Publish a 12-month forecast of monthly topics approved by the commander. This gives you an overall look at the program and assists in planning. Adjust the list as necessary.
- Set a goal for a time limit on the meeting. *Meet the goal.*

You and your commander must decide which type of program is best for your unit. Look at your enlisted safety meetings to see if they're productive and are being done to standard. If you're having any of the same problems we had, a standardized program may improve your meetings. This program improved our enlisted safety meetings and supports our mission. A similar program might do the same for your unit.

POC: CW4 William E. Wallace, Flight Safety Officer, Headquarters III Corps and Fort Hood, DSN 737-7701 (817-287-7701), FAX 737-3337

ShortFAX
Keeping you up to date

Address verification

Because of new postal regulations, we are updating our distribution lists for *FlightFax*. The post office now requires building numbers, street addresses, and 9-digit zip codes. APO addresses should include unit, box, and CMR number as appropriate.

Please review and update your current mailing label and return the corrected label to us. If your address is correct, please return the existing label and so state. Return your label to Commander, U.S. Army Safety Center, ATTN CSSC-IM, Building 4905, 5th Avenue, Fort Rucker,

AL 36362-5363, or FAX requested information to DSN 558-2266 (334-255-2266).

Request for current addresses and status of ATMs

The U.S. Army Aviation Center, Aviation Training Brigade, Aircrew Training Manual (ATM) Section is compiling a data base of addresses for use in future distribution of draft ATMs. We will also use the data base to identify subject matter experts to help resolve questions as they occur.

To conserve resources, we will only send manuscripts to units for which we have current addresses. We are asking that units provide us their current address (including building numbers, street addresses, and 9-digit zip codes). APO addresses should include unit, box, and CMR number as appropriate. We also need to know your type of aircraft, points of contact, telephone and FAX numbers, and e-mail address. Send this information to Commander, U.S. Army Aviation Center, ATTN: ATZQ-ATB-NS (ATM Section), Building 2802, Division Road, Fort Rucker, AL 36362-5218, DSN 558-3801/2864 (334-255-3801/2864), FAX DSN 558-2463 (334-255-2463), or e-mail to ATZQATBATM@rucker-emh4.army.mil.

Status of ATMs

- TC 1-210: Aircrew Training Program, Commander's Guide to Individual and Crew Standardization should be fielded around 1 October 1995. Units should ensure their 12-series is current so they will get initial distribution of this manual as well as other updated ATMS as they are published.
- TC 1-212: Aircrew Training Manual, Utility Helicopter, UH-60 is undergoing final editing.
- TC 1-213: Aircrew Training Manual, Attack Helicopter, AH-1 is being prepared for final editing.
- CH-47 crewmembers should review their current ATM and submit proposed changes to the ATM Section by 15 November 1995.

If you have questions or comments about the Aircrew Training Program, contact CW4 William "Scott" Johnson, CW4 Robb Miller, or Ms. Connie Ecker at DSN 558-3801 (334-255-3801).

Accident briefs
Information based on preliminary reports of aircraft accidents

Aviation flight accidents

Utility

UH-1 Class A

H series - About 2 minutes into flight after picking up passenger, aircraft descended, struck tree with tail rotor, and impacted in ravine. Four injuries.

UH-1 Class C

H series - In cruise flight at 100 knots and 5,300 feet MSL, aircraft yawed left, N2 decayed, RPM light illuminated, and audio activated. IP lowered collective and verified that throttle was full open. Engine was at 80 percent N1. IP increased collective, causing rotor RPM to decay. IP then lowered collective and instructed pilot to engage emergency governor operations. Engine RPM decayed. Crew autorotated to nearby road. When IP decelerated, main rotor blades struck trees along road, damaging blades.

UH-60 Class C

L series - During preflight, crew discovered all four blades had sustained damage. Suspect contact with ALQ-144.

L series - PC was maneuvering aircraft for landing to tactical PZ. While increasing collective to reduce aircraft's rate of descent, PC realized that collective travel was limited. PC was able to apply only 72 percent torque. Realizing hard landing was imminent, PC decelerated as much as possible and attempted to level aircraft. When aircraft came to rest, crew performed normal shutdown. During shutdown, PC discovered secure communications coding device (ANCD) resting on base of pilot's collective.

Cargo

CH-47 Class C

D series - During maintenance test flight, left pilot door separated from aircraft and struck high-frequency radio antenna and side of aircraft.

D series - During slingload operation, crew noted vibration. Crew repositioned load on ground. Upon shutdown, aft blade displaced and struck fuselage. (See CH-47 writeup in "Investigators' Forum.")

Observation

OH-58 Class B

D series - While in flight of seven, pilot of accident aircraft entered autorotation after experiencing engine surges and unexpected aircraft responses while performing emergency procedure. After completion of near-perfect autorotation and landing, aircraft slid into a ditch and sustained extensive damage. No injuries. (See OH-58 writeup in "Investigators' Forum.")

OH-58 Class C

A series - Aircraft was on training mission when IP initiated simulated engine failure. Pilot entered autorotation. IP told pilot to adjust airspeed, and correction caused rotor RPM to increase. IP took controls and RPM rose to 113 percent for 2 seconds.

Aviation ground accident

Severe weather resulted in damage to three EH-60s, three UH-1Hs, four OH-58As, and one AH-1 aircraft. Aircraft sustained damage to main and tail rotor blades. All aircraft had been moored (standard procedure for all aircraft upon parking). Weather was as forecasted, but unforecast winds were experienced. Damage resulted when debris from nearby building struck aircraft. Initial damage cost is in excess of $2 million.

Messages

Aviation safety action maintenance messages

■Aviation safety action maintenance mandatory message concerning inspection of main landing gear on all AH-64 aircraft (AH-64-95-ASAM-05, 261444Z Jul 95). Summary: Main landing strut mounts have cracked, and collapse of the landing gear strut has occurred. Inspection criteria previously used may not be stringent enough to detect critical flaws. The purpose of this message is to direct a one-time inspection of all aircraft not previously inspected for correct washer installation and require units to perform a recurring magnetic particle inspection on all main landing gear strut mounts during each phase maintenance inspection using revised inspection limits. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■Aviation safety action maintenance mandatory message concerning main rotor expandable blade bolt on all OH-58D helicopters (OH-58-95-ASAM-08, 181825Z July 95). Summary: Investigation of a Category I deficiency report indicates that there are a significant number of installed main rotor expanding blade bolts that have cracks in the cam handle. These cracks are the result of excessive force used during removal of stuck or jammed bolts. The use of an incorrect corrosion preventative compound (CPC) has been identified as a possible contributor to bolts sticking. The purpose of this message is to provide instructions for a one-time inspection and repair of defective bolts and dissemination of correct CPC usage. Maintainers should be made aware that cracking of handles is due to excessive force applied to the cam handle. The cam handle is not to be used as a lever to pry stuck blade bolts loose nor slammed back to attempt to loosen stuck blade bolts. Proper care, correct use, and application of the correct CPC should prevent further damage. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

Aviation maintenance information messages

■Aviation maintenance information message concerning EH/UH-60A and UH-60L aircraft (UH-60-95-001, 021816Z Aug 95). The purpose of this message is to alert aviation commanders that MWO 1-1520-237-50-73 (depot level) has been released as an urgent TB. The MWO requires that the engine trim balance hardware be modified by 31 July 1996. TB 1-1520-237-501-169 has been released and directs specific requirements for scheduling affected aircraft. Application of the MWO must be performed by 31 July 1996. Scheduling of the MWO can be accomplished before the TB is received by contacting your local OLR representative. Contact: Ms. Jennifer Collins, DSN 693-3801 (314-263-3801).

■Aviation maintenance information message concerning deactivation of AH-64 rotor (blades) de-ice capability (AH-64-95-002, 011544Z Aug 95). Changes to the AH-64 mission need (MN) statement and the operators manual now only require aircraft to operate in light icing conditions. As a result, it is no longer mandatory to maintain the rotor de-ice system. TB 1-1520-238-20-62, which is in the publishing process, allows deactivation of the rotor de-ice system at the commander's discretion. If such action is taken, the aircraft is fully mission capable (FMC). Until TB 1-1520-238-20-62 is issued, all AH-64 aircraft with either operable or inoperable rotor de-ice systems may be reported FMC. Contact: Mr. Ken Muzzo, DSN 693-5420 (314-263-5420).

■Aviation maintenance information message concerning inspection of the force gradient assembly in the cyclic controls of OH-58A/C aircraft (OH-58A/C-95-002, 201852Z Jul 95). A Category I deficiency report stated that the cyclic control would not function due to a deteriorated forward and aft force gradient assembly. The assembly is reported to have more than 3,000 flying hours in service. The purpose of this message is to inform units of an impending urgent TM change that will require removal and inspection of both the force gradient assemblies, P/N 206-001-076-1, NSN 1680-00-126-4350, at first and third phase inspections of all OH-58A/C aircraft. Contact: Mr. Stephen P. Dorey, DSN 693-5420 (314-263-5420).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

In this issue:

- New Chief of Staff of the Army, General Dennis J. Reimer's thoughts on risk management
- Risk management: key to safe winter operations
- Another unit's views on operations in blowing snow
- The facts are . . . we need your help
- Investigators' forum
- Standardized enlisted safety meetings
- Address verification
- Request for current addresses and status of ATMs
- Posters
  —This cold war isn't over
  —Safety has a go-to-war mission

Class A Accidents through August

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	0	0	0
	March	0	1	0	0
3D QTR	April	5	1	2	5
	May	0	2	0	2
	June	0	1	0	0
4TH QTR	July	4	1	5	0
	August	1	3	0	5
	September	1		0	
	TOTAL	**21**	**11**	**11**	**13**

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558-3770 (334-255-3770). Address questions about distribution to DSN 558-2062 (334-255-2062). To submit information for FlightFax, use FAX DSN 558-9478/3743, Ms. Jane Wise.

S. W. Hyatt

Scott W. Hyatt
Colonel, IN
Acting Commander
U.S. Army Safety Center

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS

November 1994 ◆ Vol 23 ◆ No 2

Soldiers die in accidents both on and off duty that could and should have been prevented. Unfortunately, there are no instant replays when dealing in ultimate reality—life and death. The only way to prevent tragic accidents is to learn to manage all risks as we encounter them daily.

The winter season is already upon us, bringing with it cold-weather hazards that soldiers haven't confronted in months. Soon the holiday season will be upon us, too, bringing with it a special group of hazards that require extra caution—alcohol, fatigue from partying a little too hard, and stress from hurrying to wrap up last-minute details before heading home to family, friends, and others.

As we approach the traditional jolly season of the year, let's ensure it remains jolly. Don't accept any unnecessary risks: don't speed; don't drink and drive; leave a day later if you have to. The happy spirit of the season can quickly change to one of sadness when carelessness leads to an accident. If you become lax and lose sight of your safety focus, the price could be much higher than you are willing to pay.

Sometimes just being human gets in the way and it becomes easy to give in to temptation, especially when others are doing so. Let's be careful out there as we enjoy the holiday festivities. Remember, you can't take a "holiday" from safety. □

Three pieces of the safety puzzle

As I reflect over 25 years of aviation experience, I want to share some of my thoughts and lessons learned on aviation safety with my fellow aviation commanders.

Until I became a brigade commander, I had never had to fix a broken safety program. I guess it was luck that I was always assigned to units that had an extremely high level of safety consciousness, so I only had to emphasize steady-state safety maintenance. When I assumed brigade command, I encountered an entirely different situation.

I thought that if I shared my safety philosophy with all of the officers and NCOs, they would embrace it as their own, and I could reverse the brigade's devastating accident trend of the previous couple of years. Wrong! Unfortunately, it took several mishaps, one by each of my four battalions/squadrons, culminating in a Class A before I woke up and decided that a more aggressive approach was necessary.

In the development of my new attack on preventable accidents, I recognized that there are three necessary parts to a world-class safety program. While some will argue that there are more than three, and perhaps there are, if any of the three prime factors are absent, your program will fail. I therefore am of the firm opinion that there are three major pieces to the safety puzzle: command involvement, organizational responsibility, and constant focus.

Command involvement

Command involvement is the easiest piece to set in place. When you are in charge, you dictate what will be done and how. I urge you to start early. As part of the Aviation Pre-Command Course at Fort Rucker, the Army Safety Center presents to incoming battalion and brigade commanders a synopsis of recent mishaps. A word to the wise: pay attention to that briefing, analyze it, and develop a safety action plan based on what you learn. Implement your plan from the day you take command. Don't accept what you find and think that you can fix it over time. Strike fast and hard! I didn't, and this is where I made my first mistake.

As soon as you take command, I suggest you gather all of your officers and NCOs and share with them your safety philosophy. Make sure they hear the words from your mouth. Don't write it and send it through distribution; I guarantee they won't get the message or the full impact of the message that way. Make sure your message includes the fact that "dumb" unsafe actions will result in strong punishment. If they do happen, make your words good by putting teeth in them.

Execute a full-court press on little things. Seatbelts, ground guides, proper tiedown and mooring procedures, tagging of parts, and disposition of hazardous waste are just a few of the things that come to mind. Attack with vengeance! Rip some lips if necessary, especially officers and NCOs because they are the ones who will be responsible for supervising your soldiers. Trust me when I say that the word will get out quickly. The message you want them to get is that "the old man is serious about this safety business."

Another technique I would recommend is one I inherited from one of my former brigade commanders: have your company commanders conduct mandatory Friday afternoon safety briefings. The last act of the normal work week should be the company commander talking for a few minutes to *all* of his or her people on a topical safety issue or two: drinking and driving, water safety, winter driving, slips and falls, to mention only a few. The key point is that the last thing soldiers should hear before the weekend is their leader talking safety.

My final recommendation is that you close every meeting you conduct with a personal challenge to every soldier to be safe. There are a myriad of other things you can do. What you choose to do is not as important as the fact that you do something positive. Your goal is to increase safety awareness, and personal command involvement is the only way you will be able to reach your objective.

Organizational responsibility

This is a concept that is difficult to name or describe and even more difficult to ingrain in your soldiers. The words may be misleading, so let me explain what I'm talking about.

There are some units in the Army that just don't have accidents. One that comes to mind is the former 501st AB(C), which later became the 4th Brigade, 1st Armored Division, and now is known as the Combat Aviation Brigade, 3d Infantry Division. It's the soldiers in Katterbach, Germany, to whom I'm referring.

The soldiers in this unit have had a great aviation safety record for years even though they have been through four brigade commanders, numerous battalion commanders, and hundreds of company commanders. What is it they are doing that is different? Why is their safety record better than the safety records of other units? Having been a member of this great unit on two previous occasions and having carefully analyzed them, I think I've discovered the answer.

This organization has accepted responsibility for its safety program, and every member of the organization has "pride of ownership" in their safety records. It is not the commander's program; it is not the safety officer's program. It belongs to the organization! "Don't do anything to screw up our safety record" is the attitude that prevails. All members of the unit are safety officers. They have developed a sixth sense of safety, and they have the moral courage to make an on-the-spot correction before it becomes an accident.

I wish I had an exact recipe for "organizational responsibility" or a formula to solve the equation and find the elusive elements of organizational responsibility. Unfortunately, I don't. It's just not that easy. It is the most difficult piece of the puzzle to get in place.

Constant focus

During your tour as a commander, you'll find that sometimes you will have to fix the same problem two or three times. You'll sit in a meeting and find yourself commenting to the group that you have fixed that particular problem once before or at least you thought you had. It will then dawn on you that you are the only remaining member of the group that fixed the problem the first time. The message you should get is that we never "fix" safety permanently. At best, we only fix safety temporarily—unless there is constant focus by all members of the organization.

Borrowing from the Chief of Staff of the Army, General Gordon R. Sullivan, safety ". . . is a journey, not a destination." We never get to the objective. We never get it "fixed." If you take your eye and focus off of safety, thinking that you have solved the problem, it will kick you in the seat of your pants.

Safety is not paragraph 6 of an operations order nor is it one of the battlefield operating systems. Rather safety is a part of every paragraph of the operations order and included in every battlefield operating system. It is not one of the glass balls that commanders juggle, it is the umbrella over the commander who is doing the juggling. It must pervade our thinking! It must be part of every task we perform every day, both on and off duty. It is not a part-time thing; it is an all-the-time thing.

Summary

So there you have the three pieces of the safety puzzle. How do the pieces all fit together? The answer is synergy—combined action or operation. The action of the three pieces combined achieves an effect which each piece individually is incapable of achieving. That is why I say your safety program must have all three pieces.

Start with command involvement. Don't give your safety program lip service; work it hard, and it will lead to increased safety awareness in your unit. Individuals will begin to accept responsibility for their actions. Safety will grow if it is nurtured; if it isn't, accidents will be waiting to happen--and they won't wait long. Keep the emphasis on safety, never let up. It will take your entire command tour, but that is okay. What is not okay is waiting for tomorrow to start. Make it happen . . . today! ☐

—Written by COL Gregory T. Johnson in collaboration with CW4 Wayne Walker. COL Johnson was commander of the 11th Aviation Brigade in Illesheim, Germany, and CW4 Walker was the brigade safety officer at the time they wrote this article. COL Johnson is now Director of the Center for Army Leadership at Fort Leavenworth and CW4 Walker is currently the battalion safety officer for the 1-502 Aviation Regiment at Fort Hood.

Show me where it says I can't

Sound like anybody you know? Somebody in your unit? Maybe even you?

We've all known people like this. They may be smart, but they're always looking for a way out, a way to justify what they want and intend to do. The way they look at it is they know as much as the people who write regs, maybe more, so why not look for another way to do things—a way that's more in line with what they want to do. These people may see themselves as a real asset to their unit and the unit mission, but they're something of a maverick when it comes to doing things by the book. When there's somebody like this in a unit, the command may have to pull in the reins and redirect their attention.

Maybe there's a person like this in your unit, and you haven't quite made up your mind about his cumulative value. True, he occasionally comes up with a real pearl, but it takes a lot of dangerous dives and a lot of handfuls of mud before he brings up that pearl. This person may be the aviator who "shops for weather" and has squeaked through too many times. He may be someone who is always looking for a way to get over on the system or to get away with something. Worse, he may be an informal leader—the one that others might choose to emulate.

Perhaps this person fits neither example completely. Most all of us have a little of this kind of person in us. Whether such a person appears positive or negative to you may depend on how much like you they are.

We in aviation may find ourselves cringing when someone we know "shops for weather," but do we feel the same way about someone who "shops for an out" in Army regulations? If we don't, we should. To give you an example of what I mean, take a look at page 5 of AR 95-1: Army Aviation: General Provisions and Flight Regulations.

Paragraph 3-11a says, "The following U.S. Army approved clothing and equipment will be worn by all crewmembers when performing crew duties: (1) Leather boots . . . ." That is straightforward language. It says what those of us who participated in the writing of this regulation meant for it to say. First, any equipment listed must be **Army approved**. Second, the equipment **will** be worn by all crewmembers. The operative word here is **will**; it makes the strongest statement possible. We could have used the word may, but that wasn't what we meant—we meant will. When will people wear this equipment? When **performing crew duties**.

Now that we have established that the equipment must be Army approved and will be worn by all crewmembers while performing crew duties, the next thing is to specify what equipment we're talking about. The first item listed is **leather boots**. We did not include Nike Air ™ or Nylon boots, we deliberately specified **leather boots**. Why? Because experience gained from both fixed and rotary wing accidents tells us that leather boots provide optimum protection for crewmembers.

Now let me show you how you can "shop the regs" and diminish your protection. I say you, because personally I don't want to diminish my protection. Go to AR 670-1, page 34, chapter 11 Flight Uniforms, paragraph 11-2c "Accessories. The following accessories are normally worn with the flight uniforms: (1) Boots, combat leather, black (paragraph 26-4)." Now selectively read and jump to subparagraph d "Optional boots . . . Optional boots, to include jungle boots, are authorized for wear in lieu of the standard black combat boot."

Great! You've found what you wanted. Forget the intent of AR 95-1 and forget that it is the more specific regulation concerning aviators and controls this situation. Forget common sense. Don't read the whole section, you've found the "out" you were looking for. So what's the big deal? The big deal is you found what you wanted, but you may not like what you get if you use this "out" and are involved in an accident.

A recent accident cost a highly qualified Army aviator a great deal of pain and suffering and deprived the Army of his services for an extended period, if not permanently. Fire was involved, and the aviator was wearing "Hi Tec" nylon boots. The nylon boot transferred the thermal energy from the fire to the area covered by the boot, increasing tissue trauma. Leather does not transfer heat as nylon does, and a leather boot would have provided an insulation value. When exposed to the heat, the nylon boot shrank, causing trauma by restricting muscle and tissue in the aviator's foot. The shrinking caused the nylon to compress against the skin and exaggerated the thermal transfer. Leather boots may fail at the seams in extreme conditions but will not tighten as nylon boots do. The nylon boot melted and caused direct tissue trauma. A leather boot does not melt and would not have caused this injury. This aviator has had his foot injuries excised, including removal of tissue down to the Achilles tendon. Multiple skin grafts have been performed in attempts to repair the affected area. Surgeons at Brooke Army Medical Center, Fort Sam Houston, hope that he will eventually be able to fly again.

Photograph A shows the nylon boot involved in the accident described. Photograph B shows a pair of **Army approved** leather boots, also called Matterhorn boots. These boots were involved in another fire-related mishap where the wearer literally ran through burning JP-4. The thermal loads were similar, possibly even higher on the leather boots. The nylon lacing on the leather boots melted and failed. The stitching failed on one side of one of the boots, and part of the sole melted on both of the leather boots. The important thing is that the aviator who was wearing leather boots received no thermal injury in the area protected by his boots. He did receive burns on his upper thighs where the Nomex was stretched tight against his body as he escaped the flames, but this aviator is back on flight status and still a viable asset to the Army.

Why have we gone to so much trouble to tell you not to "shop the regulations" to find a way out? Because we know there are human beings who will attempt to do things like that. We have provided regulations with clear directions to protect you, but we can't protect you from yourself--only you can do that. By the way, forget about shopping AR 670-1. This regulation is being changed and this "out" has been eliminated. Army approved leather boots are the only correct wear in the new regulation. ☐

—POC: Mr. Joseph R. Licina, Project Officer, Aviation Life Support Equipment Retrieval Program, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL, DSN 558-6893 (205-255-6893)

Editor's note: The following article was translated and submitted by LTC Clay Edwards, TRADOC Aviation Liaison Officer to French Army Aviation. LTC Edwards may be reached at telephone number (0033) 94 60 95 67 or E-Mail: ATFE-AV@Chievres—emhl.army.mil. Permission to reprint has been granted by the Chief of Operations, French Air Force Staff.

Les mots exacts (or "saying it like it really is")

"Thirty cars telescope on the interstate . . . the accident was caused by fog."
"A car crashed into a tree . . . the accident was caused by rain."
"An airplane struck the hillside . . . the accident was caused by terrain relief."

Rain, snow, terrain relief, and other natural elements are daily blamed when a dramatic accident occurs.

But this, in reality, is an abuse of the language. In truth, it is a sham because it is totally unjust to blame the weather or natural relief for an accident. In reality, the weather is either rainy or beautiful but never "bad"; the terrain, likewise, is either flat or mountainous, and if faith can move mountains . . . ! As a general rule of aviation, we accept as a law of nature that these mountains are anchored to the ground and never "just accidentally" float up into an aircraft's flight trajectory.

There is equally a misuse, or at least imprecise use, of the language when, faced with such events, we still use the term "accident." According to *Robert's* [the French equivalent to Funk and Wagnall's], an accident is defined as "a chance event, unforeseeable." In other words, it happens at random and without a possibility of warning. Well, we usually recall after the fact that an "accident" was never accidental and that all causes of accidents are already known—especially those that have to do with weather or terrain. Humans, and certainly pilots, are not at all ignorant of these natural phenomena.

It seems then very dangerous to attribute these "accidents" to the natural elements. Such attribution allows drivers and pilots to evade responsibility for their faults and errors. They reject responsibility for the act *they committed.*

Foggy weather and high elevations are natural occurrences, well known and identifiable ahead of time. They must be treated as such. They need to be taken into account by all responsible drivers and pilots.

As trained professionals, we should go about our business with precision, attention to detail, and vigilance. We should allow nothing to surprise us in our chosen profession. We must adapt our mission profile to the elements and their circumstances. □

—Reprinted from Bulletin de Sécurité des Vols (1993/1) Armée de l'air française

From the Translator

This article talks about natural obstacles and occurrences, but what it says applies to man-made objects and situations as well. One that readily comes to mind is failure to identify wires. Another is standing between two maneuvering armored vehicles. Still another is sleeping in an unprotected laager area. None of these is a new phenomenon, but every year soldiers are killed because they didn't follow the proper procedures or they didn't apply sound risk management principles to their situation.

Proper planning, identifying and controlling hazards, and responsible flying, driving, and so forth are the marks of true professionals. Command influence, training, risk management, and system safety are tools available to prevent these "accidents." If we in aviation want to be treated as professionals by our leaders and fellow soldiers, we need to quit telling them how professional and how soldierly we are and start quietly acting the part, without the screech of ripping metal and the screams of aircrews and their nonaviator passengers.

Attention Black Hawk crews

Correction

The September 1994 issue of FlightFax contained an article entitled "It can't work if it isn't turned on" in which a fatal UH-60 crash was linked to the failure of the pilots to turn on the pitot heat before entering freezing moisture. The resulting erroneous airspeed indications led to downward programming of the stabilator and loss of control of the aircraft. Two aspects of that article were inaccurate as pointed out by Mr. Wes Shafer of Sikorsky Aircraft.

The article stated that at 130 knots airspeed and the stabilator down 10 degrees the aircraft will pitch violently down into an unrecoverable dive. As Mr. Shafer comments, this condition is fully controllable with cyclic and will *not* result in an uncontrollable dive. Also in the article was the statement that "as long as one pitot tube is working, the airspeed data sent to the stabilator will be correct." As Mr. Shafer points out, this is not entirely accurate but the loss of only one input will not result in an unsafe condition.

FlightFax always endeavors to present the most accurate information possible, but in dealing with such complex subjects, an occasional error can occur. The main thrust of the article remains intact—the operation of the UH-60 stabilator depends on accurate airspeed data and that data requires pitot heat in conditions of freezing moisture. We encourage the exchange of information and the better-informed aviation community that results. Our thanks to Mr. Shafer. □

—LTC Robert Johnson, Chief, USASC Aviation Branch, DSN 558-3756 (205-255-3756)

Safety alert—UH-60 fuel boost pump operation now required

An accident last spring in which both engines of a UH-60 Black Hawk failed after takeoff from a pinnacle raised accident investigators' suspicions that the engines flamed out due to "outgassing."

Outgassing occurs when air in fuel is released. This released air can collect in the fuel lines, creating large bubbles. In turn, these bubbles can cause the engine boost pumps to cavitate (output pressure drops to zero), resulting in fuel interruption that can lead to engine failure.

We've known since 1992 that the combination of low-power settings and nose-down attitudes can cause air due to outgassing to be trapped in fuel lines using JP-4. In fact, we even changed the dash 10 to require fuel-tank boost pumps for all JP-4 use to prevent the problem.

Last spring's Black Hawk accident revealed that the problem is not limited to JP-4. JP-8 is also vulnerable. Here's what happened.

The aircraft sat on a pinnacle at about 4,800 feet MSL for an hour and 45 minutes with the No. 1 engine at idle and the No. 2 engine at operational RPM. After an airspeed-over-altitude takeoff, the low-rotor audio warning sounded at 50 to 75 feet AGL, and both engines failed. The PC managed to level the aircraft before it hit the ground, but the main landing gear struts and wheels were torn from the aircraft before it came to rest on its right side. Both pilots were slightly injured; the crew chief and passenger were not injured.

Preliminary examination of the engines indicated that they were operating below 100 percent and *probably* below idle speed at impact. After considering and eliminating all other possible causes, the investigation board concluded that the most likely cause of this accident was that fuel flow to the engines was interrupted, and the engines failed.

But what caused the interruption?

At first, air bubbles due to outgassing were not even suspected because the aircraft was fueled with JP-8, not JP-4. Due to its fuel characteristics, it was not anticipated that JP-8 would present the same problem.

The PI in the left seat told investigators that the fuel-tank boost pump switch was in the OFF position for the takeoff. He mentioned that the pump was not needed when they were using JP-8 fuel.

He was exactly right—or so we thought at the time.

Subsequent tests have shown that air bubbles due to fuel outgassing is a hazard in the UH-60 whether it's burning JP-4, JP-5, or JP-8 fuel. JP-4 is probably still MORE susceptible to the outgassing problem, but the risk is also there for JP-8.

In summary, it's pretty clear now that a nose-down attitude can set up a Black Hawk for engine flameout due to outgassing, regardless of what type fuel it's burning. The Army's working on a long-term fix for this problem, which includes fuel lines that are smaller in diameter. In the meantime, an Army Safety Advisory Message has been released requiring fuel-tank boost-pump operation at all times regardless of fuel type.

Use fuel-tank-mounted boost pumps at all times with all fuels in all Black Hawk models.

For more information on outgassing in the UH-60, see the first in a new series of special video editions of FlightFax, **Safety Alert: UH-60 Fuel Boost Pump Operation** (TVT 20-1040, PIN 710601). The video has already been released to selected UH-60 units Armywide and will soon be available at all installation audiovisual service centers. □

POC: Army Safety Center Aviation Branch, DSN 558-3756 (205-255-3756)

Height-velocity-avoid region

The UH-60 with its dual engines brought a safety margin to utility helicopter operations that wasn't possible with single-engine aircraft. However, as mission demands expand and new equipment is added, Black Hawks frequently operate at higher gross weights than in the past.

UH-60 crews should be aware that operating in the height-velocity-avoid regions can be hazardous to them, too, if one engine becomes inoperative. The avoid regions vary based on gross weight and atmospheric conditions encountered.

Pilots should review the information in the operators manual on the height-velocity-avoid regions for single-engine failure and avoid flying in these danger zones as much as possible. □

—POCs: Mr. Dennis Menckowski or Mr. Michael Lupo, Utility Helicopters Project Manager's Office, Aviation and Troop Command, DSN 693-3210 (314-263-3210)

It's that time again

As the temperature drops and cold winds, rain, and snow drive all but the hardiest of us indoors, another foe waits. More people in smaller spaces and airtight buildings are a perfect setup for spreading winter illnesses. The most common illnesses during the winter months, and the ones most responsible for decreased performance and lost productivity, are those caused by viruses. And the star performer of this variety of virulent viruses is **THE FLU.**

How do you feel when you have the flu?

The first word that comes to mind is rotten. Although the flu is usually thought of as a respiratory illness, it actually affects the entire body. The hapless victim probably will have chills and fever, feel tired, and ache all over. Common symptoms are a dry cough, irritated eyes, and nausea. Needless to say someone suffering from the flu won't feel much like eating. That isn't so important, but getting plenty of fluids is. Dehydration is a real danger, particularly when nausea is present.

The fever associated with flu usually comes on quickly, usually peaks at between 102° and 104°, and then subsides over 48 to 72 hours. A case of the flu can leave you feeling exhausted for days after the worst of your symptoms are over.

How serious is the flu?

In otherwise healthy people, influenza is a moderately severe illness; most adults are back on their feet in 5 to 7 days. But for people with chronic health problems, the elderly, and children, flu can be extremely dangerous. During the 1918-19 influenza epidemic, one quarter of the world's population was infected with the flu virus and 20 million people died. So treat the flu with the respect it deserves.

How important is immunization?

In a flu epidemic year, it is reported that up to 50 percent of people who are not immunized may contract influenza. Chances may be even higher if you are frequently exposed to people who are infected; for example, health care workers and home caregivers. An annual flu immunization can prevent you from having the flu. In fact, up to 92 percent of people who receive the immunization for influenza will be protected or if they get the flu will have a lighter case.

Won't the shot give me the flu?

No. A small percentage of those who receive the immunization may get a fever within 48 hours, and there may be a little soreness or redness in the inoculated area. But even if this happens, it certainly beats having a full-blown case of the flu.

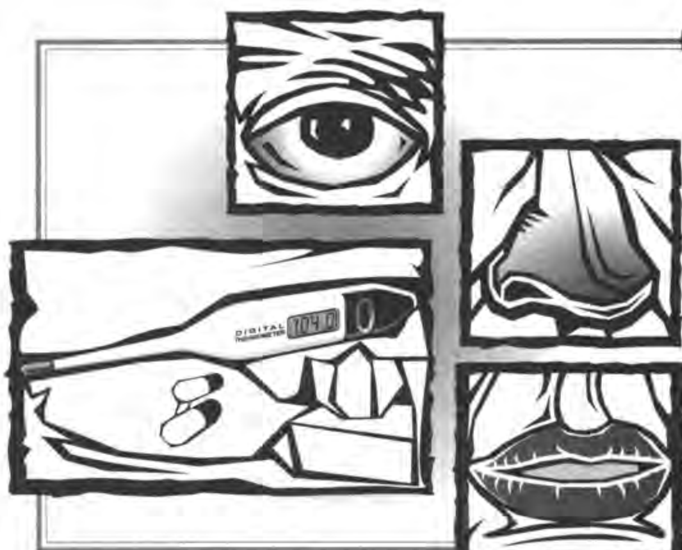
Immunization is important to you and your health, and it could prevent you from spreading the flu to your family and others with whom you come in contact.

Get your flu shot. □

—COL John Blough, Flight Surgeon, Army Safety Center, DSN 558-2763 (205-255-2763)

Flu Facts

- **Flu strikes 25 million to 50 million Americans each year.**
- **10,000 to 40,000 of these people, most of them elderly, die from flu and flu complications.**
- **Flu puts more than 172,000 people in the hospital every year in this country alone.**



If You Get the Flu

- **Go to bed.**
- **Take any prescribed medications as instructed.**
- **Take two tablets of acetaminophen three to four times daily to reduce fever and to relieve aches and pains.**
- **Drink plenty of liquids.**
- **Stay at home and rest until your temperature has been normal for 1 to 2 days.**

Broken Wing awards

The Broken wing award is given in recognition of aircrewmembers who demonstrate a high degree of professional skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in AR 672-74: Army Accident Prevention Awards Program.

■ **CW3 Gary D. Richardson, Company B, 1st Battalion, 212th Aviation, Aviation Training Brigade, Fort Rucker.** During advanced combat skills training with an IERW student, CW3 Richardson was conducting NOE flight over the north side of a field landing site when the OH-58A experienced a decrease in both engine and rotor RPM. The aircraft was at about 10 knots and 50 feet AGL when the engine-out light illuminated and the low-rotor audio activated. The aircraft started to descend toward the tree line directly in front. On a 100-degree heading, the engine surged, increasing RPM momentarily, and then continued decreasing below 40 percent N1 and 60 percent N2. CW3 Richardson made an emergency radio transmission as he simultaneously maneuvered toward a logging trail, turning the aircraft about 40 degrees right. Reducing collective to maintain rotor RPM, he then entered an autorotative descent profile. At about 2 feet AGL and with almost no forward airspeed, CW3 Richardson applied all remaining collective pitch to cushion the landing. The aircraft touched down on an 8-degree upslope—the left skid only inches from a large tree stump—on a heading of 150 degrees. After only three to five revolutions, the main rotor stopped. The engine was completely out. CW3 Richardson had selected the only available landing site as was evidenced by the fact that the aircraft that was launched to retrieve the crew could not land in the immediate vicinity, and the maintenance crew sent to recover the aircraft had to cut down additional trees to load the aircraft onto a trailer.

■ **WO1 Raymond E. Huot, Company A, 5th Battalion, 158th Aviation Regiment, APO AE 09096.** While on a service mission, the UH-1H was in cruise flight at 1,000 feet AGL. The pilot placed his hood on his helmet to practice basic instrument maneuvers. During his cross-check, he noticed that the torque gauge had dropped to zero. Seconds later, the engine-oil gauge began to fluctuate, followed by erratic indications of the systems instruments. WO1 Huot took the controls and initiated an approach to the only available landing area. The pilot removed his hood and prepared to back up WO1 Huot's actions with the checklist. As the aircraft descended, the crew noted that the engine oil temperature gauge was at the maximum reading and smoke began to fill the cabin area. As WO1 Huot began his termination, the aircraft experienced a total loss of power, accompanied by numerous explosions similar to compressor stalls from the engine area. WO1 Huot completed a power-off landing into a corn field, executed an emergency shutdown, and evacuated passengers from the aircraft. Although the engine area was smoking, no flames were visible until about 20 minutes after landing. Inspection revealed that the start fuel line was loose at the fuel control and an oil scavenge line was loose in the forward lower area of the engine.

■ **CW2 Edward C. Kime, DPTMS Aviation Division, Fort Polk.** CW2 Kime was returning from a single-pilot OH-58A mission to Polk Army Airfield. In level cruise flight at 90 knots and 60 percent torque, CW2 Kime attempted to initiate a descent for final approach to the runway then realized the collective pitch control would not move up or down. CW2 Kime notified ATC that he would be performing a missed approach because of a possible flight control malfunction and requested an orbit area clear of parked aircraft, buildings, and personnel on the ground. CW2 Kime then called the unit maintenance officer and standardization instructor pilot (SIP) on a discrete frequency. They were made aware of the malfunction and directed CW2 Kime through various checks of the flight controls in an effort to remedy the problem. Unable to free the stuck collective, CW2 Kime declared an emergency with ATC. The unit SIP and CW2 Kime determined that a shallow approach combined with retarding the throttle would be necessary to land safely. CW2 Kime then reduced the governor to 90 percent N2 and allowed the aircraft to descend to 200 feet AGL at an airspeed of 65 to 70 knots. CW2 Kime terminated this approach because it was too high and fast. He initiated a second attempt at an extremely shallow approach angle and about 40 knots. He reduced the N2 governor to 90 percent, and on 1-mile final, slowly retarded the throttle to 85 percent to lose more altitude. He again terminated his approach because it was also too high and fast. CW2 Kime initiated a go-around, heard a loud bang, and felt a vibration throughout the airframe. On his third approach attempt, CW2 Kime once again reduced N2 governor to 90 percent and retarded the throttle to 75 percent N2. Altitude was decreased, and the aircraft crossed the runway threshold at 10 feet and 60 knots. The skids contacted about midfield at 50 knots. CW2 Kime continued to reduce the throttle slowly, applied aft cyclic, which momentarily caused the aircraft to lift 2 to 3 feet. When the aircraft once again touched down, the collective moved down 1 to 2 inches and the aircraft skidded safely to a stop, sustaining no damage. Although the exact cause of the malfunction could not be isolated, maintenance replaced the swashplate and support assembly, collective servo, and main rotor hub assembly.

■ **CW2 Philip J. Cancienne, Company A, 1-244th Aviation, Louisiana Army National Guard.** Following completion of a general maintenance test flight, the UH-1H was in cruise flight at 1,000 feet and 100 knots. While scanning the engine gauges, CW2 Cancienne noticed that the engine torque pressure was 2 pounds. Because the area over which he was flying was not suitable for landing, he made a turn to the south toward a suitable area while looking for other abnormal indications. He also began making a radio call to his base operations to inform them that he had a potential problem and might have to make a precautionary landing. At this point, the engine chip light illuminated, along with the master caution light. After spotting the first available landing area, CW2 Cancienne began setting up for an approach while simultaneously performing a high reconnaissance. CW2 Cancienne and the maintenance observer began to smell smoke in the cockpit. Within seconds of smelling smoke, the crew saw the fire warning light illuminate. CW2 Cancienne completed the approach without delay and made a mayday call. Just prior to landing, the aircraft began to yaw due to impending failure of the drive shaft, but CW2 Cancienne was able to control the aircraft until touchdown. After landing, CW2 Cancienne performed an emergency shutdown and the crew exited the aircraft. As they did so, they saw that the engine compartment was engulfed in flames.

■ **CW4 James R. Beauman, Army Aviation Support Facility No. 1, Hangar A, L. I. MacArthur Airport, New York Army National Guard.** The UH-1H departed the airfield on a southwesterly heading direct to the test flight area. CW4 Beauman had just leveled off at 1,300 feet AGL when the engine RPM began to decay through 6200. He lowered the collective, but the N2 RPM continued to decay. CW4 Beauman then placed the governor switch to the emergency position, but the engine RPM continued to decay. He entered an autorotation, and the engine quit completely. CW4 Beauman maneuvered the aircraft toward a golf driving range, heading generally into the wind. As he was descending, he noticed that the driving range was completely surrounded by an 80-foot-high fence. At about 150 feet AGL, it became apparent that the area was unacceptable: ruts in the ground, mounds of dirt, people on the ground in that area, and it didn't look as though he could stop the aircraft before contacting the fence on the other side of the driving range. As CW4 Beauman was descending through 150 feet, he noticed a small school yard to the left of the driving range, made a 90-degree left turn, and maneuvered the aircraft to clear the driving range fence. He immediately noticed a group of children standing and sitting around the 30-foot-high school fence directly in his flight path. CW4 Beauman performed an exaggerated deceleration, which slowed the aircraft's forward movement significantly, and landed the aircraft in the center of the field. CW4 Beauman successfully completed the autorotation with no damage to the aircraft, its occupants, or any of the children. Before the rotors came to a stop, the crew chief got out of the aircraft and stopped the large group of children who were running toward the aircraft. Inspection revealed that the coupling assembly on the main fuel line to the fuel control had sheared the alignment/locking pins and had backed off sufficiently to activate the check valve, stopping all fuel flow to the fuel control and causing the engine to flame out. □

ShortFAX
Keeping you up to date

Wire bundle chafing can be hazardous

During approach at approximately 50 feet AGL, the AH-64 crew saw the fuel PSI light on number 2 engine illuminate. A couple of seconds later, the number 2 engine-out light illuminated, the audio sounded, and number 2 engine flamed out. The PC performed a single-engine roll-on landing. During rollout, the electrical system experienced a hard shutdown, and the number 1 engine also flamed out.

The crew noted fuel fumes in the cockpit during the emergency sequence. The PI egressed the aircraft; the PC remained at the controls until the rotor stopped turning.

Investigation revealed that a wire bundle going to the number 2 crossfeed valve had been chafed by the main transmission mount, causing it to short out and resulting in a system malfunction of the crossfeed valves. The PI's fuel panel was also found to be inoperative and was removed for evaluation.

A Category I quality deficiency report (QDR) was submitted, recommending—

- Worldwide one-time inspection
- Securing and wrapping of the wire bundle
- Establishment of an inspection interval

This area should be given special attention by maintenance personnel while performing preventive maintenance on AH-64 aircraft. □

—POC: MSG Alcides Santana-Cruz, USASC Aviation Branch, DSN 558-3051 (205-255-3051)

ANVIS/IHADSS adapter kits

The adapters that enable AH-64 copilot/gunners to mount the ANVIS night vision goggles to their IHADSS helmets are not NSN items. Unit ALSE shops must request the kits directly from the Night Vision Directorate, ATTN: AMSEL-RD-NV-ASI-PS, Fort Belvoir, VA 22060-5806. Standard issue to new Apache units is 25 kits. Units that have experienced attrition (or are restructuring under ARI) may request additional kits. Each shipment includes a set of installation instructions. □

—POC: CPT Paul M. Steele, Night Vision Directorate, Fort Belvoir, VA, DSN 654-1392 (703-704-1392)

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class E

H series - During climb to cruise for an IFR training flight, CE and IE in back of aircraft heard an unexplainable metal-to-metal flapping noise. At first intermittent, noise became more rapid when torque was decreased. Crew cancelled flight and returned to home base. Maintenance inspection revealed loose/worn transmission cowl latches. Cowl latches and rubber strips were replaced and aircraft released for flight.

H series - During engine start, CE noticed fuel leaking from top fitting at engine fuel filter. Aircraft was shut down, mission aborted, and maintenance notified. After repair of fitting at top of fuel filter, aircraft released for flight.

H series - During MTF after low RPM hover check, MP did not roll throttle to flight idle before next MTF maneuver, emergency governor operations. Aircraft was at 6000 RPM. MP switched governor switch to emergency for 1 second, causing N2 to climb to 7000 RPM, which caused overspeed of N2.

H series - During second start, aircraft would not make 14 volts by 10 percent N1. Crew aborted start and thought they shut down aircraft. About 30 seconds later, EGT was continuing to rise and rotor speed was increasing. During execution of hot start procedures, throttle could not be rolled past idle stop. EGT climbed to 800° for 10 seconds. Crew pulled fuel circuit breaker to shut down engine and notified maintenance.

V series - As aircraft lifted off to hover over parking pad, wall locker inside hangar was blown over by rotorwash. Locker hit a parked aircraft in hangar, causing sheet metal damage.

V series - PI was performing emergency governor operations. When aircraft landed from hover, PI reduced throttle and placed governor switch back into auto mode. As throttle was increased, IP realized aircraft was still in emergency mode. Aircraft was repositioned to pad and shut down. Caused by fuel solenoid.

UH-60 Class B

A series - UH-60 hovered over CH-47, causing forward rotor blades to flex, damaging all three blades and the forward head of the CH-47.

UH-60 Class C

A series - During postflight inspection following VFR cross-country flight, crew found tail rotor deice cannon plug and mounting bracket had separated from tail rotor in flight. Cannon plug impacted leading edge of main rotor blade, resulting in unrepairable damage. Caused by crack in cannon plug mounting bracket.

UH-60 Class E

A series - During 5-foot hover with about 68 percent torque on both engines, crew heard loud noise from aircraft right rear. Crew observed loss of No. 2 engine NP, torque, and oil pressure. During landing, No. 1 engine torque reached 120 percent. TGT increased to 845° for 2 to 3 seconds, and rotor RPM dropped to 90 percent. After landing, rotor RPM recovered to 100 percent, No. 1 engine stabilized at 30 percent torque and 680° TGT. No. 2 engine TGT was 690°, and No. 2 engine starter would not motor engine. Engine removed and sent to CCAD.

A series - During HIT check prior to flight, CP noted fire light on No. 2 T-handle. No master caution light noted. PC pulled T-handle and activated main fire bottle. Maintenance found no problems with fire detection system. Fire bottle was replaced, fire suppression lines blown out, and residue blown off engine.

A series - During postflight inspection, forward drive shaft cowling was found open. Closer inspection revealed 2- to 3-inch crack in drive shaft cowling with no other damage. Cover vibrated loose during flight.

L series - As PI was turning crosswind during takeoff for closed traffic pattern flight, stabilator failed with accompanying audio and warning lights. System would not reset. Manual control was used to slew up stabilator and aircraft landed. No. 2 stabilator actuator was inoperative.

L series - Aircraft was on ground at PZ, and recon team was loading. PC observed soldier approaching with a VS-17 marker panel under his arm. Before CE could reach soldier, panel was blown through rotor system. After shutdown, inspection revealed 1/2-inch hole on top and 3/4-inch hole in bottom of red main rotor tip cap.

L series - During cruise flight, No. 1 engine oil filter bypass caution light illuminated. Crew complied with emergency procedures checklist and completed a roll-on landing. Maintenance replaced oil filter bypass sensor.

Attack

AH-64 Class C

A series - During FORSCOM ORE participation, aircraft settled into tree while at 50- to 60-foot hover. Tree penetrated No. 2 engine area. Tail rotor blades were damaged.

A series - During night tactical mission operations, AH-64 departed holding area en route to battle position. About 0.8 hours into flight, transmission chip caution light illuminated. After landing and normal shutdown, crew found damage to tail rotor blades. Tail rotor blade damage was caused by striking a small tree on a berm in aircraft approach flight path.

A series - During postflight inspection, tail rotor drive shaft covers were found unsecured and open.

AH-64 Class E

A series - No. 1 engine started normally but failed after about 15 seconds. Second engine start on No. 1 engine was normal. Aircraft had recently undergone MWO, which involved removing fuel filter and disconnecting fuel lines. Investigation revealed this was the third failure of the No. 1 engine on an AH-64 in 1½ months.

A series - No. 1 engine failed during takeoff. Flight continued to maintenance recovery site. Shortly, SDC caution light illuminated. Second aircraft noticed smoke coming from first aircraft. Crew executed single-engine roll-on landing to field. Suspect failure of transmission accessory drive section. Cause of engine failure unknown.

Cargo

CH-47 Class D

D series - Sling clevis chain keeper failed, releasing load. Inspection of other sling assembly revealed improper repair of chain grab hook keeper assembly. Suspect hook assembly failed to maintain eye to roller contact during initial lift of load, allowing subsequent failure.

D series - Rotor blades of parked aircraft had been secured with one blade positioned over the tunnel cover and only two blades tied down. Rotorwash from landing aircraft caused inadequately secured blades to flex down, and one aft blade struck fuselage.

CH-47 Class E

D series - During insertion of external load (single HMMWV) into dusty LZ, crew selected clearing apart from main LZ. After load touched down, aircraft began rearward drift. CE informed crew and released load. PI on controls climbed out of LZ and clear of dust cloud. Crew noticed HMMWV had rolled onto its side.

Observation

OH-6 Class C

J series - During firing of M134 7.62mm machine guns during aerial gunnery, barrel clamp bolt came out, allowing flash suppressor and barrel clamp to come off. Bullets struck barrel clamp and ricocheted, damaging aircraft.

OH-58 Class D

C series - IP initiated hovering autorotation with forward motion. PI applied aft cyclic. Aircraft was landed on skid heels, rocked forward, and bounced/slid about 10 feet.

C series - While unmasking at OGE hover, aircraft entered uncommanded right yaw. PI applied full left pedal and transferred controls to IP. Aircraft began to settle as it yawed 180 degrees for 3 seconds. IP landed aircraft without further incident. Maintenance replaced K-flex drive shaft.

OH-58 Class E

A series - PI and CE detected fuel fumes in cockpit during cruise flight. Aircraft was landed in parking lot, and fuel was found leaking from fuel shutoff valve fitting on engine deck.

C series - During termination phase of day/night APART/currency flight, IP and PI brought aircraft to 2-foot hover from instrument approach to center sod. Logbook, which is normally kept between left heater duct and windscreen, fell between IP's feet. IP decided to land before retrieving logbook. Suspecting landing might have been too hard, IP exited aircraft to inspect for damage. Because of uneven terrain, no damage was noticed. After air taxiing to parking and shutdown on level ground, crew noticed damage to skid cross tubes.

D series - Crew noticed foul odor following liftoff. As odor intensified, pilots checked for fire. After receiving hot battery caution, pilots turned on defog blower and compartment blower and shot approach to parking. Pilots completed emergency shutdown, and crash/rescue reported white smoke coming from battery compartment. Maintenance replaced battery.

Fixed wing

C-12 Class E

D series - While passing through FL 270 and climbing to FL 280, fuel began siphoning from right main fuel cap. Aircraft was landed, and maintenance replaced stuck check valve that had allowed pressure to build up in right main fuel tanks. BASI is troubleshooting problem.

Messages

■ Safety-of-flight technical message concerning one-time replacement of MS17825-10 self-locking nuts on AH-1S/E/F/P series aircraft (AH-1-94-01, 231400Z Sep 94). Summary: A Category 1 deficiency report reported a cracked MS17825-10 self-locking nut on the power pitch change link bearing after 19 flight hours. Laboratory analysis of the nut revealed the material from which the nut was manufactured did not conform to the material specification. Suspect nuts are identified with one or more capital "Gs" on the face of the nut. Serviceable nuts will be reidentified with an inspector's stamp. Contact: Mr. Brad Meyer, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (205-255-2119).

Good ships and good guns are simply good weapons, and the best weapons are useless save in the hands of men who know how to fight with them.

—Theodore Roosevelt

In this issue:

Class A Accidents through October

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3		0	
	December	2		2	
2D QTR	January	1		2	
	February	2		0	
	March	0		0	
3D QTR	April	5		2	
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	**21**	**0**	**11**	**0**

U.S. ARMY SAFETY CENTER

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REPORT of ARMY AIRCRAFT ACCIDENTS

December 1994 ◆ Vol 23 ◆ No 3

ARMY TOP LEADERS COMMITTED TO RISK MANAGEMENT

Following is a reprint of a message to the field from the Honorable Togo D. West, Jr., Secretary of the Army, and General Gordon R. Sullivan, Chief of Staff, Army.

Every day our Army responds to our nation's needs in uncertain and high-risk environments. Soldiers routinely perform complex tasks and missions at home station and throughout the world and are accomplishing these missions safer than ever before. Reportable Army accidents continue to decline, and our accident rate of 6.33 accidents per 1,000 personnel is the lowest on record. We can attribute much of our outstanding safety record to the hard work and dedicated effort of commanders, noncommissioned officers, and soldiers.

While taking pride in our accomplishments, we cannot become complacent to the high-risk nature of our business. The environment of our Army has changed. As we continue to reshape the force, turbulence increases while experience declines. And while the operational pace of our Army is at an all-time high short of war, soldier and unit training opportunities are less, due to competing priorities and declining resources. These and other factors have contributed to unprecedented turbulence, causing the loss of seasoned leaders and instability at the crew, squad, and small-unit level.

We have recently experienced a number of training accidents, making us painfully aware of the increased risks associated with our profession. These accidents should serve as "red star clusters," a warning signal to all who have the responsibility of caring for soldiers. While safety statistics continue to be favorable, there is no denying that certain risk factors have increased. We must recognize changing conditions and the role they play in risk assessment.

We urge all of our commanders, noncommissioned officer leaders, and great young soldiers to make a renewed commitment to increased safety awareness, more rigorous use of risk assessments, and improved adherence to SOPs and training policies, which are designed to minimize the risks associated with the way we work and train. People are our most valuable resource, and their safety and well being is one of our most important missions.

Confront the issue!

The day was clear and crisp. The aircraft had been preflighted and was ready to go. The commander was probably the best stick and rudder pilot I had ever had the pleasure to fly with, and we were ready to strap in and escape the "surly bonds of earth." Everything was just perfect, and we were feeling great.

Flying toward our intended destination, the commander decided to try a maneuver that we both knew was prohibited. Although we knew the aircraft could handle it, the standing operating procedures said **do not** perform this particular maneuver, and it listed the reasons why. Nevertheless, the commander put the aircraft through the maneuver and never asked my opinion. The maneuver was marginal at best, and when the aircraft was once again straight and level, I sighed with relief that we'd made it through. The remainder of the flight was flawless and we returned to base without any problems.

The very next day, the commander took a newly assigned aviator up on an orientation flight. They never came back. The accident investigation report read as follows:

> *After careful examination of the destroyed aircraft, combined with several eyewitness reports and other data, this board has determined that the pilot of the aircraft intentionally performed a prohibited maneuver, which resulted in the loss of flight control, causing the aircraft to impact the ground.*

Two people died in that crash and much of the blame was on my shoulders as well as the shoulders of several other pilots who had flown with the commander. There was a long history of "break room" war stories about things the commander had done while flying. It seems that everyone who had flown with him, at one time or another, had come back with a hair-raising tale of "nearly buying the farm." They laughed and thanked their lucky stars that they were alive and made comments like "that man can really fly that airplane" and "I wish I had half the flying skill he does." So if his flying ability was so great, why did he die? He died because his friends never said anything to him about his unauthorized, unprofessional, and unsafe flying practices.

"He was a good guy." "I like him and I don't want to make him angry at me." "He'll think I'm a troublemaker if I report him." These were typical of the excuses everyone used. Of course nobody wanted to be thought of as a "whistle-blower," so no one was willing to confront him or report him to his superiors for his reckless flying. Maybe if just one person had asked him to stop flying so recklessly, he might still be alive. And the pilot who died with him would have lived to fly another day. But they didn't and I didn't, and my commander is dead and I've lost a dear friend forever.

This story didn't happen, but how many of you can truthfully say you've never known anyone like this commander and the people in the unit who wouldn't confront him because they liked him and thought he was a "good guy."

A recent article in my local newspaper cited a military aircraft crash in the northeast U.S. The article called the pilot of the aircraft a "hot-dog pilot" and blamed his commanding officers for failing to recognize the pilot's "excessively aggressive" flying during previous flights dating back as far as 3 years. Three years! And like the fictional story about my commander, no one seemed to care enough or was leader enough to put a stop to this pilot's antics. I feel sure the pilot was an excellent flyer with several thousand flight hours to his credit. He probably had a great track record as a team player and a superior reputation as an officer. He was probably a family man, whose family loved him very much and was proud of his accomplishments. But he's dead, and so are several other people who were on board his aircraft, because no one seemed to have the fortitude or leadership to confront him properly about the way he flew. Even worse, none of his friends seemed to care enough to tell him they feared for his welfare and those who might be flying with him during those "hot dog" flight episodes. **Nobody properly confronted the issue!** And even if they did, it is very obvious that no one initiated appropriate countermeasures to prevent the accident. The next question is **why?**

Many of us know pilots who seem to live a charmed life in the air. They are the envy of their fellow aviators. They're always on top of every situation, and they never have any problems meeting or exceeding the requirements for their position as a pilot. We sit around and marvel at their accomplishments, listen to their war stories, and laugh about the times they've "cheated death," hiding our envy of never having done any of the marvelous things they have done. Some of us have flown with these pilots and have seen them do things that were unsafe and against the rules, but we never say anything to them because we're afraid of what they might think of us. They might think we're too inexperienced to critique their flying or maybe they'll tell our peers that we're troublemakers, alienating us from the comradery that pilots so often enjoy. The reasons are many and varied, but the one common factor is that **we do not confront the issue**. Well, guess what, people? **We're wrong**.

Aviation is not the only field in which people do foolish things to try and impress others. It happens every day in almost every aspect of life, and every day people are injured or killed because they did not follow the safe and correct procedure to accomplish their task. People constantly exceed the boundaries of their ability in the interest of gaining favor with their peers. The sad and unforgivable aspect of this situation is the fact that when people see their friends and coworkers break the rules, they fail to take any action to prevent it from happening again. Once again, the question is **why?**

I have been accused of being a rigid and unrelenting SOB as an instructor pilot because I place a great deal of emphasis on precision. I don't mean the kind of precision that demands knowledge of how many rivets hold a wing together or explaining the lift equation but the kind of precision that will prevent you from flying into a situation that would result in your death. My attitude is devoted to "**safety of flight!**" When I see a fellow aviator doing something unsafe, I'm the SOB that will tell him. Maybe you should do the same. This is not to say that I am a perfect pilot. I make my share of mistakes like everyone else, but I do strive to perform as a superior pilot. In case you might think this attitude is somewhat egotistical, let's review the definition of "superior pilot." A superior pilot is one who exercises his or her superior judgment in order to avoid situations requiring the use of his or her superior skills. It doesn't sound so egotistical now, does it?

Some of you who read this article will form an opinion that I'm an overzealous "do gooder" trying to preach safety. Well, I'm doing exactly that! I'm preaching to you now, so your local chaplain or pastor won't have to preach *over* you later, so listen up! I care enough to speak up when safety is compromised, and you should feel the same way. So next time you see your coworker or fellow aviator doing something unsafe, care enough to at least confront him or her about the situation. A simple "Why did you do that?" or "Please don't do that!" might prevent an injury and may postpone a funeral. If the personal approach doesn't work, show you care by advising your immediate supervisor of the situation. If that approach doesn't work either, advise the "big bosses" and let them handle it, but at least **do something to confront the issue!** Amen.

—MW4 James F. Spiers, Jr., Aviation Safety Officer, 151st Medical Battalion, Georgia Army National Guard, Dobbins Air Reserve Base, GA, 404-421-5630

Keeping our skies safe

Air traffic control (ATC) is a system based upon pilot and controller communication and understanding. This is the basic component that makes the airspace system work. Another vital component is the regulatory guidelines that pilots and controllers follow to ensure the process goes smoothly and safely. When either of these components breaks down, the consequences can be devastating.

As air traffic controllers, we are charged with the responsibility of maintaining situational awareness at all times. The pilot's primary role in this process is to operate his or her aircraft in accordance with regulatory guidelines and controller instructions. When controllers and pilots perform their roles as expected, a relationship of mutual trust is formed that makes our air traffic system safe.

Historically, accidents have revealed that communications and procedures are vitally important. Analysis of most accidents that occurred in terminal areas reveals that deviation from ATC procedures, outdated airfield policies, and lax ATC management and training were significant contributing factors.

There is a lot to be learned from aircraft accidents, and ATC managers should be proactive in analyzing these tragic events to determine if airfields are safe. Following are some of the basic requirements to ensure a safe airfield environment.

- Review local operating procedures and flying rules to ensure that the procedures are in accordance with Army Regulation (AR) 95-3: General Provisions, Training, Standardization, and Resource Management and remain valid to meet current airfield requirements.
- Write letters of agreement/operation in accordance with Field Manual (FM) 1-303: Air Traffic Control Facility Operations and Training to ensure all procedures outlined are pertinent and up to date for current operations. Ensure all controllers know the contents of these letters.
- Night vision devices (NVD) and local training area procedures and requirements are mandated by AR 95-2: Air Traffic Control, Airspace, Airfields, Flight Activity, and Navigational Aids and FM 1-303. At those locations where NVDs are required, ensure that a training program is established and all controllers are instructed in the operational use of NVDs prior to commencing NVD operations.
- Survey instrument flight rules/minimum vectoring altitude areas on current sectional charts and notify the Department of the Army regional representative of any changes in the area.
- Establish a comprehensive training/proficiency program to keep ATC personnel abreast of all current procedural changes and policies affecting the facility, airspace, and airfield.
- Ensure all controllers, including ATC facility chiefs, remain current and proficient in their facility. Inform airfield management of the requirements of AR 95-2 at those locations where currency requirements cannot be met.
- Establish a rapport among members of the aviation community to resolve any problem areas and to educate one another on pilot/controller responsibilities.

As we perform our day-to-day duties as air traffic controllers and managers, it is imperative that we operate in accordance with regulatory guidance. Federal Aviation Administration Handbook 7110.65: Air Traffic Control prescribes procedures, phraseology, and correct pilot/controller terminology to be used by all air traffic controllers. Controllers are required to be familiar with and adhere to the provisions that pertain to their operational responsibilities and to exercise their best judgment for situations not covered in this handbook.

Shift supervisors, facility chiefs, and ATC chiefs should, as part of their duty, check the phraseology that emanates from their facility. They need to ensure that all controllers are using the correct pilot/controller terms and procedures.

Additionally, it is extremely important that members of a shift perform as a team. A shift's success depends on every member being cognitive of potential hazards. Complacency perpetuates accidents.

Teaching new controllers to control traffic is an art in itself. This is the prime time to instill values and basic principles of air traffic control. Start the crawl, walk, run theory with solid book work, transition through the different positions, and culminate with an evaluation of performance. Impress upon these new controllers the importance of memorizing call signs, knowing various aircraft maneuvers, sequencing and spacing techniques, and having the ability to conceptualize and visualize the execution of their plan to control aircraft.

The success of an airfield is built upon a mutual understanding between ATC, airfield operations, and aviators. AR 95-3 states that "an air traffic control representative will be a member of the aviation standardization committee." The committee's function is to review directives, provide guidance, and recommend changes to aviation literature. The ATC chief needs to be an active member of this committee to ensure air traffic control procedures are integrated into the airfield standards. They should also use this committee as a vehicle to enlighten the aviation community on ATC safety concerns and practices.

Another area that is vitally important but often overlooked is the operational hazard report (OHR) process. The OHR (DA Form 2696-R) is an outstanding tool that can be used to correct any condition or set of circumstances that could compromise the safety of aircraft, associated personnel, airfields, or equipment. The purpose of the OHR is not to air a technical gripe between ATC and pilots. Its purpose is to record information about hazardous acts or conditions so that corrective action can be taken. As a supplement to this process, the ATC chief and others in the aviation community need to foster a relationship that is based upon mutual support and education of each other.

This article is not intended to be all inclusive; rather, it is a sample of things that should be checked and working to ensure the air traffic system is operating safely. Time invested now will pay future dividends in the safety of Army aviation operations. As controllers, we must stand by our creed to be safe, orderly, and expeditious in protecting lives and preserving the Army's highly valued aviation resources.

—MSG Eddie L. Spivey, U.S. Army Air Traffic Control Activity, Fixed-Base Support Division, Fort Rucker, AL, DSN 558-1115/9067

Using safety NCOs to their full potential

A good safety NCO is one of the greatest assets any commander, leader, or supervisor can have in his or her force protection (safety) program. But no matter how good safety NCOs are, if they aren't being utilized properly or, worse, aren't being utilized at all, they're just dead weight. In today's lean and mean Army with the kind of optempo we're facing, we simply cannot allow this to happen. Leaders who don't use all of their assets properly—and this certainly includes the safety NCO—contribute to the problem instead of being problem solvers.

AR 385-40: Accident Reporting and Records defines an accident as an unplanned event that causes personal injury, illness, or property damage. Those of us in safety are paid to put forth a valiant effort to prevent accidents or to assist in developing mechanisms to reduce them. But we must be allowed to do our jobs if we are going to help protect the force, accomplish the unit mission, and meet the Army's objectives.

Shared responsibility/authority

The key to a good safety program is to eliminate hazards and develop ways to reduce risk of injury to soldiers and damage to equipment. If you are using your safety NCO only to get ready for inspections, catch up on paperwork, or prepare for upcoming rotations or deployments, you're not getting your money's worth. In these austere times, we're having to do a lot more with less—less time, less money, and fewer personnel. We're all familiar with the old saying "work smarter, not harder," but there are still some people who believe they are the only one who can do it right and get it right the first time. Egos are sometimes hard to push aside while staying focused on mission accomplishment. There may be leaders who say "I have key responsibilities and authority, and I am not going to give any of it up." That's not working smarter. Sharing these responsibilities and authority with your safety NCO will allow you to—

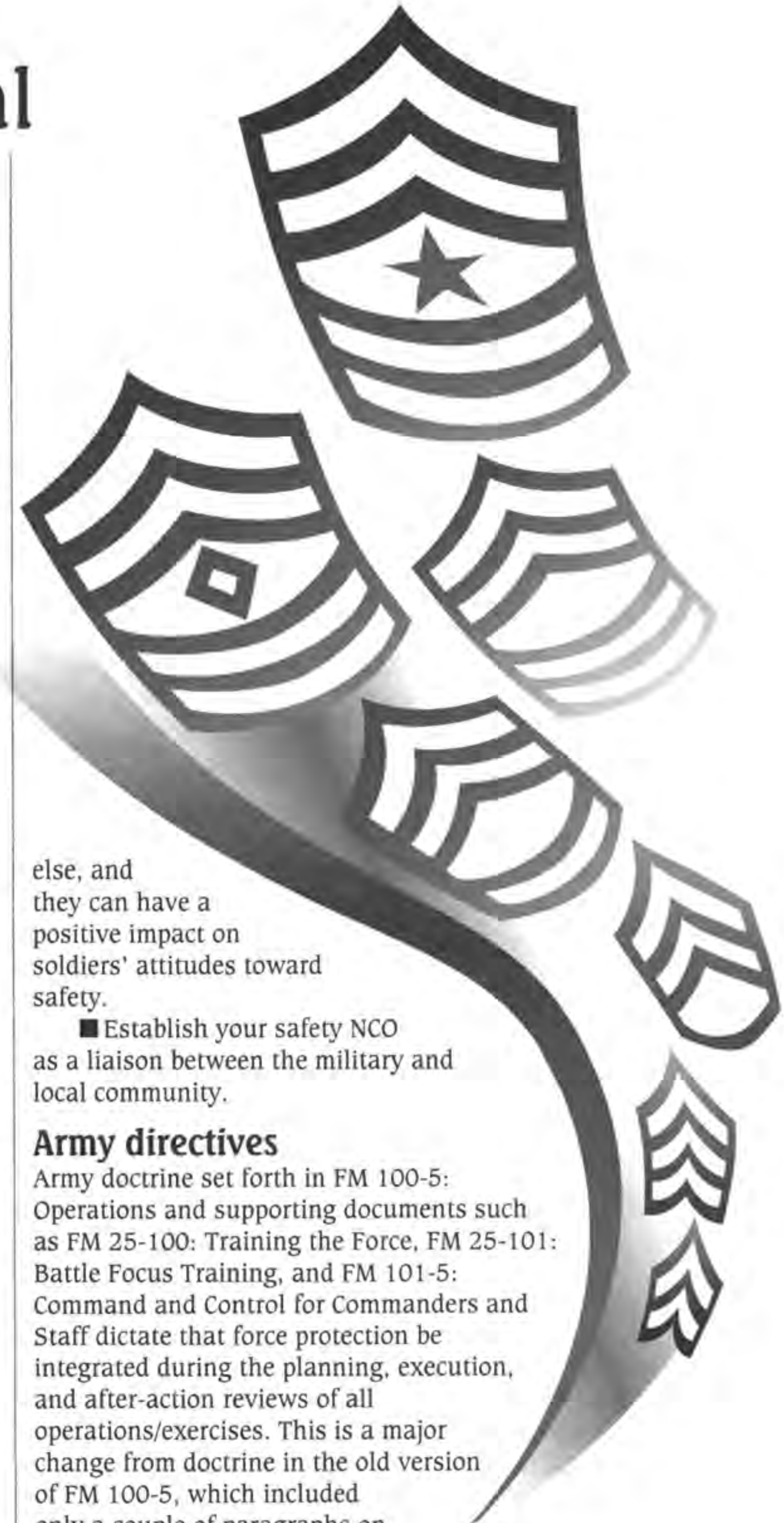
■ Double your exposure (mirror image). You can't be everywhere all of the time, but by properly utilizing your safety NCO, you *can* be effective in twice as many places a lot more of the time.

■ Conduct safety surveys to determine your unit's safety climate.

■ Capitalize on the expertise of your safety NCO to help identify accident causes and contributing factors and make recommendations to prevent future accidents.

■ Have an NCO safety standard bearer (on and off duty). NCOs spend more time with soldiers than anyone else, and they can have a positive impact on soldiers' attitudes toward safety.

■ Establish your safety NCO as a liaison between the military and local community.



Army directives

Army doctrine set forth in FM 100-5: Operations and supporting documents such as FM 25-100: Training the Force, FM 25-101: Battle Focus Training, and FM 101-5: Command and Control for Commanders and Staff dictate that force protection be integrated during the planning, execution, and after-action reviews of all operations/exercises. This is a major change from doctrine in the old version of FM 100-5, which included only a couple of paragraphs on protection as one of the elements of combat power. Every noncommissioned officer in the Army has a big part to play in the implementation of our new doctrine.

The first institutional exposure of an NCO to force protection is in the Primary Leadership Development Course (PLDC). Exposure to force protection continues in the basic/advance NCO courses, battle staff, first sergeant, and the Sergeants Major Academy. Why not include all of your NCOs in your safety program? Section/platoon sergeants, operations sergeants, first sergeants, and sergeants major are ideal safety NCOs because of their day-to-day and hour-by-hour interaction with every soldier in the unit. Using them as safety NCOs does not take away from your designated unit safety NCO's responsibilities. Rather, forming a coalition comprising the safety officer, safety NCO, and unit NCOs can do much to maintain the standards of force protection throughout the unit. The following are tasks and processes in which all NCOs should be routinely involved:

- Risk management (planning, execution, and after-action review).
- Developing a good command climate (soldier feedback should be encouraged and welcomed).
- Safety council member (serve as a sounding board and be candid).
- Serve as eyes and ears of the command.

Safety NCO functions

Safety NCOs should—

- Detect problems/hazards early in training management and operations and make recommendations to control or eliminate them (risk management).
- Keep the command advised and informed of current program effectiveness.
- Support the command's accident prevention program by enforcing standards.
- Maintain contact with and provide assistance to members of the command's staff, commanders, and other leaders concerning integration of risk management.

Safety NCO training

To be effective and enable them to make the maximum contribution to the unit safety program, safety NCOs must be properly trained. Training provided at the Safety Center's Aviation Accident Prevention Course includes the following areas:

- Accident causation
- Job hazard analysis
- Range safety
- Shop and flight line safety
- Airfield operations
- Ground-accident reporting
- ALSE
- Risk management
- Safety publications
- Army Oil Analysis Program
- Unit operations
- Aviation POL operations
- Toxic hazards

The Safety Center is currently developing the program of instruction for a ground-safety course. The first course is planned for 23 January 1995. Watch for future class dates on the Army Training Requirements and Resources System (ATARS).

Summary

This article is not intended to tell anyone all they ever needed to know about utilizing safety NCOs. But it does include some of the things that have proved successful in aviation units throughout the Army. I hope they will prove helpful to other units. Remember that force protection (safety) is everyone's responsibility, and for it to work as it should, we must make it a way of life every day, on and off duty.

POC: SGM Charlie L. Mahone, USASC, DSN 558-3575 (205-255-3575)

JP-8 fuel conversion

The initiative to replace JP-4 fuel began in the early 1970s and was primarily driven by safety concerns. U.S. Air Force studies conducted during the Vietnam War revealed that aircraft fueled with JP-4 experienced much greater fire-related combat losses than aircraft used in Naval air operations, which used JP-5 fuel.

The critical difference between the hazardous nature of JP-4 versus JP-5 is the flash point. Flash point is defined as "the lowest temperature at which a fuel will ignite given sufficient oxygen and an ignition source." JP-4 is a blend of naphtha and kerosene, and, much like gasoline, it is ignitable over a very wide range of normal ambient temperatures. Unlike gasoline, the kerosene portion of JP-4 lessens the tendency of the fuel to release vapors, otherwise known as vapor pressure. Suppression of vapor pressure creates a dangerous condition where the environment above the fuel surface is nearly always ready to ignite. This condition has been the cause of many JP-4 fires from even the smallest ignition sources such as static electricity discharge.

JP-5 and JP-8 are both straight kerosene-type fuels that have little or no vapor pressure and minimum flash points of 140°F and 100°F respectively. Although similar to JP-5, JP-8 is more widely available from commercial supply sources as it is almost identical, except for military additives, to commercial aviation fuel. Due to improved safety, availability, and interoperability with allies, JP-8 was chosen by the Air Force to replace JP-4 within NATO.

OCONUS conversion began in 1979 at air bases in the United Kingdom and was expanded to include all U.S. forces in NATO by 1988.

Single fuel for the battlefield concept

Additional research performed in the mid-1980s confirmed the feasibility of using JP-8 in diesel-powered combat vehicles and ground equipment. Following coordination with DOD during April through September 1987, DOD Directive 4140.43, which addressed fuel standardization, was issued on 11 March 1988. The directive specified JP-8 conversion for all overseas land-based air and ground forces. This concept became known as the "single fuel for the battlefield" by replacing diesel and JP-4 with JP-8 as the primary fuel. All overseas unified commands have now converted or are in the process of converting to JP-8 as a single fuel for aviation and ground equipment.

Advantages of single-fuel concept in CONUS

Along with the increased safety advantages of JP-8, there are significant logistics advantages to the single-fuel concept. Among these are the procurement of only one fuel and the consolidation of previously segregated fuel distribution systems used for diesel and JP-4. Due largely to these benefits, plans were made to continue the JP-8 single-fuel concept in CONUS. However, the ground-fuel phase of CONUS conversion was preempted by EPA restrictions on sulfur levels in diesel and diesel substitutes such as JP-8. The EPA low-sulfur mandate became effective on 1 October 1993. Ongoing comparative exhaust emissions testing by the TACOM Mobility Technical Center may determine whether ground-fuel conversion in CONUS will ever be fully implemented. (See sidebar for status of aviation conversion phase of this program.)

Disadvantages of JP-8 conversion

Although the advantages favor JP-8 conversion, there are some disadvantages. JP-8 has caused cold-start problems with some older aircraft models when used in extremely cold climates. Ignition problems occur due to the higher flash point of JP-8 and because it is a slightly heavier and more viscous fuel than JP-4, especially at colder temperatures. UH-1, OH58A/C, and AH-1S aircraft begin to experience cold-start problems at -25°F using JP-8. No Army aircraft are presumed capable of unassisted starts at temperatures of -50°F or below. Alaska is the only state where this problem has been reported on a common recurring basis. The most practical and economical solution for this problem to date has been to continue using JP-4. Alaska will continue to use JP-4 or the commercial equivalent (JET-B) until other solutions or aircraft replacement can be achieved.

Problem areas

Due to environmental or logistics reasons, plans for ground fuel conversion to JP-8 may be eliminated or only partially completed. If this occurs, the activities that do not convert may experience complications when having to repeatedly convert in CONUS at training sites or upon deployment to an OCONUS staging area where only JP-8 is available.

The likelihood of problems such as filter plugging upon conversion from diesel to JP-8 is directly related to the cleanliness of the fuel system. This type of problem has been most prevalent with Army Guard and Reserve components that subject their fuel and equipment to long periods of inactivity between training periods. Long periods of inactivity tend to worsen fuel contamination conditions that may already exist. The U.S. Army Petroleum Center (USAPC) is currently formalizing a contingency plan that involves the use of a diesel fuel biocide/stabilizer additive that can enhance unit readiness by conditioning diesel fuel and fuel systems prior to deployment.

Summary

Historically, the biggest problem with petroleum logistics in previous wars has been the ability to maintain sufficient quantities of fuel to keep pace with our extremely mobile ground forces. By consolidating multiple fuel and fuel handling assets to JP-8 and exercising diesel contingency options, we will improve our battlefield logistics capability and provide a much safer fuel to handle under peacetime and battlefield conditions. For updates and assistance on the JP-8 conversion program, contact Mr. Del Leese at the USAPC, DSN 977-8580/7258 (717-770-8580).

CONUS Aviation Fuel Conversion Program

Region	Status of Conversion
West Coast	Completed October 1993
Gulf/East Coast	Completed April 1994
Midwest	Began October 1994

ASO CORNER

Accident causation: a father's perspective

Having spent several years of my life teaching accident causation and corrective action in the aerospace industry as well as accident prevention at my National Guard squadron, it wasn't until my 4-year-old daughter ran into her own mishap scenario that I realized the military and civilian fields have a great deal in common.

Andrea's pre-school was located just across the street from our house. One afternoon as I picked her up from school and she raised her arm to take my hand, I noticed a cartoon-decorated bandage adorning her right elbow. Once we had crossed the street, I asked her what had happened. Her one-word explanation was a simple "Swing." The next day, as she raised her left arm for our journey across the street, I noticed she now had a matching pair of bandages. Again, her one-word response to my query as to the cause of her scrape was "Swing."

On Wednesday, as we stepped off the curb, I noticed yet a third bandage—this one adorning her left knee. My mind now boggled at the possibilities: Was Andrea collecting bandages? Was she, at the ripe old age of 4, becoming accident prone? Would the school's supply be able to keep up with her demand for bandages? I squatted down so that I was eye-to-eye with my small daughter. My query to Andrea now became more indepth: What were the proximities and conditions under which each of these injuries occurred? How did each of these proximities culminate into a single root cause, and what form would corrective action have to take to adequately prevent a recurrence? What Andrea heard me say, however, was "Show Daddy how you got the booboos, Sweetheart."

We walked back through her classroom and onto the playground behind the school. Andrea ran toward a mammoth suspension assembly that I was convinced McDonnell Douglas had used to drop-test static DC-9 fuselages from. Beneath the center of the gargantuan A-frame were suspended dual strands of chains, culminating in simple leather saddles that would adequately serve as the most important part of the swingset.

Andrea climbed into one of the saddles and began pumping back and forth, propelling herself faster and faster. I was convinced it wouldn't take much more of this for her to get into compressibility! Not yet understanding how this swinging led to her bandages, I looked around the playground. It didn't take long for me to spot the playground sandbox, strategically placed over 75 feet from the swingset. This was no ordinary sandbox, no sir! This desert was twice the size of any golf course sandtrap I had ever had the dubious pleasure of playing into.

The sandbox was enclosed by 2- x 12-inch planks. The approach path from the swing showed three skid marks, each successively closer to the sandbox. Returning my attention to Andrea, I noticed her nearing terminal velocity, on the verge of actually wrapping herself in a loop around the upper bar of the swing. Her eyes were as large as saucers, and her dream of actually being able to propel herself across the playground and into the sandbox was on the verge of becoming a reality. However, unless assisted by some rocket propulsion, my concern was the sandbox planking serving as an effective speedbrake should she fail to reach her goal! Quite needless to say, I didn't lose a moment in arresting Andrea's further efforts to launch herself in a fourth attempt to make playground history.

In performing a little accident causation analysis, it didn't take a rocket scientist (or even an ASO) to determine that each of Andrea's scrapes were, in this case, merely proximate causes. While a bandage had been applied to each, nothing had yet been done to arrest yet a fourth scrape from occurring. It was apparent that no one had yet identified the root cause—Andrea was tasked to reach an unachievable goal given her current suite of propulsion equipment.

Having identified the root cause, I could now work on a corrective action plan. While having the school served with an injunction to preclude children from using the swing would have certainly prevented a recurrence, this was akin to hunting butterflies with a howitzer. And moving Andrea to another school would have been merely rearranging the deck chairs on the Titanic.

Too often in the military, as well as industry, we tend to inadequately perform three significant steps in accident causation:

- Correctly identify the problem.
- Correctly identify its proximate causes and root causes.
- Adequately identify and perform a correct and adequate corrective action.

Allow me to leave you with a parting thought: If Andrea, at the age of four, could grasp the concepts of keeping herself from getting hurt again, imagine how dynamic an understanding of these concepts could be in the hands of a full-grown soldier!

—CW3 Mark W. Grapin, ASO, B Company, 1-211 Attack Battalion, Utah ARNG

STACOMs no longer used to publish publication changes

In accordance with U.S. Army Aviation Center message 011500Z Sep 94, publication change information contained in STACOMs 154, 155, 158, 159, and 160 is considered official and will be retained until formal changes are incorporated into affected publications. In the future, STACOMs will be used only for information purposes. Official changes to publications will be accomplished by other means. STACOMs will continue to reference these official changes in informative articles.

Facts about STACOMs

Some confusion still exists about STACOMs. The following questions and answers should clear up the confusion.

Q. Are STACOM files required?

A. No. But we highly recommend that *FlightFax*, which publishes STACOMs, be a part of the unit's aviation safety publications library. Libraries should retain copies of *FlightFax* from the previous 12 months.

Q. Are STACOMs regulatory?

A. No. STACOMs are published in *FlightFax* as information. STACOMs are a convenient means of disseminating up-to-date information to aviation personnel, allowing correction of deficiencies and misunderstandings regarding Army aviation programs and publications. *FlightFax* is a more responsive and rapid means of reaching more people than messages or letters.

Q. Does the aviation library have to contain all of the STACOMs that have been published?

A. No. As a minimum, the library should maintain a file of STACOMs that have been published in the previous 12 issues of *FlightFax*.

STACOM 162 **December 1994**

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-1098/3504. Information published here generally precedes the formal staffing and distribution of Department of the Army official policy. This information is provided to all commanders to enhance aviation operations and training support.

William H. Bryan
Colonel, Aviation
Director of Evaluation and Standardization

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class C

V series - While returning to airfield, crew heard loud bang and metal-on-metal grinding noise, and engine failed. Pilot executed autorotation to clearing in subdivision. Rear skids spread and WSPS broke. Suspect internal failure of compressor section. Engine sent to CCAD for teardown and analysis.

UH-1 Class E

H series - During postphase test flight, MP entered autorotation. Right tail rotor pedal movement became restricted and then moved past restriction. As throttle was advanced, pedal stuck momentarily as it moved through restricted area. Tail rotor trunnion spindles were worn excessively by needle bearings.

V series - On short final after .3-hour flight, PC noted fuel indicator at 1,200 pounds. Fuel needle did not respond when PC pressed test button. After landing, circuit breaker was found to be out. When reset, circuit breaker kicked out again. Inspection revealed burned wires and bad fuel gauge.

V series - While conducting MOC, MP felt unusual control response in cyclic during takeoff. Aircraft landed and maintenance determined hydraulic pump was beginning to fail.

UH-60 Class C

A series - During engine start sequence, No. 2 engine starter would not stay engaged. Start control valve had malfunctioned, shorting out cannon plug and allowing starter to fall off line. Believing start switch was out of rig, IP attempted second start, using pencil to actuate starter microswitch. Starter indicated proper operation, No. 2 PCL was placed to idle position, and TGT began to increase normally. Between 400° and 500°C TGT, IP noted starter had dropped off line, NG was decreasing, and TGT was increasing rapidly. IP performed emergency engine shutdown procedure, but TGT increased to 960°C before shutdown was complete. Start control valve had failed again. No. 2 engine's power turbine, gas generator, nozzle, and combustion liner had to be replaced due to engine overtemp.

A series - Aircraft had been engaged in NVG refresher training and an NVG annual evaluation, requiring numerous approaches to unimproved areas in local training area. Crew noticed nothing unusual during flight. During postflight, damage was found to stabilator, and main rotor blades had contacted infrared countermeasure transmitter.

A series - PI reported tail transmission chip light. PC took controls. Power was available upon descent, but no apparent tail rotor. Aircraft landed hard, damaging stabilator, tailboom, tail wheel, and left main gear. Suspect tail rotor gearbox malfunction.

UH-60 Class D

A series - Aircraft was conducting NVG training to unimproved tactical landing area containing muskeg (frozen ground). High temperatures had resulted in thinner than normal ice for time of year. As aircraft landed, skis broke through ice. PC picked aircraft up to hover, and no damage was noted. Postflight revealed radar warning antenna had been broken off.

A series - Suspect passenger pulled emergency jettison handle during NVG mission, causing window to jettison. Window was not recovered.

A series - While on downwind for landing, master caution and left accessory module chip lights came on. PC took controls, notified tower of emergency, and decided to conduct a roll-on landing. Crew failed to conduct a before-landing check. PC landed aircraft with parking brake set, damaging left and right main tires. Main tires and left accessory module were unserviceable.

UH-60 Class E

A series - During serviceability check for main transmission module chip light, master caution and transmission oil-pressure-low lights illuminated as PCLs were advanced from idle to fly. Transmission oil pressure dropped to zero, and burning odor entered cockpit. When emergency shutdown was performed, transmission seized within 30 seconds. Suspect failure of main transmission planetary gear.

L series - During pickup of two A22 bags, CE noticed additional cargo net attached. Flight was aborted, and load was re-rigged by ground unit. Shortly after takeoff, load was lost. Sling remained attached to aircraft. Grab hook keeper was missing from sling assembly. Suspect ground personnel failed to recognize improper sling arrangement.

L series - During postflight, crew found 8-inch tear in bottom of aircraft. Aircraft had been operating in poor illumination and dusty conditions. Suspect crew failed to recognize object on ground.

L series - Door was left unsecured during preflight. Nearby aircraft took off, causing door to open rapidly and damage inside forward door post.

L series - While on ground, No. 1 power control lever was placed in idle position to conserve fuel. PI executed immediate takeoff before PC could complete before-takeoff check. To avoid drooping rotor RPM and entering trees, PC moved power control lever back to fly position, inadvertently placing it in ECU lockout. Crew suspected compressor stall and landed.

L series - Chalk 2 in flight of five aborted takeoff after M60 machine gun discharged single round into cabin floor, penetrating Kevlar floor and making 2-inch exit hole on underside of aircraft. Caused by failure to properly clear weapon.

Attack

AH-1 Class E

F series - Aircraft was in cruise flight at 90 KIAS during redeployment to home station after NTC rotation. Master caution and engine oil bypass lights illuminated, and engine oil temperature increased to 110°C. Engine oil pressure remained within limits. After landing, inspection revealed oil leaking at quick-disconnect on oil debris detection system. Coupling was replaced.

AH-64 Class C

A series - Aircraft was flying NOE in desert terrain. During movement to contact at altitude of less than 6 feet, PC accelerated to airspeed in excess of 100 knots. As aircraft entered 10-degree right turn, crew heard a thump. Blades had contacted yucca plant.

A series - Aircraft was trail in flight of six AH-64s. Unit was flying training mission at contour flight (25 to 80 feet AHO) while also conducting wire hazard reconnaissance. PI, who was flying from back seat, transferred controls to PC while changing radio frequencies. PI resumed controls; aircraft crossed into a depression and hit a set of wires at 33 feet AGL, running perpendicular to route of flight. Aircraft remained controllable and crew landed in a field. Two rotor blades, four pitch change links, and ASE antennas were damaged.

A series - While performing normal shutdown with engines at idle and cyclic displaced forward, PI heard noise overhead. During postflight, main rotor head damage was found. Caused by droop stop pounding.

AH-64 Class E

A series - ENCU began blowing hot air during flight. Aircraft landed at field site, and a CE climbed into turtle back prior to engine shutdown and without crew approval. He tapped throttle valve, and ENCU began working properly. As CE closed cowlings and straightened up, main rotor blades struck his head. No serious injuries or damage to aircraft.

A series - During night training flight, crew heard loud noise followed by fumes in cockpit. Crew determined there was no fire and returned to airfield. Caused by failure of No. 2 transformer/rectifier.

Cargo

CH-47 Class C

D series - Aircraft was on approach to LZ with external load consisting of an M998 HMMWV. During final, nonrated crewmember slid winch/hoist control, causing cargo hook release switch to strike hardware on passenger seat. Load was released at 100 feet AGL and 20 knots airspeed. Crew landed aircraft in LZ and performed normal shutdown.

CH-47 Class E

D series - While in cruise flight with external load consisting of MREs in cargo net, load was inadvertently dropped. Slings remained attached to aircraft. Load had been rigged with all chain legs attached to one keeper, causing keeper to fail in flight. No damage to aircraft; MREs recovered.

D series - During insertion of external load consisting of single HMMWV into dusty LZ, crew selected clearing separate from main LZ. After load touched down, aircraft began rearward drift. CE called out rearward drift and released load. HMMWV rolled onto its side.

D series - En route to LZ, utility hydraulic light illuminated. Crew executed emergency procedures. CE checked maintenance panel and found utility hydraulic reservoir empty. Caused by loose fitting.

D series - Aircraft was in MTF status following depot level application of five MWOs. After uneventful runup, aircraft was 10 minutes into ground run when OR informed MP he was not receiving reliable vibration data. Shortly afterwards, CE reported oil leaking into ramp area from aft pylon, and within seconds, a high-pitched squeal was heard from forward pylon area. MP began shutdown, and No. 1 hydraulic flight control light illuminated as engines were being shut down. No hydraulic temperature limits were exceeded. Postflight revealed failure of seal on upper portion of aft swiveling actuator, which resulted in loss of most of No. 1 flight boost system hydraulic fluid. Actuator was within 50 hours of TBO time and had been seeping prior to this incident. Seepage was within allowable limits.

D series - While on search and rescue mission in mountains, FE was performing control closet check when he discovered a large hydraulic leak but could not find source. During landing, No. 1 flight hydraulic system and No. 1 advanced flight control system (AFCS) caution light illuminated. Maintenance panel showed low pressure and low fluid level in No. 1 system. AFCS was switched to No. 2 system and aircraft was shut down. Leak was located at upper roll ILCA crossover tube. Caused by possible packing failure.

D series - During tandem load hookup with clevis in forward hook, aircraft was repositioned for aft hookup. Aircraft drifted and descended, and left landing gear struck aft hookup man, pinning him to load and bruising his chest.

OH-58 Class B

D series - Aircraft tail stinger became entangled in netting on side of ship. Aircraft landed hard, skids spread, and belly contacted deck. Damage to tail rotor blade, tailboom, drive shaft, and skid mount hard points.

OH-58 Class C

A series - After landing at port, PC was told to reposition to rinse facility. After aircraft was moved, PC reduced throttle to engine idle. At rinse facility he was told to increase throttle to operating RPM. As throttle was advanced through 90 percent, engine flamed out because of water ingestion. PC was told to restart engine. During restart, he noted TOT below 200° and N1 at 15 percent. PC advanced throttle to engine idle and TOT rose to 900°C. When it reached 927°, PC initiated engine hot start procedures. TOT exceeded 1,000°C.

Fixed wing

C-12 Class C

F series - Aircraft was descending out of FL 240 for 16,000 in moderate precipitation. Clouds were of stratus formation with no cumulus buildup. At about FL 210, lightning struck aircraft. Aircraft was landed, inspected, and no damage found. All systems operated normally, and mission continued. When mission was completed, more detailed inspection revealed arcing on both propeller systems, radome, left outboard wing flap, and right aileron. Static discharge wick on right elevator was burned off, and paint burns were found on elevator surface. When radome was removed, arcing was found on radar antenna.

C-12 Class E

H series - Crewmembers smelled fumes after takeoff. Air mode switch and vent blowers were turned off, masks donned, cabin pressure dumped, windows opened, and aircraft returned to home base. Caused by vent blower malfunction.

C-31 Class D

A series - Two employees were directing PI during parking at civilian airfield. Pilot and front ground handler received a thumbs-up from left wing guide. As pilot continued right turn, left wing tip struck hangar.

OV-1 Class E

D series - During after-takeoff checks, PC placed gear handle in up position. Nose wheel gear indicator showed gear down. PC recycled gear handle with same results. PC made normal landing at airfield. Wire on taxi light chafed against airframe and grounded out, causing false indications from nose wheel gear.

D series - After ILS approach and go-around, No. 1 engine started to surge and run erratically. Torque, EGT, N1, oil temperature, and oil pressure fluctuated rapidly. PC retarded power lever and conditions remained unchanged. PC attempted single engine ILS and did not break out. PC executed single engine go-around and noticed RMI and gyros had failed. PC conducted no-gyro PAR approach to uneventful landing.

U-21 Class C

A series - Aircraft departed with loose oil reservoir cap, and oil pumped overboard. Crew noted fluctuation in torque and decrease in oil pressure reading. Engine was secured and precautionary landing executed. Engine required replacement.

U-21 Class E

A series - While performing airspace surveillance, crew made normal descent from 9,000 to 7,000 feet with autopilot engaged. Aircraft made uncommanded right yaw, autopilot disengaged and audio sounded. All electrical and associated lights illuminated. PC took controls and re-established controlled flight. Electrical fire appeared in area of landing gear extension handle and burning odor was detected. PI initiated emergency procedures, and PC continued descent, turning toward airport 35 miles away. Critical electrical systems were re-established for communications, landing gear, lights, and flaps. Aircraft made normal landing at airfield.

Messages

■ Aviation safety action maintenance mandatory message concerning one-time inspection of all AH-64 aircraft for chafing of wire harnesses W102 and W119 (AH-64-95-ASAM-01, 071510 Nov 94). Summary: A Category I deficiency report identified wire harness W102 chafed against the aft mast base support strut (FS 230) and shorted out, causing a malfunction of the crossfeed valve. The harness was burned extensively and resulted in an engine flameout. The purpose of this message is to direct a one-time inspection of wire harnesses W102 and W119 for damage, chafing, and proper clearance; and application of anti-chafe material to both wire harnesses. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning requirement for re-shimming of tail rotor pivot bearings on all UH-60 aircraft per revised procedures and inspection of certain blade assemblies for specified serial numbered tail rotor blades that contain composite pivot bearing retainers (UH-60-95-ASAM-03, 261645Z Oct 94). Summary: Recently manufactured tail rotor pivot bearing retainers were changed to a composite material instead of aluminum. This material change resulted in an increase in bond failures due to the change in adhesive used with the composite. In addition, the pivot bearing is installed with a compressive preload through the use of shims. It has been determined that the current procedures in TM 55-1520-237-23 allow installation of the pivot bearing with less than optimum preload. The purpose of this message is to inform UH-60 users of the revised procedures to determine correct bearing shim thicknesses to attain the correct assembly preload and to require that this new shimming procedure be implemented within 500 flight hours. In addition, this message will identify specific serial numbered tail rotor blades manufactured with composite retainers. These blades will require shim correction within 150 hours and once identified to the logistical POC will be corrected by a Sikorsky field service team. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Safety-of-flight technical message concerning replacement of P/N MS17825-10, NSN 5310-00-455-6881 nuts on scissors and sleeve assemblies, P/N 209-010-401-11, NSN 1615-00-168-5863 in stock for AH-1S/E/F/P series aircraft IAW AH-1-94-01 (AH-1-95-01, 261900Z Sep 94). Summary: AH-1-94-01 required replacement of suspect MS17825-10 nuts in nine locations on aircraft. One of these locations is the scissors and sleeve assembly, P/N 209-010-401-11, NSN 1615-00-168-5863. Scissors and sleeve assemblies in stock were not required to be inspected/replaced per AH-1-94-01. The purpose of this message is to require units and depots with scissors and sleeve assemblies in stock to replace MS17825-10 nuts IAW instructions in AH-1-94-01. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning inspection of fuel quantity and low-fuel caution systems on OH-58A/C helicopters (OH-58-95-ASAM-02, 011933Z Nov 94). Summary: An accident has occurred where the engine quit as a result of fuel starvation.

After the accident, the low fuel caution system was found inoperative and the fuel quantity system indicated fuel remaining although the tank contained only one-half gallon of fuel. The purpose of this message is to institute a recurring inspection of the fuel quantity and low-fuel caution systems for proper function. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action operational message concerning requirement to operate the fuel tank submerged boost pumps on all H-60 aircraft, at all times, with all fuels, during ground and flight operations (UH-60-95-ASAM-02, 131557Z Oct 94). Summary: The H-60 aircraft fuel system was designed as a suction fuel system with the engine-driven low-pressure suction pump sucking the fuel from the fuel tank. For high-altitude/hot-temperature-extremes operation, it was supplemented by positive pressure fuel tank submerged boost pumps. The fuel tank boost pump usage was then based on the volatility property of JP-4 aviation fuel. JP-4 fuel volatility is represented by the percentage of vapor to liquid (V/L) present in the fuel lines during suction operation. Further testing with JP-4 fuel identified fuel system trapping of vapor/air bubbles after prolonged nose-down attitude operation. Nose-down operation includes either ground flat pitch idle or cruise; i.e., ESSS/EFRS installed. When the aircraft is pitched up to level attitude, the bubble trapped in the fuel system high spot moves up the fuel line into the engine suction fuel pump. The time required for the bubble to accumulate was measured at around 25 or more minutes' operation. Nose-down ground operation generates the largest bubble due to the low fuel flow rates during flat pitch operation. If the bubble causes the suction fuel pump to cavitate, the cockpit low-fuel-pressure caution light will illuminate. In most cases, the caution light self extinguishes because the engine low-pressure boost pump will re-prime itself with the help of the engine HMU high pressure pump and the engines will continue operating normally. Engine malfunction that could occur can be either a torque roll back or an engine flameout. Recent testing with JP-8 confirmed the same problems could occur with respect to nose-down operation. Engine flameout events in H-60 aircraft have been attributed to bubbles in the aircraft fuel system. Events occurred immediately following takeoff, i.e., pitch-up attitude. Those aircraft were not operating with fuel boost pumps on. ATCOM is taking action to modify the fuel system and restore the suction fuel system operating envelope with JP-4, JP-5, and JP-8. In the interim, it is a requirement to operate the tank-mounted submerged fuel boost pumps at all times with all fuels. This will prevent any fuel bubbles from being accumlated in the aircraft fuel system that could affect engine operation. The purpose of this message is to implement a change to the UH-60A/L, EH-60A, and MH-60K operator's manuals to operate the fuel tank submerged boost pumps "on" at all times with all fuels. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning aft-facing seats on all C-12/RC-12 aircraft (C-12-94-ASAM-01, 081717Z Nov 94). Summary: The C-12 aircraft were procured with all seats facing forward. The seats were designed and tested to meet the Federal Aviation Regulation (FAR), which requires an occupant weight of only 170 pounds. The Army levied an additional requirement for the seats to withstand a 250-pound occupant, except for the aft facing direction. Years later, the Army modified the C-12 aircraft with tables and seats arranged around the tables (forward/aft facing). This came to be known as "club seating." Beech Aircraft Corporation placarded the seats, limiting occupant weight to 170 pounds in the aft-facing position, and the operators manual reflects this limitation. Recently, the awareness level rose within the C-12 community and this limitation was enforced. Engineering has reviewed contractor data and can substantiate by test data and by similarity the seats' ability to withstand a 250-pound occupant in the aft-facing direction. The purpose of this message is to authorize the use of aft-facing seats without the 170-pound occupant limitation in all C-12/RC-12 aircraft. The aft-facing seats listed below are authorized for use in the aft-facing direction for a 250-pound occupant.

Nomenclature	Part No.
Chair assembly	101-530195-1/-2
Chair assembly	101-530294-23/-24/-31
Chair assembly	127-530026-1/-2/-3

Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (205-255-2119).

In this issue:

- Army top leaders committed to risk management
- Confront the issue!
- Keeping our skies safe
- Using safety NCOs to their full potential
- JP-8 fuel conversion
- ASO corner—
  Accident causation: a father's perspective
- STACOM

Class A Accidents through November

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2		2	
2D QTR	January	1		2	
	February	2		0	
	March	0		0	
3D QTR	April	5		2	
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	**21**	**0**	**11**	**0**

U.S. ARMY SAFETY CENTER

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REPORT of ARMY AIRCRAFT ACCIDENTS

January 1995 ◆ Vol 23 ◆ No 4

Historically, we experience the highest number of Class A flight accidents during the first quarter of each fiscal year.

Great news! We've broken the mold: only one Class A and no fatalities for the first quarter of FY 95. Thanks to each of you for the great job you are doing in continuing to move force protection initiatives in the right direction and making Army aviation a safer place to live and work.

With the exceptional skills of our aviation soldiers and their dedication to promoting force protection efforts, great work has been done to make our Army safer. BUT we must continue to be vigilant for even a momentary safety lapse could be far too costly. By the time we finish this fiscal year, hopefully, we will be able to say that we reduced accidental losses to their lowest level ever and still accomplished more.

"IN THE PURSUIT OF EXCELLENCE, THERE IS NO FINISH LINE."

LTG ROBERT H. FORMAN

Looking ahead through FY 95

Army aviation has just completed the first quarter of FY 95 with a remarkable estimated Class A accident rate of 0.37. The actual rate will not be known until the flight-hour exposure is available. However, to complete an entire quarter with only one Class A flight accident is a noteworthy accomplishment, especially when taking into account that a suspected materiel failure could be the culprit in the one Class A that did occur.

The previous 5-year average for first quarter Class A flight accidents is 8, ranging from 5 in FY 92 (the best year on record) to 10 in FY 91—the Desert Shield/Desert Storm buildup. The average number of Class A flight accidents during the period of FY 90 through FY 94, excluding FY 91, is 24. Taking into account the average total number of Class A accidents during the recent 2-, 3-, and 4-year periods, this promises to be yet another record-setting year in this category.

Class A through C flight accidents

Looking at the average number of Class A through C flight accidents during the same 4-year period shows an average of 23 accidents for the first quarter of the fiscal year. The number of Class A through C flight accidents during the first quarter of FY 95 was 17. Of course, the most notable difference is the number of Class As.

The difference between a Class A and Class E is often a result of the circumstances under which the mishap occurs. For example, experiencing an engine failure while operating in the height-velocity-avoid region could feasibly result in a Class A or Class E. Factors such as gross weight, atmospheric conditions, suitable forced landing areas, as well as pilot proficiency all contribute to the end result.

Some folks probably attribute this low first quarter Class A accident rate to "lady luck" or fate. I, on the other hand, think we should attribute it to the skill and professionalism of today's Army aviators and current force protection initiatives.

Tools for safe mission accomplishment

The commander sets the tone for the safety program in the unit. Through the integration of risk management in daily operations and the establishment and enforcement of standards through the unit's safety and standardization officers and programs, the commander will be able to establish accountability and responsibility. Accountability or ownership is a key factor in every operation.

The tools to ensure safe mission accomplishment come in many different forms and are readily available. They include doctrinal literature such as field manuals and aircrew training manuals, regulatory publications such as ARs and command policy letters, and operational procedures such as SOPs and technical manuals. There are also risk-management tools in the form of numerous articles in publications such as *FlightFax* and *Countermeasure*. These articles address risk-management techniques and provide risk-management examples to assist soldiers in integrating risk management into all tasks.

Keeping safety on track

To continue on the course we have set during the first quarter of FY 95 will require the dedicated efforts of all members of the aviation team. Let's maintain our vigilance and strive to surpass the lowest Class A flight accident rate on record (1.57 per 100,000 flying hours set in FY 92).

To accomplish this feat, we must continue our initiatives to integrate risk management into everything that we do by practicing risk-management techniques until they become intuitive and accepting responsibility for our actions or lack thereof. Doing so will provide us with the best chance of keeping safety on the right track as we face the tough challenges ahead in FY 95.

POC: MAJ James Dunn, USASC Aviation Branch, DSN 558-3754 (334-255-3754)


CY 94 FlightFax index

Too much pressure can lead to an accident (account of how a mechanic allowed pressure by peers and supervisors to persuade him to do a task he was not authorized to do)—February

UH-1 accident review (a nearly deadly combination of events)—August

UH-60 fuel boost pump operation now required (safety alert)—November

Uniforms for aircraft fuel handlers—February

Use of C-12C/D/F passenger seats in forward- and aft-facing positions—June

Use of global positioning system—June

Using safety NCOs to their full potential—December

Valid risk assessments needed—April

Vibration analysis equipment—August

Video edition of FlightFax available, "Safety Alert: UH-60 Fuel Boost Pump Operation" (TVT 20-1040, PIN 710601)—November

Wake turbulence caution—March

WAR (wartime accident realism) project prevents accidental losses—July

Well done Army aviation team—October

Where are all the ALSE maintenance personnel?—April

Whiteout/brownout prevention techniques—January

Wing stores inadvertently jettisoned—April

Wire bundle chafing can be hazardous (AH-64)—November

Working around aircraft requires extra care (rotor blades, propellers, jet engine exhaust, and live armaments are constant hazards)—February

Aviation safety action messages

General

- Updated information on night vision goggles—February
- Revision to updated night vision goggle information—February
- Use a quality deficiency report to report fuel cell problems for all Army aircraft—April
- Nonstandard vibration analysis equipment—April
- Rescission of GEN-94-ASAM-05 concerning vibration analysis equipment—August
- Hydra-70 rocket firing from Army helicopters—September
- Addressing requests for disposition of damaged, destroyed, or deteriorated aircraft. Procedures for AVIM units to be approved to perform depot-level repair of an item—September
- Approved engine cleaners for Army turbine engines—October

Utility

- UH-60 NVG compatibility rework of master warning panel assembly—January
- H-60 return for exchange of certain Aerospace Research Associates manufactured buckle/crotch strap assemblies, P/N D4495-28—February
- H-60 one-time refurbishment of main rotor spindle and replacement of certain main rotor thrust bearings—February
- UH-1 crew seatbelts—March
- H-60 reissue of one-time inspection to remove suspect tail rotor pitch beams—March
- H-60 Black Hawk one-time removal of tail gearboxes with tail gearbox output shaft, P/N 70358-06620-101, for rework—March
- H-60 cockpit standardization of pilot and copilot restraint release systems—March
- UH-1H/V modification to left cyclic rigid connection link—April
- Revision to UH-60-94-ASAM-07—April
- UH-1 clarification of UH-1-94-ASAM-03 concerning modification to left cyclic rigid connecting link—May
- UH-60 removal of certain primary servo assemblies—May
- UH-60 one-time refurbishment of main rotor spindle and replacement of certain main rotor thrust bearings—May
- UH-60 main rotor blade deice heater mat resistance measurements test method—May
- UH-1 one-time inspection of tail rotor drive shaft hanger bearing—June
- UH-60L authorization for aircraft to be utilized for external load operations limited to a maximum 9,000-pound static weight and a corresponding maximum external load operation gross weight of 23,500 pounds—August
- UH-60 requirement for re-shimming of tail rotor pivot bearings per revised procedures and inspection of certain blade assemblies for specified serial numbered tail rotor blades that contain composite pivot bearing retainers—August
- UH-60 requirement to operate the fuel tank submerged boost pumps on all H-60 aircraft, at all times, with all fuels, during ground and flight operations—December

Attack

- AH-1 crew seatbelts—March
- AH-64 retirement life change for Avibank blade pins, P/N 53460-3—March
- AH-1S(MOD) one-time inspection of Grimes master panel, P/N 80-0199-39—April
- AH-1 with hub spring installed—May
- AH-64 chafing inspection of collective bellcrank and forward fuel cell—May
- AH-64 one-time inspection of wire harness W108 for chafing—May
- AH-64 one-time inspection for chafing of wire harness W102 and W119—December

Cargo

- CH-47 crew seatbelts—March
- CH-47D, MH-47D, and MH-47E one-time and recurring inspection of certain rigid connecting links, P/N 145C3340-10, until replacement—March
- CH-47D, MH-47D, and MH-47E one-time inspection of the 5,000-pound tiedown receptacle assemblies and instructions to correct defective tiedown receptacle assemblies—June
- CH-47D, MH-47D, and MH-47E one-time and recurring inspection of hydraulic pumping unit—June

Observation

- OH-58A/C one-time inspection of cartridge-type fuel boost pump—January
- OH-6A and AH-6C one-time inspection of fuel level sender—February
- OH-58D and improved OH-58D visual inspection of tail boom—February
- OH-58 crew seatbelts—March
- OH-58D one-time inspection of directional control tube contained within the center post—March
- OH-58A/C bonding failure of the bellmouth assemblies on the T63A720 engine—March

- OH-58A/C revised operating limits for alternate fuels—March
- OH-58A/C KY-58 wire bundle interference with collective and cyclic controls—April
- OH-58A/C one-time inspection of landing gear crosstubes—May
- OH-58 inspection of swashplate support—May
- OH-58C ATAS-equipped aircraft boresight confirmation—July
- OH-58A\C inspection of fuel quantity and low-fuel caution systems—December

■ Fixed wing

- C-12 aft-facing seats—December

Safety-of-flight messages

■ Utility

- UH-1 immediate grounding of aircraft with T53-L-13BA engines—March
- UH-1 visual inspection of T53 engine data plates and instructions to obtain T53-L-13B engines—April
- UH-1 one-time inspection of tail rotor blade—July
- UH-1H/V restriction of hydraulics-off maneuvers and one-time inspection for loose main rotor hub worm gears—October

■ Attack

- AH-64 main rotor stretched strap assembly—April
- AH-64 removal of main rotor stretched strap assembly—May
- AH-64 one-time inspection to locate and remove from service one main rotor stretched strap assembly—July
- AH-1S/E/F/P one-time replacement of MS17825-10 self-locking nuts—November
- AH-1 replacement of P/N MS17825-10, NSN 5310-00-455-6881 nuts on scissors and sleeve assemblies, P/N 209-010-401-11, NSN 1615-00-168-5863 in stock for AN-1S/E/F/P series aircraft IAW AH-1-94-01—December

■ Cargo

- H-47 immediate grounding of aircraft assigned only to 160th SOAR—October
- H-47 rescission of SOF message CH-47-94-01 grounding H-47 aircraft assigned only to 160th SOAR—October

■ Observation

- OH-58A/C inspection of main rotor trunnion for mislocated master spline—February
- OH-58D and improved OH-58D flight maneuver prohibition—June
- OH-58D flight maneuver prohibition to include specific overhauled fuel pumps—July
- OH-58 and improved OH-58D flight maneuver prohibition—September

CY 94 STACOM index

STACOM 160, January

- Interim change to TC 1-210
- STACOM CY 93 Index

STACOM 161, July

- Change to TC 1-216
- Change to TC 1-210

STACOM 162, December

- STACOMs no longer used to publish publication changes
- Facts about STACOMs

Questions (???) about accident reporting

In case you have been out of the net lately, there are two new significant safety policy publications on the street: AR 385-40: Accident Reporting and Records, 1 November 1994; and DA Pam 385-40: Army Accident Investigation and Reporting, 1 November 1994. See the June 1994 issue of *FlightFax* for a brief description of the major changes.

Because these two publications have made notable changes to the Army accident reporting system, questions may come up that need prompt answers. If you have questions, the Director of Army Safety (proponent of these publications) suggests the following procedures:

■ Call your major Army command (MACOM) safety office for an answer because someone from the MACOM safety office may have already contacted the Army Safety Center for clarification on the same issue.

■ If your MACOM safety office does not have the answer—

- Check the SafReg Conference on E-Mail to see if the issue has been addressed previously.

• Call Mr. Lee McCown at the Army Safety Center, DSN 558-3913/2372 (334-3913/2372).

• Call the Accident Reporting answering machine, DSN 558-9513 (334-255-9513), and leave your name, the date, your specific question (with appropriate references to the AR/Pam), and your DSN or commercial telephone number. Calls will be answered within 24 duty hours.

Significant questions and appropriate responses will also be published in *FlightFax* and *Countermeasure* so that others may benefit from the information as well as the individual making the inquiry.

Also, please note that **all** Army accident reporting forms with the exception of DA Form 285, May 1991 or January 1992, are included in the back of AR 385-40 and DA Pam 385-40 and are reproducible.

POC: Mr. Lee McCown, Policy, Installation, and Evaluation Division, DSN 558-3913 (334-255-3913)

Aviation gunnery strategy for 2.75-inch rockets

According to a recent message (HQ, DAMO-TR, 081802Z Dec 94), the Army Material Command (AMC) has suspended training use of 2.75-inch Hydra-70 rockets. Suspension affects production and 98 percent of the Hydra-70 stockpile. War reserve rockets are coded for combat use only. Training rockets are coded for inspection/repair before release. An investigation determined a deficiency in the propellant of some manufactured MK-66 motors. Short-term and long-term fixes are being worked. AMC anticipates release of 12,000 Hydra-70s in January 1995. Remaining rockets will be inspected and repaired/released IAW AMC strategy. Hydra-70, HE, M151 (H490) MK-40 rockets are not affected by this suspension.

To minimize the impact the suspension has on readiness and facilitate continued execution of the gunnery tasks that support unit's METL, units should consider the following temporary work-around strategies:

■ Maximize the use of simulations to maintain switchology and rocket employment skills to include notional Tables VII and VIII (this will not substitute for Table VIII live-fire qualification requirements).

■ Where available, use MK-40 HE rockets for qualification through Table VIII. This will require units to use subjective grading in place of the area weapons scoring system; however, it will allow units to remain proficient and qualified on all weapon systems.

■ Units that do not have available rockets should continue qualification through Table VIII less the rocket engagement scenarios (6 of 20 for AH-64, 6 of 16 for AH-1E/F, and 6 of 20 for OH-58D KW) and annotate the impact on their unit status report until training rockets become available. This will allow units to remain proficient/qualified in both guns and missile systems.

POC: LTC Thomas Hinkel, HQ, DAMO-TR, DSN 225-2591

ASO CORNER

> **ASO Refresher Course 7K-F21**
>
> | | |
> |---|---|
> | 95-1 | 20-24 March |
> | 95-2 | 22-26 May |
> | 95-3 | 28 August-1 September |

Aviation safety seminar

The 1994 Army Safety Conference was held in San Diego from 26 through 28 October. As part of the conference, the Army Safety Center hosted an Aviation Safety Professional Development Seminar.

This year's Army Safety Conference was the first to target aviation safety officers with seminars and discussions tailored to their needs. The number of participants was surprisingly large, with more than 50 officers attending each event. Based on their comments and critiques, the ASO seminar was very beneficial to the participants. The seminar's agenda is presented in the sidebar.

The most noticeable aspect of the aviation workshops was the vigorous participation by the safety officers in attendance. The seminar discussed developments in aviation safety training, current aviation safety issues such as willful indiscipline by flight crews, and aviation life support equipment (ALSE) problems identified by accident investigations. The seminar also featured briefings on the role of the Aviation Branch Safety Office (ABSO), developments in the Aircrew Coordination Program, and National Guard aviation safety issues related to restructuring of the force. Of particular value were two "Problem Identification Seminars" in which the audience selected the topics and guided the subsequent discussions. The ASO Refresher Course was discussed, from concept and program of instruction (POI) to the FY 95 schedule (see box). There was very high interest in this subject and unanimous approval for the course.

In 1995, the Army Safety Conference will be held in Dallas from 6 through 10 November in conjunction with the National Safety Conference. This central location should make the ASO Seminar accessible to more safety officers. So make your plans early to attend the 1995 Army Safety Conference and participate in the next Aviation Safety Professional Development Seminar.

—POC: CW5 Stephen V. Rauch, Aviation Safety Officer, Training Division, DSN 558-9868 (334-255-9868)

Aviation Safety Seminar

Wednesday, 26 October 1994

Welcome ..... COL Scott Hyatt
Aviation Safety Training Update ..... CW5 Steve Rauch
Aviation Branch Safety Update ..... CW5 Mark Barker
Aviation Safety Issues ..... CW5 Steve Rauch
Aviation Safety Problem Identification Seminar ..... CW5 Steve Rauch
Army Safety Workshop #1: AR and DA Pam 385-40: Army Aircraft Investigation, Reporting, and Recordkeeping, 1 November 1994

Thursday, 27 October 1994

General Session ..... COL Scott Hyatt
Aviation Safety Problem Identification Seminar ..... CW5 Steve Rauch
Army Safety Workshop #2: Installations—Partnering Opportunities
Army Safety Workshop #3: Pre-Disaster Planning
Army Safety Workshop #4: OSHA Reform—Impact on the Garrison
Army Safety Workshop #5: Risk Management—The Next Step and Tactical Applications
Army Safety Workshop #6: POV Accident Prevention

Friday, 28 October 1994

Aircrew Coordination Update ..... CW5 Mark Barker
Aviation Safety Problem Identification Seminar ..... CW5 Steve Rauch
ASO General Session ..... CW5 Steve Rauch
Army Safety Workshop #7: Safety and Industrial Hygiene
Army Safety Workshop #8: Safety Installation Support Module
Army Safety Workshop #9: Violence in the Workplace
General Session (conclusion)

New Aviation Tool System (NATS-95)

NATS-95 is the Army's new aviation tool program. Field and garrison testing of the program was conducted by the 101st Aviation Regiment at Fort Campbell, KY, in 1993. Getting the right tools to the soldiers at the Aviation Unit Maintenance (AVUM) level is the main objective of the program. Soldier feedback during the testing was used to reconfigure the tools until the optimum set was found. Following approval of the system, fielding the new tool sets began with the 101st Aviation Regiment in October 1994.

New program features

Program components include: the tool kits/sets; the aviation footlocker (AFL), which replaces the AVUM No. 1 tool set; and a number of new tools to improve the AVUM No. 2 tool set. NATS-95 will provide the new general mechanics tool kits (GMTK) to units authorized to have the old general mechanics tool boxes. NATS-95 will also provide new tool kits for powertrain, electrical, powerplant, and airframe repair to soldiers in AVUM and Aviation Intermediate Maintenance (AVIM) shops. The tools the Army purchased in the past often were of poor quality. NATS-95 provides for industrial-quality tools through a new General Services Administration program. Because of their higher quality, these new tools should last longer and save money in the long run. Many of these higher-quality tools come with warranties. Warrantied tools that break due to defects can be replaced by simply calling a GSA 1-800 telephone number. GSA will send the replacement tool to the unit within 48 hours, along with a return envelope for the broken tool.

Then and now

■ In previous tool sets, the tools were different colors, dimensions, and shapes. NATS-95 tools that come in sets, such as wrenches and sockets, will be maintained as just that—sets.

■ Other military services have tool boxes that are shadow-boxed to facilitate an instant inventory. With NATS-95, the Army will also have this kind of instant inventory system. The interior of the new tool kit is made of polyethylene foam, with a place for each individual tool. By regulation (AR 385-95, paragraph 3-3d(5), an inventory of tools is to be conducted after each repair is completed. A quick look at the tool kit after a repair is completed will tell a soldier if a tool is missing and which tool it is. If a tool is lost in or around an aircraft, the commander may ground the aircraft or take other action as appropriate.

The commander now has a tool system that he can use as a strong base for a tool accountability program. NATS-95 will become part of his Command Supply Discipline Program (CSDP).

■ The ergonomically designed exterior of the case is made of forest green durable polyethylene, the same material used to make Army canteens.

■ Supply catalogs will list the specific manufacturer's name, part number, and the unique national stock number (NSN) for the higher-quality tool.

■ In the past, when a soldier in an AVUM or AVIM unit required a special tool that was not part of his tool kit, he went to the tool room and signed it out. These tools were part of the AVUM No. 1 or No. 2 tool sets. Now the soldier can simply go to the platoon's AFL and sign out the tool he needs. Torque wrenches, ½-inch drive sockets, a cordless drill, measuring indicators, as well as many other frequently used tools, are included in the AFL. There is also space allocated for tools from the AVUM No. 2 tool set so the unit can tailor the tool set to the mission.

Aviation Foot Locker (AFL), NSN: 4920-01-377-5412

Use of tools must be in accordance with applicable safety-of-use messages and technical manuals. Do not use cordless drills around open fuel containers or fuel cells.

The AFL concept began with the platoon sergeant who would sign out various torque wrenches and other special tools before going to the field. He would put them in an Army barracks footlocker so that the tools would be immediately available when needed. This idea was extremely helpful in the field environment, and it has been carried over into the AFL. The AFL is slightly larger than the Army barracks footlocker but is easily transportable. Because it is made of polyethylene, it is also much more durable. Weighing only 142 pounds, the AFL can be carried in the back of a utility helicopter or truck. The unit of issue for the AFL is one per five aircraft (rounded up), one per ten AVUM maintenance section repairmen (rounded up), and one per ten AVIM maintenance section repairmen for each type helicopter supported.

A system that meets the soldier's needs

With the fielding of NATS-95, aviation soldiers are getting a system that meets their needs. The NATS-95 system will enhance the Army's mission by providing high-quality tools, a safer operating environment through tool accountability, and a reduction in foreign object damage incidents.

—CPT John A. Lanzi was a student in Aviation Safety Officer Course 95-1 when he wrote this article. He has since been reassigned to Korea. CPT Lanzi's DSN is 753-6112/6113.

Editor's note: *The proponent of the NATS-95 is the Aviation and Troop Command, Weapon Systems Management Office for Aviation Ground Support Equipment. If you need further information about the NATS-95, contact Mr. Carl Hoeninger, DSN 693-2828/2834 (314-263-2828/2834).*

STACOM
Standardization Communication

The Directorate of Evaluation and Standardization published USAAVNC message 271200Z Oct 94, subject: Aircraft Currency Requirements, to clarify instructor pilot and instrument flight examiner aircraft currency requirements. Following is a reprint of that message:

"1. AR 95-1, paragraphs 4-11 and 4-12, states qualified IPs and SPs will be designated in writing by the commander and qualified and current in the aircraft to be flown. AR 95-1, paragraph 4-18(1)(c), states the instrument flight evaluation will be conducted in an aircraft equipped with dual controls by an instrument flight examiner (IE) qualified and current in the aircraft category in which the evaluation is being conducted. Paragraph 4-18(2) further allows the use of a compatible simulator for this evaluation.

"2. Worldwide assessment visits have found noncurrent simulator instructor/operators, console operators, and FAC 3 aviators conducting flight evaluations in simulators. In accordance with AR 95-1 and TC 1-210, FAC 3 aviators, flight simulator instructors, and console operators cannot perform IP or IE duties unless they meet requirements of AR 95-1.

"3. If current regulatory requirements are an undue burden, request this subject be forwarded as an agenda item for the upcoming Aviation Brigade Commanders Conference.

"4. Point of contact at the Directorate of Evaluation and Standardization is CW5 Murray, DSN 558-3475."

Editor's note: *This item was not on the agenda of the January 1995 Aviation Brigade Commanders Conference.*

STACOM 163 **January 1995**

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-1098/3504. Information published here generally precedes the formal staffing and distribution of Department of the Army official policy. This information is provided to all commanders to enhance aviation operations and training support.

William H. Bryan
Colonel, Aviation
Director of Evaluation and Standardization

ShortFAX
Keeping you up to date

Delay in fielding TC 1-210

The fielding date of the new TC 1-210: Commanders Guide to Standardization will be delayed until the third quarter of FY 95. A change in editors and additional input has resulted in the delay of publication. Expect the new fielding date to be June 1995.

—POCs: CW4 Bernard Agnew or CW4 William S. Johnson, Aviation Training Brigade, U.S. Army Aviation Center, DSN 558-3801/2864 (334-255-3801/2864)

Telephone area code change

The telephone area code for the Army Safety Center changes from 205 to 334 effective 15 January 1995. During a 4-month transition period, calls using the old 205 area code will go through, but beginning 13 May 1995, the new area code 334 must be used.

We suggest you go ahead and make the change on Rolodexes, FAX machines, computer modems, and anywhere else you list our telephone numbers and start using the 334 area code now.

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class E

H series - Crew was conducting NVG confined area operation. At 50 feet AGL on crosswind, they heard high-pitched wail from aircraft rear. Hydraulic pressure caution light illuminated, and crew noted significant control feedback. SP took controls, adjusted to 80 knots, and climbed to 600 feet AGL. Crew confirmed emergency procedures with checklist and elected to proceed to nearest airfield with improved runway where they declared an emergency. Control feedback was moderate with intermittent severe surges occurring in conjunction with wailing from hydraulic pump. Crew made shallow approach and running landing with no damage to aircraft.

H series - On extended final approach, PC directed PI to turn off force trim switch. PC noted stiffness in pedals and determined aircraft was incapable of hovering flight. PC informed crew and passengers they were returning to dirt strip about 20 NM away to make run-on landing. Then master caution light illuminated with no segment light. Aircraft was landed without further incident. Maintenance replaced tail rotor servo.

H series - After about 1.3 hours of flight during NOE multiship operations, PI of Chalk 2 experienced binding in pedals for about 1 second. About 3 minutes later, PI experienced binding for about 2 seconds. PI notified PC, who took controls and notified flight lead and platoon leader of problem and his intention to break out of formation and return to airfield. No further binding was detected during climbout, cruise flight, and landing. Inspection revealed tail rotor chain was worn and tail rotor servo actuator assembly showed internal wear.

UH-60 Class C

A series - During postflight inspection, crew found damage to main rotor blade. Black tail rotor deice cannon plug, bracket, and connecting wires had separated in flight and struck blade.

UH-60 Class D

A series - During mission to transport patient, crew encountered clouds building around mountainous areas. Selected route and VFR altitude placed crew in position of going around mountain range and cloud buildup or proceeding through a saddle. Crew estimated cloud height through saddle at 300 to 500 feet AGL. PI, who was on controls, decided to continue through saddle. PC's attention was focused on changing radio frequencies. Crew heard thud, and PC took controls. Medic reported damage to stabilator. After performing controllability check, PC elected to continue flight to airport, which was within sight. Indications were aircraft had hit a tree or low scrub/brush, damaging left stabilator. Lower anti-collision light lens was torn off.

UH-60 Class E

A series - No. 2 engine experienced compressor stall during start. TGT reached 810°. Crew shut down engine, and maintenance purged water from bleed air lines and scroll casing. Aircraft had been exposed to excessive rain.

A series - During ground taxi, No. 1 tail rotor servo and reservoir-low lights illuminated followed by backup pump advisory and No. 1 hydraulic pump lights. Hydraulic line had chafed against return line.

L series - Aircraft was about 50 feet AGL in takeoff profile when M60 machinegun discharged single round into cabin floor. Crew aborted takeoff and executed precautionary landing.

Attack

AH-1 Class C

F series - Master caution and engine oil segment light illuminated during climbout. Crew landed aircraft, and smoke could be seen coming from engine area. On landing, engine oil temperature rose to 150°. PC performed emergency shutdown. Engine oil vent line had detached from bottom of engine oil reservoir during flight.

AH-64 Class C

A series - While in cruise flight during gunnery training, pilot smelled burning odor in cockpit. Pilot initiated turn back to FARP. Shortly after turn was completed, No. 2 nose gearbox oil temperature light illuminated. PC initiated precautionary landing. Shortly after nose gearbox oil temperature light illuminated, No. 2 engine failed. Once aircraft was on ground, PC noticed smoke and flames coming from No. 2 nose gearbox area. PC extinguished flames with onboard fire extinguisher and turned aircraft over to maintenance. Investigation revealed probable bearing failure of output shaft had occurred, allowing fan to come in contact with diffuser. Diffuser overheated and parts broke away and entered engine, causing sudden stoppage.

AH-64 Class E

A series - During cruise flight, crew heard thump but noted no other indications. About 15 minutes into flight, nose gearbox oil-hot light illuminated on No. 1 engine. Crew returned to airfield and made single-engine landing. During ground taxi, crew saw left transmission panel blowing around taxiway. Loose panel apparently blocked airflow to nose gearbox, causing it to overheat.

Observation

OH-58 Class B

D series - During currency training at approximately 1,200 feet AGL, IP retarded throttle to initiate simulated engine failure maneuver. As PI initiated turn, engine quit. Aircraft landed hard, resulting in major damage to main rotor, tailboom, and landing gear. Reason for engine failure has not been determined.

OH-58 Class C

A series - Aircraft was operating at 90 percent N2 RPM while being washed down with water hoses prior to loading on ship for redeployment. PC noted reduction in engine RPM and shut down aircraft. When engine TOT dropped below 200°, MTP instructed PC to restart aircraft. During restart, engine TOT rose to 900° at normal rate, then began rising rapidly until it exceeded 1,000°. PC executed emergency shutdown. Investigation continues.

OH-58 Class E

C series - During cruise flight, PI initiated shallow left turn while increasing collective. N2 dropped to 90 percent RPM, and audio and light activated. PI moved governor increase/decrease switch to full increase, and N2 RPM began recovering to 100 percent. Crew verified throttle was full open. During approach, PC noticed slight engine surges. After landing, N2 decreased to 98 percent and stabilized. Maintenance found loose wire on linear actuator. MTP was unable to duplicate drop in N2.

Trainer

TH-67 Class C

During postflight inspection, crew found wrinkles in tailboom about 12 inches aft of point where tailboom attaches to fuselage. Crew had been performing touchdown autorotations.

Fixed wing

C-12 Class E

D series - Crew took off after aircraft was deiced. As aircraft entered clouds at 400 feet AGL, No. 1 engine fire light illuminated. Pilots verified there was no fire and returned to airfield. After maintenance cleaned and dried in-line connectors to sensors, fire light went out. Suspect deicing fluid caused fire light to come on.

U-21 Class C

F series - During routine preventive maintenance, BASI personnel found small burn spot on trailing edge of left prop. Lightning had struck left prop, exiting through right rear elevator end cap.

Messages

■ Safety-of-flight technical message concerning one-time visual inspection of upper boost actuator serial numbers on all CH-47D, MH-47D, and MH-47E aircraft to ensure proper screws are installed (CH-47-95-01, 062048Z Dec 94). Summary: A 1992 accident in Alaska was caused by a screw in the upper boost actuator control valve failing from hydrogen embrittlement. The failed screw restricted the travel of the pilot valve in the actuator, resulting in reduced controllability of the aircraft. To correct the problem, the material and plating of the screws have been changed. Also, the bonded nylon locking feature of the screws has been changed to a hexagonal or round configuration from a longitudinal strip type. After replacing the eight actuator screws IAW Boeing letter/message 8-1420-3-4440, the actuators were reidentified with the letter A behind the serial number on the metal decal as stated in CH-47-93-02 message. Recently, however, CH-47 units have been reporting that they are receiving actuators from the supply system without the letter A following the serial number. The purpose of this message is to direct a one-time visual inspection of serial numbers on all upper boost actuators. Actuators without the letter A behind the serial number are required to be replaced prior to the next flight. Contact: Mr. Brad Meyer, DSN 693-2085, (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning revision to updated information on night vision goggles (GEN-95-ASAM-01, 132121Z Dec 94). Summary: The purpose of this message is to provide consolidated and updated information on aviation NVG messages. It is not intended to replace any publication. This message does not address NVGs used for ground operations. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message regarding reduction of torque of self-retaining pivot bolts on all H-60 aircraft (UH-60-95-ASAM-04, 071536Z Nov 94). Summary: During review of maintenance procedures, it was determined that the installation torque for the self-retaining pivot bolts is incorrect. Purpose of this message is to reduce the installation torque and at the next PMS II require application of corrosion preventative compound on all aircraft and replacement of SS5092-12 and -14 nuts with MS21244-12 and -14 nuts on certain UH-60L and MH-60K aircraft. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning one-time and recurring daily inspection of thrust idler assembly on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-95-ASAM-01, 132230Z Dec 94). Summary: Recent field reports indicate that thrust idler assemblies, P/N 145C1408-1, are being discovered with bent inboard arms. At least one case of inflight failure has occurred, which resulted in a loss of engine/rotor droop anticipation. The thrust idler assemblies are not loaded laterally during their normal mode of operation and, consequently, are not designed to withstand abnormal lateral loading. Drawings will be changed to reinforce the thrust idler assembly. Purpose of this message is to require a one-time and recurring daily inspection of the thrust idler assembly for bending and cracking. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

What is the good of experience if you do r

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In this issue:

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- Looking ahead through FY 95
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- Aviation safety seminar
- New Aviation Tool System (NATS-95)
- STACOM
- Telephone area code change
- Delay in fielding TC 1-210

Class A Accidents through December

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1		2	
	February	2		0	
	March	0		0	
3D QTR	April	5		2	
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	21	1	11	0

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Thomas W. Garrett
Brigadier General, USA
Commanding General
U.S. Army Safety Center

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
February 1995 ◆ Vol 23 ◆ No 5

"You're on fire! Get out, get out, GET OUT!!!!"

Words we hope you never have to hear, but you could. And if you do, you will have no time to waste. Seconds could mean the difference between living and burning to death.

In this issue of FlightFax, one pilot recounts the most horrifying 18 seconds of his life—18 seconds from the time he knew his aircraft was on fire until he bailed out and ran, his flight suit smoking, from the inferno that had been his AH-64.

From out of the fire!

PC: "Lieutenant, before-landing check, please."

PI: "Hold on, let me grab the checklist. Okay, weapons systems safe."

PC: "Safe and off."

PI: "Tail wheel locked."

PC: "Tail wheel locked."

PI: "Parking brakes released."

PC: "Handle in and verified."

PI: "TADS/PNVS, anti-ice off."

PC: "Off in the back; verify in front."

PI: "Front's off."

PC: "Okay boss. I've got the FARP out the left. Leads on it and turning. Everything looks good. We'll be going into point four. Remember the log pile they briefed, so keep an eye out for it."

PI: "I think I've got it in sight. Should be no problem."

Chalk 3: "35 this is 55. I'm going to go ahead and scoot on over to point four and give you guys three. That way you don't have to worry about the woodpile."

PC: "'Roger, we've got it.' Okay lieutenant, everything looks good. Watch for the ground guide and keep me off of the grounding rod."

PI: "No sweat, looking good. Roll forward about a foot."

PC: "Okay, if you'll block, I'll set the brakes."

PI: "Blocking."

PC: "Brakes set. I have the flight controls."

PI: "You've got 'em."

PC: "Number two is back at idle. Okay, I'll monitor refueling. Start putting all your notes together so we can debrief the guys as soon as we get back. I'll go through mine too. HOLY S___!"

PI: "What's the matter???"

Chalk 3: "Skip, you're on fire. Get out, get out, get out!"

PC: "Get out'ta here lieutenant. We're on fire! Get out!"

This is not some fictional scenario out of a novel. How I wish that it were. Unfortunately, this was the last few minutes of a normal training flight that ended in disaster. I was the PC in the back seat.

The reason for writing this article is not to point fingers or to place blame but to give a little insight into this accident from the unique point of view of one of the pilots who lived through it. Valuable lessons were learned, and I want to share them in the hope that should you ever be involved in an aircraft fire, you will be able to respond quickly.

What caused it?

Until this accident, I had no idea that the Army had purchased an emergency breakaway connector (EBC) for the D-1 nozzle on the HEMTT tanker aviation refueling system (HTARS) or that it had been fielded and was in use. The purpose of the connector was to allow a crew to pull pitch in the event of an emergency while still refueling and have the hose separate from the nozzle in a controlled, safe manner.

It was a good idea in principle, but there was a serious shortcoming in the design of the system that allowed the EBC to be installed backwards. The locking pins were not properly seated, which allowed the coupling to back off as the refueler manipulated the hose from the stand to the aircraft and partially decouple after he attached the D-1 nozzle to the aircraft refueling port and began refueling.

*(**Editor's note:** In May of 1994 the Aviation and Troop Command issued a message stating that "effective immediately . . . use of the frangible coupling [emergency breakaway connector] in refueling operations using HTARS is no longer authorized and the coupling shall be removed from the HTARS assembly." As of this date, use of the EBC is still unauthorized.)*

When the fuel line separated at the EBC connection (not a failure of the actual EBC), between 2 and 6 gallons of fuel per second sprayed over the refueler and the running AH-64. Fortunately for the refueler, he knocked the hose down and ran backwards when this happened and this took him out of the fireball when the fuel ignited.

The HEMTT crew got the fuel shut off in a matter of seconds, but too much fuel was already on the aircraft and on the ground. When fuel sprayed up into the rotor system, it atomized, forming a vapor cloud. Whether it was an engine or an electrical spark or some other source, something ignited the fuel. There was no actual explosion, but the entire forward portion of the aircraft from about the engines to the nose was almost instantaneously engulfed in flame.

How did we deal with it?

When I first saw the fuel spraying all over the cockpit, all I could think was "this can't be happening." I looked out the right canopy in utter disbelief—it was completely obscured by fuel running down it. I remember looking up and over to the left as I followed the trail of spraying fuel. It was just as bad on the left side. Even as I muttered a few choice expletives, one of the guys in another aircraft was on the radio telling me I was on fire and to get out. In the time it took me to turn my head back to the right, fire was already spreading from the right wing forward. I still can't believe how fast it started—a matter of only seconds.

I told the lieutenant in the front to get out. I grabbed the power levers and pulled them off, shut the fuel switches off, and initially turned the battery switch off in my hurry to get out. I immediately turned it back on as I remembered the warning in the dash 10 about leaving it on in the event of an emergency egress with the rotors turning. (This is to keep the magnetic control brakes functioning so the rotor system doesn't flop around as you're trying to get away from the aircraft.)

I took an extra second or two to glance at the cockpit instruments and switches to make sure that I had done everything I could to shut the aircraft down and minimize any chance of an explosion or the aircraft coming apart while still running and injuring someone on the ground. I looked out the left front as the pilot of the aircraft in the refueling point on my left pulled pitch. As I looked back to the right, I could barely see through the fire now and I couldn't tell if the aircraft to my right was gone or not. I could see that the lieutenant was on the forward avionics bay so I knew he was almost out.

Finding a way out

I had done all I could, now it was my turn. I made the same mistake here that most people make when they are in a hurry to get out of a cockpit in an emergency: I forgot to release my shoulder harness. I reached down to grab the door handle and in the 2 or 3 seconds since I had first seen the fire there, it was already so hot that it burned my hand right through the glove.

I threw the canopy door open, and it was instant inferno. The fire hit the open door, and it was channeled right into the cockpit, across the top inside of the canopy, and down the left side. Even if I had released my harness, at this point natural reaction wasn't going to let me go out. I remember turning my face to the left and trying to breathe and get away from the fire. It felt like my face was melting from the heat. There was nowhere to turn to get away from it. I reached up and grabbed the canopy release to let the canopy door back down. Another habit of mine is that when I turn the canopy release handle, I flip it back down so that the door will lock in the open position. This allows the door to lock in the intermediate position when lowered. When the door came down, it locked as advertised so now there was about a 3- to 4-inch-wide opening funneling the fire into the cockpit with me.

My mind was racing a million miles per hour as I tried to deal with my situation and find a way out. By now the whole right side of the aircraft was nothing but flames. I couldn't even see the ground. The left wasn't much better. I remember thinking briefly about blowing the canopy and going out the left side, but something told me not to. Looking back on it, it was the right decision. I didn't know it at the time, but the left side was burning worse than the right, and the winds were blowing from the left rear to the right front. I very probably would have flash fried if I had blown the canopy.

Probably because of the adrenaline rush, my hand was not hurting yet from the severe burn it had received. I released my harness and started to reach for the cockpit door handle again, but human nature wouldn't let me reach into that fire to close the door even though the heat was unbearable. I remember thinking "I've got to get out of here before it blows up" as I half stood in the cramped cockpit and with my right foot kicked the door to break the locking mechanism. As the door closed, I grabbed a big breath of air.

The pain from the burn on my face was intense, but that wasn't my primary concern as I looked around the aircraft, searching for an easier way out. Not finding one, I made my decision to go. Then I threw the door open and half dove, half fell out of the cockpit.

AH-64 in refueling point three (second aircraft from left) at 14:50:00.

As fuel ignited, aviator in nearby aircraft began snapping pictures. This photo at 14:51:30 was made only 1 minute and 12 seconds after CW3 Tackett ran through the fireball to safety.

This photo at 14:52:30 shows how quickly aircraft was destroyed.

Into the fire

Jumping out into that fire was absolutely the hardest thing I have ever done, but I was determined not to sit in that cockpit and burn to death. If I was going to die in the fire, then they would find my charred body trying to crawl away. I kept thinking about my wife and four sons and how badly I wanted to see them again as I hit the ground.

The heat was extremely intense, and I remember screaming at the top of my lungs as I began to really burn. As it turned out, that was exactly what I needed to do. It kept me from inhaling not only the fire and smoke but also the toxic fumes from the composites as the aircraft burned. Because of this, I had only very minor damage to one small portion of my left lung.

I half crawled and half stumbled as I tried to get my feet underneath me to keep going. Somehow in all of this confusion, I remained oriented to where "out" was and ran in the right direction. I was later told that I set the land speed record for covering distance as I came out of the fire, but I don't remember. All I knew was that I was burning and had to get away from the fire.

Making it out of the fireball

As I came out of the fire, I ran a few more feet, then stopped and started gulping air. It really felt good! I looked down at my front to see if I was on fire and needed to do the old "stop, drop, and roll." No fire. I was only smoking from my chest to my boots, and for some reason, I found this humorous. I guess it was just a relief action from making it out of the hell behind me. From the moment I knew the aircraft was on fire until I ran out of the fireball was only 18 seconds!

First reactions

I saw the lieutenant in front of me and asked him if he was okay. He looked at me and said the same thing. Neither one of us answered; we just looked at each other. The unasked question that each of us was thinking was "If he looks like that, how bad am I?"

The majority of the pain had not really set in yet, but I knew that I was burned pretty badly. My face hurt the worst. It felt like it had melted, and I could smell my burned skin and sort of see my charred nose when I looked down. I looked back at the flaming inferno behind me and couldn't believe that I had just come out of that.

What I didn't know at this point was that at least three people were trying to use the 25-pound fire extinguishers to help us out, but the heat from the fire was so intense that they couldn't get close enough for the extinguishing agent to even reach the edge of the fire. In all of the confusion, they had not seen us get out.

I started walking over to where the FARP guys were by the HEMTT. I remember feeling really weak all of a sudden, and I began to stumble as one of the other pilots came running up. He helped me over to a cot that someone had brought out of the tent for us and I sat down. He popped the chin strap in my helmet and took it off. I didn't have my visor down, but it wouldn't have mattered anyway because the third-degree burns that I received on my face were along my lower jaw and mouth. My sunglasses saved my eyes.

Unharmed skin protected by cotton underwear contrasts sharply with burns on CW3 Tackett's face, arms, and hands.

To those who helped

From this point on, everything got fuzzy. The intense pain began to set in, and my body began to shut down to deal with the injuries. There were so many people trying to help us; people literally giving the shirts off their backs to cover and protect us. All I can say to all of them who were there: the medics, those who tried to fight the fire to help us out of the cockpit, the ones who just gave us moral support, and to those who helped in ways that I don't even know about—**Thank You** from the bottom of my heart!

The end results

I received burns to 41.5 percent of my body, and 10.5 percent of those were third-degree burns. The rest were medium to deep second-degree burns. The lieutenant had medium to deep second-degree burns on 21 percent of his body with 3 percent third-degree burns.

Thanks to our *leather* boots, our feet were not burned at all. With the exception of our faces, the majority of our burns were on the back part of our bodies where the Nomex was pulled tight either as we were exiting the cockpit or as we were getting up from the ground.

My chest, back, and buttocks were spared from any burns at all due to the cotton underwear that I had on. The burns literally went to where the underwear was and stopped.

The bottom line is this: If I hadn't been wearing my Nomex protective equipment and wearing it properly— Velcro fastened, collar up, rings in the pocket, and so forth—there is no doubt in my mind that I would very probably have either died in the fire or died as a result of the burns I would have received. Luckily enough, I was wearing an almost new flight suit and had just DX'd my gloves with all the fingers hanging out for new ones just before going to the field. It truly paid off.

The lieutenant and I were extremely lucky to have survived this ordeal. According to the experts at the burn center, another 3 or 4 seconds and we very probably would not have been able to get out. The lieutenant is back at work now and flying. For me, it will take a longer time to recover. Unfortunately, there will be some things that we will never recover from such as an extreme sensitivity to heat and cold—but we can live with that!

It can happen to you

No amount of training can prepare you for a situation like the one we had to face, especially when there are no emergency procedures that deal with an almost instantaneous total envelopment of the cockpit by fire. But that doesn't mean that it can't be dealt with **quickly** and professionally. The key is not to panic. Let the survival instinct take over, and do what you have to do to get out. Keep going and never quit!

I hope this account of my routine refueling that went bad has caused you to think about what you would do in a similar situation. And hopefully you won't make the mistake of thinking it couldn't happen to you. All it takes is the blink of an eye to go from "it can't" to "it did." Learn from our experience. Trust me, you wouldn't want to have to experience this for yourself.

POC: CW3 Boyd A. Tackett III, B Company, 1-502d Attack Helicopter Battalion, Fort Hood, 817-539-5745

The Army Safety Center is in the process of producing a video of CW3 Tackett recounting the events leading up to and causing this AH-64 refueling accident, lessons learned, and his personal struggle to recover from the burns he received. As soon as copies have been distributed to audiovisual libraries, we will publish the product identification number and FlightFax video number so that you may acquire a copy for use during your next safety briefing.

Close calls and near-miss accident info needed

This is one of those good news, bad news stories. The good news is that over the last few years, we (make that you) have driven the accident rate down and lives are being saved and equipment protected that only a few years ago would have been lost. The bad news is that because the accident rate is down, it is becoming harder for us to discover trends and develop proactive programs to prevent further losses of people and equipment. The gross trends of the past just aren't there anymore. At times, we find ourselves trying to perform a trend analysis based on one or two accidents. Needless to say, this does not provide an effective data base from which to draw conclusions and implement prevention programs.

In our analysis of current accidents, we are down into second- and third-order effects—the real subtleties. And even in analyzing accidents to greater degrees, we are still being reactive, not proactive and ahead of the power curve. We are not spotting problems and correcting them before they become an accident. By no means are we advocating that we need more accidents in order to develop lessons learned and implement prevention programs. Information is readily available; we just have not capitalized on it.

Academic studies have shown that for each serious accident, 59 minor accidents and 600 near-misses occur (*Management Guide to Loss Control*, Frank E. Bird, Jr. Institute Press, Atlanta, 1974). Imagine the benefit that could be gained from the lessons learned in those 600 near-misses.

Sharing lessons learned

Other services, for example the Navy, have means for their pilots to share lessons learned from their missions that almost went wrong. Navy pilots write to *Approach* magazine and tell their "there I was," "this happened to me" stories so that other people can benefit from them.

From comments, it appears that pilots everywhere like to read about those death-defying events. Probably a lot of Army aviators can even relate to some of those precarious situations. They, on the other hand, may not have shared their experiences because of concern about repercussions or just simple pride.

In the profession of arms, we are all charged with the responsibility to mentor subordinates. Young members of the aviation team listen when the old aviators speak. They realize that they have not experienced every situation and probably will not get the chance to during their aviation career. Granted, aviators learn through hands-on experience and repetition; however, with dwindling resources, "there I was" talks may be the only experience upon which to base a decision.

We have all heard the saying "There are old aviators and there are bold aviators, but there are no old, bold aviators." This may stem from the fact the old aviators lived through enough close calls to develop respect for the profession and the ability to recognize their individual limitations. "There I was" stories could help fellow aviators vicariously experience difficult situations without the risk of injury.

Fixing the problem is more important than affixing the blame.

—Anonymous

Accident prevention—the next level

The time has come to take accident prevention to the next level. We are trying to capture the valuable lessons from near accidents and share them with others so that they, too, can learn from the close calls or near-misses that are occurring in our daily operations.

A recent survey of aviation brigade commanders showed unanimous support for this effort. However, when I recently addressed students in an Aviation Safety Officer Course, there was some concern about repercussions. We need and intend to do this in a way that pilots and crews will feel secure enough to tell their stories without fear of reprimand or self-incrimination.

Ways of capturing needed info

■ *Operational hazard report (OHR)*. There are already successful reporting programs out there such as the OHR. We do not want to increase the official reporting burden, but we do encourage you to continue to use the already-established process and submit OHRs. However, two problems are readily apparent with using the OHR system to report close calls and near-misses.

The OHR program is set up to be handled at the lowest level of command that can correct the identified hazard. As a result, the rest of the Army aviation team does not benefit from the information contained in the OHR. One course of action could be to forward the completed OHR to the Safety Center where a data base could be established, especially when there are Armywide implications.

The other problem area centers around the fact that crews are often reluctant to submit a formal report such as the OHR if the close call or near-miss was a result of their own error. Sometimes the prevailing attitude is that we didn't have an accident, so why tell on ourselves and risk any repercussions?

■ ***New FlightFax forum***. In an effort to capture lessons learned, the Safety Center is establishing a "There I Was" forum in *FlightFax* similar to the one used in the Navy's *Approach* magazine

The purpose of the stories is not to incriminate you or question "Why did you do that?" or "Why didn't you do this instead?" Second-guessing your actions is up to you. By sharing your experiences—the what, when, where, why, and how of the accident that almost happened but didn't—you can assist others who might find themselves in similar situations. We just want other members of the aviation team to benefit from the lessons you learned the hard way.

Do you have a story to tell? If so, we would like to hear from you. Don't worry about the grammar, style, punctuation, and so forth. We'll help you. Just send us your story, along with your name, address, and a telephone number where we can reach you if we have any questions about your story.

If you have a story to tell but don't want your name associated with it, we understand. If you want anonymity, just tell us so. We'll respect your request and withhold your name from the article. However, be sure to include your name and phone number so we can contact you if we have any questions and to give you the opportunity to proof the story prior to publication.

Close calls and near-miss scenarios can take us to the next level of accident prevention. The effectiveness of this program will depend upon the level of participation by the aviation community. We are even looking for your feedback on how to get those close calls and near-miss stories, videos, and so forth coming in.

If you, too, want to be proactive in accident prevention, send your stories and ideas to Commander, U.S. Army Safety Center, ATTN: *FlightFax* (Ms. Jane Wise), Fort Rucker, AL 36362-5363. If you prefer to talk one-on-one about your story before writing and submitting it, please call DSN 558-3770 (334-255-3770).

—MAJ James Dunn, USASC Aviation Branch, DSN 558-3754 (334-255-3754)

Need good safety training material? Try a video!

Safety videos presently available at local audiovisual support centers are valuable training aids. They are designed to stimulate discussion in unit safety meetings and to lead to self-examination not only by individual aviators but by the unit as a whole.

The following are synopses of the aviation safety videos that have been distributed to audiovisual information libraries throughout the Army. You may obtain a copy by contacting your local audiovisual library.

Crashfax videos

■ **UH-60 Midair** (CFV 46-1, PIN 707996). A re-creation of the midair collision of two Black Hawks during a night vision goggle training mission. All 7 crewmembers and 10 soldiers on board the 2 aircraft were killed. The absence of evasive action by either crew indicates they never saw each other.

■ **High-Risk Aviator** (CFV 46-2, PIN 707997). Re-creation of the events leading up to the crash of an OH-58 into a lake. The warning signs were there that this pilot was a high-risk aviator, but he was allowed to continue to fly until the inevitable happened and he was killed in a crash.

■ **Surviving in the Wire Environment** (CFV 46-3, PIN 708002). This video is targeted at air mission leaders and operational pilots. It focuses on five key wire strike prevention actions and the importance of strict adherence to standards.

■ **Good Pilots, Bad Decisions** (CFV 46-4, PIN 708405). Re-creation of an accident caused by experienced pilots who decided just once not to fly by the standards. This decision to abandon their professionalism and give a group of soldiers a "ride to remember" cost 10 people their lives.

■ **Performance Planning: What the Aircraft Can and Can't Do** (CFV 46-5, PIN 708403). This video shows the results of poor performance planning in two helicopter accidents: a UH-1 accident in which the pilot misfigured performance data and a CH-47 accident in which the pilot used the wrong charts. The dangers of ignoring established safety practices and the importance of correctly filling out the log are also emphasized.

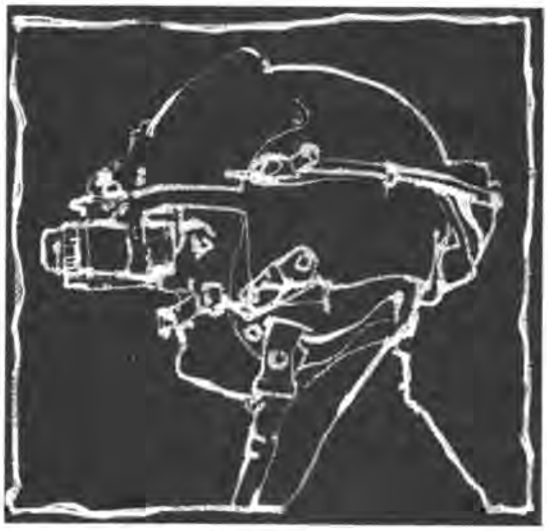
■ **Performance Versus Reality** (CFV 46-6, PIN 710612). This video is an actual crash of a CH-47 helicopter while landing in a mountainous area. Although a reconnaissance had been made of the site, the pilots had been given the wrong information. The area had burned, and water had been dropped on the site to keep down dust while landing, causing a lack of contrast the pilots could use for visual cues. This video shows the importance of an effective landing reconnaissance and how contrast can distort slope perceptions.

NVG videos

■ **Flying Goggles: A Special Report** (TVT 46-14, PIN 707999). This video is targeted at operational pilots and focuses on NVG capabilities and limitations. It is intended for use in unit training programs.

■ **Critical Procedures for Night Vision Goggle Training** (TVT 46-15, PIN 708000). This video is targeted at aviation unit commanders and focuses on the development of a night operations SOP for a typical UH-60 unit.

■ **NVG Distortion Evaluation** (TVT 46-18, PIN 708321). Although this video was developed to aid those performing a one-time evaluation required by an AVSCOM



message, aircrews can also benefit from viewing it. The video shows examples of actual distortion as seen through goggles. This footage can be helpful in judging what is and what is not acceptable distortion.

■ **Aviation Night Vision Goggle Operations—Desert Environment** (TVT 46-62, PIN 708404). This video demonstrates low-level and NOE flight operations in a variety of desert conditions. It also illustrates essential mission planning, to include risk assessment and the identification of specific hazards. Included in the video are flight demonstrations over three different types of desert terrain. The video also emphasizes the need to follow all safety precautions when flying low level as well as NOE.

Other videos

■ **Crew Error in Night Rotary Wing Accidents** (TVT 20-943, PIN 709224). This video identifies major causes of night rotary wing aircraft accidents. Four major operational situations are emphasized in which crew-error accidents occurred:

- Improper scanning
- Improper decision making
- Improper crew coordination
- Improper scanning and crew coordination

Four common factors emerge from these crew errors and operational profiles:

1) The primary crew failure is when the pilot on the controls stops scanning to focus attention either inside or outside the aircraft and fails to coordinate with other crewmembers to maintain obstacle clearance.

2) Most accidents occurred while operating at low altitude: hover, taxi, landing, or en route at terrain flight altitudes.

3) Most accidents occurred when illumination was low, and more than half happened when environmental conditions such as haze, dust, fog, rain, and snow were present.

4) Accidents experienced en route in terrain flight showed median altitude has decreased without a corresponding decrease in airspeed.

■ **Desert Shield Mobilization Safety Lessons Learned** (TVT 20-952, PIN 709291). In the first 3 months of Operation Desert Shield, accidents caused death and countless injuries to soldiers. The fast-paced start-up climate of Desert Shield began when the mobilization started. This video emphasizes the importance of using safety measures in all activities during mobilization in a desert environment. Actual safety lessons learned during Operation Desert Shield are depicted. Statistics show that 80 percent of all accidents are caused by human error, and supervision is the key to preventing human error.

■ **Eliminating the Avoidable Accident** (TVT 46-145, PIN 710219). In this roundtable discussion video, MG John D. Robinson, (former) Commander of the U.S. Army Aviation Center and Fort Rucker, is joined by other leaders within the aviation community in a discussion of the causes of many Army aviation accidents. Drawing from their own personal experiences, leaders discuss specific incidents and accidents and make recommendations on how the accidents could have been avoided.

■ **Army Safety Leadership on Risk Management** (TVT 20-1012, PIN 710271). In this video, BG R. Dennis Kerr, (former) Director of Army Safety, and CSM Samuel R. Reynolds, (former) Sergeant Major of the Army Safety Center, discuss the basics of risk management and how they apply to today's smaller Army. This video is designed to help commanders understand what risk management is and how to use it to make their commands safer. The video also shows how accidents can happen when risk management is not used.

■ **Safety Alert: UH-60 Fuel Boost Pump Operation** (TVT 20-1040, PIN 710601). This video provides information on outgassing, which occurs when air in fuel is released, in the UH-60. This released air can collect in fuel lines, creating large bubbles. Under the right conditions, these bubbles can cause the engine boost pumps to cavitate (outpressure drops to zero), resulting in fuel interruption that can cause an engine to flame out regardless of what type fuel it's burning. Explained in the video is an interim fix for the problem and a possible long-term solution.

Coming soon

■ Video on AH-64 refueling fire with pilot recounting events leading up to and causing the accident, lessons learned, and his personal struggle to recover from burn injuries received in the fireball.

■ Video on inadvertent IMC. The presentation is based on an OH-58 that went into inadvertent IMC and crashed, killing both crewmembers. Also addressed in the video are five Cs—control, coordination, clearance, course, and call—to help aviators handle those first critical seconds of flight into IMC.

These videos and many others are available and easily accessible from your local audiovisual library. Don't miss out on these valuable training aids and the beneficial discussions that result. When planning your next unit safety meeting or safety standdown, remember the videos. ❑

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class C

H series - During ILS approach under IMC, engine chip light illuminated at 3,000 feet AGL and engine failed at 1,000 feet AGL. Crew autorotated aircraft into field, and aircraft landed hard.

H series - Aircraft was at 8,400 feet MSL during troop insertion into LZ when pilot received radio call from troops on ground informing him that LZ was at his 2 o'clock position. On short final with near-zero airspeed, PC started right pedal turn. When PC tried to stop turn with left pedal, aircraft continued uncommanded right turn. PC raised collective to miss obstacles and rotor began to bleed off. PC then reduced collective, began descent into trees, and applied collective to cushion impact.

UH-1 Class E

H series - While performing contour flight to field site, complete hydraulics failure occurred. Aircraft was not in level attitude, and crew elected not to immediately pull hydraulic control circuit breaker. While positioning aircraft to level attitude, hydraulic power was restored. Crew decided to make running landing to nearby suitable area in desert. While on short final, hydraulic power was once again lost and crew experienced cyclic feedback which they misinterpreted as a cyclic hardover. Crew initiated emergency procedure for cyclic hardover and completed landing without further incident. Maintenance discovered hydraulics elbow tube had failed, causing loss of hydraulic fluid.

H series - While on approach, PC felt feedback through cyclic control. Feedback increased and PC completed landing without delay and shut down aircraft. Inspection revealed that the servo retaining nut located at the base of the servo had come loose, backing off the threads. It appeared that the locking tang washer used to safety the retaining nut had not been bent into place during manufacturing or remanufacturing.

H series - During MTF for completion of compressor-stall inspections, MP was performing baseline TEAC with 50 pounds torque applied, N1 at 99.5 percent, EGT at 525°C, pressure altitude of 2,000 feet, and climbing at 1,500 to 2,000 feet per minute when aircraft experienced apparent compressor stall/overtorque. Due to severity of torque fluctuation and aircraft yaw, MP was unable to get N1 and EGT indications during incident. Although torque fluctuated between 46 and 54 pounds, crew landed aircraft without further damage. Inspection revealed loose P3 air line that had been repaired prior to flight.

UH-60 Class A

A series - Aircraft crashed for unknown reason in wooded area. Postcrash fire occurred. One fatality.

UH-60 Class C

A series - During medevac mission, crew initiated approach to field landing zone. After landing, crew chief noticed that aircraft was sitting tail low. Believing that tail wheel was in rut, crew elected to move aircraft. After aircraft was lifted to hover, crew chief saw damage to tail wheel. PC elected to proceed to area where landing could be accomplished with crash crew available. Postflight inspection revealed failure of the tail strut.

A series - During loading of VIPs, APU compressor section came apart and compressor blade punctured skin of aircraft.

UH-60 Class D

A series - During door gunnery at range complex, M-60D jammed every 20 to 30 rounds. Crew decided to change weapons. After aircraft landed, crew got out of aircraft and took malfunctioning weapon off mount. Later crew moved weapon, which had not been properly cleared, safetied, and rodded before being taken off mount, and weapon fired. Crew confirmed that discharge was inside aircraft and directed up toward No. 1 engine. PC decided to shut down aircraft where it was. During shutdown, No. 1 engine did not respond to power control lever movement. PC then shut off fuel to No. 1 engine, waited for it to quit, and completed aircraft shutdown. No injuries.

A series - On takeoff from confined area, aircraft rotor blades struck tree.

A series - Drive shaft was removed and hardware was placed inside drive shaft. Different mechanic installed drive shaft and did not know hardware was inside. Aircraft was run up, causing damage to inside of drive shaft.

UH-60 Class E

A series - During MOC, starter failed to disengage, causing shaft to shear and oil to blow out of starter. Oil ignited upon contact with engine. Crew extinguished fire with onboard equipment.

Attack

AH-64 Class C

A series - Pilot practiced out-of-ground-effect hovering turns and unmasking maneuvers for 20 minutes, then PC took controls and accelerated to 100 knots at 50 feet AGL heading east. PC then executed left climbing turn to about 200 feet AGL heading west, allowing airspeed to decrease to about 60 knots. PC continued left turn and pitched nose of aircraft down to gain airspeed. His intent was to make continuous descending left turn to east to terrain flight altitude. Midway through descending and accelerating left turn, pilot became concerned about high rate of descent and high closure rate and announced "watch out for the trees." PC applied power and pulled nose of aircraft up to stop rate of descent, but aircraft continued descent and struck several trees. Crew completed landing about one-half mile from point of tree strike.

AH-64 Class E

A series - For about 60 seconds during cruise flight, strong smell of melting plastic entered cockpit through environmental control unit. TADS electronic unit had failed 30 minutes earlier. Smell dissipated, and crew aborted mission. No caution or warning lights illuminated. Inspection revealed environmental control system was defective.

A series - During cruise flight at 500 feet AGL and 100 knots, No. 1 engine nose gearbox oil PSI segment light came on. Crew cross referenced fault detection location system to verify gearbox was losing oil. Crew brought engine to idle and flew about 14 kilometers before making precautionary landing.

A series - Aircraft was in cruise flight when CPG's TADS made uncommanded slew to -60 degrees in elevation. CPG unsuccessfully attempted to regain control of TADS. PC in backseat confirmed with CPG that no caution/warning lights had illuminated at any time. Crew returned aircraft to home base and completed shutdown without further incident.

Cargo

CH-47 Class C

D series - While four-wheel taxiing, right rear landing gear collapsed. Drag brace failed. Aircraft was recovered by maintenance.

CH-47 Class E

D series - On downwind leg of traffic pattern, crew heard noise, followed by severe aft transmission oil leak. Crew completed landing in field. Investigation revealed failure of aft transmission oil cooler fan. Maintenance replaced assembly and quill shaft, cooler fan, and cooler assembly.

D series - During test fire of M-60D machine gun in flight, gun malfunctioned twice. Each time crew chief cleared weapon, removing a round each time. Following third malfunction, crew chief opened feed tray, did not see round, closed feed tray, and removed weapon to cargo area floor. During aircraft shutdown, crew chief tried to pick up weapon but bipod was caught on some equipment. Crew chief tugged on weapon and it discharged. Round penetrated floor and exited bottom of aircraft.

D series - Heater was on, and smoke started coming from heater compartment. Crew turned heater off, but it continued to glow red. Crew completed landing, shut down aircraft to allow smoke to dissipate, and flew aircraft back to base.

D series - Flight of five CH-47Ds were on approach to land at parking area. Landing area was not large enough to accommodate all aircraft at one time. Therefore, Chalk 1 extended approach to land on taxiway behind parked aircraft. After landing and taxiing to parking and shutting down aircraft, Chalk 3 informed Chalk 1 that CH-47 blade box sitting near taxiway had been blown around while Chalk 1 and 2 were on short final.

Observation

OH-6 Class E

A series - After conducting normal start, runup, and two successful deceleration checks, crew reduced throttle to idle stop and engine quit. Fuel was JP-8 and OAT was about 15°F. Crew completed remaining shutdown checks without incident. Maintenance replaced fuel nozzle and inspected main fuel filter and fuel control and inlet screen. Engine flamed out again during MOC. Maintenance then replaced fuel control and tightened air lines. Engine operates within limits.

J series - Aircraft had been performing numerous nonstandard manuevers as part of instructor pilot course. After last low-level autorotation, aircraft had come to complete stop. Upon attempting to hover, aircraft left rear strut broke. Apparent metal fatigue.

OH-58 Class B

D series - While hovering on ramp, aircraft nose pitched up and tail rotor struck ground. Aircraft started spinning, and pilot initiated hovering autorotation. Aircraft sustained damage to belly and tail rotor.

OH-58 Class C

D series - During daily inspection, maintenance personnel found damage (wrinkling) to all four main rotor blades. Aircraft had last been flown for p.m. contact training during which IP had been performing autorotations.

OH-58 Class D

D series - While performing zone reconnaissance at 50 feet AGL and near-zero ground speed, PC instructed pilot on controls in right seat to orient aircraft from south to west. While making right pedal turn, aircraft entered right crosswind condition. Pilot then pulled collective and added left pedal to prevent aircraft from descending into trees. Aircraft's multifunction display (MFD) showed "high torque time" caution message with simultaneous audio caution. PC read message to pilot. Pilot continued to increase collective. Aircraft MFD displayed warning audio. Pilot completed normal landing and shutdown. During shutdown, PC noted 118 percent mast torque and 131 percent engine torque.

Fixed wing

C-12 Class C

F series - While on descent during authorized service mission, aircraft was struck by lightning. Crew was unaware of strike until aircraft was inspected at home station. Inspection revealed arc tracings on both propellers, left outboard wing flap, right aileron, static discharge wick on right elevator, weather radar antenna, and radome.

C-12 Class E

D series - During rollout, aircraft developed severe vertical vibration that worsened as airspeed decreased. Crew stopped aircraft on runway. Postflight inspection revealed missing torque knee retaining bolt on right main landing gear.

OV-1 Class A

D series - Aircraft was returning to base after experiencing radio failure. During descent, aircraft suffered total electrical failure, followed by dual-engine failure. Both crewmembers successfully ejected, and aircraft crashed into field.

OV-1 Class B

D series - During MTF landing, engine thruster failed. Aircraft landing gear collapsed, damaging undercarriage and propellers.

OV-1 Class D

D series - During runup check, aircraft brakes released. Crew attempted to reset brake. Left pedal went full forward. Pilot noticed flame out left side of aircraft and alerted TO. Crew exited aircraft on right side. Crash rescue arrived and put out fire. Metal-to-metal contact from interior brake pucks caused brakes to overheat. Hydraulic fluid on brake assembly ignited, causing tire to burn.

OV-1 Class E

B series - During reverse thrust check, NR No. 2 propeller reversed properly but feathered upon returning power lever to forward thrust position. Crew repeated check with the same result. Crew returned aircraft to parking and shut it down without further incident. Investigation revealed malfunctioning solenoid.

D series - During start of second engine, crew chief saw smoke coming from engine and signaled for pilot to abort start. PC executed emergency shutdown. Inspection revealed propeller mag plug had been installed improperly, causing propeller fluid to be ingested into engine.

D series - After takeoff, pilot attempted to contact departure control on both UHF and VHF radios. PC was unable to contact any controlling agency on either radio, squawked lost commo code, performed entry into traffic pattern under lost commo procedures, and completed normal landing without further incident. Inspection revealed that when radios had been replaced the day prior, antenna leads had been connected improperly.

Flight related

UH-60 Class C

L series - As part of company NVG air assault, PC initiated slingload procedure for M1025 HMMWV. Aircraft landed next to load and picked up three passengers. Ground crew hooked load, and aircraft ascended to 40-foot hover for power check. Aircraft stabilized at 108 percent for about 15 seconds. PC pulled in torque of 116 percent, below maximum torque available, to sustain hover. This caused rotor RPM to decay, and low rotor audio sounded. PC descended aircraft to regain rotor RPM. At 30 feet, rotor RPM was still decreasing so PC instructed pilot to release load. Pilot verified PC's intentions and released load. Vehicle dropped about 15 feet. PC landed aircraft without further incident. Crew chief and door gunner inspected load and noticed damage to HMMWV.

CH-47 Class A

D series - During night tactical training multiship fast-rope exercise, flight crews inserted assault troops into densely wooded area with heavy undergrowth rather than into designated helicopter landing area. As troops attempted to descend through trees, soldiers struck trees and sustained multiple injuries. One fatality.

CH-47 Class E

D series - While ground crew was attempting to hook up slingload, aircraft descended, pinning one soldier between belly of aircraft and slingload. Second soldier was injured while jumping clear of or falling from vehicle.

Messages

■ Aviation safety action informational message concerning procedural change for all Army aircraft to aircraft records processing when aircraft is transferred between activities (GEN-95-ASAM-02, 251505Z Jan 95). Summary: Due to a lack of adequate instructions and complicated requirements, records are being lost or destroyed when aircraft are transferred. This message clarifies and simplifies record processing for transferred aircraft and will remain in effect until the next revision of DA Pam 738-751: Functional Users Manual for the Army Maintenance Management System-Aviation (TAMMS-A), 15 June 1992, is published. The records for aircraft being transferred or reclassified will be processed per this ASAM. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning change in retirement life for servo beam rails, P/N 70209-22103-050/052/054/056 for all EH/UH/MH-60A/L aircraft (UH-60-95-ASAM-05, 231334Z Jan 95). Summary: The overhaul/retirement life table in TM 1-1520-237-23 presently lists the P/N 70209-22103-050/052/054/056 servo beam rails as retirement-life items. The purpose of this message is to change the overhaul/retirement life table and to implement a recurring inspection to be conducted during PMS 2. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning one-time torque verification of the nuts securing the No. 1 and No. 2 power transfer unit (PTU) motor/pump, P/N 145HS140-8 on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-95-ASAM-02, 18002Z Jan 95). Summary: An inspection at Boeing Helicopters revealed that the nuts securing the motor to the pump on the PTU, P/N 145HS140-8, were not properly torqued. Loose motor/pumps could possibly cause cracks in the unit and eventual component failure. The purpose of this message is to perform a one-time torque on the four nuts (figure 219, item 48 of TM 55-1520-240-23P for CH-47D and MH-47D aircraft and figure 7-20, item 48 of TM 1-1520-252-23P for MH-47E aircraft) on the PTU motor/pump to 85 inch-pounds and provide a torque value for the nuts. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of OH-58D directional control tubes on all OH-58D aircraft (OH-58-95-ASAM-03, 251559Z Jan 95). Summary: Army personnel at Fort Bragg have found a directional control tube in the nose of the aircraft to be chafed where the tube passes through a web. Twelve aircraft were inspected. Four control tubes have chafing through the paint and into the tube. The purpose of this message is to require inspection of the directional control tubes—items 13 and 14, figure 183 of TM 55-1520-248-23P—located in the nose of the aircraft and maintain aircraft safety. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

Our job is to develop bold audacious leaders, competent enough to know the difference between risk and gamble...

—LTG Gerald T. Bartlett

In this issue:

- From out of the fire!
- Coming attraction! (video)
- Close calls and near-miss accident info needed
- Need good safety training material? Try a video!

Class A Accidents through January

		Class A Flight Accidents 94	Class A Flight Accidents 95	Army Military Fatalities 94	Army Military Fatalities 95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2		0	
	March	0		0	
3D QTR	April	5		2	
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	21	2	11	1

U.S. ARMY SAFETY CENTER

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Thomas W. Garrett
Brigadier General, USA
Commanding General
U.S. Army Safety Center

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
March 1995 ◆ Vol 23 ◆ No 6

With little or no warning, the visual cues disappear. You're in the milky white. Instantly, you feel your stomach muscles tighten: you know that flight into adverse weather conditions poses risks even for instrument-proficient pilots. Not a good time to realize your instrument flight skills are less than what they should be. But without hesitation, you transition to instruments because you also know that thinking you'll soon break through the milky white uses up precious seconds you can't afford to lose.

The next time you're tempted to press on into marginal weather, think carefully. Is the mission important enough that the potential benefits of accomplishing it outweigh the risks? If so, are you instrument proficient . . . are you confident in your abilities as an instrument-rated pilot? If you do go inadvertent IMC, you'll need INSTRUMENT FLIGHT PROFICIENCY and CONFIDENCE to get out of the clouds safely.

Inadvertent IMC

The February 1994 issue of *FlightFax* provided an analysis of inadvertent IMC-related accidents over the last 20 years.

A quick recap—

- From January 1974 through January 1994, the Army experienced 50 Class A through C rotary wing accidents involving inadvertent IMC.
- Of these 50 accidents, 40 (80 percent) were Class As.
- UH-1 and OH-58 crews experienced most of the accidents with 17 each.
- Of the 50 Class A through C accidents, 36 (72 percent) were at night.

Accidently flying into clouds continues to be a significant cause of Army flight accidents. In the last 5 years alone, IMC-related accidents have accounted for 23 fatalities and destruction of more than $20 million worth of equipment. What does all this mean to you? Flying is serious business, and if you are going to fly an aircraft when weather conditions are marginal VFR, you absolutely must be proficient and confident in your abilities as an Army aviator.

IMC accident scenario

Most IMC-related accidents tend to occur during one of three flight scenarios: aircraft encounters clouds at flight level, aircraft flies into ground fog, or aircraft flies into heavy rain. The following IMC-related accident involves an OH-58 aircraft that encountered clouds at flight level, and as too often happens, it was fatal.

The attack battalion had just completed a battalion deep attack. After the deep attack, the unit returned to a civilian airport to conduct refueling operations prior to recovering to the unit's tactical assembly area. While at the airport, weather information was updated with the forecast calling for a broken cloud layer at 1,500 feet and an overcast cloud layer at 2,500 feet with 7 miles' visibility in rain.

The unit organized into four flight groups for the return flight. The first three flights were AH-64 companies with three OH-58s making up the fourth flight. With a 5-minute separation between flights, the groups began departing at 2100. At 2130, the lead Apache company encountered weather conditions that forced it to break up momentarily. As the flight reassembled and alerted follow-on flights of the weather conditions, the lead flight encountered improving conditions and continued eastward. The improving-weather-condition information was also relayed to the remaining three flights and subsequently to the chain of command.

As the lead Apache company continued to fly eastward, they encountered a fog bank and all three Apache companies diverted to a nearby civilian airfield and terminated the mission. The OH-58 flight monitored the transmission and continued the flight. As the OH-58 flight approached the same general area where the lead Apache company had encountered the deteriorating weather and the ceiling and visibility started to decrease, the flight slowed to 60 knots. As collective was increased to climb over a ridge, the IP of the lead OH-58 was heard to announce to the flight, "I am IMC."

The aircraft was observed on radar turning toward the north at an altitude of 2,200 feet MSL, squawking 7700 emergency code. Air traffic control tracked the aircraft as it climbed to 4,000 feet MSL where it remained for approximately 5 to 10 seconds. The aircraft then entered a high rate of descent with a ground speed below 30 knots. The slow forward ground speed prevented radar tracking of the aircraft heading. As the aircraft descended in altitude, the IP transmitted in a highly stressed voice, "I have the controls." The aircraft continued its descent and impacted the ground in a nose-down, left-side-low, left-yaw attitude and disintegrated upon impact, killing both crewmembers.

Lessons learned

- *The five Cs.* Several years ago, someone established a procedure to help aviators handle those first critical seconds when an aircraft flies into IMC: **Control**, **Coordination**, **Clearance**, **Course**, and **Call**. The five Cs of IMC as the procedure is known also include those actions specified in the acronym **AHTA**: **Attitude**, **Heading**, **Torque**, and **Airspeed**. This procedure gives the pilot something to follow when confronted with inadvertent IMC.

Control

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. The other four Cs depend upon the successful accomplishment of the first C, control.

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.

Coordination

Before a flight begins, the crew should discuss what each will do in case of unplanned entry into IMC. It should be understood that the pilot on the controls will concentrate on flying the aircraft by referencing the instruments. The pilot not on the controls should monitor the pilot flying the aircraft and look outside the aircraft for VFR conditions and obstacles.

While we are talking about things that should be accomplished prior to flight, this is probably a good time to mention preflight and runup of the aircraft. In the OH-58 accident, the fuse in the ADF receiver was blown. It is quite possible that the fuse was blown during the crash sequence. However, if the weather is marginally VFR or less, your onboard navigational equipment just may be the difference between living and dying. Check it before you leave the ground.

Clearance Climb straight ahead to an altitude that will provide clearance over the highest obstacles along the route of flight.

Course Select the appropriate heading and turn to it. The heading you turn to will most likely be dictated by the IMC recovery procedures at your installation. The accident aircraft turned to the north although the recovery airfield was 23 nautical miles to the southeast. The most likely explanation for the pilot's behavior is that he was attempting to rejoin the other flights at the civilian airfield to the north. The frequency found displayed in the automatic direction finder (ADF) receiver was the nondirectional radio beacon frequency for the beacon at the civilian airfield. It is noteworthy that this particular civilian airfield is not listed in the DOD FLIP publication.

Call Make any required radio calls for assistance or advisory.

■ ***Training***. The five Cs provide tools to assist you in coping with inadvertent IMC, but tools alone will not provide you with the confidence you need in your abilities. That confidence can come only through training.

Training to be proficient at coping with inadvertent IMC flight is probably the single most important thing you can do to ensure your survival during an IMC encounter. The intent here is not to debate the issue of currency versus proficiency. But, if you only fly the minimums in accordance with your aircrew training manual and fly the majority of your simulator and hood time during the last months of your 6-month period, you are probably current but not very proficient in instrument flying.

Instrument training should be challenging, but realistic, and it should promote aviator confidence. Your training should also reflect the kind of flying you do most of the time. As shown in the analysis of IMC-related accidents, the majority of inadvertent IMC accidents occur at night and often while NVGs are being used. If you are an NVG pilot and fly little or no instrument training in the aircraft at night, you are playing Russian roulette with your life. It's just a matter of time.

■ ***Commit to IMC.*** Never attempt to reestablish VMC if you bump into a cloud. You have been trained to accomplish a recovery. Execute! It is possible that the crew of the OH-58 was attempting to establish VMC at the airfield where the other flights had terminated, but that airfield was not the designated IMC recovery airfield. 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."

Through training and practice, you can develop critical aviator skills along with the confidence that will make your encounter with inadvertent IMC the subject of your next session of hangar talk. As you become the hero of your "There I was" hangar talk with the newbies, remember how training and practice provided you with the edge for success.

—MAJ Marline J. Johnson, USASC Aviation Branch, DSN 558-9854 (334-255-9854), johnsonm@rucker-safety.army.mil

IMC video now available

A new video presentation on inadvertent IMC is now available. The presentation is based on the OH-58 accident described in this IMC article. Advance copies of the video were distributed to brigade commanders at the January 1995 Aviation Brigade Commanders Conference. You may obtain a copy by asking your local audiovisual library for—

Inadvertent IMC

TVT 20-1052 PIN 710656

Human factors in Army rotary wing accidents

Causes of Army Accidents

Unit readiness, OPTEMPO, high-risk mission, and the high-risk aviator . . . what is their role in accidents? They are believed to be generators of human performance errors that result in Army rotary wing accidents. The effect of human performance on Army aviation is not trivial! In FY 93 and 94, at least 130 Class A through C rotary wing accidents were caused by human factors, and historically 80 percent of all Army accidents have human-factor causes.

Human-Performance Accident Study

Class A-C Rotary Wing Flight Accidents
FY93 - FY94

Accident Total

Aircraft	Number
AH-1	10
AH-64	18
CH-47	6
H-6	8
OH-58	43
UH-1	20
UH-60	25
TOTAL	130
Class A	32
Class B	14
Class C	84

	FY93	FY94	TOTAL
Aircraft Destroyed	18	12	30
Fatalities	10	8	18
Cost in Millions	$72	$72	$144

Building a data base to study human-performance accidents

Until recently no one had accumulated a comprehensive data base of detailed, factual information about human-performance accidents. To support a study of human factors in Army rotary wing accidents, the Army Safety Center constructed the first data base to make unit, accident, person, and performance information available for detailed analyses. This data base allowed us to compare information between accident and nonaccident units. And we built an intercorrelation matrix of 167 variables and formed subject matter expert teams to interpret the results of the 27,000 correlations!

Needless to say, this was a monumental undertaking. However, this is the level of effort now required to gain ground in our battle to reduce the human factors that cause rotary wing accidents. The overall accident rate is at an all-time low, making it very hard to identify problems and trends and develop countermeasures. So we must redouble our efforts to find the root sources of human error, to "take human error out of play, off the table."

Emerging results

Analyses of the data are producing some interesting and important findings.

■ *The 130 Class A through C human-error accidents used in this study resulted in 18 fatalities and a loss of $144 million (including 30 destroyed aircraft).* The most frequent performance errors involved crew coordination and crewmember scanning. These errors were found in 41 percent of the accidents. It is too soon to tell if crew coordination training is effective in reducing crew coordination errors. Of the crewmembers involved in crew coordination and scanning accidents, 78 percent had not received crew coordination training. Furthermore, of all crewmembers involved in these 130 accidents, 79 percent had not received crew coordination training.

■ *Reductions in unit readiness/resources are NOT resulting in increased accidents.* Using unit status report data provided by Deputy Chief of Staff for Operations and Plans, we compared "accident" units with "nonaccident" units on overall unit rating, personnel, equipment, maintenance, training, percent MOS qualified, turnover percentage, and personnel availability.

Counter to expectations, the accident units did not show any statistically significant shortfalls in readiness or resources. Unexplainably, accident units were found to have a higher training rating than nonaccident units.

■ ***Unit OPTEMPO appears unrelated to human-error accidents.*** Most accidents occurred in units reporting low to medium OPTEMPO. Using the accident unit commander's subjective assessment of OPTEMPO, 33 percent reported low and 32 percent reported medium OPTEMPO, while 29 percent reported high and 6 percent reported extremely high OPTEMPO.

■ ***Neither are a few units nor any specific unit type having a disproportionate number of accidents.*** The most accidents found for any single unit was four, and only four units had four accidents. Further, attack battalions, which represent about 33 percent of the aviation battalions, had 33 percent of the accidents and cavalry squadrons, which represent 17 percent of the aviation battalions, had 16 percent of the accidents.

■ ***High-risk aviators are still out there, but fortunately there are not many of them.*** The word is out that high-risk behavior will not be tolerated. In the study, only about 1 pilot in 20 had a previous at-fault accident. Research shows that if you have a high-risk aviator in your unit, chances are that he will be a single male under 25 years of age and will have flight standards violations, an at-fault accident, counseling for poor performance, aeromedical violations, and an administrative action/punishment. This individual will also show a low ability to recognize hazards and personal risk, and he will overestimate his own personal ability.

The Next Accident Assessment for Aviators and Leaders of Aviators are valuable tools available to help identify high-risk aviators. You may obtain copies by writing to Commander, U.S. Army Safety Center, ATTN: CSSC-PMR, Fort Rucker, AL 36362-5363 or by calling Mr. Glen Davis, Reasearch, Analysis, and Studies Branch, DSN 558-3013 (334-255-3013).

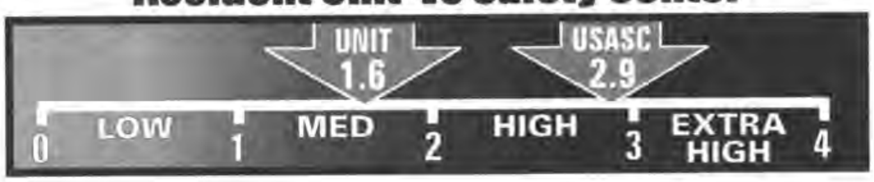
■ ***The accuracy of current mission risk-assessment procedures is questionable.*** Of the 130 accidents, 87 (67 percent) were briefed as low risk and were approved at or below company level. Only 4 percent of the accidents were assessed as high or extremely high risk. However, in attack units 72 percent of the missions were assessed as low risk and 82 percent were approved at or below company level. This is alarming in that the attack missions were typically tactical, multiship, night, aided, and NOE!

New automated mission risk assessment coming

The Safety Center is currently developing an improved mission risk-assessment method, and it is AUTOMATED! To test its accuracy, we reassessed the mission risk of 45 night, rotary wing, human-factors accidents using this automated mission risk assessment program. The reassessment was performed using only information available to the unit or crew when they performed their mission risk assessment. When we compared our results with theirs, we found that theirs had underestimated the mission risk in 78 percent of the cases. In addition, where their mission risk assessment revealed an overall average factor of 1.6, or medium risk, the Safety Center's program produced an overall average factor of 2.9 or high risk. Extremely high risk begins at factor 3.

The automated risk assessment program was also accurate in 51 percent of the cases in predicting the type of accident that actually occurred. Further refinements and field testing of the program are now underway with fielding projected for 4th quarter FY 95.

Risk Assessment Methods: Accident Unit vs Safety Center



Conclusion

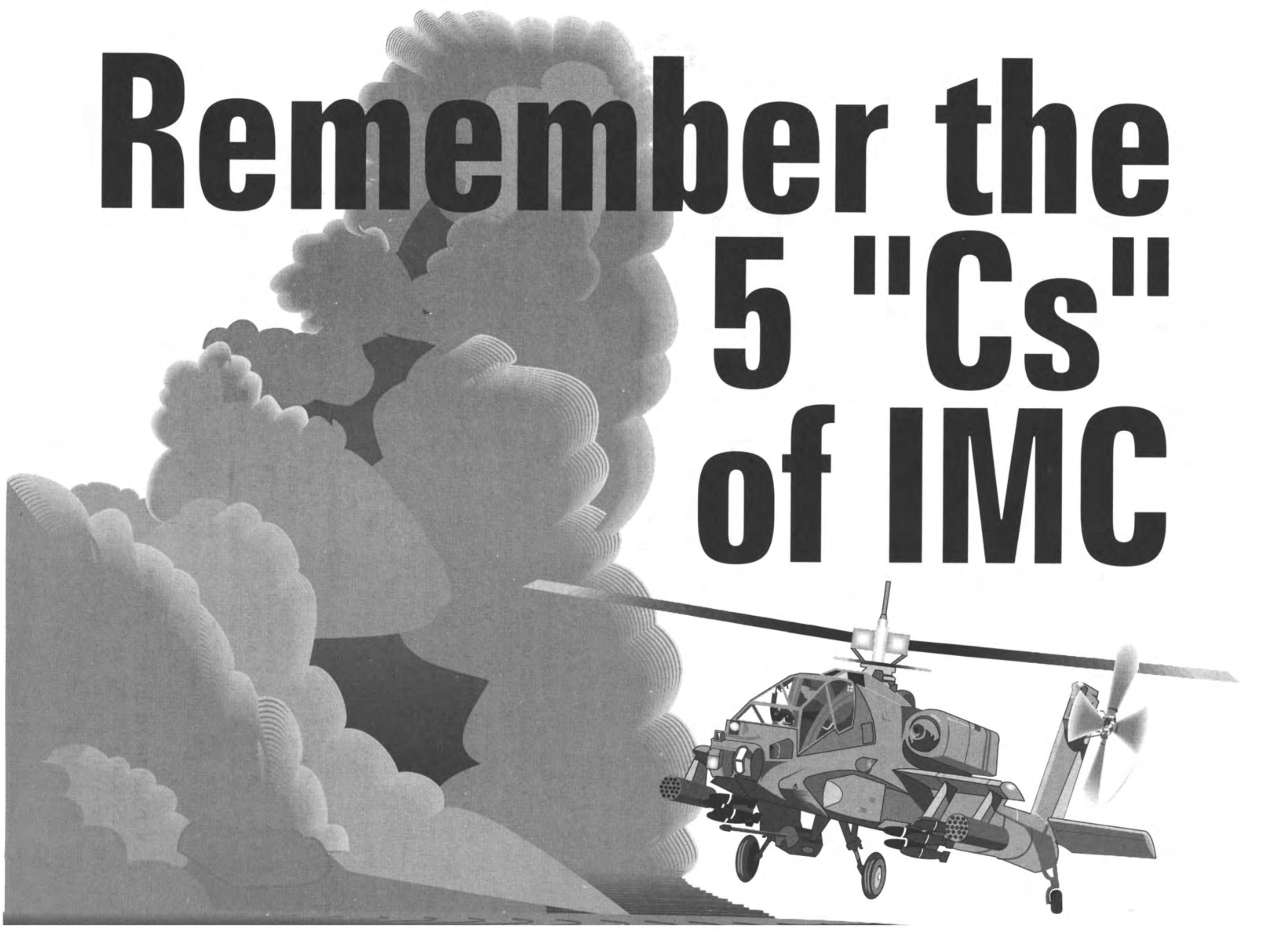
The Army aviation accident rate has declined to record low levels in spite of conditions such as reduced readiness/ resources and high OPTEMPO, which normally bring an increase in accidents. Furthermore, no longer are a few units, a specific unit type, or a profusion of high-risk aviators having a disproportionate number of accidents.

As a result of the human factors study, we now believe that the accuracy of current mission risk-assessment procedures is questionable. To counter this problem, the Safety Center is continuing rigorous analyses, studies, and field testing of an improved, automated mission risk assessment program that we hope will be ready for release before the end of this fiscal year.

The percentage of human-performance accidents has remained solidly entrenched at the historical level of 80 percent. If we are to gain ground in our efforts to expand beyond human error, to "take human error out of play, off the table," we must continue to develop and use improved risk-management methods and tools. Only through a concerted effort can we expect to see a decline in the historical 80 percent of Army aviation accidents caused by human factors.

—POC: Mr. Glen Davis, Research, Analysis, and Studies Branch, DSN 558-3013 (334-255-3013), davisg@rucker-emh3.army.mil

Remember the 5 "Cs" of IMC



Control Maintain control - AHTA
Attitude, Heading, Torque, Airspeed

Coordination Pilot concentrates on instruments; copilot assists and looks outside

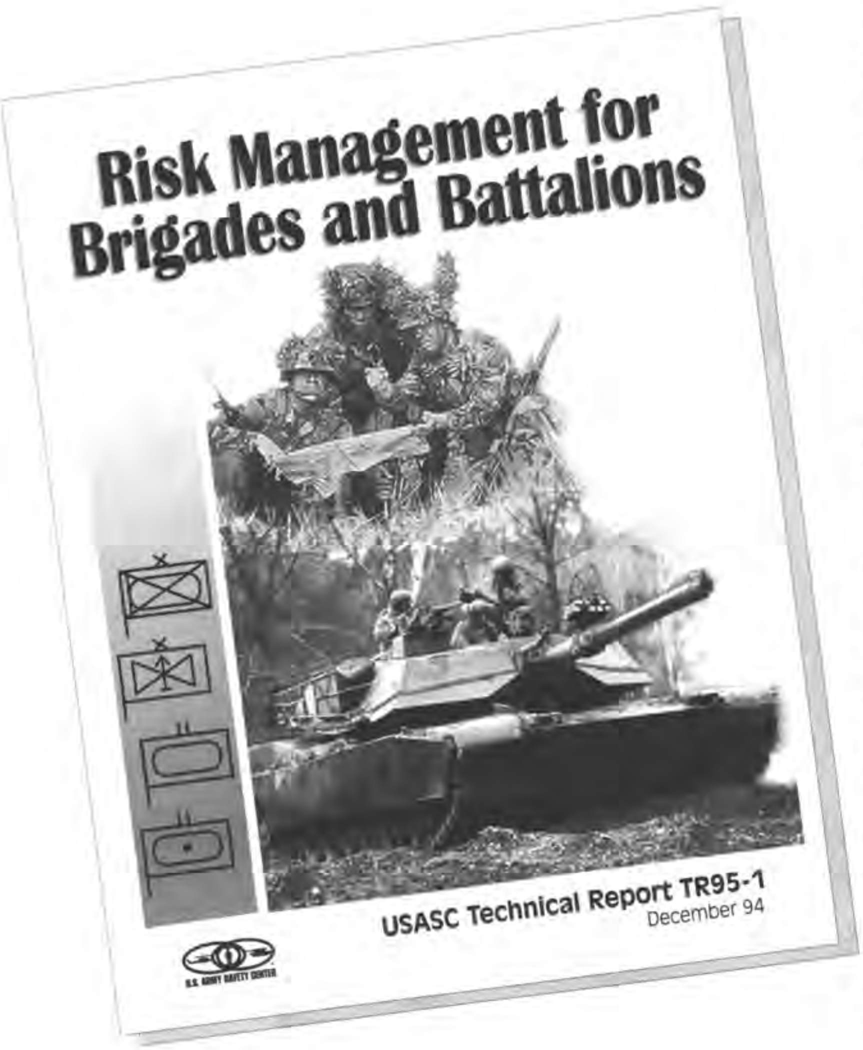
Clearance Clear highest obstacles with straight controlled climb

Course Select and turn to appropriate heading

Call Make required radio call for assistance

VIDEO!
Inadvertent IMC
TVT 20-1052
PIN 710656

New risk-management report now available



Risk Management for Brigades and Battalions describes procedures and responsibilities for risk management during mission essential task list training and operations. The procedures and responsibilities reflect the roles of safety and fratricide avoidance as elements of force protection as described in FM 100-5: Operations. They also are consistent with those presented in FM 101-5: Command and Control for Commanders and Staff (final draft, August 1993), which is approved as interim doctrine. It should be noted that draft FM 101-5 places staff safety responsibilities in the S3 functional area. Also the procedures are integrated into and support phases of the training management cycle in FM 25-101: Battle Focused Training.

These procedures have been tested with three brigades and one battalion during the planning, execution, and assessment phases for rotations at the National Training Center, Joint Readiness Training Center, and Combat Maneuver Training Center. Test units achieved significant reductions in ground accident casualty rates and experienced no aircraft accidents. Finally, this report updates risk-management tactics, techniques, and procedures published in the Center for Army Lessons Learned Newsletter "Force Protection (Safety)," No. 9, December 1993.

Copies of this report were distributed to brigade commanders at the January 1995 Aviation Brigade Commanders Conference at Fort Rucker, AL.

The report can be obtained by writing to Commander, U.S. Army Safety Center, ATTN: CSSC-PMR, Fort Rucker, AL 36362-5363 or by calling Mr. Darwin S. Ricketson, Jr., Research, Analysis, and Studies Branch, DSN 558-9580 (334-255-9580).

Plan smart! Fly smart!

The Federal Aviation Administration (FAA) Southern Region has recently experienced an increase in pilot deviations (flight violations). Pilot deviations are serious matters and should be treated as such by both the Department of Defense and the FAA.

Suppose while you are flying in the National Airspace System, the air traffic controller (ATC) advises you that a flight deviation has occurred and asks you to please call by telephone to discuss the deviation when you land. Such an event strikes fear in the heart of every Army aviator, especially those who hold FAA civilian flight certificates.

Examples of recent military pilot deviations include—

- Flying 300 feet off an assigned IFR altitude.
- Flying through Class B, C, or D airspace without ATC authority.
- Flying to and landing at an airport (Class E surface area without a control tower) without ATC authority while operating under special VFR conditions.

■ Flying over an area that is protected by a temporary flight restriction without ATC authority.

Army aviators need to follow some actions and must avoid others.

■ **Information you should not provide.** First and foremost, DO NOT, repeat, DO NOT provide any FAA representative with your name and/or social security number over the radio or telephone. This also applies for all crewmembers on the flight, including crew chiefs and flight engineers. No names are to be given out.

Why? you may ask. AR 95-3: Aviation: General Provisions, Training, Standardization, and Resource Management, paragraph 2-6d states "names of crewmembers of military aircraft involved in actual or alleged violations will be treated as restricted information and not be released to the public or any agency outside the DOD except by proper authority. Any person receiving requests for names of crewmembers of Army aircraft should direct such inquiries to the Director, U.S. Army Aeronautical Services Agency (USAASA)." USAASA headquarters (MOAS-AS office) can be contacted at DSN 656-4865, FAX 656-4409 (703-806-4865, FAX 703-806-4409).

Revealing your name and/or social security number could provoke FAA enforcement procedures against you, suspending your FAA civilian flight certificate(s) for a short period of time or permanently before you have an opportunity to rebut the allegations.

■ **Information you should provide.** You may provide the FAA representative with your unit's name and address. Do not give your commander's name or telephone number. Remember that all telephonic inquiries are to be routed through USAASA. If your unit is contacted, the AR 95-3 paragraph 2-6d provision applies to whoever answers the phone. If the FAA persists in requesting crewmember names, refer them to USAASA (703-806-4865).

The purpose of these actions is not to be uncooperative or devious with the FAA. Army aviators are held accountable to their commander, not the FAA, for violations of either FAA or Army regulations. Army commanders, not the FAA, are responsible for conducting investigations and if appropriate recommending aviators for further action in accordance with paragraph 2-6 of AR 95-3, Chapter 4 of AR 600-105: Aviation Service of Rated Army Officers, and AR 15-6: Procedures for Investigating Officers and Boards of Officers.

Aviators who are performing authorized, briefed missions are not held in double jeopardy by FAA enforcement procedures and U.S. Army enforcement procedures per Federal Aviation Regulation (FAR) 13.21.

Routing of pilot deviation reports

Military pilot deviation reports and other alleged violations involving Army aircraft are forwarded from the FAA facility involved through the FAA regional headquarters to HQ USAASA. The deviation investigation report is then

forwarded to the aviator's commander through the MACOM-, ARNG-, or USAR-level chain of command. The FAA normally establishes a suspense of 90 days for the reply to be returned to the FAA regional office.

The Department of the Army regional representative (DARR) to the FAA regional headquarters is often informed by the FAA of the alleged deviation shortly after the event. The DARR informs the MACOM, ARNG, or USAR air traffic and airspace (AT&A) officer and aviation safety officer that a military pilot deviation report has been received and a formal report may be pending.

The advance warning affords the unit commander the opportunity to obtain crewmember statements and explanations while memories are still fresh and, if necessary, implement individual or unit training to correct the problem. The official FAA deviation investigation request can sometimes take a great deal of time, 6 months or more, to reach the commander.

Fly safe

The bottom line is FLY SAFE, but do not knowingly violate the FARs. FARs have the weight of public law, and violations of FARs are serious. Protect your rights as an Army aviator by—

■ Complying with AR 95-3 paragraph 2-6d and not divulging restricted personal information.

■ Informing your commander immediately if ATC informs you a flight deviation has occurred or you suspect one has occurred. Your commander should then contact the DARR in your region for further instructions. The DARR phone numbers may be found in either the Flight Information Bulletin or Table 6-1 of AR 95-2: Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids.

■ Flying by the rules!

Points of contact:

■ LTC Ricky C. Smith, DARR, FAA Southern Region, Atlanta, GA, DSN 797-5481 (404-305-6916).

■ CW5 Randy Hansen, Assistant DARR, DSN 797-5481 (404-305-6915, FAX 404-305-6926).

—Adapted from DARR FAA Southern Region 3rd quarter FY 94 newsletter

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class C

H series - At 90 knots and 800 feet AGL during cruise flight, crew heard loud series of pops accompanied by left yaw. They determined that aircraft had incurred compressor stall and completed landing without further incident. Sudden stoppage maintenance inspection revealed that 45- and 90-degree gearboxes and main rotor mast require replacement.

H series - During NVD external load training mission, overtorque of 55 PSI occurred for 1.5 seconds. Crew shut down aircraft. Aircraft was released following inspection. Chips were later detected in primary and external transmission oil filters. Transmission requires replacement.

UH-60 Class A

L series - During night air assault landing, Chalk 4 of eight entered brownout conditions. Main rotor blades struck trees, and aircraft landed hard. Landing gear collapsed, and aircraft sustained possible structural damage due to broken right-side strut pylon. Main rotor blade tip caps were also damaged.

UH-60 Class C

L series - Following takeoff, left cargo door jettisoned for unknown reason and struck blue main rotor blade. Crew completed landing without further incident.

UH-60 Class D

A series - On final approach, electronic countermeasures (ECM) system failed to function properly, resulting in ECM antenna shearing off during roll-on landing. Master caution and master warning segment lights did not illuminate to warn crew that ECM antenna was in down position nor did system automatically retract antenna as it was designed to do. Maintenance is currently evaluating ECM system.

Attack

AH-1 Class C

F series - At cruise altitude about 15 minutes into cruise flight, master and No. 2 hydraulic caution lights illuminated. Crew completed emergency procedures and performed running landing at 50 knots. Both skids collapsed upon contact with ground. Aircraft came to rest upright.

S series - Postflight inspection revealed that dzus fastener had separated from vertical fin and struck tail rotor and then tail boom. Tail boom, tail rotor blades, and 42- and 90-degree gearboxes require replacement. Repair has been deemed uneconomical due to phaseout of series.

AH-1 Class E

E series - During descent for landing, IP saw unidentified object flash past main rotor disk at about the 2 o'clock position, followed by specks of unidentified debris on gunner's windshield. Postflight inspection revealed two small dents on leading edge erosion guards of both blades. Suspected bird strike.

F series - During MTF, engine oil bypass light illuminated. MP noted increasing engine oil temperature and initiated immediate approach for landing. Engine oil bypass light then extinguished, and engine oil temperature returned to normal. Engine oil bypass light illuminated again on short final, and MP completed landing without incident. Maintenance troubleshooting revealed No. 3 main bearing engine seal was leaking, causing high engine oil consumption.

F series - N2 RPM increased to 103 percent as crew increased throttle from idle. Increase-decrease switch would not reduce RPM from either pilot or gunner station. Maintenance replaced linear actuator.

AH-64 Class C

A series - During aircraft runup for MTF, No. 1 main rotor blade sustained damage. Damage was caused by survival knife that had been left on main rotor hub by armament personnel after replacing omnidirectional airspeed sensor.

A series - Flight of four AH-64s were lined up for takeoff. The PC of Chalk 4 was in back seat. Just before takeoff, his kneeboard slipped off his leg. While reaching down to pick up kneeboard, PC pushed cyclic forward, causing main rotor blades to contact PNVS turret. Upon rotor blade contact, PNVS shroud and reflective mirror shattered and germanium crystal was destroyed.

AH-64 Class E

A series - Aircraft was on short final when caution warning light illuminated "OIL PSI NGB 1." IP reduced power lever on No. 1 engine, declared an emergency to tower, and performed roll-on landing. Crew taxied aircraft into transient parking and completed normal shutdown. Postflight inspection revealed oil cap had not been secured properly.

A series - As aircraft landed from a hover, crew noticed unusual lateral oscillation. When blades were at flat pitch, oscillations stopped. Oscillation recurred when crew applied pitch. Crew shut down aircraft and aborted mission. Maintenance replaced No. 4 tail rotor drive shaft. Aircraft was vibration checked and released for flight.

A series - During runup, crew felt high-frequency vibration that stopped after about 10 seconds. After maintenance checked for hydraulic leaks and movement in gun turret, crew continued runup. When crew picked aircraft up to OGE hover, vibration returned. Crew landed aircraft and returned to parking. Maintenance found TADS inner gimbal was faulty. Maintenance replaced TADS electronic control amplifier, MOC was completed, and aircraft released for flight.

Observation

OH-58D Class E

C series - While in cruise flight, crew noticed stiffness in cyclic controls when turning. Crew completed landing without further incident. Maintenance determined that swashplate was binding around uniball and replaced swashplate assembly.

D series - During aircraft ground run at 100 percent RPM following engine rinse after completion of gunnery exercise, stability control augmentation system would not engage. Pilot checked multifunction display and found "HYD FAIL" caution message displayed. Crew shut down aircraft without further damage. Inspection revealed that transmission pump shaft had failed.

D series - During refueling operation, fuel handler connected refuel nozzle and checked by pulling to verify that nozzle was seated. When he did, the CCR receptacle broke off its hinge and fell inside fuel cell. Crew shut down aircraft without further incident.

Fixed wing

C-12 Class C

D series - During engine startup, No. 2 engine TGT indicator rose to 1,200° for 2 seconds. Crew shut down aircraft. Maintenance repaired starter relay the following day and released aircraft for return to station. Postflight inspection by BASI personnel revealed engine damage. Engine removed.

Flight related

UH-60 Class B

L series - Aircraft was lead in multiship slingload mission. Upon reaching DZ, aircraft encountered dusty conditions while coming to hover at 35 feet AGL with slingload height of about 20 feet. Slingload (M119A1 howitzer) separated and struck ground, damaging front wheel assembly. Suspected inadvertent release.

UH-60 Class C

L series - Helocast master had soldiers exit aircraft before pilot notified him that aircraft was at proper airspeed and altitude. Several soldiers sustained injuries.

Messages

■ Safety-of-flight technical message concerning one-time and recurring visual inspection of the tail boom and related restriction on forward indicated airspeed for all OH-58D helicopters (OH-58-95-01, 161616Z Feb 95). Summary: OH-58-94-ASAM-03 required a one-time inspection and a recurring visual inspection of the tail boom in the area of the gearbox support assembly attachment for cracks. A recent quality deficiency report detailing a severe crack and indeterminate results in the ongoing investigation have warranted additional inspections and restrictions. This message supersedes the requirements of OH-58-94-ASAM-04. The purpose of this message is to require a one-time visual inspection (visually aided) of the tail boom skin in the area of the gearbox support assembly casting attachment for loose or working rivets and/or cracks in the rivet area prior to next flight with a 20-hour recurring inspection, require a visual inspection (visually unaided) of the same area every 2.5 hours, and restrict forward indicated airspeed to a maximum of 80 knots with the exception of maintenance test flights. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of cartridge-type fuel boost pump on all UH-1 series aircraft (UH-1-95-ASAM-01, 071800Z Feb 95). Summary: Several incidents have been reported on UH-1 aircraft that show the shutoff arm of the cartridge-type fuel boost pumps bent. A bent shutoff arm can restrict fuel flow to the engine fuel control. This condition is unacceptable and may result in power loss or flameout. None of these incidents have been reported on the AH-1 series aircraft. The AH-1 maintenance manual adequately addresses the possibility of bending the arm when installing the fuel boost pump. Therefore, the one-time inspection required by this message does not apply to AH-1 aircraft. Although the UH-1 maintenance manual has recently been updated to preclude this situation during installation of the boost pump, there could be pump assemblies currently installed using the old procedure that resulted in the bent arm. The purpose of this message is to require a one-time inspection of the cartridge-type boost pump shutoff arm on UH-1 series aircraft. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action informational message concerning all CH-47D, MH-47D, and MH-47E aircraft with engine transmissions utilizing Speco manufactured gears (CH-47-95-ASAM-03, 311827Z Jan 95). Summary: Two safety-of-flight messages—CH-47-91-01 (TB 1-1520-240-20-55) and CH-47-93-03 (TB 1-1520-240-20-66)—were issued to identify the unserviceable engine transmissions, P/N 145D6300-series. These SOF messages were generated by a 1991 Operation Desert Storm incident and by a 1993 Fort Meade incident involving a CH-47D engine transmission. The failures were caused by gears manufactured by Speco Corporation. Since then the gears have undergone a program of intensive inspection and changes in manufacturing processes to eliminate the cause of the problem. However, two memorandums—one from the Department of Defense Inspector General, 2 December 1994, subject: Notification of Defective Transmission Gears for the Boeing CH-47, Chinook Helicopter and the other from the 515th Military Police Detachment (CID), 3 January 1995, subject: Criminal Alert Notice—have been published. These messages are incomplete and do not contain the most current information and measures that have been put in place to solve the problem. ATCOM is continuing the technical investigation of the allegations. At this time in the investigation, there has been no indication of a safety problem with these gears. The accidents caused by the failed Speco gears—Saudi Arabia in 1991 and Fort Meade in 1993—were thoroughly investigated and appropriate corrective actions were taken. All Speco gears went through an additional nondestructive inspection following the Saudi accident. As a result, the manufacturing processes and plans were changed to eliminate the cause of the cracks—postcarburizing grinding of the damping ring grooves. The Fort Meade failure initiated in an area of a nonauthorized rework for the removal of burrs. The manufacturing plan for the gear, Boeing P/N 145D6302-2, did not have an approved procedure for deburring operation in the area of the gear that failed. This was the only part number and the only area on the gear where the deburring operation was not controlled. Changes in the manufacturing plan were addressed and all P/N 145D6302-2 gears were inspected again. The gears are used in the CH-47D, MH-47D, and MH-47E transmissions, P/N 145D6300 series. The inspections resulted in some gears being rejected. The depot maintenance work requests were revised to include more stringent inspections. There has been no recurrence of these failures in the thousands of flying hours subsequent to the inspection. The purpose of this message is to inform the user of updated information that is not reflected in the Department of Defense memo dated 2 December 1994 or in the CID memo dated 3 January 1995. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of pilot's seat web cover and copilot's seat cover assembly on all OH-58D and improved OH-58D helicopters (OH-58-95-ASAM-04, 071518Z Feb 95). Summary: The pilot's seat web cover and copilot's seat cover assembly (crew seat side supports) provide progressive deformation to absorb a portion of the "G" loads developed during a hard landing or crash. Some crew seat side supports have been improperly structurally repaired, possibly degrading crash survivability. These repairs may not conform to a Bell Helicopter Textron, Inc. authorized production-line-only repair. The purpose of this message is to provide instruction to discontinue the practice of repairing these panels and replace existing panels that have been improperly repaired. Aviation personnel should be made aware that much of the damage to this assembly is caused by using the pilot seats as steps. In addition, when the seat panel assemblies are removed for maintenance, the chance of damaging the seat side supports is greatly increased. Extra care should be taken when performing maintenance with the seat panels removed. The logistical area representatives (LARs) have been supplied with documentation on the approved Bell Helicopter Textron, Inc. one-time production-line repairs. This documentation is not to be used to effect field repairs. Its only purpose is to determine if a previous repair conforms to the authorized repair. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

Posters are coming

Scarcely a day goes by that we don't receive several requests for safety posters. The problem is that with the curtailment of printing funds, we simply can't produce the full-color posters of the past. We wish we could. But we're going to try to do the next-best thing by publishing black and white posters in *FlightFax* as space permits.

This month's issue contains the first of these posters "Remember the 5 'Cs' of IMC." This poster is a reminder to aviators of a procedure that will help them during those first critical seconds after an aircraft inadvertently flies into instrument meteorological conditions. This issue also includes an article on inadvertent IMC and an announcement that an IMC video is available. Whenever possible, we will "package" a critical safety subject this way, giving you several media tools to use in increasing awareness of these problems.

The 11- x 17-inch poster in this issue should be locally reproduced on a copy machine to prevent removing the part of your *FlightFax* that is printed on the reverse side. Most units have access to a copier that can be adjusted to accommodate this size paper.

Now this is where we need your help. You know what you want to draw attention to with a poster. Maybe in your unit it's FOD, or maybe you still see people working around aircraft wearing rings, or it could be that you want to remind flight crews of the importance of their protective equipment. Write us (Commander, U.S. Army Safety Center, ATTN: CSSC-PMA (FlightFax), Bldg 4905 5th Avenue, Fort Rucker, AL 36362-5363); send us a FAX (DSN 558-9377, 334-255-9377); or give us a call (DSN 558-3770, 334-255-3770).

For they had learned that true safety was to be found in long previous training and not in eloquent exhortations uttered when they were going into action.

—Thucydides, The History of the Peloponnesian War, c. 404 B.C.

In this issue:

Class A Accidents through February

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	1	0	0
	March	0		0	
3D QTR	April	5		2	
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	21	3	11	1

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Report
by the U
AL 3636
prevent
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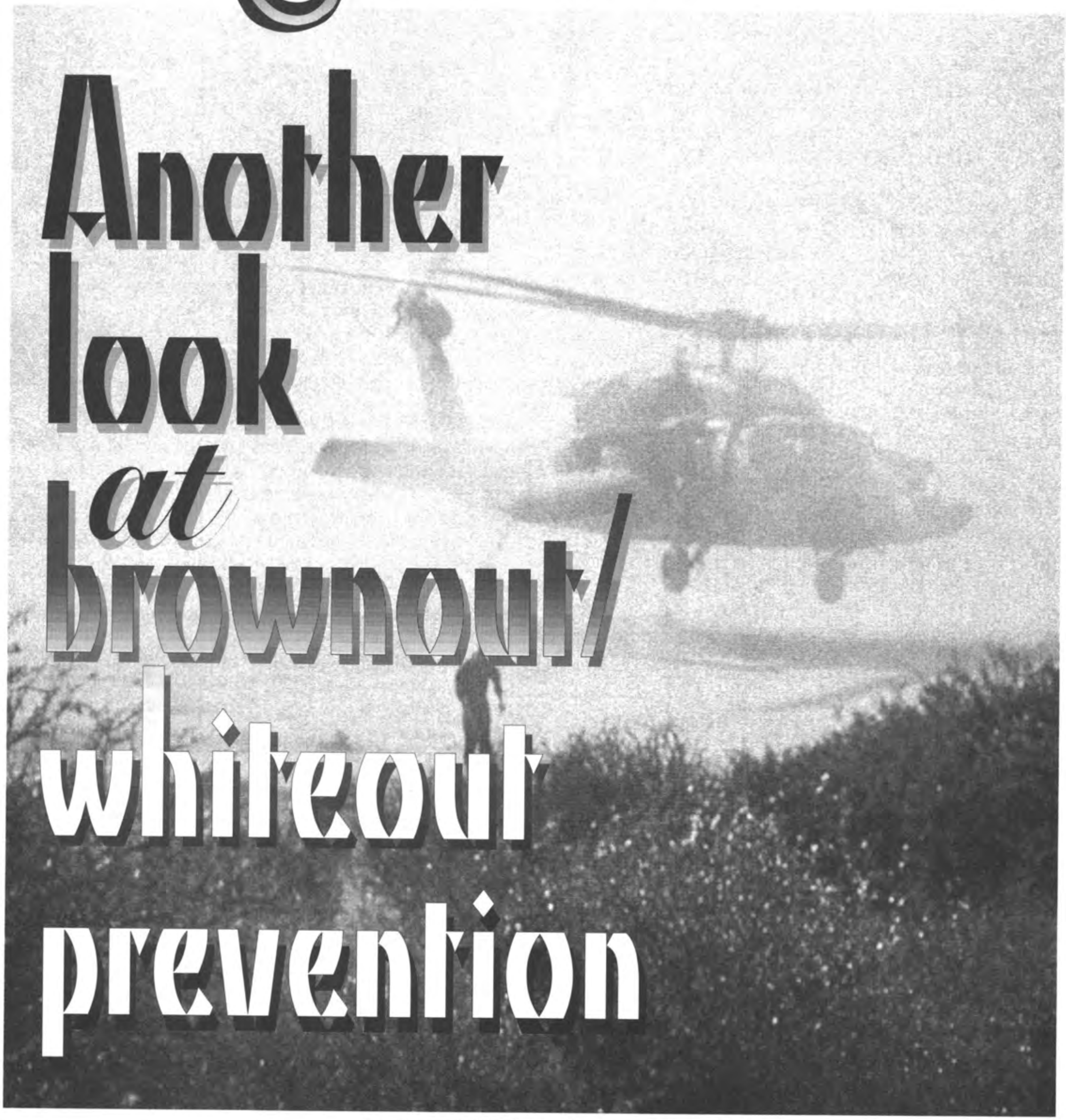
matters
Address
558-3770. Address questions about distribution to DSN 558-2062. To submit information for FlightFax, use FAX DSN 558-9377, Ms. Jane Wise.

Thomas W. Garrett
Brigadier General, USA
Commanding General
U.S. Army Safety Center

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
April 1995 ◆ Vol 23 ◆ No 7



Another look at brownout/whiteout prevention

Operating in limited-visibility conditions caused by blowing snow or dust can be challenging, risky, and potentially destructive. In this issue of FlightFax, one commander shares his unit's search for safer brownout/whiteout operating techniques and provides a sample of their new blowing dust/snow SOP in the hope that others may find his unit's experience and new techniques helpful.

Desert operations revisited: a success story

"... despite my experiences as a brigade XO during Desert Storm with an accident-free brigade, I needed advice, guidance, and some good ideas."

The January 1994 issue of *FlightFax* featured an article entitled "Brownout/Whiteout Prevention Techniques" by LTC William A. Tucker and MAJ Richard Young of the Army Safety Center. As a battalion commander who had suffered one Class C and a few Class D and E accidents and incidents at the National Training Center in August 1993, I had a vested interest in whatever the authors had to say. The desert had not been very good to me, and despite my experiences as a brigade XO during Desert Storm with an accident-free brigade, I needed advice, guidance, and some good ideas.

Tips and techniques provided

The authors offered just that, including some rather obvious points to consider. Reviewing flight manuals and other sources on techniques and tips for brownout conditions is one thing; anticipating and planning for such conditions is another. And we had done all of that prior to our rotation to the NTC in August of 1993. Clearly there was more to this.

LTC Tucker and MAJ Young also offered advice on takeoffs, landings, taxiing, and crew coordination. Many of their ideas seemed logical and easy to grasp, but our experiences as an air assault battalion at the NTC provided some contradictory evidence.

For instance, the authors recommended 30 seconds to 1 minute separation on takeoffs and landings "to allow the previous aircraft's dust to dissipate during multiship operations." Our multiship operations typically included more than 20 mission UH-60s in serials of 5 or 6 aircraft. While a 1-minute separation time would give our ground tactical commanders the ability to mass combat power on an LZ or objective, we found that without a stiff breeze (over 15 knots), the dust clouds would not dissipate unless we had 2- to 5-minute separations. Under NVGs (our normal mission profile) and with zero illumination conditions, vast dense clouds sat on our previous landing sites and back in our PZs.

Perhaps the greatest area of discussion among my leadership was the part of the article where the authors mentioned two landing techniques: roll-on and a "high hover over your intended landing point, and then slowly hover straight down." The roll-on proved disastrous in my August 1993 NTC rotation, because no matter how we tried to beat the dust cloud following us to the ground, we seemed to bump into ruts, fighting positions, brush, or rocks with our forward roll. The high-hover technique seemed unthinkable in the conditions we encountered where huge clouds stirred up by our rotor vortices grew all around any aircraft attempting to hover for any brief period.

Searching for new techniques

What then were the techniques I needed to train my crews that would ensure maximum safety, minimum damage, and still allow me to rapidly build combat power on the LZ?

I called the authors and told them that I had convened a panel composed of my standardization instructor pilot (SP), instructor pilots (IPs), unit trainers (UTs), and flight leads and had given them the task of analyzing our past rotation's mission profiles, accident reports, after action reviews, and interviews with crewmembers. I wanted an exhaustive reconstruction of events, conditions, and mission analysis. The result would be the drafting of a new dust/snow SOP for brigade and division review. With the wholehearted support of the brigade and division safety offices, we began our self-examination.

Results of the analysis

Clearly, the accident reviews pointed to similar circumstances encountered by my crews: multiship formations, arriving at PZs or LZs and finding an incredible amount of residual dust that would not dissipate, and attempts to "outrun" the dust cloud formed by the landing aircraft, which often resulted in aircraft slamming into objects on the ground, damaging sheet metal, landing/searchlights, or MILES gear.

My SP summed up the thoughts of the reviewers: "We think that our forward momentum is the cause of most of our problems. If we can find a way to land with little, or better yet, zero forward ground roll, we'll probably see a tremendous reduction in incidents." Additionally, we formed a consensus on several other issues—

- Multiship formations need greater separation by either time or distance, requiring our infantry brothers to "rethink" their ground tactical plans.
- PZ/LZ reconnaissance by flight leads is crucial to determining suitability and the "on-scene" conditions.
- PZs must allow for greater physical separation between aircraft on the ground to prevent these locations from becoming totally browned out.
- Slingload operations at night under NVGs are high-risk and should be considered only as a last resort.
- Day slingloads are a challenge and can be detrimental to engine health over the long run, but they are doable.

The new draft SOP was completed over the cold, wet winter months at Fort Campbell. During this period, no suitable dusty or snowy conditions existed in the local flying area where we might attempt to validate our findings.

What was the new technique?

The "desert think tank" had come to the conclusion that there should be a way to land in a desert/dust environment that, in all but the most severe conditions, will allow the crew to maintain visual contact with the ground. It must also preclude forward momentum to avoid "going bump in the night."

In theory, what they agreed upon was a modified "steep" approach to a preselected (by the PC) touchdown point. The vertical descent should delay the cloud buildup, while the slower forward airspeed would still allow time for the aircraft to proceed in front of the cloud.

In practice, what actually happened was that the dust cloud would advance forward, with the crew chief calling its position: "tail, cargo door, gunner's window." Then if the pilot's patience held up, we found that the cloud continued past the cockpit and left the crew with a fairly unobscured view of the landing point. If the crew felt uncomfortable, they merely executed a go-around and returned to another location. Many hours of practice led to confidence, skill, and zero incidents.

A training opportunity

In March 1994, we were alerted to provide a company of Black Hawks to go to the NTC to support the famous digitized rotation of the 24th Aviation Brigade. Here was our opportunity to see if the new techniques would work.

In addition to this unforeseen training opportunity, we would also benefit from a more extensive environmental train-up period than previously offered. Once we arrived and completed our mandatory safety classes, the NTC was going to give us almost 1 week of desert flight operations "in the box." Never before, in my experience, has a unit been given the chance to train in the area of operations they would be "fighting" in. We would make the most of this opportunity.

Our philosophy was the same as that established during Operation Desert Storm—crawl, walk, run. My "task force" was composed of crews from both of my line companies. An IP first trained the UTs and flight leads for each company. They, in turn, trained other PCs and crew chiefs. After a week, even the doubters had been won over.

"... huge clouds stirred up by our rotor vortices grew all around any aircraft attempting to hover for any brief period."

The rotation was an unqualified success. We flew missions of every type and under a wide variety of conditions. All of the crews came back to Fort Campbell with rave reviews of our new technique. As the weather improved in the late spring of 1994, we were able to go out to our local training area and find some truly challenging dusty landing areas. The rest of the crews in the battalion got trained on the new technique by our desert-experienced crews. The objective was our next battalion rotation, 94-09, which would be the first-ever Air Assault rotation at NTC.

NTC rotation 94-09

We flew six brigade and battalion air assaults, typically employing 24 mission UH-60As/Ls, 3 UH-60 spares, a DART/SAR aircraft, a command and control console bird, 3 EH-60s, 3 UH-60V medevac aircraft, and 8 CH-47Ds. The battalion had zero accidents or incidents and caused the chief of the operations group to say that rotation 94-09 was the safest aviation rotation ever at the NTC.

Keys to success

Our success hinged on the following three key factors.

■ Breaking the mindset that forward roll was the answer to overcoming the dust clouds. Unless you fly and work in a flat, almost featureless desert, forward roll will ultimately do you more harm than good. There are just too many random things to bump into—day or night.

■ Being very critical in the selection of PZs and LZs. PZs should always be reconned for every type of aircraft that will use them; for example, CH-47s present a different challenge than an OH-58. LZ selection should include a recon if possible. If that is not possible, a map recon for slope, vegetation, or surface composition should be performed.

■ Training up as crews—day, night, NVG, and then NVG-in-formation modes. I cannot overemphasize the importance of this. The confidence building and team building that goes on through such a process is invaluable. You can tell your crew what it will be like, or you can go through it together, collectively analyzing the risks, techniques, and lessons learned along the way. When you have completed numerous repetitions of landing in increasingly tougher conditions, the shared knowledge and expertise is a combat multiplier.

I am proud of the accomplishments of some very fine soldiers who conceived the techniques, trained others to do them properly, and who refused to accept the results of the previous year as "the cost of doing business at NTC." Clearly these aviators relished the challenge and thoroughly enjoyed proving what proud professionals everywhere in Army aviation know—you can always find a way to do difficult things with less risk through good training.

POC: LTC Marshall T. Hillard, Commander, 4th Battalion, 101st Aviation Regiment, Fort Campbell, DSN 635-4015/3189 (502-798-4015/3189)

Sample blowing dust/blowing snow SOP

Editor's note: The following is a copy of the SOP that was developed by the 4-101 Aviation Regiment (Assault). The techniques described in this SOP are not official Army doctrine; they are provided for your information, consideration, or possible adaptation for use within your unit.

Appendix 1: Blowing Dust/Snow SOP to Annex F: Standardization of Task Force 4-101 Tactical SOP

1. **REFERENCES.**

a. AR 95-Series
b. FM 1-202.
c. FM 1-203.
d. FM 1-230.
e. FM 1-301.
f. FM 1-400.
g. TC 1-202.
h. TC 1-204.
i. TC 1-212.

2. **MISSION AND CONTINUATION TRAINING.**

a. During RL progression training, unit trainers and evaluators will demonstrate flight techniques to be used when brownout/whiteout conditions are encountered. Tasks to be demonstrated include:

(1) Hovering flight.
(2) Ground taxi.
(3) VMC takeoff.
(4) VMC approach.
(5) IIMC procedures.

b. If crews have not operated in a dust/snow environment in the past 90 days, they should perform a day rehearsal (flight), when possible, prior to conducting a multiship, NVG mission.

3. **TRAINING FOR DEPLOYMENT.**

a. Before deployment to a dust/snow environment, all crews will receive academic training on how to perform dust landings and takeoffs. All crews should as a minimum review the ATM tasks listed above (paragraph 2a). The following academic instruction will be scheduled:

(1) D/N/NVG flight techniques for blowing dust/snow conditions.

(2) Multihelicopter operations in blowing dust/snow conditions.

(3) Use of landing/searchlight and position lights in blowing dust/snow conditions.

(4) Areas where blowing dust/snow can be expected to occur.

(5) Techniques for attempting to dissipate effects of blowing dust/snow before takeoff.

b. After deployment to a dust/snow environment and before performing missions, all crews will perform environmental training. Environmental training should be completed in four phases:

(1) *Phase one: standardization flight*. All IPs and UTs should conduct a standardization flight during day conditions. The purpose of the standardization flight is to ensure that all trainers are teaching the same snow/dust landing techniques. Single-ship and multiship operations should be conducted. It is not necessary for all trainers to fly with one IP. Ideally, two or more aircraft are used for the standardization flight. Then after each multiship landing, landing techniques can be critiqued. If an IP or UT has not flown in a dust/snow environment in the previous 12 months, an NVG standardization flight should also be conducted.

(2) *Phase two: individual training*. As a minimum, all crewmembers who have not flown in a dust/snow environment in the previous 12 months will fly with an IP or UT during day and NVG conditions. The IP or UT will demonstrate the different landing techniques for dust/snow conditions.

(3) *Phase three: collective training, single-ship*. All crewmembers will conduct dust/snow landings under first day and then NVG conditions. Crewmembers should fly with the crewmembers they are planning to fly missions with. The purpose of this flight is to allow crewmembers to work together and to build **confidence** in their landing techniques prior to conducting air assault operations.

(4) *Phase four: collective training, multiship*. All crewmembers should conduct multiship dust/snow landings under first day and then NVG conditions.

c. These phases can be completed simultaneously. Some crewmembers may be performing phase one and two on one day, while others are performing phase three and four.

d. Crew chiefs and pilots should be trained simultaneously. Crew chiefs will be instructed to:

(1) Advise pilots of the relative position of the dust/snow cloud during approach, landing, and ground taxi operations.

(2) Assist in identifying hazards and avoiding obstacles in blowing dust/snow conditions.

(3) Assist pilots in recognizing and controlling drift if engulfed in the dust/snow cloud before landing or during takeoff.

(4) Advise pilots of the thickness of the dust cloud.

4. **FLIGHT TASKS**. A description of how to perform flight tasks:

a. *Before takeoff*: Align aircraft with desired takeoff heading if possible. Set the attitude indicator for takeoff if the aircraft is on level terrain. Crews should exercise caution when performing a takeoff in snow, because the wheels may be frozen to the ground. If snow is only a few inches thick, apply sufficient pitch to blow away loose snow but not enough to lift the helicopter. This should reduce the amount of snow blown up during actual takeoff. In a dusty environment, power applications should be minimized before takeoff.

b. *Takeoff*: Determine points for ground track, place cyclic in neutral position and smoothly increase collective and maintain heading with pedals. A near-vertical ascent will be required until clear of the snow/dust cloud. Continue to increase collective to obtain power necessary to clear obstacles without exceeding aircraft limitations. Maintain takeoff heading with pedals and takeoff attitude with cyclic. Blowing snow/dust may increase and ground references may be lost. If this happens, transition to flight instruments and continue climb as in ATM task 1075 (ITO). Once clear of snow/dust cloud, adjust torque, attitude, and airspeed as necessary to achieve normal or desired rate of climb.

c. *Hover*: Hovering may not be possible in a dusty/snowy environment. Hovering should only be attempted when snow/dust is minimum. When picking up to a hover, attempt to blow loose snow/dust away by smoothly increasing collective until aircraft is light on wheels. Once snow/dust cloud has dissipated, apply pressure and counterpressure on pedals to ensure aircraft is free to ascend. While maintaining heading with pedals, coordinate cyclic for a vertical ascent to a higher than normal hover height (20 to 25 feet). Aircraft should be flown at a higher than normal hover height and taxied at a taxi speed that is slightly faster than ETL. A snow/dust environment provides little contrast or reference points. To avoid spatial disorientation, maintain proper visual scan techniques. If visual references are lost, apply sufficient power for ITO. If takeoff is not feasible, attempt to maneuver the aircraft forward and down to the ground to limit the possibility of sideward or rearward movement.

d. *Landing*:

(1) Roll on—touchdown ahead of dust/snow cloud. *It will be performed only at an improved landing site or when landing surface is free of obstructions*. Determine an approach angle that allows safe obstacle clearance to arrive at the intended point of landing. Adjust collective as necessary to establish and maintain the angle. Maintain entry airspeed until apparent rate of closure and ground speed appear to be increasing. Maintain ground track alignment with landing direction by maintaining aircraft in trim above 100 feet AGL and aligning the aircraft with the landing direction below 100 feet AGL. Control rate of descent at touchdown with collective. Maintain aircraft attitude and landing alignment with cyclic and heading with pedals. During the last 50 feet of the approach and touchdown, airspeed should be at or slightly above ETL as necessary to avoid the possibility of brownout/whiteout and keep the snow or dust cloud behind the cockpit. After ground contact, ensure the aircraft remains stable as collective is lowered. Maintain heading with pedals and ground track with cyclic. Apply brakes as necessary.

(2) VMC approach to the ground (minimum forward ground roll). *It will be performed to an unimproved landing site*. Crew must be able to see through dust/snow cloud. The approach is steeper and slightly faster than a normal VMC approach to the ground. This approach will be initiated at approximately 50 feet and at an airspeed of less than 50 knots and above ETL. The idea is to be high enough not to stir up dust/snow for the aircraft behind you and to be slow enough that you don't have to put the aircraft in a nose-high attitude. Select a landing point and then initiate an approach by reducing collective to establish a descent. Maintain proper attitude with cyclic and heading with pedals. Prior to touchdown, it is normal for the dust cloud to engulf the aircraft. However, the dust cloud will move in front of the nose and visual contact with the ground can be maintained. If visual contact with the ground is lost, initiate a go-around. After ground contact, ensure the aircraft remains stable as collective is lowered. Apply brakes immediately. Touch down with *minimum* forward ground roll.

NOTE 1: Adequate reference features and lines of contrast are required to minimize drift and reduce the possibility of brownout/whiteout. It is helpful to initiate an approach to an area where there are small shrubs or bushes.

NOTE 2: The possibility of inadvertent IMC exists during snow/dust operations and the appropriate actions should be discussed before landing. The decision to continue or perform a go-around should be made prior to descending below obstacles, entering a snow/dust cloud, or decelerating below ETL. However, if IMC is encountered prior to touchdown, inadvertent IMC procedures will be initiated immediately.

NOTE 3: The roll-on landing technique will only be attempted to an improved landing area or when the landing surface is free of obstacles.

NOTE 4: The conditions at some unimproved PZs/LZs may be such that brownout/whiteout may occur when performing the VMC approach-to-the-ground technique. If this occurs, initiate a go-around and land at an alternate location. *Do not attempt the roll-on landing technique.* These locations will not be used for air assault operations.

NOTE 5: OGE power is required for takeoffs and landings in a snow/dust environment.

NOTE 6: Whenever possible, the aircraft should be ground taxied to keep the dust/snow cloud to a minimum.

NOTE 7: It is very important to attempt to land with a headwind or crosswind. Landing with a tailwind should be avoided.

5. **MULTISHIP.**

a. The maximum number of aircraft for dust/snow takeoffs and landings is dependent upon environmental conditions but should not exceed six.

b. The preferred landing and takeoff formations are staggered or echelon.

c. If landing to a dirt strip and the landing site is too narrow to land staggered or echelon, the aircraft should do approaches one at a time. Trail formation landings should be avoided.

d. When coming in for landing, aircraft should stack down if possible and all should initiate the approach simultaneously. To stack down, the lead aircraft may need to initiate an approach from 75 feet in order for trail to start at 50 feet.

e. During formation landings, aircraft should land far enough apart to avoid encountering the dust from the aircraft in front of them.

6. **PZ/LZ OPERATIONS.**

a. In a dust/snow environment, PZs/LZs will be reconned if possible before conducting air assault operations. This recon should be performed in an aircraft (daytime) to determine suitability. If it is an unimproved landing area, the VMC approach-to-the-ground technique will be used by the recon aircraft. If brownout/whiteout occurs before touchdown, the area will not be used for air assault operations.

NOTE 1: At the NTC during the train-up period, commanders should recon areas to determine suitability for possible PZs/LZs.

b. Large LZs/PZs will be selected.

c. In a dust/snow environment, do not bring 15 aircraft into one PZ. Disperse the aircraft into three or four different PZs. This will minimize the dust/snow.

d. It is very important to attempt to land with a headwind or crosswind. Landing with a tailwind should be avoided.

7. **EXTERNAL LOAD OPERATIONS.**

a. Slingload operations should only be conducted in areas where visual contact with the ground is possible. Slingload operations are extremely difficult in areas where brownout/whiteout occurs.

b. Before conducting slingload operations, the PZs and LZs should be reconned in a UH-60 aircraft if at all possible (during day conditions) to determine if visual contact with the ground can be maintained.

c. Before attempting slingload operations, a dust-free recovery airfield/area will be identified and briefed.

d. All external-load operations will be briefed as high risk and will require the approval of the battalion commander.

8. **NVG CONSIDERATIONS.**

a. Surface conditions will be more difficult to judge at night. The possibility of spatial disorientation due to limited reference and contrast will increase at night. It is very helpful to do your approaches to areas where there are small shrubs or bushes. As you do your VMC approach to the ground, the shrubs provide the necessary contrast.

b. Use of the position lights and searchlights may increase contrast and reference points during landings. However, use of the searchlight or position lights may cause NVGs to shut down if a snow/dust cloud develops around the aircraft. It is normally best to leave the searchlight on and place the position lights on steady dim for approaches. If you place the position lights on steady bright, it tends to bleach out the landing environment. The searchlight provides the necessary illumination to see the landing environment and can be dimmed if necessary.

c. Air assault operations should be conducted inside the NVG window (moon angle is greater than 30 degrees with 23 percent or greater illumination) whenever possible. Outside the NVG window, there is hardly any contrast above 50 feet and it is almost impossible to see a horizon. If conducted outside the NVG window, the mission will be briefed as high risk and will require the battalion commander's approval. ❑

Quality crews . . . good decisions

Armed with a cool head, experience, and training, an extremely dangerous situation can be handled effectively.

We hear it repeatedly: approximately 80 percent of all reported accidents are attributed to *human factors*. Someone made a mistake, someone violated regulations or policies, or someone did not follow procedures as specified in the dash 10 or aircrew training manual. What we don't hear often enough are reports about those accidents that were prevented or minimized due to superior judgment and skill of the individual—the *human*—at the controls.

Until the middle of December, Army aviation enjoyed an exceptional flight safety record for the first quarter of a fiscal year. The outstanding safety record for early FY 1995 can be attributed to crewmembers who were able to correctly identify and assess hazards, accurately diagnose an emergency, analyze the situation quickly, and execute emergency procedures with learned exactness. While I know there are many others out there who deserve equal credit for outstanding performance, I am personally aware of two recent cases in which the crews deserve recognition for their performance.

■ In November 1994, Mr. Mel Strobel, a contract instrument instructor pilot was conducting instrument flight training in a UH-1 under actual instrument conditions with 2LT Mike Mora, a student pilot. Due to deteriorating weather conditions, Mr. Strobel decided to conduct the instrument approaches at Cairns Army Airfield, Fort Rucker, AL. During ATC vectoring to the final approach course, he had monitored other aircraft reports of breaking out of the clouds at 300 feet AGL and 1 mile from the airfield.

In actual weather conditions at approximately 1,500 feet AGL, 2LT Mora established the aircraft on the final approach course 3 miles from the airfield and the master caution and engine chip lights illuminated. A decision had to be made. At that moment, the aircraft entered a "sucker hole" approximately ¼-mile in diameter. Mr. Strobel saw the ground and saw a wall of clouds approach as they neared the airfield. Examining his options, he elected to initiate a circling descent to land in the only area they could see rather than continue to the airfield.

Mr. Strobel took the aircraft controls and selected his landing area based on his limited visibility. 2LT Mora performed those crew actions that allowed Mr. Strobel to concentrate on landing. As they continued their descent, the aircraft engine seized. Mr. Strobel continued his descending turn and committed to his landing area. He estimated that they had made three complete 180-degree turns during the descent to keep the ground in sight. As he approached the ground, he leveled the aircraft, flared, and cushioned, knowing he had to minimize his ground run. The aircraft landed in a soft, sandy field with minimum ground run and suffered only minimal damage due to the expert handling by the pilot.

Mr. Strobel has an extensive flight background that includes 12 years as an active-duty pilot, continued Reserve flight training, and 12 years as a contract instructor pilot for the Army. His flight experience, coupled with his level of comfort conducting instrument flight, enabled him to remain cool and collected as he evaluated the signals from the aircraft. His decision to remain in the limited "sucker hole" was a decision to play it safe rather than to try to make it to home base. Mr. Strobel's excellent decision to land immediately in the only area he could see paid off and saved the aircraft and crew.

■ An RV-1D Mohawk pilot and air intelligence specialist were conducting a mission in actual weather conditions at altitude. When their VHF radio became inoperative, LTC Richard Leyden, the pilot-in-command, elected to abort the mission, as required by the unit SOP. As they were en route to their home base and descending from altitude of 12,000 feet MSL, both engines quit.

Once LTC Leyden determined that he had no engine response, he elected not to eject as is recommended. At this point he was still in the clouds, was uncertain if he was over the ocean or near a populated area, or if he had a suitable landing area available. He continued the descent until he had visibility with the ground (about 2,000 feet AGL) and he was able to determine that he had no suitable landing area. He trimmed the aircraft level, aiming toward an area that did not appear to be populated. LTC Leyden instructed the observer to eject, and he followed as the aircraft passed through 800 feet AGL. Both crewmembers landed safely and uninjured.

Even though the aircraft was totally destroyed, no property or personnel were injured because of LTC Leyden's decisions and actions. He had 16 years as an aviator, most of them in fixed wing aircraft. Even though I'm sure he was experiencing a high degree of anxiety, LTC Leyden kept cool and made the best decision possible when he ejected from the aircraft.

These are but two examples demonstrating that Army aviation has quality aircrews who identify and assess hazards and make good risk decisions daily. When Mr. Strobel and LTC Leyden were presented with an emergency situation, they made smart decisions based on the immediate situation and their aviation experience and training. They were understandably excited but remained calm and collected and were able to perform in the professional, skillful manner required to keep a bad situation from becoming a tragedy.

—MAJ Paul E. Nagy, nagyp@rucker-safety.army.mil, DSN 558-3262 (334-255-3262)

AH-64 tail wheel locking mechanism

In a recent AH-64 Class C accident, the crew could not get the tail-wheel-unlocked light to illuminate prior to ground taxi. The pilot in the front seat directed the crew chief to visually confirm that there was no tail wheel safety pin installed. After visual confirmation that no tail wheel safety pin was installed, the crew elected to hover taxi to an adjacent parking ramp.

After landing the aircraft, the crew again attempted to get the tail wheel to unlock by applying slight pressure to the tail rotor control pedals. As the crew applied pressure, the tail wheel swiveled. However, the tail-wheel-unlocked light did not illuminate.

During postflight inspection following a maintenance test flight, the crew found damage to the tail wheel trailing arms and tail wheel locking mechanism. Maintenance inspection revealed that the interior surface of the tail wheel fork assembly bearing sleeve was excessively worn, causing the tail lock pin to stick in the locked position.

Contributing causes

Recent accumulations of ice and snow in combination with below-freezing temperatures may also have contributed to the tail wheel locking pin becoming stuck in the locked position. The moisture and ice may have accumulated inside the bearing sleeve, further restricting the movement of the tail wheel locking pin.

The pilot on the controls may have applied excessive pressure to the tail rotor control pedal when trying to unstick the tail wheel locking pin. This excessive pressure may have caused the tail wheel pin to shear.

Prevention measures

■ Ensure aircrews and maintenance personnel are aware of the potential problem.

■ Look for excessive wear of the tail wheel fork bearing sleeve during scheduled maintenance inspection.

■ Give special attention to removal of snow and ice from the tail wheel locking mechanism during cold-weather operations.

■ Be cautious when using the tail rotor control pedals to assist in unsticking a stuck tail wheel locking pin.

■ Be aware that a free-swiveling tail wheel without a corresponding "tail-wheel-unlocked" light is generally indicative of a sheared tail wheel pin and further ground taxi should be minimized.

POC: MSG Alcides Santana, santanaa@rucker-safety.army.mil, DSN 558-3051 (334-255-3051)

Congratulations AAAA winners!

The Army Aviation Association of America national award recipients for 1994 are as follows:

■ *Outstanding Aviation Unit of the Year (Active).* 4th Battalion, 24th Aviation Regiment, 24th Combat Aviation Brigade, Hunter Army Airfield, GA 31409-5109. Commander, LTC Jack Dibrell, Senior Noncommissioned Officer, CSM Karl Moody.

■ *Outstanding Aviation Unit of the Year (ARNG).* Company G, 140th Aviation Regiment, 8010 South Airport Way, Stockton, CA 95206. Commander, MAJ Kevin Keenan, Senior Noncommissioned Officer, 1SG Charles Chaisson.

■ *Outstanding Aviation Unit of the Year (USAR).* 1st Battalion, 214th Aviation Regiment, 63d Army Reserve Command, 11200 Lexinton Drive, Building 42, Armed Forces Reserve Center, Los Alamitos, CA 90700-5002. Commander, LTC Ronald Brown, Senior Noncommissioned Officer, CSM Kent Snyder.

■ *Army Aviator of the Year.* CW2 Victoria Welch, 194th Maintenance Battalion, APO AP 96271.

■ *Aviation Soldier of the Year.* SSG Donald L. Wilson, 3d Battalion, 25th Aviation Regiment, Fort Drum, NY 13602.

■ *Army Aviation Medicine Award.* MAJ Lisa A. Black, D.O., 159th Combat Aviation Group (Airborne), Fort Bragg, NC.

■ *Joseph P. Cribbins Department of the Army Civilian of the Year.* Mr. Rodney J. Schulz, Deputy Assistant Commandant, U.S. Army Aviation Logistics School, Fort Eustis, VA 23604-5414.

■ *James H. McClellan Aviation Safety Award.* CW5 Gerald D. Cartier, 10th Aviation Brigade, 10th Mountain Division, Fort Drum, NY 13602.

■ *Robert M. Leich Award.* 1st Battalion, 58th Aviation Regiment (Corps), 159th Combat Aviation Group, Fort Bragg, NC 28707-5000.

■ *Top Chapter of the Year.* Colonial Virginia Chapter, COL Thomas E. Johnson, Chapter President, Assistant Commandant, U.S. Army Aviation Logistics School, Fort Eustis, VA 23604-5414.

Congratulations to all recipients for their significant achievements in Army aviation. ❑

ShortFAX
Keeping you up to date

Maintenance advisory message on closed circuit refueling nozzles, NSN 4930-00-204-9452 and 4930-00-117-4726

After refueling an AH-1S, the closed circuit refueling (CCR) nozzle was disconnected from the aircraft receiver and the nozzle subassembly tube, P/N CCN101-063, was expelled from the nozzle, resulting in an uncontrolled fuel discharge that soaked both the aircraft and the pilot.

Note: Although the Wiggins nozzle has not been supported by the military supply system for more than 6 years, many of these nozzles have been supported by commercially available parts and are still in service, particularly in Army National Guard units.

Inspection/correction procedures

■ During normal assembly of the nozzle, ensure the nonmetallic thread locking feature of the subassembly tube, P/N CCN101-063, is still functional—that is, some resistance should be felt during tightening.

■ If the nonmetallic locking feature is degraded and a new subassembly tube is not available, Loctite 242, NSN 8040-01-250-3969, must be applied to the threads during assembly.

Points of contact

■ Technical POC is Mr. Charles Bright, DSN 693-3888 (314-263-3888).

■ Logistical POC is Mr. Jack Shortridge, DSN 693-2618 (314-263-2618).

■ Safety POC is Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

Accident briefs
Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class C

V series - On normal NOE approach to snow-covered LZ during routine authorized training flight, main rotor blades contacted small tree. Both blades sustained damage.

UH-1 Class E

H series - Prior to engine start, crew chief verbally responded to PC that aircraft was "clear." Although crew chief untied tiedown from tail boom, he did not remove it from main rotor blade. During start, PC felt unusual shaking and shut down aircraft. Main rotor tiedown had struck tail rotor and FM whip antenna.

H series - While performing HIT check, crew raised collective about 4 inches but could not lower it to flat pitch. Crew reduced throttle to idle. As RPM came back through 4400, crew was able to lower collective. Crew shut down aircraft and aborted mission. Maintenance serviced hydraulic system.

H series - During IFR flight, fire light flickered. Crew encountered VFR conditions shortly after incident. PC decided to land aircraft at uncontrolled airport. Suspect wiring problem.

H series - During NVG air assault, aircraft was at engine idle in LZ when master caution light flickered and then illuminated. PC checked segment light panel but found none illuminated, reset master caution, and shut down aircraft. Technical inspector was flown to site to inspect aircraft and found nothing. Crew ran up aircraft. Master caution light did not illuminate, and crew flew aircraft back to airfield. Master caution box then replaced.

H series - Returning to airfield after completion of TEAC and vibemeter test (all normal), MP started descent on left base for landing and N2 drooped to 6300 RPM. MP reduced collective to regain RPM. In less than 1 minute, RPM decreased to 6000. Increase/decrease switch had no effect. MP diverted and N2 decreased to 5800 RPM. MP increased airspeed to clear trees on approach end. As aircraft cleared trees, MP continued shallow approach, noticed decrease in engine noise, and saw N2/rotor needles split. MP continued to decelerate aircraft and made running landing. Aircraft slid about 700 feet down runway and then off left side into sod before coming to a stop. Postflight inspection revealed no damage to aircraft. Suspect engine failure.

H series - During hover OGE check, crew felt binding in tail rotor pedals with near full left-pedal input. Crew completed normal landing without further incident. Maintenance troubleshooting revealed that tail rotor trunion spindles were worn excessively by needle bearings, which ride against that surface.

V series - On final approach, master caution and engine chip lights illuminated. About 5 seconds later, N2 gauge oversped. Crew reduced throttle to correct overspeed. N2 gauge then indicated zero. At 50 feet AGL, engine appeared to quit completely. Crew autorotated aircraft to ground with no further damage.

V series - About 1.5 hours into flight, crew began to smell increasingly strong jet fuel odor. Master caution and auxiliary fuel-low caution lights subsequently illuminated early, after only 45 minutes of fuel transfer. Crew verified that auxiliary tank was empty, determined that fuel was leaking from auxiliary fuel system, and landed at nearest airport to investigate. Crew observed fuel dripping from tail boom of aircraft, aborted mission, and initiated fuel-containment procedures.

UH-60 Class C

A series - Crew had been flying aircraft for about 1 hour on acceptance test flight. During autorotational RPM check, nose door came open. Crew completed power recovery and landed without further damage. Inspection revealed damage to nose door, nose door strut, ice sensor, and center windshield.

L series - While aircraft was hovering in confined area on hillside, main rotor blade contacted small tree in left rear quadrant. Crew returned aircraft to home base, which was closest suitable landing area. Postflight inspection revealed damage to four main rotor blade tip caps.

UH-60 Class E

A series - During contour flight, aircraft was in right turn when main rotor blades contacted top of tree. Crew completed landing without further incident. Maintenance inspection revealed small chip on leading edge of nickel abrasion strip 2 feet inboard of tip cap on blue blade. Aircraft was released for one-time flight to airfield. Maintenance applied hysol to damaged area and released aircraft for flight.

A series - During cruise flight, No. 1 tail rotor caution light, master caution and backup pump advisory lights, and No. 2 tail rotor advisory light illuminated and tail rotor control was lost momentarily. No. 2 tail rotor servo came back on line and tail rotor control was regained. Crew landed aircraft without further incident. Maintenance could not duplicate problem and released aircraft for flight.

A series - During stabilator test on runup procedures, crew depressed stabilator test button and stabilator moved upward about 10 degrees with no accompanying stabilator caution light or audio. When crew released test button, stabilator moved back to full-down position without their pressing auto control reset. Maintenance replaced No. 2 stabilator amplifier.

L series - During IFR flight, right tank of ESSS/ERFS failed to transfer fuel. Crew aborted mission. Suspect blockage of bleed air valve in ESSS.

L series - While in formation flight, stabilator failed and would not reset. Master caution and segment lights and stabilator audio all functioned properly. Crew returned to airfield without incident. Maintenance replaced stabilator amplifier.

Attack

AH-64 Class A

A series - After refueling and departing for second sortie of pre-gunnery training, aircraft crashed in traffic pattern. Aircraft came to rest upright with all four main rotor blades destroyed, tail boom separated, and PNVS damaged. Minor injuries.

AH-64 Class E

A series - Aircraft was .5 hours into flight when pilot felt uncommanded pedal input. Crew immediately smelled burning odor and landed aircraft. Due to unstable landing surface, PC took controls and moved aircraft to improved road surface. Just prior to landing, PC felt second uncommanded pedal input but landed aircraft without further incident. Postflight inspection revealed L200 transmission panel was unsecured on forward two-thirds of panel. Panel had rubbed and shorted nose gearbox heater wiring. L200 panel had rubbed on nose gearbox shaft flex coupling with no damage, and L200 panel had come in contact with tail rotor linkage bellcrank, which caused uncommanded pedal inputs. L200 panel was bent outward by force of airflow in flight and had started chain reaction of dzus fasteners working loose due to excessive buffeting. Fiberglass structure of panel was cracked aft of transmission area access door and was creased inward on forward lower corner along line running diagonally across about 15 inches from corner. All of the forward nut plates were bent outward. This and inward crease of lower front corner is evidence that front lower dzus fastener was probably the last one to come loose. This supports the theory that the camlock fasteners were in fact locked before flight and the lower latch failed and was lost during flight. Failure of latch is believed to be caused by wear due to age and the spring coming loose. Other aircraft L200 panels were inspected and also showed degree of wear.

A series - During APU operation, crew engaged generators and received intermittent backup control system caution light. Maintenance found chafed electrical wire under B-60 access panel.

Cargo

CH-47 Class C

D series - Upon arrival at home station, crew discovered that aircraft clamshell doors had departed in flight. Suspect latch-pin failure.

D series - While taxiing to park, aircraft blade contacted blade of parked aircraft. Each aircraft sustained tip damage to one main rotor blade.

CH-47 Class D

D series - After accomplishing hover hookup, hookup team began to recover static probe grounding rod, which was about 7 feet from load. Aircrew began to lift load, and aircraft drifted right slightly. When load was lifted clear of ground, it swung right, hitting members of hookup team. One member of team suffered minor injury.

Observation

OH-58 Class E

D series - During transfer of controls while hovering for takeoff, aircraft nose pitched up, resulting in tail rotor striking taxiway. Aircraft landed hard.

Training

TH-67 Class C

Upon leveling aircraft for touchdown during controlled autorotation, pilot applied excessive collective and aircraft climbed 5 to 8 feet. Low RPM resulted in pylon whirl. Swashplate contacted cowling, mast damaged static stops, and striker plate and isolation mount were damaged.

Fixed wing

C-12 Class C

F series - While performing upper-air-work maneuvers during aviator qualification course training, IP failed and feathered left engine. When pilot recovered engine, prop failed to come out of feather and subsequent addition of power created overtorque condition. Engine must be replaced.

OV-1 Class E

D series - In cruise flight, autopilot continuously disengaged, rapidly putting aircraft into 25-degree angle of bank with aircraft trimmed for level flight. After failure of INS and compass placed in backup mode, autopilot generated wing rock of plus/minus 4 degrees. Crew disengaged autopilot and returned aircraft to base without further incident. Maintenance replaced flight controller assembly.

Messages

■ Safety-of-flight technical message concerning change to retirement life for certain main rotor blade cuffs on all EH/UH/MH-60A/L aircraft (UH-60-95-02, 131544Z Feb 95). Summary: Due to changes in the way the UH-60 is being operated, certain main rotor cuffs have a lower retirement life. The purpose of this message is to require a one-time inspection of all main rotor blade and cuff assemblies and to establish a reduction of the retirement life for the eight lug main rotor cuffs. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action operational message concerning Hydra 70 rocket motor suspension and information for all AH-64A/D, OH-58D, AH-1S/P/E/F, A/MH-6, and MH-60 series aircraft (GEN-95-ASAM-03, 142020Z Feb 95). Summary: Army Materiel Command suspended training use of the 2.75-inch Hydra 70 rockets with the MK-66 rocket motor (all mods). This message is released by ATCOM to assure affected aviation units are aware of and implement the suspension to prevent aircraft damage. The purpose of this message is to provide a listing of suspended lots of MK-66 rockets to the aviation community and to ensure units are aware of HQDA guidance in HQDA message DAMO-TR, 081802Z Dec 94, subject: Aviation Gunnery Strategy for 2.75-inch Rockets. (See January 1995 issue of *FlightFax* for reprint of message.) Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning main rotor stretched strap assembly Teflon removal and borescope inspection on all AH-64 series aircraft (AH-64-95-ASAM-02, 081900Z Mar 95). Summary: This ASAM addresses four strap pack problem areas—

• Depending on the failure location, it can be difficult to detect failed laminates on the main rotor strap pack using the current inspection. To facilitate performing the new 10-hour borescope inspection required by this ASAM, the excess Teflon located around the outboard and inboard shoes of each strap pack must be trimmed in accordance with TB 1-1520-238-50-03. This is to be accomplished by an OLR team.

• The inspection/repair procedures for the main rotor strap pack in TM 1-1520-238-23 dated 16 May 1994 have been superseded by this message. In addition, the requirements of TB 1-1520-238-20-52 dated 30 March 1994 and TB 1-1520-238-20-55 dated 11 April 1994 have been superseded by this message. The requirement for removal of main rotor strap pack P/N 7-311411146 (basic) is still valid.

• The 29 June 1994 issue of the interim statement of airworthiness qualification (ISAQ), AH-64A helicopter, changed the retirement interval for the main rotor strap pack from 4,500 flight hours to "on condition."

• The 16 May 1994 TM 1-1520-238-23 provides damage criteria limits for the link pin that has been determined to be inadequate.

The purpose of this message is to—

• Prepare the field units for an enhanced 10-flight-hour inspection using a flexible borescope kit. Units will be trained in the use of borescopes for this application prior to receiving borescope kits. Before the borescope inspection can be performed, the Teflon protruding out from around the inboard and outboard end must be trimmed flush. This trimming will be accomplished in compliance with TB 1-1520-238-50-03 by an OLR team.

• Provide corrections to the following TM 1-1520-238-23 inspection/repair procedures: special inspection No. 27, paragraph 5.1.3.E and paragraph 5.36.3.

• Return the retirement interval for the main rotor strap pack back to 4,500 flight hours. This change is required in order to ensure that the flight hours can be accurately tracked by ATCOM.

• Revise the damage criteria limits contained in the TM 1-1520-238-23 for the link pin, P/N 7-211411199/-3. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of wire bundle and restack of Adel clamps near bus bar, P/N 406-075-156-101 (OH-58-95-ASAM-05, 082200Z Mar 95). Summary: Field reports have indicated that several aircraft have experienced electrical short circuits between the power distribution bus bar, P/N 406-075-156-101 and a wire harness that runs parallel to the bus bar. These shorts have resulted in the loss of several aircraft systems and have caused severe damage to the wire harness. This problem has been attributed to the Adel clamp arrangement and the close proximity of the wire harness to the bus bar. The purpose of this message is to require a one-time inspection of the wire harness running parallel to the bus bar, P/N 406-075-156-101, and provide restack instructions of Adel clamps. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

The only way an officer can demonstrate his leadership qualities is through personal example. . . . I for one have never believed that you should ask any person to do anything that you wouldn't do yourself.

—General Louis H. Wilson

In this issue:

Class A Accidents through March

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	1	0	0
	March	0	1	0	0
3D QTR	April	5		2	
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	**21**	**4**	**11**	**1**

U.S. ARMY SAFETY CENTER

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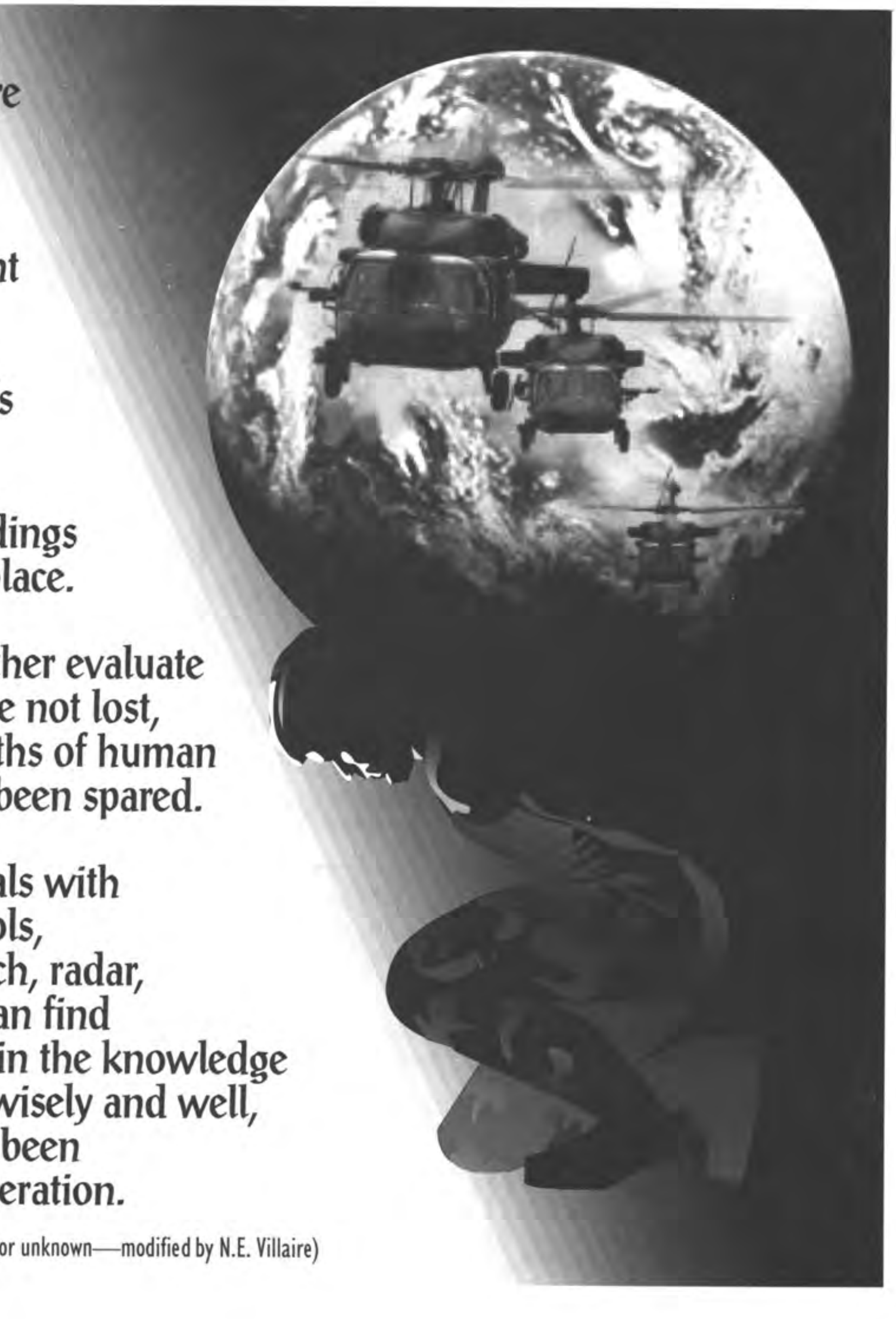
REPORT of ARMY AIRCRAFT ACCIDENTS
May 1995 ◆ Vol 23 ◆ No 8

It is impossible to
accurately measure
the results of
aviation safety.

No one can count
the fires
that never start,
the aborted takeoffs
that do not occur,
the engine failures
and the forced landings
that never take place.

And one can neither evaluate
the lives that are not lost,
nor plumb the depths of human
misery we have been spared.

But the individuals with
the flight controls,
fueling hose, wrench, radar,
or dispatch order can find
lasting satisfaction in the knowledge
they have worked wisely and well,
and that safety has been
the prime consideration.



(author unknown—modified by N.E. Villaire)

Preserving combat readiness and saving defense dollars are top priorities with everyone these days. Fortunately, Army aviation will soon be able to reduce accidental losses of lives and equipment with the introduction of some amazing new inspection technology.

In the first quarter of FY 96, the Army will equip its first aviation intermediate maintenance (AVIM) unit with state-of-the-art nondestructive test equipment (NDTE). Material flaws hidden from the human eye can be detected with the NDTE during inspections, and tragic accidents resulting from catastrophic structural failures can be prevented.

New NDTE system for Army aviation

Nondestructive test equipment is used in two significant ways. The first is in "fingerprinting" (documenting the as-manufactured state) of new parts and assemblies before putting the hardware into service. These fingerprints can subsequently be compared to fingerprints of the same parts and assemblies after they have been in service for a period of time. The results of the comparison will reveal important structural changes (flaws, including debonds) for a period of service. Nondestructive testing is a method of determining the actual part/assembly life. The obvious benefit is the increased service life for time-change components.

The second and most common way in which NDTE will be used is in the detection of flaws in structural areas of airframes that were not initially fingerprinted. The easiest way to explain this process is to visualize small (or large) imperfections (flaws) that exist in structural airframe materials such as ferrous and nonferrous metal parts as well as composite material parts. Many times these flaws, which occur for many different reasons, are below the surface of the material and therefore hidden from the human eye. Needless to say, these flaws have the potential to result in catastrophic structural failures.

portable x-ray machine

harmonic bond tester

ultrasonic flaw detector

Introduction of new inspection technology

The Army's current capability to detect such flaws is primarily by outdated and costly processes such as—

- Liquid dye penetrant testing (PT).
- Magnetic particle testing (MT).
- Removing parts/assemblies and shipping to a depot for inspection.
- Using medical x-ray equipment.

In addition to such processes, inspections by local contractors or collocated sister services may be employed.

The NDTE system comprises the following items of inspection equipment:

- Radiographic test unit (RT). See sidebar regarding required implementation of a comprehensive radiation protection program.
- Ultrasonic flaw detector (UT).
- Eddy current tester (ET).
- Harmonic bond tester (HBT).

In addition to these primary items of equipment, many accessory items are required to perform the various kinds of testing. Some of the additional

Marines have operated this type of equipment as a standard process with great success and cost savings/avoidance, the Army to date has used this technology only on a limited basis. NDTE program management has insisted from the beginning that we should not "replow plowed ground." If the Army's aircraft nondestructive test requirements are not greater than the capabilities of equipment other services have procured, tested, operated, and are still using today, we should not waste taxpayer dollars repeating procurement actions. This is the essence of the nondevelopmental item acquisition process. Consequently, the Army will procure the NDTE system and logistical support (as required) via a military interdepartmental purchase request (MIPR) and memorandum of agreement (MOA) with the Air Force. This will result in savings to both the Army and the Air Force.

Recapping the benefits of NDTE

The facts are clear. When the NDTE system and trained personnel are fielded, the Army will save lives and dollars and combat readiness will increase. Cost and readiness improvements will accrue in the following areas:

- Increased weapons system availability.
- Reduced maintenance manhours.
- Reduced ozone-depleting chemicals.
- Reduced dependency on contractors.
- Aircraft will fly longer and more safely.
- Maintenance manhours per flight hour will decrease.

For assistance . . .

Contact the Army's Nondestructive Testing Program Office at ATCOM. The primary functions of this office are to—

- Serve as a central worldwide management point for nondestructive testing, including activities at aviation unit maintenance (AVUM) and AVIM units and depots.
- Ensure standardization of equipment and support for fielded systems.
- Develop Army nondestructive testing policy and provide guidance.
- Serve as nondestructive testing POC for PEO aviation programs.
- Provide training support and guidance.
- Manage requirements and technology updates.

Some will say that "it's about time!" But fielding the *right* equipment is important, and at the Aviation Ground Support Equipment Weapon Systems Management Office of the Aviation and Troop Command (ATCOM) in St. Louis, MO, which is charged with fielding this new technology, we believe that it will have been worth the wait.

The Army's new NDTE is coming soon! For those MOS 68Ds who are eagerly waiting to begin doing nondestructive testing in a far superior way, get into that ITRO school and get yourselves trained. There are two ways to accomplish this: TDY en route and TDY and return. For further information, contact the ATCOM NDT/I Program Office.

POC: Mr. Wayne Suchman, ATCOM NDT/I Program Office Manager, DSN 693-9307 (314-263-9307)

Finger and lip lights are on the way

Supplemental cockpit lighting is a subject of high interest among pilots flying night-aided and unaided missions. Aviators use various lighting devices that include mini-mag style flashlights, gooseneck lights, and lip and finger lights of various designs. However, lip lights and finger lights currently available do not meet military specifications and are not completely NVG compatible.

The Army is working to establish military specification standards for both lip and finger lights that will be completely NVG compatible. In the interim, a program is underway to provide authorized supplemental lighting to aviators within about 6 months.

In January 1995, the Defense General Supply Center, Richmond, VA, established two contracts with Seitz Scientific Industries, Inc. to provide finger lights, NSN 6230-01-357-2175 and lip lights, NSN 6240-01-362-4902, for shipment to Army aviation units. The contract is for over 12,000 units of each item.

A third contract was made with Hoffman Engineering Corp. for approximately 2,800 Army flashlight NVG-compatible filters, NSN 6230-01-369-1658. The filters will be fielded during the same period as the lip and finger lights.

The finger lights, lip lights, and flashlight filters will be sent to aviation units that have NVGs. Units will receive these items without requesting them on a one-time issue basis. Units that want to know the quantity they will receive may call CW4 Popovitch, Directorate of Combat Developments, U.S. Army Aviation Center, Fort Rucker, AL, DSN 558-9130 or commercial 334-255-9130.

Although the items are assigned NSNs, the proponent agency, Project Manager, Soldier, does not plan to provide the lights through the Army supply system. Units or individuals can purchase finger lights and lip lights (Mike Lite) directly from Seitz Scientific Industries, Inc., 201 E. Hickory Bend Road, Enterprise, AL 36330-1007, telephone 334-347-9713 or FAX 334-393-2381. The NVG-compatible flashlight filters can be purchased from Hoffman Engineering Corp., 22 Omega, 8 River Bend Center, Stamford, CT 06907, telephone 203-425-8900.

Unit SOP and aviator training requirements for use of supplemental lighting, including lip and finger lights, are contained in TB 1-1500-346-20: Updated Information On Night Vision Goggles, 20 January 1995.

POC: CW5 Daniel W. Medina, Investigations Division, DSN 558-9857 (334-255-9857)

accessories are radiographic film-developing equipment and materials, radiation safety devices, tester probes, transducers, and so forth. Current planning is for each AVIM and National Guard aviation classification repair activity depot (AVCRAD) unit to be outfitted with one RT and two each of the UTs, ETs, and HBTs and their associated accessories.

Training

Operator/tester training is a major part of the NDTE program. The MOS 68D, Powertrain Repairman, has been selected to perform nondestructive testing for the Army. There are approximately 35 technicians who are currently qualified to operate and perform aircraft nondestructive testing with the NDTE system. These technicians received their special training at the Interservice Training Review Organization (ITRO) in Millington, TN. The Army plans to increase the number of personnel in this training as required to match or exceed the fielding of NDTE systems.

NDTE system support

Daily and scheduled maintenance for the NDTE system will be performed by the MOS 68D technician. All other required maintenance for the system below the depot level will be performed by the MOS 35H—Test, Measurement, and Diagnostic Equipment (TMDE) technician. The x-ray unit tube head will be maintained and repaired by the U.S. Air Force depots. Air Force technical orders (TOs) will be revised to become Air Force TOs/U.S. Army Technical Manuals (TMs).

Airframe and component nondestructive testing/inspection (NDT/I) procedures are currently being written and validated at Corpus Christi, TX. There will be approximately 400 new procedures as well as existing procedures, which will be converted from the PT or MT processes, designed to support current Army rotary wing aircraft. These procedures will be supplemented by video films that will greatly augment the NDT/I procedures.

Eddy CURRENT TESTER

Saving lives and dollars

The Army's "throw-away" mentality is changing, especially on high-dollar parts. Costs now "drive the train." For structural flaw detection in Army aviation, nondestructive testing is the best choice.

■ **NDTE advantages**. The gains to be made from the operation of the NDTE system by the Army accrue primarily from two advantages: finding defects that are not visible by any other means can prevent catastrophic failures, saving lives and preventing losses of equipment; and avoiding premature disassembly and removal of aircraft parts and assemblies to perform structural inspection that can now be performed in shops only. Also to be avoided is the outright replacement of parts from time before overhaul, retirement life, or condition change where there is no means of inspection.

■ **Procuring the NDTE.** One interesting aspect of the Army's NDTE program is the fact that the NDTE and its Integrated Logistics Support System will be procured through the U.S. Air Force. While the Air Force, Navy, and

Implementation of comprehensive radiation protection program

The nondestructive test equipment to be fielded by ATCOM includes a 160-kilovolt portable industrial x-ray system. This system emits hazardous levels of radiation, and its safe use depends on strict adherence to established safety procedures.

A comprehensive radiation protection program must be fully implemented in each unit before initiation of industrial radiography operations. Adequacy of this program must also be verified by ATCOM before radiography equipment will be issued.

To facilitate implementation of this program, ATCOM has provided detailed radiological safety information directly to the commander and to supporting safety personnel of each AVIM and AVCRAD. Commanders must review this information and assure full implementation of all radiation protection program requirements prior to materiel fielding of nondestructive test equipment.

Contact your radiation protection officer, MACOM radiation control officer, or the ATCOM health physicist if additional radiation safety information is required. The ATCOM health physicist, Mr. Dennis Chambers, may be contacted at DSN 693-2196 (314-263-2196).

Flight helmet success stories

. . . and another reminder about proper wear, fit, and maintenance

The SPH-4 flight helmet has received improvements and modifications since its fielding in 1970. One feature that hasn't changed is its invaluable protection for the most vulnerable part of the body: the head. The SPH-4 flight helmet and its derivative, the SPH-4B, have saved a lot of crewmembers' lives and prevented or reduced many injuries since entering service with the U. S. Army.

Another save for the SPH-4 flight helmet! Following hydraulics-off running landing, aircraft rolled over, pinning IP in wreckage. His head was protected by his helmet.

Success stories

While we often hear stories of helmet failures during crash sequences, most of the success stories, such as the following, have gone unnoticed.

- At 100 feet AGL and 100 knots while on approach to landing, a UH-60 struck a sea gull. The bird penetrated the windscreen and parts of it splattered around the cockpit. Fortunately, the pilot on the controls had his visor down and was protected from the bird debris. Without the visor protection, he likely would have suffered eye injuries or temporary vision impairment. Thanks to the protection the helmet and visor afforded, the pilot was able to land the aircraft safely.
- A UH-60 on a night flight landed hard (in excess of 12 Gs). The upper body of the occupant in the right gunner's seat was tossed forward and laterally. His head struck the M60 machine gun pintle. Fortunately his flight helmet took the impact and protected his head from serious injury—another save for the helmet. The helmet received a 2-inch crack in its shell and was rendered unserviceable.
- A UH-60 on an NVG mission inadvertently flew into the ground. Both pilots' heads struck with strong impact forces against cockpit structures. Both helmets sustained broken visor shell covers, and both styrofoam liners were compressed by impact with the helmet's headband. The pilots suffered only minor head injuries. Chalk up two saves for the helmets.
- An OH-58 struck the ground hard. The pilot's shoulder harness did not lock properly and his head swung forward and down. The visor on the pilot's helmet struck the cyclic stick, causing it to be scarred and rendering it unserviceable. Without the visor's protection, the pilot's eyes could have been seriously injured and his flying career ended.

The HGU-56/P

Agencies that developed, procured, fielded, and continue to support our SPH-4 have done commendable work. Now the Army is fielding its next generation flight helmet, the HGU-56/P. This helmet is lighter, stronger, more versatile, and provides better head protection than the SPH-4 and -4B.

Proper wear, fit, and maintenance required

Regardless of which helmet an aviator is issued, its protection is reduced to the lowest denominator if it's not maintained, fitted, and worn correctly.

During a recent accident investigation, four crewmember helmets were inspected for serviceability. Each of the four had maintenance flaws (not resulting from the accident); three had red-X discrepancies. The majority of the discrepancies should have been discovered by the crewmember (operator) during preflight inspection. Unfortunately, this example is repeated over and over in Army aviation.

It is imperative that flight crews preflight their helmets and flight gear. No one has more at stake than the person who is counting on his or her flight helmet for protection. Preflight checklists are found in the helmet maintenance manuals: SPH-4—TM 10-8415-206-12 &P, SPH-4B—TM 10-8415-215-12 &P, and HGU-56/P—TM 1-8415-216-12 &P. Helmets with discrepancies should immediately be taken to the unit ALSE maintainer for correction.

The Army's desire is for you to always have the best helmet available but to never have an opportunity to prove it. If the worst does happen, however, careful inspection and fitting and proper wear of your helmet will maximize protection for the most important and most vulnerable part of your body: your head.

POC: CW5 Daniel W. Medina, Investigations Division, DSN 558-9857 (334-255-9857)

Plastic sunglasses: issues, answers, and solutions

Some military aviators have reported difficulty distinguishing the color of cockpit warning lights when wearing sunglasses with plastic lenses. This could be due to lenses that are too dark or that lack neutrality and therefore distort color vision. The U.S. Army Aeromedical Research Laboratory (USAARL) conducted a study to determine the origin of this problem and recommend solutions.

Five pairs of plastic sunglasses (-4 to +4D power) were ordered from each of seven military optical labs (70 lenses total). Each lab was instructed to dye the lenses a neutral gray with 21-percent transmittance. Light transmittance and color distortion were measured on all lenses.

Surprisingly, sunglass transmittance varied widely across optical labs (1 percent to 30 percent). Color distortion also varied between labs, and this effect was related inversely to light transmittance (high color distortion with low light transmittance).

USAARL felt that both factors could be corrected by accurate verification of transmittance with commercially-available transmittance meters. However, USAARL determined that these meters read too high. Plastic sunglass dyes transmit a disproportionate amount of deep red/infrared light that is read as visible light by the meters, making readings too high.

To improve the accuracy of these meters, USAARL identified a correction filter that blocks deep red light. When this filter is placed in the optical path of the transmittance meter, accurate readings are obtained.

All U.S. Army optical labs have been directed to obtain electronic transmittance meters. USAARL is providing correction filters and guidance to ensure that the meters give accurate readings.

To ensure that all currently fielded sunglasses are within military standards, each Army optometry service is conducting visual inspections of fielded aviator sunglasses as well as those being received from optical labs. The criterion used is that no sunglasses should be darker than a neutral gray 15-percent glass comparison lens (N15).

Aviators and aircrewmembers should take their current sunglasses to the nearest military optometrist for visual inspection. If the lenses are within military standards, the service member can safely wear the sunglasses in flight during appropriate weather conditions.

POCs: LTC Jeff Rabin, Dr. Roger Wiley, SGT James Wicks, and SPC Antonia Rivers, USAARL, DSN 558-6876 (334-255-6876)

Aviator cold-weather underwear —what do we order?

The Logistics and Soldier Systems Division (LSSD) of the U.S. Army Aviation Center Directorate of Combat Developments has been alerted to a potentially dangerous problem related to cold-weather underwear for aviation crewmembers.

All aviation personnel are advised that effective immediately, they are *not* to requisition cold-weather underwear using the following NSNs:

- Cold-weather drawers, NSN 8415-01-285-0153(S).
- Cold-weather undershirt, NSN 8415-01-285-0159(S).

Cold-weather underwear has historically been fabricated of 50-percent cotton and 50-percent wool. However, during Desert Storm, the Army agreed to use a commercial item made of 50-percent cotton and 50-percent polyester as an interim substitute. Stock of the interim items was commingled with the standard cotton and wool version under the same NSNs.

The undesired cotton and polyester underwear was purchased under DLA contract number DLA100-091-C-0364. It can also be identified by its color, which is natural white, rather than the brown shade 436 used for standard cotton and wool items.

Due to the potential for injuries resulting from heat and flame during a fire, crewmembers should not wear the cotton and polyester underwear under their flight suits. Crewmembers requiring cold-weather long underwear should requisition a 100-percent cotton type that is available using the following NSNs:

- Cold-weather drawers, NSN 8415-00-782-3226(S).
- Cold-weather undershirt, NSN 8415-00-270-2012(S).

POC: CPT Rudy Schulz, LSSD, DSN 558-3154 (334-255-3154)

Starching ABDUs increases risk of burn injuries

Soldiers like to look "sharp," and starching battle dress uniforms (BDUs) makes them look sharp. But the aviation battle dress uniform (ABDU) isn't supposed to be starched. The ABDU as well as the one-piece flight suit it replaces are made of Nomex, and starching Nomex defeats its protective nature.

Nomex—do not starch

Nomex material is highly flame resistant and will protect the wearer from degrees of flame and heat that would severely injure and incapacitate an unprotected individual. But uniforms made of Nomex can fail to protect the wearer if they are worn improperly, damaged, or contaminated. Contaminants such as POL and solvents can cause Nomex uniforms to burn. Even something as seemingly innocent as starching Nomex degrades the material's flame- and heat-resistant qualities, which can lead to severe burns if the wearer is caught in a fire.

Rising concerns

Concern exists about the dangerous practice of starching the ABDU. The Natick Research, Development, and Engineering Center (NRDEC) is the materiel developer for the ABDU. According to NRDEC, starch in the ABDU will cause the uniform to burn during an aircraft fire. A burning, starched ABDU will be of little or no value to the wearer and will contribute to greater bodily injuries received during a fire.

The U.S. Army Aeromedical Research Laboratory (USAARL) and the U.S. Army Aviation Center Branch Safety Office concur with this assessment. Mr. Joe Licina—a member of the USAARL staff who has investigated numerous aircraft accidents and has documented burn injuries intensified by the improper wear of protective clothing, the wear of unauthorized clothing, and the wear of damaged protective clothing—states that "under no circumstances should the ABDU be starched."

No ABDUs should be starched for the sake of looking sharp or for any other reason. It's better to live with a few wrinkles than to be a well-dressed burn victim. If a starched uniform is required, the crewmember should *not* wear the ABDU.

POCs: Mr. Bernard Roberson or CPT Rudy Schulz, Logistics and Soldier Systems Division, Directorate of Combat Developments, USAAVNC, DSN 558-3154 ext 284 (334-255-3154)

Requirements for use of reach pendants on external slingloads

Reach pendants (11K or 25K) can be used with all loads carried externally from military helicopters. Reach pendants are strongly recommended for use on all HMMWV-mounted shelter loads when there is not adequate clearance between the load and the helicopter during hookup.

The requirement for a static discharge person during hookup under helicopters does not apply when a reach pendant is used. The 5-foot reach pendant provides sufficient insulation between the hookup person and the hook.

There has also been a problem with chafing of sling legs where they rest against the top edge of the LMS and S-250 type shelters mounted on HMMWVs. The nylon portion of the sling contacts the edge of the shelter, and this has resulted in chafing and cuts in single, tandem, and dual-point configurations under CH-47 and CH-53 helicopters.

The spreader bar from the ambulance HMMWV kit has been used to alleviate this problem, but it is difficult to store, rig, and keep in place once rigged. Another solution is to use sling extensions (the chain portion of an additional sling leg) on all four sling legs so that there will be metal-to-metal contact between the chain and the shelter edge. Using the sling extensions also reduces the sling angle. Extensions are the best solution to the chafing problems, however there is one disadvantage because additional sling legs are required—eight legs in the case of a tandem load. The U. S. Army Research, Development, and Engineering Center (Natick) has certified all HMMWV shelter loads with the extensions (chains).

POC: Mr. Ted Rodriguez, U.S. Army Transportation School, DSN 927-6570 (804-878-6570)

AN/APX-100(V) operating procedures advisory

The Aviation and Troop Command recently reissued a Naval Air Systems Command message concerning an operating procedures advisory to operating forces that certain AN/APX-100 switch position combinations will inhibit identification, friend or foe (IFF) cockpit warnings that no reply has been transmitted to a valid interrogation.

Operating instructions

The following general operating instructions for audio-light-out switch and antenna positions are recommended. Formal changes to training, operating procedures, and publications should be directed via separate correspondence.

■ ***AN/APX-100 mode audio-light-out switch***. When conducting tactical Mode 4 operations, this switch should be placed in the audio position at all times. With the master switch in normal and the Mode 4 select switch on, the audio position provides ICS indications when the received code does not match the installed code and a Mode 4 caution indication when the system is not replying to a valid Mode 4 interrogation. The light position provides only a Mode 4 caution when the system is not replying to a valid Mode 4 interrogation and no indications as to improper code matching. Selecting the out switch position disables all Mode 4 caution indications. ***Caution: Use of switch positions other than audio will deny the aircrew mission-critical system status***.

■ ***AN/APX-100 antenna selection (top-diversity-bottom) or (top-auto-bottom) switch***. This switch shall be operated in the div/auto position at all times except as determined by special mission requirements. ***Caution: Use of the top or bottom position may result in no replies being transmitted to a valid IFF interrogation in any mode (1/2/3/4/C)***.

Background summary

The DOD AIMS program office issued an alert/advisory message (WR ALC Robins AFB, 031456Z Nov 94) that stated specific selections of the AN/APX-100 transponder Mode 4 audio-light-out switch and the antenna selection switch could result in no reply to valid interrogations and no subsequent cockpit IFF warnings. Interim operating procedures were also recommended for all concerned.

The U.S. Navy, as the executive service for AN/APX-100 program management, recently completed engineering analysis and functional tests to determine corrective action. These tests demonstrated that the AN/APX-100 met performance specs and worked as designed. However, it was determined that certain switch positions could result in a hazardous situation during combat operations. There are also minor differences in AN/APX-72 and AN/APX-100 switch functionality that contribute to improper AN/APX-100 switch selection.

The Mode 4 audio-light-out switch was the initial switch tested. It was determined that the switch works properly if the system has been keyed with the correct code and is operating normally. It was confirmed that when the switch is placed in the out position, the Mode 4 caution is disabled. The Mode 4 caution alerts the flight crew when the system is not replying to valid Mode 4 interrogations. As a result, in the out position, the system replies if properly keyed and operating normally; however, should conditions exist where a reply is not transmitted (zeroized key, incorrect A/B code, power transient, and so forth) and the out position is selected, then no cockpit warning of this condition is provided. The out switch position was designed to disable the Mode 4 caution in order to prevent this caution signal from masking other aircraft master caution conditions such as low fuel. In the out position on an AN/APX-72, the Mode 4 caution is enabled at all times when the system is operating normally and when no reply is generated to a valid Mode 4 interrogation.

The antenna selection (top-diversity-bottom) or (top-auto-bottom) switch was also tested and determined to function as designed. The AN/APX-100 in all IFF modes of operation was designed to receive the signals from both the top and bottom antennas and to transmit a reply to the antenna from which the stronger interrogation signal was received. If either top or bottom is selected and if the deselected antenna receives a signal that is stronger than the selected antenna, then a reply is not transmitted and no cockpit indications are displayed. This is different from the AN/APX-72 where a reply is always transmitted from the selected antenna. The diversity or auto position allows a reply to be transmitted to all valid interrogations.

It is also recommended that training in the differences between the AN/APX-72 and AN/APX-100 be conducted immediately. This may help prevent improper operations of the AN/APX-100 due to habit patterns associated with the AN/APX-72 equipment. An action team has been formed to address the status and update requirements of related training, publications, and operations procedures.

Points of contact

■ Naval Air Systems Command POC is Cdr. Doug Dickman, 703-604-2500 extension 8862.

■ Operations/training/publications action team POC is MAJ George Brown, U.S. Marine Corps, 703-604-2500 extension 8871.

■ U.S. Army Aviation and Troop Command POC is Mr. Dennis Sparks, DSN 693-9947 (314-263-9947). ❑

Broken Wing award

The Broken Wing award is given in recognition of aircrewmembers who demonstrate a high degree of professional skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in AR 672-74: Army Accident Prevention Awards Program.

■ **CW4 Larry L. Thornton, Headquarters and Headquarters Company, 2d Battalion, 501st Aviation Regiment, APO AP 96271.** At 90 knots and 800 feet AGL in mountainous terrain, the UH-1H was on a single-ship mission conducting an extraction of pathfinders from a pinnacle when power was lost. CW4 Thornton, the PC, was at the controls when the N2 dropped to 5200 RPM. He checked the throttle to ensure it had not backed off and simultaneously entered autorotation. As he reduced the collective, he instructed the pilot to place the governor switch in the emergency position. Anticipating a rapid increase in engine RPM, he reduced the throttle about one-quarter turn. The engine RPM increased rapidly for about 5 seconds. CW4 Thornton adjusted collective pitch to prevent an overspeed and arrested the descent momentarily. The engine lost power again and did not respond to throttle adjustments. At about 85 feet AGL, CW4 Thornton entered autorotation again. His options were few: a farm village out the left door, a flooded rice paddy directly below, and a steep, wooded hillside to his right. The only viable option was to maneuver the aircraft across a set of 40-foot-high power lines to reach a dry, plowed rice paddy roughly 200 meters ahead. He adjusted the collective and glided across the wires. As the aircraft cleared the wires, he lowered the collective and applied full left pedal to line up with the long axis of the plowed field. He applied aft cyclic to decelerate the aircraft, lining up the skids with the furrows. At about 3 feet AGL, he applied coordinated collective pitch to complete a controlled touchdown with no injuries to personnel on board or damage to the aircraft.

■ **CW3 David A. Swann, C Company, 3d Battalion, 227th Aviation Regiment, 4th Aviation Brigade, 1st Armored Division, APO AE 09165.** CW3 Swann was conducting aerial gunnery qualification in an AH-64 with a new crewmember in the front seat. While at a 100-foot OGE hover under night vision devices (NVD), the No. 2 generator seized, causing it to catch on fire and disintegrate. The crew smelled the smoke and saw the master caution and No. 2 generator segment lights illuminate. As the cockpit filled with smoke, CW3 Swann identified the emergency in progress, made a distress call, initiated the emergency procedure of shutting down the No. 2 generator, and began scanning for a suitable place to perform an emergency landing. During the search for a landing area, the crew could see flames coming from the right side of the aircraft. An OH-58, acting as a safety aircraft, informed the crew that they did indeed have a fire on the right side of the aircraft. As the AH-64 was maneuvering into position, the CPG announced that the NP/NR was down to 96 percent and bleeding off. (This was found to have been caused by the No. 2 generator shaft not shearing as designed and putting increased drag on the transmission, resulting in the NP/NR droop). CW3 Swann, dealing with the reduced visibility in the cockpit and poor natural illumination, attempted to maneuver the aircraft into an opening he had noticed earlier that day. Knowing that if the rotor RPM (NR) dropped below 89 to 92 percent most of the electrical systems, including the NVD, would be lost, CW3 Swann managed collective applications to accomplish a minimum power landing in the only available area. Upon landing, the crew completed an emergency shutdown, exited the aircraft, and used the onboard fire extinguisher to extinguish the fire and cool the overheated generator. During daylight recovery, it was discovered that if the aircraft had landed just a few feet to the east of its position, it would have impacted a safety berm, damaging the underside or entering dynamic rollover if it had landed on top of the berm. The tail rotor would also have hit some trees and bushes and would probably have caused a subsequent loss of control.

■ **CW2 William R. Armstrong, Army Aviation Support Facility, Alaska Army National Guard.** At 250 feet AGL and 70 knots, the UH-1H was making an approach to landing after completing a tail rotor maintenance test flight check. CW2 Armstrong was about one-quarter mile south of the helipad and was just crossing a four-lane divided highway when he and his crew chief heard a loud growling noise coming from the engine compartment. The growling noise grew louder and rotor RPM dropped to 290. CW2 Armstrong entered autorotation and announced "engine failure" to the tower. He could not go to his immediate right due to traffic on the highway, and he could not maneuver left due to trees. He continued with the autorotation straight ahead and aimed for a small gravel access road that ran parallel to a 10-foot-high chain link fence. CW2 Armstrong noted that his altitude was too low and airspeed too high to stop before encountering the main gate access road into Fort Richardson, so he performed a very steep nose-high flare to reduce his forward airspeed to zero and land on the main gate road perpendicular to his flight path. His tail skid contacted the ground 20 feet from the main gate road. With remaining main rotor blade inertia, CW2 Armstrong pulled pitch and settled the UH-1H up onto the 4-foot-high road bed with a ground run of 8 feet and no damage to the aircraft. The N1 section of the engine was still running after termination of the autorotation. CW2 Armstrong shut down the engine, inspected for any damage, and noted that the main rotor blades could not be turned backwards, indicating that the engine had seized in place.

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class B

H series - As aircraft was hovered with tail into wind during IERW solo training, crew reported loss of control of aircraft. Aircraft impacted ground and sustained major damage. Minor injuries to crew and one civilian on ground.

H series - During night unaided right hovering turn about the tail, aircraft right skid struck ground sideways. Right skid broke, and aircraft rolled onto its right side. Aircraft came to rest inverted, causing major damage to aircraft. One crewmember sustained minor injuries.

UH-1 Class C

H series - Crew reported hydraulic failure during maintenance test flight, followed by collective hardover (full up) and engine overtorque (60 PSI).

UH-1 Class E

H series - On final approach for landing from long cross-country flight, pilot noticed that anti-torque pedals felt "strange." Crew completed normal landing with no writeup. Later during phase inspection, maintenance found damage to vertical drive shaft of tail rotor. Damage was caused by loose tail rotor control cables and chain contacting shaft. Maintenance replaced cables and chain.

V series - During simulated engine failure at altitude, IP noted rotor and N2 decreasing together. Rotor reached 270 RPM and N1 dropped to 70 percent with no needle split. In accordance with dash 10, IP reestablished engine RPM and landed aircraft. Maintenance checked freewheeling action and found it okay.

V series - In cruise flight at 2,500 feet MSL, aircraft developed loud noise and severe vibration and smoke and burning odor filled cockpit and cabin area. Crew immediately performed precautionary landing to open field and shut down aircraft. Bearing failed on blower unit for muff heater.

UH-60 Class C

A series - Aircraft departed on limited test flight for track and balance. Upon postflight adjustment, damage was discovered on top of one main rotor blade. Pair of damaged wire cutters was discovered 100 yards away from aircraft.

A series - During preflight inspection, crew found damage to underside (VHF/FM, ADF sense, and Doppler antennas) of aircraft. Aircraft had been flown previously during night readiness level progression training that included only approaches to improved landing sites and approaches using the fast rope insertion/extraction system.

L series - During preflight, crew discovered damage to all four blades. Suspect damage caused by contact with ALQ144.

L series - Aircraft experienced engine loss of power and landed hard in muddy area. Aircraft landing gear stroked, and aircraft sustained suspected structural damage to left side.

UH-60 Class D

A series - Upon landing at the LZ, crew chief stated he wanted to do walk-around inspection because he had observed something go past aircraft while it was on approach to LZ. During walk around, crew chief noticed left APU compartment door was missing. Crew noticed no unusual sound or vibrations. Search to locate APU door was unsuccessful. Inspection of other unit UH-60s revealed one other aircraft with an unserviceable hinge on APU door. QDR submitted.

UH-60 Class E

A series - Aircraft was Chalk 2 in flight of two climbing through 400 feet AGL at 80 knots when stabilator audio sounded and master warning and stabilator caution lights activated. PC initiated auto control reset and system momentarily engaged and then failed. Crew slewed stabilator to 0 degrees and returned to base for termination. Inspection revealed that stabilator had failed internally.

Attack

AH-1 Class C

F series - While hovering sideways at 5 feet AGL and less than 5 knots, crew heard loud report, followed by abrupt left yaw, activation of low RPM audio, and loss of engine power. Suspecting compressor stall, pilot, under NVGs, initially lowered collective to land. Aircraft made initial contact with ground while moving laterally. Pilot increased collective, stopped lateral movement, and then cushioned landing. Inspection revealed that engine had seized.

AH-1 Class E

F series - At 5-foot hover, pilot was unable to complete 360-degree left pedal turn. Pilot felt feedback in pedals and landed aircraft without further incident. Inspection revealed tail rotor required rigging adjustments.

F series - At about 75 feet AGL, aircraft flew over parked OH-58. Rotorwash from AH-1 blew door off OH-58. Suspect door of OH-58 was not completely latched.

F series - During initial hover check, aircraft began yawing erratically left and right with no pilot input on tail rotor pedals. Crew disengaged yaw SCAS channel, and aircraft returned to normal stabilized hover. Maintenance repaired broken electrical wire leading to SCAS servo actuator.

AH-64 Class B

A series - All main rotor blades contacted tree during test flight and were damaged beyond repair.

AH-64 Class C

A series - Following maintenance test flight, crew suspected maintenance problem in tail rotor system. System was visually inspected. During aircraft runup, tail rotor system failed. Tail rotor swung 90 degrees, two main rotor blades contacted vertical and horizontal fins, tail wheel strut collapsed, and FM antenna was destroyed.

AH-64 Class E

A series - As aircraft taxied from parking, ground personnel noticed something fall from No. 1 engine area. Ground personnel signaled for aircrew to hold and shut down aircraft. Crews found piece of 3-inch by 5-inch metal on ground. Maintenance inspected aircraft and found that No. 2 primary exhaust nozzle had failed.

A series - After completing refueling, PC executed bubble burn procedures. PC moved crossfeed switch to aft position and started to increase collective to 60-percent torque on No. 1 engine. As torque approached 35 percent, PC noticed master caution and No. 1 engine fuel PSI caution/warning lights illuminate. PC lowered collective and was attempting to return fuel crossfeed switch to normal when No. 1 engine flamed out. Aircraft experienced hard shutdown. Maintenance found that K4 relay of fuel panel assembly had failed.

A series - During maintenance test flight, crew was in process of performing maximum power TGT limiter check on No. 1 engine. No. 2 engine was at idle (65-percent torque), and No. 1 engine (test engine) was at 98-percent torque. TGT limiting was in effect with No. 1 engine when No. 2 engine failed. Torque on No. 1 engine increased to 112 percent for 2 seconds, and NP and NR increased to 108 percent. Engine instruments and caution lights confirmed No. 2 engine failure. Crew returned aircraft to station without further incident. Maintenance found that yellow cable to ECU had shorted out and had sent erroneous signal to No. 2 engine. Signal indicated that No. 2 engine was overspeeding and caused ECU to shut down No. 2 engine.

A series - During roll-on landing, IP and pilot smelled smoke. IP alerted tower and landed aircraft without further incident. Inspection revealed that paper had been ingested by standby fan in right forward avionics bay, causing it to jam and motor to burn out.

A series - While aircraft was running at 100 percent on ground, crew noticed odor of electrical fire and immediately shut down aircraft. Inspection revealed No. 1 generator had seized.

Cargo

CH-47 Class E

D series - Approximately 35 minutes after taking off, rear sling around fuselage of RA-5C failed at upper clevis. Flight engineer announced failure to flight crew and manually released load as nose of RA-5C began to rotate toward aircraft. RA-5C settled tail first, then began to rotate nose down until it impacted in slightly nose-low attitude on dirt road.

D series - During slope operations with AFCS off, master caution light illuminated with no other associated segment lights when aft right landing gear touched down. On termination, forward cyclic speed trim would not extend to ground position from auto position. Manual operation was required to position cyclic speed trim. Aircraft has history of electrical short that burns up master caution panel.

Observation

OH-58 Class C

A series - While hovering on ridgeline during battalion battle drill, aircraft main rotor blades struck trees. When PC applied power, aircraft yawed and tail rotor also struck trees. Crew immediately began descent to land in small open area and completed landing without further incident. Aircraft sustained major damage to main and tail rotors, transmission, and drive train.

D series - During gunnery training, engine experienced overtorque (recorded at 131 percent) and mast overtorque (recorded at 118 percent).

OH-58 Class D

A series - During cruise flight, pilot's right-side armor panel blew open and was ripped from aircraft by wind force. Crew unsuccessfully attempted to recover panel. Suspect latch rim was loose.

OH-58 Class E

A series - During preventive maintenance daily following night flight, crew chief found battery switch in on position, pitot heater switch in on position, and pitot tube cover burned.

Fixed wing

C-12 Class C

C series - At about 9,000 feet MSL during climbout from IFR departure, passenger door came to full-open position. Crew declared an emergency and returned to Army airfield. During emergency landing, door made contact with ground from point of rollout until aircraft came to full stop.

C-26 Class D

B series - During single-engine operation training maneuver, aircraft drifted to left side of runway and contacted runway light with left propeller.

C-26 Class E

B series - During takeoff roll, pilot overtorqued No. 2 engine to 120 percent for 2 to 2.5 seconds. Pilot aborted mission without further incident.

OV-1 Class E

D series - After takeoff check, pilot noticed that nose gear indication was in transient condition. Crew also heard unusual wind noise from below pilot area. Crew advised ATC and requested vectors for ILS approach, completed before-landing check (gear indicated down and locked), and completed normal landing. Maintenance found that system had too much air and not enough hydraulic fluid.

D series - During cruise descent, autopilot would not disengage with control stick button or with switch on autopilot control head. Pilot placed compass in backup position and fast erected system. Autopilot still failed to disengage. Pilot then turned off inverters to disengage autopilot. Aircraft continued to base in VMC with no gyro without further incident. Maintenance replaced autopilot reference control and roll actuator shear pin.

D series - During approach, crew placed landing gear handle in down position. Left main gear indicated unsafe on wheel and flap indicator. Crew recycled gear with same result. Crew pulled landing gear emergency blowdown handle but unsafe gear indication was still present. Crew landed aircraft at home base without further incident. Maintenance replaced downlock switch.

Messages

■ Safety-of-flight (SOF) technical message concerning revision to visual inspections of tail booms required by SOF message OH-58-95-01 (OH-58-95-02, 222140Z Mar 95). Summary: SOF message OH-58-95-01 required an initial inspection prior to next flight, a 2.5-hour recurring inspection, a 20-hour recurring inspection and restricted forward indicated airspeed to 80 knots except for maintenance test flights. As a result of field input and engineering analysis, the requirements of OH-58-95-01 need revising. Implement the requirements of this message at the next 2.5-hour recurring tail boom inspection required by OH-58-95-01. This message supersedes SOF OH-58-95-01 entirely and makes the following changes:

• Removes from service all tail booms with previous repairs made to the skin aft of the horizontal stabilator.

• Increases the size of the inspection area.

• Requires the use of fluorescent penetrant inspection in lieu of visual inspection.

• Requires use of CPC Mil-C-16173, grade 4 to protect inspection area.

• Increases inspection interval to 8 hours.

Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning one-time inspection for Stratopower pumps, NSN 1650-01-249-4341 and reporting for turnaround program on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-95-ASAM-04, 222239Z Mar 95). Summary: ATCOM has received numerous reports from the field of leaking and pressure fluctuations being experienced with the Stratopower hydraulic pumps. A typical scenario is that during normal flight, the hydraulic system indicates pressure fluctuations from a maximum of 4,000 PSI to a minimum of 2,000 PSI, followed by illumination of the hydraulic flight control segment light. Also, high temperatures in the hydraulic system have been noted when the aircraft is shut down. An intensive investigation has been completed, resulting in design changes to the Stratopower pump for improved reliability of the pump. The investigation revealed friction between the counterbalance sleeve and piston, failure of the counterbalance sleeve in fatigue that caused external leakage and prevented free movement of the counterbalance piston, and failure of the compensator housing mounting screw(s) in fatigue. An engineering change proposal was developed to create a new counterbalance piston, sleeve and seat, pump housing, control piston, compensator assembly mounting screws, compensator housing and pilot spool, and matched compensator housing/spool assembly. Extensive bench testing (300 hours) and field testing (12 modified pumps have accumulated more than 3,000 flight hours and are still ongoing without failure) have resulted in a full qualification approval for the new design features. The purpose of this message is to direct the field and supply depots to locate Stratopower hydraulic pumps and report to the logistical point of contact so a turnaround program can be established. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

In this issue:

- New NDTE system for Army aviation
- Implementation of comprehensive radiation protection program
- Finger and lip lights are on the way
- Flight helmet success stories
- Plastic sunglasses: issues, answers, and solutions
- Aviator cold-weather underwear—what do we order?
- Starching ABDUs increases risk of burn injuries
- Reach pendants on external slingloads
- AN/APX-100 (V) operating procedures advisory
- Broken Wing Awards

Class A Accidents through April

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	0	0	0
	March	0	1	0	0
3D QTR	April	5	1	2	5
	May	0		0	
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	21	4	11	6

Report of ... by the U.S ... AL 36362- ... preventic ... prohibited ... matters of ... Address q ... 558-3770. Address questions about distribution to DSN 558-2062. To submit information for FlightFax, use FAX DSN 558-9377, Ms. Jane Wise.

Thomas W. Garrett
Brigadier General, USA
Commanding General
U.S. Army Safety Center

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
June 1995 ◆ Vol 23 ◆ No 9

Commanders face hard choices in selecting the types and amounts of ATC services and equipment maintenance that can be provided with dwindling resources. Ensuring the emphasis remains on safety requires the effective application of risk-management techniques.

ATC—keeping the emphasis on safety

The downsizing of the Army continues, and the effect it is having on air traffic control (ATC) services and ATC equipment maintenance is becoming more apparent. With the elimination of aviation units and assets, the Army leadership at affected installations and airfields must seriously review ATC operations and maintenance requirements to ensure that adequate services are provided to remaining units and that those required services can be provided with shrinking resources.

The common thread that runs through the entire resource issue is aviation safety. For years, the aviation community has often taken ATC services for granted and considered those services a "right." Just like everyone else in today's Army, the ATC community is suffering from dollar and personnel shortages and cutbacks and streamlining of services has become inevitable. While resource issues are often beyond their immediate control, commanders are still responsible for ensuring that ATC services and equipment maintenance remain at sufficient levels to ensure safe operations.

We must remember that pilots are betting their lives that information they receive from the NAVAID is accurate.

ARMS evaluations for ATC assets

The U.S. Army Air Traffic Control Activity (USAATCA) serves as a member of the Aviation branch aviation resource management survey (ARMS) team. The USAATCA ARMS team also augments MACOM ARMS teams and assesses ATC services and ATC equipment maintenance worldwide. The USAATCA ARMS team normally consists of a team chief (usually a chief warrant officer, W-5), a seasoned fixed wing pilot, two senior MOS 93D (Senior Flight Inspection Technician) noncommissioned officers (NCOs), and one senior MOS 93C (Air Traffic Control Senior Sergeant) NCO.

The ARMS evaluations for ATC assets are now running on about a 2-year cycle. As evidenced by the following observations from recent ARMS evaluations, it is obvious that ATC chiefs and airfield commanders need to closely monitor ATC services and equipment maintenance to ensure cutbacks do not adversely affect safety.

■ *ATC services*. Downsizing and limited resources have resulted in a reduction in operating hours, use of less-experienced personnel, and minimum staffing levels at a large number of airfields and installations.

• *Reduced hours of operation*. Elimination or reduction in ATC services may leave airfields without some of the additional or desired safety buffers that are normally provided for flight operations. Provision of ATC services is no longer economically feasible at every installation or airfield. This makes it necessary for commanders to find different and possibly less-effective means of ensuring safe operations. For example, part-time towers and flight-following facilities are becoming more common.

• *Less-experienced personnel*. The experience level of the personnel providing ATC services and maintenance is also changing. Personnel are having to assume more responsibility earlier in their careers than they normally would. We are now assigning less-experienced personnel to positions that would normally be filled by seasoned noncommissioned officers. When this becomes necessary, we must be careful not to put soldiers in situations that require more experience than they have. Supervision and leadership are more essential now than ever before and are critical to ensure that the highest quality of services we can afford continues to be provided.

• *Minimum staffing requirements*. Staffing levels for shift requirements have been reduced to the bare minimum, and in some cases, waivers have been granted to operate at below-minimum shift requirements. Before a waiver is approved, all requirements and operational considerations are reviewed extensively by the waiver authority. If the waiver is granted, operations under the requested parameters are deemed safe—but at the lowest level of safety.

■ *Equipment maintenance*. ATC equipment maintenance is suffering as the ever-shrinking budget continues to impact operations. Airfields and navigational aids (NAVAIDS) are expensive to operate and maintain. Replacement parts and maintenance of high-dollar items are relatively easy victims of budget reductions. Additionally, effects of these reductions on ATC equipment may not be readily noticeable, thus leading to a false sense of security.

• *Lack of equipment maintenance technicians*. One major installation with two instrument flight rules (IFR) airfields that are 45 minutes apart and normally require at least four ATC equipment maintenance technicians has had only two for the past year. These technicians work on multiple NAVAIDS that utilize high voltage. For safety reasons as stated in TB 385-4, these NAVAIDS cannot be worked on by one person. To those who are knowledgeable of ATC maintenance procedures, it is obvious that doing so would compromise safe operations.

The most dangerous aspect of operating under these conditions is that after a while people begin to accept the elevated level of risk. They presume that there simply isn't enough time or people available to allow the procedure to be performed at an optimum level of safety. In other words, accepting more risk becomes routine. To avoid this kind of thinking, we must stress and continually reinforce the idea that self-discipline to resist shortcuts and perform by-the-book procedures is absolutely vital to safe operations.

• *Contractor maintenance.* At some airfields, the Army has begun using contractors as a more cost-effective method of maintaining ATC equipment. This may be one solution, but the installation must effectively monitor contractors to ensure Army standards are maintained.

Another major installation with an IFR airfield that utilized contractor maintenance did not renew the maintenance contract. The installation went approximately 90 days without basic ATC equipment maintenance performed by qualified maintenance technicians—hardly an acceptable practice.

• *NAVAID maintenance.* At some airfields, NAVAIDS are often out of service for as much as 24 hours and in some cases for extended periods of 6 to 9 months due to a lack of parts or qualified personnel to repair and maintain them.

Commanders must take an active interest in the status of their airfields and NAVAIDS. If the chain of command decides that it cannot afford NAVAID maintenance, then the NAVAID should be taken out of service rather than allowing it to remain in service and not be maintained in accordance with DA and Federal Aviation Administration regulations. It would be better not to have the NAVAID on the air than to have it providing erroneous information. If someone assumes something based on false data (or no data at all), the situation can quickly become critical. We must remember that pilots are betting their lives that information they receive from the NAVAID is accurate. A decision to delay or forego maintenance on NAVAIDS should certainly be considered high risk.

These are just a few examples of the problems that face the ATC community as we deal with current changes and reductions in assets. The potential to focus our attention on dwindling resources and away from our day-to-day operational business remains high. But we cannot allow that to happen. Don't let frustration over changes and reduced resources cloud your judgment and distract your concentration from the immediate task at hand. We must be vigilant and work even harder to ensure risks are identified and properly assessed and that commanders know and understand the consequences of accepting certain levels of risks.

Commanders have a special responsibility—especially during these changing times—to monitor people on the move, people working different assignments, people doing a new job, and people trying to do the same good job with fewer resources. Effective use of risk-management principles is key to making smart risk decisions that will help us get the most out of limited resources and continue to provide the quality of service that our aircrewmembers deserve. Without question, commanders face difficult choices. But applying the principles of risk management intelligently will in most instances lead to smart risk decisions.

Commanders are ultimately responsible and accountable for ensuring safe operations, but it isn't all on their shoulders. It is critical that each of us takes the extra minute to do our jobs as safely as possible the first time. Regardless of whether we are the air traffic controller, the equipment maintenance technician, or the aviator flying the aircraft, safety has to be a full-time, conscientious effort on everyone's part for it to work effectively. Only quality soldiers and civilians can make it all work.

While the ATC community has enjoyed and continues to enjoy an admirable safety record and an unblemished reputation of excellent service to the aviation community, extreme care must be given to all areas of ATC services and equipment maintenance to ensure that our plan for continued success will be based on excellent leadership, effective risk management, and thoughtful allocation of assets rather than a hope for good fortune.

POCs: CW5 Gregory Waltz, MSG Kenneth Roman, CW3 Dana O'Meara, MSG Eddie Spivey, and SSG Steven Haag USAATCA ARMS team members, DSN 558-9067 (334-255-9067)

The most dangerous aspect of operating under these conditions is that accepting more risk becomes routine.

Selecting an alternate airfield

AR 95-1: Aviation Flight Regulations requires Army aviators to check certain items in the DOD FLIP before filing an IFR flight plan. One of the requirements for determining whether an airfield can be used as an alternate is to check and make sure that there is controlled airspace to the surface (the old control zone).

Currently, there is no reference in the DOD FLIP to determine whether a part-time Class C or Class D surface area reverts to Class E or G airspace. The NOAA Airport/Facility Directory contains this information for civil airfields. But how do Army units in the field obtain this information?

Presently, this problem is being worked in two ways. When issued, the updated AR 95-1 will require that an alternate airport have a weather reporting capability, have an approved altimeter setting available, and the NAVAID be monitored.

The control zone requirement will be eliminated in the new AR 95-1. Additionally, the joint services FLIP Coordinating Committee (FCC) has recommended that the Defense Mapping Agency include the class of airspace and any changes to airspace in the remarks section for each airfield in the DOD FLIP En Route Supplement. (At its 27 February - 2 March 1995 meeting, the FLIP FCC agreed to the placement of airspace classification in the en route supplement when the airspace is *part-time* and reverts to *other than the next lower level*.) Although not needed for selecting an alternate airfield, knowing the airspace classification is essential for safe operations.

—Adapted from Army Aviation Flight Information Bulletin, February/March 1995 issue

Read the label!

I stopped by the clothing sales store the other day to pick up a few items I needed. After browsing through the store and speaking with a few acquaintances, I gathered my selections and moved to the checkout line. As the customer in front of me placed her purchases on the counter, I was casually glancing at the items I was holding to make a general assessment of their cost when I noticed the label on the package of socks I had selected. I was shocked to find that they were made of 60 percent polyester and 40 percent cotton.

As an aviator and a safety officer, I understand the dangers of wearing nylon and nonfire-resistant or -retardant clothing that propagates injury in an aircraft mishap involving fire. I read the February 1995 *FlightFax* article entitled, "You're on fire! Get out, get out, GET OUT!!!" and have spoken to the pilot-in-command of that Apache on numerous occasions, so I'm very sensitive to the need to wear proper clothing when performing flight duties.

Concerned, I got out of the checkout line and began shopping anew. The first thing I noticed was that right next to the package of socks I had selected was an identical package, but the socks were made of cotton, an all natural fiber. I was amazed that I had so easily selected the wrong package—all because I hadn't "read the label." Had I bothered looking at the label, I clearly would not have made the initial selection.

I became curious at this point and began looking at other articles in the store to see if aviation personnel could purchase necessary items of clothing and not violate AR 95-1, paragraph 3-11(5). I looked at all the garments in the store and found that aviators, crewmembers, and noncrewmembers can, in fact, purchase the appropriate clothing when replacing old or worn items. The key is to ensure that each item purchased is made of cotton, wool, or Nomex. But you can only determine this by reading the label. From undershirts to socks to long johns, there were always more items available that were made out of polypropylene, nylon, Dacron, or acrylic than there were of items made of cotton or wool, but the cotton or wool items were there if you looked for them.

Common sense also tells us that knowingly wearing nonprescribed clothing cheats no one but ourselves. Our contemporaries who have survived postcrash fires attest to the merits of wearing clothing prescribed in AR 95-1. (If you haven't already, I recommend that you read the article previously mentioned.) I think of the ill-fated Apache crew and the account of their accident often. I am convinced, and I know that the Apache crew would agree, that wearing the correct clothing is imperative even if it means that we must now take the time to **read the label**.

I guess protecting your health by reading the label doesn't apply only to purchases made at the grocery store anymore. We in the aviation community must also be prudent shoppers and purchase only those items prescribed for us, such as all-leather boots and cotton or wool undergarments. Make sure you're buying authorized items; it could be well worth the small amount of time you'll have to invest in reading the label.

POC: CW5 Joel J. Voisine, Aviation Life Support Equipment Retrieval Program Manager, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL, DSN 558-6895 (334-255-6895)

"Why can't I wear an amber visor on my flight helmet? It's much better than the smoke-colored visor the Army issues! A friend of mine in the Navy gave it to me, and if the Navy issues it, it has to be good."

Amber visors

Theirs-is-better misperception

I received this question and challenge from an aviator who attended an ALSE presentation I gave last fall. I answered the question at the time, but since then the subject has come up again on numerous occasions. Therefore, I feel an explanation is in order to dispel the apparently *misguided perception* that because the Air Force, Navy, or another service has tested and issued a certain item, it must be better than anything the Army has.

All too often we look at our sister services and think that they have an edge on the Army and its ability to field new equipment. We automatically assume that another service's equipment is the answer to our "problems." Each service tests aviation life support equipment to determine its ability to complement the accomplishment of their particular mission. The Navy may find that the amber visor is superior for their pilots to wear while performing overwater operations given their cockpit lighting system.

Army mission-compatible visors

The Army, however, has different concerns, including accomplishing missions over land in environments that range from snow to desert operations and in cockpits configured for night vision device (NVD) compatibility. Army visors must not distort the colors we use while performing tactical and nontactical missions.

The Army's smoke-colored and clear visors have been tested in all those environments and meet test specifications. Both visors are made of a shatter-resistant polycarbonate material that provides 100 percent and approximately 96 percent ultraviolet (UV) protection respectively, and both visors have been tested for compatibility with NVD cockpit lighting and color distortion. Laboratory tests have determined that the clear and smoke color of the visor will not interfere with the identification of light emitted from cockpit instrumentation nor will the particular shade distort the color emitted from field markers such as smoke grenades. The amber visor used by the Navy has not been tested for this type of compatibility.

Do not succumb to personal preferences

In many cases, personal preference gets in the way of sound judgment and we elect to wear equipment because we perceive that it's better. Visual acuity tests on amber versus smoke-colored visors do not indicate that the amber visor improves the individual's ability to see items brought into the field of view any better than does the smoke-colored visor.

It comes down to personal preference versus viability. Until the Army tests the amber visor for compatibility, it's foolish to wear it and possibly endanger yourself and your crew. What if you were unable to see a particular segment light due to distortion from the amber-colored visor and were too late interpreting the emergency and applying corrective action to prevent an otherwise avoidable accident? What if you led a flight through a gun target line in an attempt to land to the wrong smoke and endangered the entire flight? Is it worth it? Whatever your personal preferences may be, be safe and stay with the Army-issue visors.

Questions about ALSE

The U.S. Army Aeromedical Research Laboratory (USAARL) is one member of the widely diversified testing community. We communicate with program managers and other DOD and non-DOD laboratories daily. Should you have any questions on the applicability of any piece of ALSE and cannot find resolution through normal command channels, feel free to call us. We'll either give you an answer or provide you with an appropriate point of contact who can address your concerns.

POCs: CW5 Joel J. Voisine or Mr. Joseph R. Licina, Aviation Life Support Equipment Retrieval Program Managers, USAARL, Fort Rucker, AL, DSN 558-6895/6893, (334-255-6895/6893)

Aviation battle dress uniform

According to a message issued by DA on 4 April 1995, the two-piece aviation battle dress uniform (ABDU) is authorized for wear by all flight crew personnel on flight status. The ABDU will be worn on duty when flying, on standby awaiting flight, when performing any related missions, or as directed by the commander. The ABDU is not authorized for travel or wear off military installations except in transit between the individual's quarters and duty station. See paragraph 2-6c of AR 670-1: Wear and Appearance of Army Uniforms and Insignia for exceptions to this policy.

Basic uniform

The organizational flight uniform is for use by flight crews as prescribed in Common Table of Allowances (CTA) 50-900: Clothing and Individual Equipment. These uniforms are designed to be loose fitting. Alterations to make the uniforms form fitting are not authorized.

■ ***ABDU blouse***. The ABDU blouse will be worn outside the trousers for all duties including flight. The ABDU blouse will not extend below the top of the cargo pocket on the trousers and will not be any higher than the bottom of the side pockets on the trousers.

When sleeves are rolled up, the camouflage pattern will remain exposed (BDU style). When rolled up, the sleeves will be above the elbow but no more than 3 inches above the elbow.

■ ***ABDU trousers***. The ABDU trousers will be worn with the standard black cotton web belt. During the execution of flight crew duties, the trousers will not be bloused into the boots. When bloused (while in a garrison environment), trouser legs will not be wrapped around the leg so tight as to present a pegged appearance.

Note: The ABDU will not be pressed or starched.

■ ***BDU cap***. The BDU cap is the basic headgear for the ABDU. The BDU cap will be worn straight on the head so that the cap band creates a straight line around the head parallel to the ground. The cap will be worn so that no hair will be visible on the forehead. At the discretion of the individual, the earflaps may be worn down during cold weather except when in formation. When in formation, the commander may prescribe wear policy. The cap will not be blocked or rolled. Personnel authorized to wear organizational berets or other organizational headgear may wear such headgear in lieu of the BDU cap.

Commissioned and warrant officers will wear nonsubdued insignia of grade on the BDU cap and organizational berets in a garrison environment. Subdued insignia of grade will be worn on all headgear in a field environment. Enlisted personnel wear subdued insignia of grade on the BDU cap and unit crests on organizational berets.

■ ***Black leather combat boot and insulated boot***. The black leather combat boot and the black leather insulated boot (when authorized according to CTA 50-900) are the authorized footwear for wear with the flight uniform. Jungle boots and high-tech boots are not authorized for wear with the ABDU.

■ ***Black leather shell gloves.*** Black leather shell gloves may be worn with the ABDU when not performing crew duties. Without cold-weather outer garments, sleeves must be rolled down and over the tops of the gloves.

■ ***Flight jackets.*** Flight jackets will only be worn with the organizational flight uniform. The Defense Personnel Support Center (DPSC) is currently fielding the ABDU without the companion ABDU flight jacket. The ABDU flight jacket will be fielded as a component of the aviation cold-weather clothing system in January 1996.

The U.S. Army Safety Center and user community recognize the continued requirement for fire-resistant alternative clothing items for wear in lieu of the ABDU jacket. Until fielding of the ABDU flight jacket in FY 96, the ABDU jacket alternatives in order of increasing risk are as follows:

- Combinations of the items listed below.
- Current sage green Nomex flight jacket.
- Sweater, wool, worn under ABDU.
- Undershirt, cotton, worn under ABDU.

■ ***Black all-weather coat.*** When organizational rain gear has not been issued, the black all-weather coat may be worn as a raincoat with the ABDU in a garrison environment but not during flight operations. Coats will be worn buttoned and zipped.

■ ***Solid-colored baseball caps.*** Local commanders may authorize the wearing of solid-colored baseball caps (when authorized per CTA 50-900) by aircraft and ground crewmembers as a safety and identification measure while on the flight line or in the base operations area. Standard headgear will be worn outside these areas. The caps will be provided at no expense to the individual.

Commanders may authorize other uniforms for wear during administrative flights after performing a proper risk assessment.

Insignia and accouterments

The following insignia and accouterments are authorized for wear on the ABDU:

■ Badges (subdued).
- Combat and special skill badges.
- Special skill tabs.
- Subdued identification badges.

■ Branch insignia.

■ Combat leader's identification.

■ Grade insignia.

■ Headgear insignia.

■ Subdued shoulder sleeve insignia, current organization.

■ Subdued shoulder sleeve insignia, former wartime service.

■ Name and U.S. Army distinguishing tapes.

Foreign badges, distinctive unit insignia, and regiment distinctive insignia will not be worn on the ABDU.

All insignia and accouterments worn on the ABDU must be embroidered only.

Accessories

The following accessories are normally worn with the ABDU:

■ Belt, web with open-faced black buckle.

■ Boots, combat leather, black.

■ Headgear.
- Cap, BDU.
- Berets, organizational.

■ Scarf, olive green 208.

■ Socks, olive green/black cushion sole.

■ Undergarments.

■ Undershirt, brown.

■ Organizational clothing and equipment as determined by the commander per CTA 50-900.

■ Gloves, flyers, LIN J67052, CTA 50-900.

■ Wool sweater.

■ Aviation cold-weather clothing system jacket is currently the authorized jacket for the ABDU when performing flight crew duties.

The above information extracted from the recent DA message on the ABDU will appear in the next update of AR 670-1.

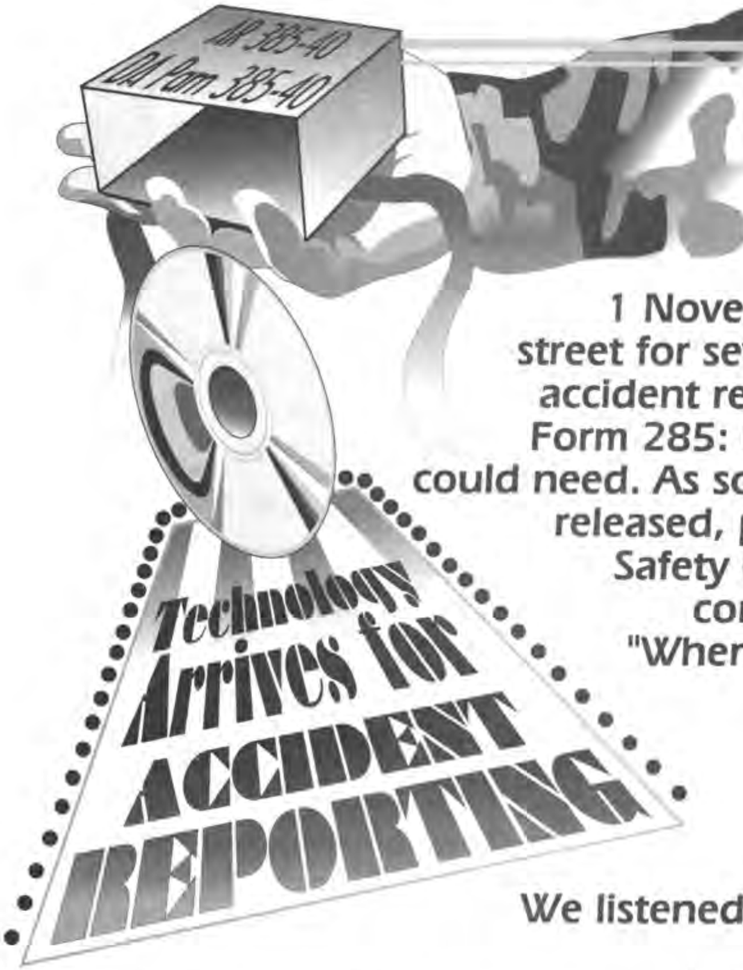
Suggested improvements and questions about fielding should be directed to the U. S. Army Aviation Center's Logistics and Soldier Systems Division, Fort Rucker, AL, DSN 558-9130/9507, FAX 558-2916/1008.

POC: SGM Johnnie E. Walters, Office of the Deputy Chief of Staff for Personnel, DSN 225-6361 (703-695-6361)

Aircrew training manual revisions

TC 1-214: Aircrew Training Manual, AH-64 and TC 1-216: Aircrew Training Manual, CH-47 are the next training circulars scheduled for revision. All AH-64 aviators and CH-47 crewmembers are asked to review their current manuals and submit proposed changes, comments, questions, or suggestions to Commander, U.S. Army Aviation Center, ATTN: ATZQ-ATB-NS (ATM Section), Fort Rucker, AL 36362-5218. To be included in the next coordinating draft of each manual, suggested changes should be submitted by 9 August 1995 for AH-64 users and by 15 November 1995 for CH-47 users.

POC: CW4 William S. Johnson, Chief, ATM Section, DSN 558-3801/2864 (334-255-3801/2864), E-mail ATZQATBATM@Rucker-EMH4.ARMY.MIL, FAX DSN 558-2463



Technology Arrives for Accident Reporting

The new AR 385-40: Accident Reporting and Records and DA Pam 385-40: Army Accident Investigation and Reporting, both dated 1 November 1994, have now been on the street for several months and contain all of the accident reporting forms (except the basic DA Form 285: U.S. Army Accident Report) anyone could need. As soon as these two publications were released, people began calling the U.S. Army Safety Center (USASC) with questions and comments. One recurring question is, "When are you going to put the accident reporting forms into a computer software format?"

We listened to your questions and comments.

In January 1995, we requested that the U.S. Army Printing and Publications Command (USAPPC) computerize all of the safety forms contained in AR 385-10: The Army Safety Program, AR 385-40, and DA Pam 385-40.

In June 1995, the following Army accident reporting forms will be available on CD-ROM:

- DA Form 285-AB-R: Abbreviated Ground Accident Report.
- DA Form 285-O-R: Statement of Reviewing Officials.
- DA Form 2397-AB-R: Abbreviated Aviation Accident Report. (The USASC has asked USAPPC to add this form to the initial list of forms that will be included on the June 1995 CD-ROM. Hopefully, the request has been made in sufficient time to allow contractor completion of required work to accomplish this.)
- DA Form 2397-R: Technical Report of U.S. Army Aircraft Accident, Part I—Statement of Reviewing Officials.
- DA Form 2397-3-R: Technical Report of U.S. Army Aircraft Accident, Part IV—Narrative.
- DA Form 2397-4-R: Technical Report of U.S. Army Aircraft Accident, Part V—Summary of Witness Interview.
- DA Form 2397-13-R: Technical Report of U.S. Army Aircraft Accident, Index A.
- DA Form 2397-14-R: Technical Report of U.S. Army Aircraft Accident, Index B.

According to USAPPC, you should ask your publications/forms officer to order the CD-ROM through the normal publication channels. When requesting this item, refer to DA Form 12-04, Block 0661 (this form may have to be ordered on the DA Form 1299-R by your forms officer). "CDROM" is the unit of issue. You also have to state the quantity requested. The Army safety forms are not the only forms on the CD-ROM. However, because all of the forms on the CD-ROM are official forms, there is no need to worry about copyright protection.

Hardware requirements

Use of the CD-ROM requires a personal computer (386 or higher); MS-WINDOWS 3.1; 4MB of RAM; HP II- or HP III-compatible laser printer; and the right software. A CD-ROM reader is also necessary.

Software requirements

These electronic forms can be used in GEM, PerForm, or FormFlow software as long as the users have the appropriate "filler" software. FormFlow filler software is currently available from the U.S. Navy standard desktop computer "companion" contract. The single-user price for the FormFlow filler software under CLIN 0845AB is $75.00. Site licenses for up to 1,000 users are also available. For "companion" contract information, call GTSI at 1-800-968-7384.

Currently, the Army Safety Center is working to allow electronic transmission of the completed abbreviated forms (DA Form 285-AB-R and DA Form 2397-AB-R) from the unit to the Army Safety Center.

POC: Mr. Lee McCown, USASC, DSN 558-3913 (334-255-3913), FAX DSN 558-9478 (334-255-9478)

Broken Wing awards

The Broken Wing award is given in recognition of aircrewmembers who demonstrate a high degree of professional skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in AR 672-74: Army Accident Prevention Awards Program.

■ **CW3 Eric D. Fremming, Company D, 1st Battalion, 14th Aviation Regiment, Aviation Training Brigade, Fort Rucker.** During an AH-64 instructor pilot night systems training flight, the student was performing method of instruction. At about 110 feet above the highest obstacle, the student retarded the No. 2 power lever to idle to demonstrate a simulated single-engine failure and CW3 Fremming heard a loud noise from the No. 1 engine. Engine instruments indicated an engine failure had occurred on the No. 1 engine, and the No. 2 engine power lever was still at idle. The power turbine section of both engines and the rotor system were below 94 percent, and all gauges were in the red, accompanied by a low-RPM audio and an engine-out audio. Realizing that the aircraft's generators would shut down if the rotor RPM went below 89 percent and all electrical systems would fail including the night vision system, CW3 Fremming took the controls, pushed the power lever to fly, applied forward cyclic, and reduced the collective to regain rotor RPM. CW3 Fremming recovered the aircraft into forward flight after a 100-foot altitude loss. The aircraft cleared treetops by about 10 feet. The crew completed an emergency call and a successful roll-on landing. Inspection revealed failure of the No. 1 engine gas generator rotor.

■ **CPT Curt S. Cooper, 1st Battalion, 212th Aviation Regiment, Aviation Training Brigade, Fort Rucker.** CPT Cooper was conducting combat skills (tactics) training with two IERW students on board the UH-1H. As the crew arrived at the landing zone, CPT Cooper directed the student on the controls to execute a left downwind at 70 knots and about 100 feet AGL and to prepare for a 290-degree landing while conducting a high area reconnaissance of the confined area. On downwind, CPT Cooper evaluated the winds to be about 270 degrees at 10 to 15 knots. At 70 knots and 100 feet AGL, the student initiated his terrain flight approach to the right side of the landing zone. As the student began to slow the aircraft to 40 to 50 knots, CPT Cooper noticed that he had poor heading control. The student maintained a 310-degree heading on the approach (a right yaw accompanied with a left sideslip). Noticing the approach was out of standard, CPT Cooper began to verbally correct the student by explaining left pedal input was needed to correct for heading control. The heading of the aircraft remained 20 degrees off the landing direction. At 15 to 30 knots and 7 to 10 feet AGL, the aircraft began to turn left. CPT Cooper relaxed, noticing that the student was applying a correction. He then noticed that his student appeared unsettled. Suddenly, the aircraft began to yaw violently to the right at a rate of about 90 degrees per second. As the turn progressed, the student immediately announced that the pedals of the aircraft were stuck. At 7 to 10 feet AGL and with 5 to 10 knots of forward airspeed, CPT Cooper took the flight controls as the aircraft entered an uncontrolled right spin. Immediately after coming on the controls, CPT Cooper determined that the pedals were indeed stuck and the aircraft heading control could not be maintained. At that point, the aircraft had already turned 90 degrees to the right from the original heading and the spin became more violent (more than 90 degrees per second). As the aircraft continued forward and in a right spin, CPT Cooper reduced the throttle to the engine idle stop in an attempt to retard the violent spin. The aircraft was approaching 15 to 20 feet from bordering trees that surrounded the landing zone. CPT Cooper applied aft cyclic in order to dissipate the forward movement and prevent the aircraft from experiencing dynamic rollover when ground contact was made. The throttle reduction slowed the spin, and the aircraft began to settle from 7 to 10 feet AGL. CPT Cooper applied collective at about 3 feet AGL, which arrested the spin of the aircraft, and applied additional aft cyclic to stop the forward motion. CPT Cooper landed the aircraft on a final heading of 310 degrees about 10 feet from the trees with no damage to the aircraft. Maintenance inspection verified a tail rotor malfunction. ❑

Correction to AAAA winners

On 31 January 1995, DA released a message, which was reprinted in *FlightFax*, announcing the 1994 Army Aviation Association of America (AAAA) national award recipients. Unfortunately, the message contained an error in announcing the outstanding aviation unit of the year for the U.S. Army Reserves. DA subsequently rescinded the original message and issued a corrected announcement of the AAAA award winners. *FlightFax* failed to make the correction.

The correct winner of the "Outstanding Aviation Unit of the Year (USAR)" award is the 8th Battalion, 229th Aviation Regiment (Attack) located at Fort Knox, KY, subordinate to the 121st Army Reserve Command, Birmingham, AL. The commander of this unit is LTC James B. Blunk, Jr., and the senior noncommissioned officer is CSM Robert C. Leffel.

Congratulations to the 8th Battalion, 229th Aviation Regiment (Attack), 121st Army Reserve Command for their significant achievements in Army aviation. We apologize for the previous incorrect announcement and failure to recognize this outstanding unit.

—Ms. Jane D. Wise, Writer, FlightFax, DSN 558-3770 (334-255-3770)

U.S. Army FLIP-specific DODAACs

In the near future, the U.S. Army Aeronautical Services Agency (USAASA), Logistical Support Agency, and Defense Mapping Agency (DMA) will implement the use of FLIP-specific DOD Activity Address Codes (DODAACs). These DODAACs will be "**non-requisitioning**" and will be used for the distribution of DMA FLIP products only. Units will continue making product and account address changes through either USAASA or USAASD-E.

DMA will change from using present DMA account numbers to FLIP-specific DODAAC account numbers in phases. Army customers receiving FLIPs should check their packaging and mailing labels for newly assigned FLIP-specific DODAACs and to ensure that mailing addresses are correct. Unit addresses that include post office box numbers should be changed to a building number, street address, or other geographical location to facilitate delivery of FLIP products by parcel post or UPS. As new FLIP-specific DODAACs are assigned, they will be on the cyclical mailing labels.

Units may contact USAASA or USAASD-E for clarification or assistance. This transformation should **not** interrupt the flow of FLIP products to Army units.

—Adapted from Army Aviation Flight Information Bulletin, February/March 1995 issue

Aviators needed

The U.S. Army Aeromedical Research Laboratory (USAARL) at Fort Rucker, AL, needs aviator volunteers immediately to participate in a research study. Volunteers must be active duty, Department of the Army civilian, or contractor rotary wing aviators on current flight status assigned to Fort Rucker and have a minimum of 2 months left on station. The purpose of the study is to compare speech intelligibility performance of three communications headsets in normal and waivered rotary wing aviators in noise.

The SPH-4B helmet will be tested in its standard-issue configuration. A second system will incorporate into the SPH-4B the communications earplug developed at USAARL. This system combines hearing protection with enhanced speech intelligibility and fits comfortably into the ear canal. The third system will include an active noise reduction system mounted into the SPH-4B.

The study is broken down into one 2-hour and one 3-hour test session. All tests will be conducted in the laboratory. There will be two groups of 20 subjects each. One group will be composed of aviators who meet Class II audiometric flight standards (IAW AR 40-501); the other group will comprise aviators who *exceed* Class II standards; that is, aviators on hearing waiver or who are being considered for waiver. The data will help researchers determine which of the communications systems being tested is best suited to the operational environment and will improve in-flight communications.

For further information, contact MAJ John Ribera, USAARL, DSN 558-6823 (314-255-6823). ❑

Don't leave home without $$$$$

Soldiers coming TDY to the Army Safety Center at Fort Rucker, AL, to attend the Aviation Accident Prevention Course and the Small Unit Leader's Force Protection Course should bring adequate money with them or have a government credit card with a personal identification number (PIN). The Fort Rucker Finance and Accounting Office will no longer handle TDY advances.

In addition, enlisted personnel should request advances at the non-space-available rate because of a shortage of bachelor enlisted quarters.

POC: SFC Audrey Sterling, Training Division, DSN 558-2490 (334-255-2490)

Accident briefs

Information based on preliminary reports of aircraft accidents

Aviation flight accidents

Utility

UH-1 Class E

H series - While in cruise flight, N2 accessory drive carrier assembly failed, resulting in loss of governor operation and reduction in engine RPM to about 5000. Pilot entered autorotational descent, landed aircraft with power, and completed shutdown without further incident.

H series - About 30 seconds into MOC runup, aircraft made "thump" sound. Crew chief motioned for pilot to kill engine, and crew completed emergency engine shutdown. Postflight inspection revealed that transmission external oil filter had come apart, draining oil out of transmission. Oil filters on other aircraft were checked and also found to be loose. Category I QDR submitted.

H series - On precision approach, hydraulic control segment and master caution lights illuminated. Pilot on controls determined actual loss of hydraulics as cyclic began to move into right forward quadrant. Crew completed emergency procedures and normal shutdown. Inspection revealed hairline crack in aluminum elbow.

UH-60 Class D

A series - While flying at 250 feet AGL and 50 knots during day recon of NVG single-ship NOE route, aircraft struck set of unmarked wires. Crew completed landing without further incident. Aircraft sustained minimal damage.

L series - Pilot lowered M119 howitzer to ground. Crew chief was giving directions and told pilot "going forward." Pilot understood to "go forward." M119 began to roll, and crew chief released load. M119 came to rest in inverted position with damage to M187 sight mount.

UH-60 Class E

A series - During commander's flight evaluation, aircraft was at 80 knots and 400 feet AGL on downwind when No. 2 engine failed during ECU-lockout operations. Crew continued to airfield and completed shallow roll-on landing without any damage to aircraft. Maintenance evaluation of engine failure is ongoing.

Attack

AH-1 Class C

F series - While at 15-foot hover during power cylinder check, aircraft made uncommanded right yaw. Aircraft climbed, and pilot attempted to return aircraft to 15-foot hover. Watching for uncommanded pedal inputs, MP reacted with left pedal, causing aircraft to settle more rapidly. MP performed hovering autorotation, and aircraft landed hard due to low rotor RPM. Aircraft sustained damage to landing gear and support.

F series - While flying low level during daylight along twisting river route, PC in back seat failed to detect three ½-inch power transmission lines strung across river. Aircraft broke two strands of wire, causing significant damage. PC completed landing without further damage.

AH-64 Class D

A series - Aircraft was lead in flight of two conducting terrain flight along ridgeline for purpose of evaluating trail aircraft's back-seat pilot. Two kilometers after takeoff, lead aircraft struck topmost wire of 110-foot set of high-tension power lines. Wire contacted aircraft above main rotor system on lower portion of air data sensor and subsequently broke due to aircraft's forward progress. Crew immediately performed uneventful approach, landing, and shutdown. Inspection revealed damage to air data sensor and main rotor deice power distribution system.

Cargo

CH-47 Class A

D series - At 140 knots and 1,100 feet AGL during routine maintenance test flight, one of the aft rotor blades contacted the upper cabin area, initiating an in-flight breakup. Five fatalities.

Observation

OH-6 Class C

J series - Flight of two OH-6Js departed airport. After departure, flight lead unsuccessfully attempted to contact trail. Flight lead backtracked and located trail aircraft on hillside. During climb to clear mountain, aircraft had lost rotor RPM and crashed. One injury.

OH-58 Class A

A series - During night qualification training, crew had just finished slope landing in confined area. Student pilot brought aircraft to hover, and it began to drift. Right skid contacted ground, and aircraft rolled right and came to rest on its right side. One fatality.

C series - At about 100 feet AGL, aircraft was participating in multiship mission when it was observed to initiate sudden climb and subsequent descent. Aircraft impacted ground and was consumed by postcrash fire. Two fatalities.

Fixed wing

C-12 Class C

C series - During IFR mission, bird struck left wing of aircraft. Postflight inspection revealed 16-inch by 18-inch hole in aircraft wing.

C-12 Class D

C series - At about 10 feet AGL, pilot reduced remaining power. Aircraft fell through last 10 feet and landed hard in level attitude. Postflight inspection revealed left main gear-down lock plate was bent. Maintenance replaced left main gear actuator and drag brace.

N series - During preflight inspection, crew discovered damage to right lower dipole (mission) antenna. Damage most likely occurred on descent or landing during previous night-mission flight. Suspect damage was caused by bird strike during descent or FOD during landing.

OV-1 Class E

D series - During cruise flight, crew detected smoke and fumes in cockpit. Crew shut down environmental control system, opened air vents, and donned oxygen masks. With heater off, smoke and fumes stopped due to cold temperature at altitude. Crew terminated mission and returned aircraft to base without further incident. Nose cowling insulation panels No. 2, 3, 6, and 24 started smoldering. This was caused by heater blowing against old insulation.

Aviation ground accidents

OH-58 Class A

D series - During hot-refueling attempt of two OH-58D(I) aircraft from UH-60L using "Fathawk" concept, hose nozzle separated from CCR nozzle at one OH-58D fuel port. Pressurized fuel sprayed over OH-58D, ignited, and engulfed aircraft. OH-58D crews conducted emergency engine shutdown procedures and exited their aircraft. Crew started UH-60L and flew it clear of area. One OH-58 was destroyed, and two fuel handlers received minor injuries.

OH-58 Class C

A series - During engine start, TOT began rapid increase after crew pressed start switch. Pilot rotated throttle off and released starter. TOT stabilized at 700°C. Pilot again checked throttle off and pressed starter button to cool engine. TOT again made rapid increase to 1,000°C. Pilot then used both hands and forced throttle closed.

FOD incident

OH-58

C series - During takeoff, aircraft shuddered three times in rapid succession and aircrew heard low rotor RPM warning. Crew completed landing without further incident. Maintenance discovered missing engine collar and damage to first-stage compressor blades.

Messages

■ Safety-of-flight technical message concerning one-time visual inspection and torque check of lower drive link to the swashplate retaining hardware on all Army CH-47D, MH-47D, and MH-47E aircraft (CH-47-95-02, 051912Z May 95). Summary: A CH-47D from Fort Hood crashed. Initial results indicate the lower drive link to the swashplate retaining bolt failed in fatigue. The investigation is continuing. However, initial teardown analysis indicates that the slip-fit bushing was omitted from the lower swashplate drive arm. It is possible that the errors and inconsistencies in the dash 23 manual may have contributed to the omission. The purpose of this message is to direct a one-time visual inspection of the lower drive link to swashplate retaining hardware for proper installation and perform a torque check of bolts, P/N 114RS352-2, prior to the next engine runup. This inspection is required for both forward and aft swashplates. Contact: Mr. Dave Scott, DSN 693-2045 (314-263-2045).

■ Aviation safety action maintenance mandatory message concerning all AH-1F and UH-1H/V aircraft with MWO 1-1520-236-50-30 and MWO 1-1520-242-50-2 oil debris detection system (ODDS) applied (AH-1-95-ASAM-01 and UH-1-95-ASAM-02, 111612Z Apr 95). Summary: A field unit reported that during daily inspection, the four mounting screws for the transmission ODDS debris monitor electrical connector were found loose or missing. Upon further investigation, it was noted that the mounting screws on the 42-degree gearbox ODDS chip detector were also loose. The 90-degree gearbox screws were tight; however, the potential exists for them to become loose also. This problem was noted on several aircraft. The engine oil debris detection system already utilizes lockwired screws and is not affected by this message. The purpose of this message is to replace existing hardware on the ODDS with MS35265-13 screws for the transmission electrical connector and MS35265-12 screws for the 42- and 90-degree gearbox electrical connectors, which will allow for lockwiring of the screws. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time removal of engine oil return line clamp on all AH-1E and AH-1F aircraft modified by MWO 55-1520-236-50-12 (AH-1-95-ASAM-02, 011626Z May 95). Summary: AH-1E/F aircraft modified by MWO 55-1520-236-50-12 may have an improperly installed clamp on the engine oil return hose that can cause the quick disconnect to become disengaged. Failure of the quick disconnect will result in a loss of engine oil and subsequently a rise of the engine oil temperature into the red/warning range. The outcome of this is an emergency condition that requires a procedure to land as soon as possible. The purpose of this message is to remove the clamp on the oil return hose that was installed by MWO 55-1520-236-50-12, Modification for Improved Air Filtration System, and ensure that the quick disconnect is properly installed. The clamp can restrict movement of the hose and prevent the quick disconnect pins from locking. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning increase to engine oil change interval on OH-58A/C aircraft (OH-58-95-ASAM-06, 011509Z May 95). Summary: MWO 55-1520-228-50-44, Installation of External Scavenge Oil Filter Kit on OH-58A720 and OH-58C Helicopters, 15 July 1994, has been installed on most OH-58A/C aircraft. Testing of increased engine oil change intervals was accomplished on selected aircraft. Results of testing supported increased oil change intervals. Manual changes to support the scavenge oil filter will be published. Current instructions are in memorandum, AMSAT-R-EIO, subject: Airworthiness Release for OH-58A/C Helicopters with the Scavenge Oil Filter Installed, dated 15 June 1994, and in handout draft data. The purpose of this message is to provide information concerning the OH-58A/C scavenge oil filter installation and to increase the oil change interval from 100 hours to 200 hours. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

In this issue:

Class A Accidents through May

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	0	0	0
	March	0	1	0	0
3D QTR	April	5	1	2	5
	May	0	2	0	2
	June	0		0	
4TH QTR	July	4		5	
	August	1		0	
	September	1		0	
	TOTAL	21	6	11	8

U.S. ARMY SAFETY CENTER

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REPORT of ARMY AIRCRAFT ACCIDENTS
October 1995 ◆ Vol 24 ◆ No 1

a DREAM *becomes a* REALITY

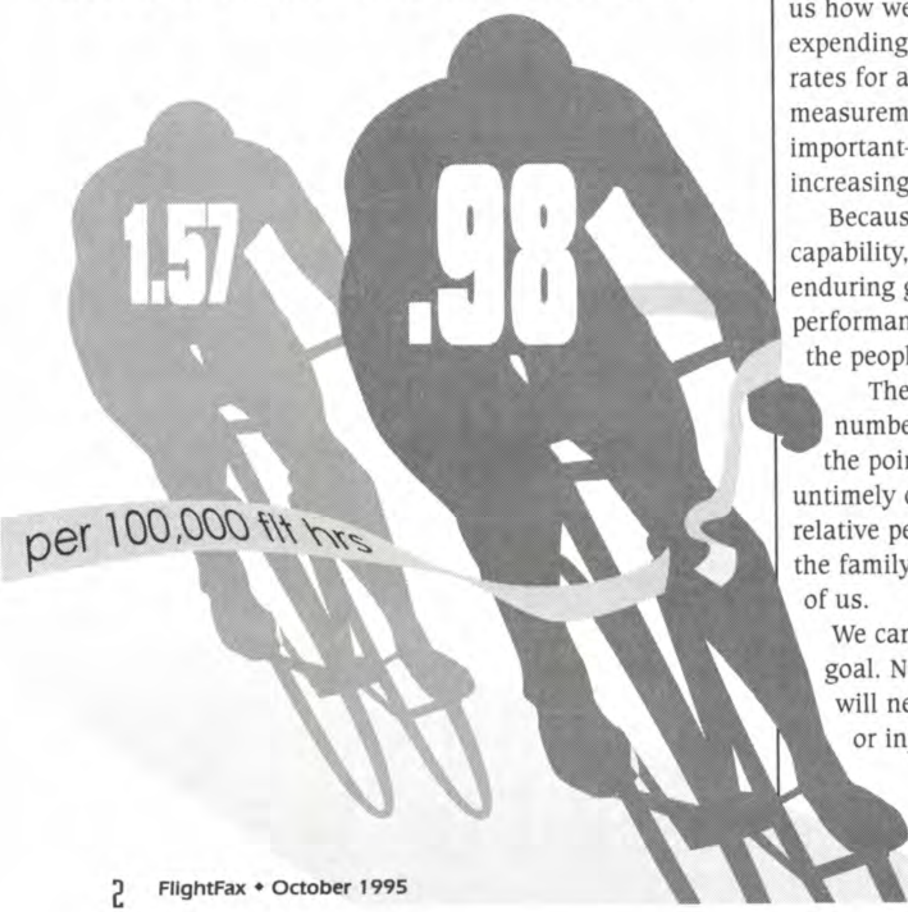
FY 95 was a breakthrough year in aviation safety: we achieved a Class A flight accident rate of 0.98 per 100,000 flight hours. Just a few years ago, only the visionaries dared to dream that someday we would be able to turn the corner on aviation accidents and break the 1.0 mark.

Congratulations to every single member of the Army aviation team on accomplishing the most significant event ever in Army aviation safety. Your embracing risk management and force protection efforts made a once seemingly impossible vision a reality.

FY 95—the best year ever in Army aviation safety

The benchmark aviation safety record was set in FY 92 with a Class A flight accident rate of 1.57 per 100,000 flight hours. Repeating achievement of such a significant milestone proved to be a tough challenge. In fact in FY 93 and FY 94, we fell just short of the FY 92 record. But we continued to move in the right direction by indoctrinating soldiers in the safety culture. And the result of all aviation team members applying risk management to daily operations has made FY 95 the year we turned the corner on aviation accidents.

As this issue of *FlightFax* goes to press, the Class A aviation flight accident rate for FY 95 stands at 0.98 per 100,000 flight hours. The final FY 95 statistics will not be available until the flying hours are verified during this month of October. Even though the final Class A flight accident rate may change slightly, we are confident that the FY 95 Class A rate will become a new Army benchmark. Final FY 95 statistics and a recap of all FY 95 Class A accidents will be included in the next issue of *FlightFax*.



Pause for a moment to . . .

Congratulate yourselves and take pride in this monumental safety accomplishment—but don't linger too long with the backslapping. Even as we savor the moment, we must remind ourselves that if all we do is look back, something out front will be waiting to snare us and our safety momentum will be lost. We still have much work to do.

Recap of FY 95

The good news. A lot of good things were going on in aviation safety during FY 95. Not only were we able to reduce our Class A flight accident rate to its lowest ever in FY 95, we also reduced our Class A through C flight accidents and total costs.

Compared to 21 in FY 94, the Army experienced only 12 Class A flight accidents during a year in which the optempo was exceptionally high for some units. Our Class A through C flight accidents decreased significantly as well—from 116 in FY 94 to 84 in FY 95. And we were able to reduce total aviation accident costs from approximately $108 million in FY 94 to about $76 million in FY 95.

The bad news. In spite of our great successes, FY 95 was marred by the loss of soldiers in accidents that could have been prevented. We lost 13 soldiers in FY 95 flight accidents, 2 more than we lost in FY 94.

Remembering those lost

Although we sometimes tend to focus on statistics to tell us how well we are doing in aviation safety, we are not expending all this effort to produce ever more impressive rates for all the world to see. The rates are only a measurement of how well we are doing in what's really important—saving lives, equipment, and money while increasing our combat capability.

Because of the importance of safety to our combat capability, improving our safety performance must be an enduring goal. But as we continue to work to improve that performance, let us never forget that what really counts is the people.

The 13 lives lost during this fiscal year are not just numbers. If all you see is the number 13, you've missed the point. Each number represents a soldier who met an untimely death while serving our country in a time of relative peace. The loss of each individual not only touches the family and friends affected by that death, it touches all of us.

We cannot rest on the laurels of reaching a numerical goal. No matter how low the numbers and rates go, they will never be acceptable as long as we continue to lose or injure soldiers in preventable accidents.

Looking ahead to FY 96

The big question is, Can we repeat or perhaps even improve upon our FY 95 safety performance? As we begin FY 96, the safety momentum is high, but we must stay focused to maintain it. If we don't we could quickly give up some of the high ground we've worked so hard to achieve. No one doubts that FY 96 will be another challenging year for Army aviation. The missions won't be easy, and we must work hard to protect our soldiers and preserve our resources.

Your role

Risk management is the bedrock of our safety culture. And we must continue to promote it because soldiers live and operate in a highly demanding and potentially dangerous environment. Study risk management, learn to use and apply it intuitively, and teach others to do the same. When you think about the mission, apply risk management by constantly identifying, assessing, and controlling hazards in your daily operations. The more you practice applying the risk management process and principles, the easier it becomes.

Safety begins with you. In everything you do, practice safety by planning ahead, applying risk management, and using common sense. *Don't take any unnecessary risks*. Make a personal commitment to force protection efforts and help us ensure that an even safer future lies ahead for all members of Army aviation. The fact is you will determine what we accomplish in FY 96. ❑

The Hawthorne effect and accident reduction . . .

Should an upward trend in accidents occur, this phenomenon can be used as a short-term fix but be wary of failure to identify underlying causes.

I was stationed in Korea during the summer of 1994 when Eighth U.S. Army (EUSA) had a series of aviation mishaps. About 12 major accidents occurred within a 3-month period—a totally unacceptable upward trend in accidents. The Commanding General held a meeting with aviation commanders to determine what could be done to reverse the trend. The inevitable safety standdown days were held, and the mandated training in aircrew coordination was completed in record time.

A curious phenomenon regarding accident trends sometimes happens in Army aviation safety. After the Commanding General's meeting with aviation commanders, which was followed by increased unit emphasis on safe operations, the accidents mysteriously stopped. My battalion commander also noted this phenomenon and asked, "Why did the accidents stop after the Commanding General became involved?"

As a safety officer, I was also puzzled. I in turn asked a senior safety officer, CW5 Windell Mock, about this. He said, "Al, it's easy to explain. Think of it in terms of the Hawthorne effect." The Hawthorne effect? What is the Hawthorne effect?

The study

Webster's defines the Hawthorne effect as "the stimulation to output or accomplishment that results from the mere fact of being under concerned observation." It refers to an interesting discovery made during a study at the Hawthorne plant of the Western Electric Company in Cicero, IL, from 1924 to 1932. The study focused on the effect that raising and lowering work area light levels would have on productivity.

Group A employees were *told* their work performance was being studied and monitored while the researchers *increased* light levels in their work areas. When higher light levels were applied, a corresponding increase in worker productivity occurred. Meanwhile, a control group was not informed about the close scrutiny of their performance with varying light levels. Although light levels were increased, their productivity remained the same. Group B employees were also *told* their work performance was being studied while researchers *decreased* their available light. Amazingly enough, their productivity also *increased* even though lights were turned down so dim they could barely see what they were doing.

The conclusion

It was not the increase or decrease in light levels that changed productivity. Productivity changed because workers became aware of the fact that they were part of a special group. Because they were being monitored and attention was being given to their work, the workers felt special, as if they were an elite group.

How does this apply to Army operations?

The Hawthorne effect may have been evident during the Desert Shield buildup. Following several early Class A accidents, it became evident that aviation units were operating in an environment like none they had encountered before. The Army's senior leadership quickly focused on this problem area and formed a team of experts to assess the hazards, particularly during NVG operations.

Attention by the chain of command, the public, and the media put Army aircrewmembers in the limelight. Aware that they were the focus of intense efforts to establish more effective techniques for operation in the desert terrain, aircrewmembers took pride in knowing that America's Army was counting on them to perform as disciplined professionals in as safe a manner as possible until more effective NVG desert flying techniques could be determined. Consequently, even in preparing for imminent war in a harsh, unfamiliar environment, aircrewmembers began exercising more caution while an operations planning guide with a crawl-walk-run progression of unit NVG training programs in desert operations was being prepared. The result: a decrease in the accident rate.

Considering that at least 75 to 80 percent of all accidents are attributed to human performance, commanders and leaders at all echelons must consider and use principles such as the Hawthorne effect when attempting to control accident cause factors. The obvious lesson is that if you make a group or person feel special, they will usually respond in proportion to the degree of importance they feel. Our Army leadership recognizes this point and continually stresses that we have a trained and ready Army—one that is capable of decisive victory. America counts on them, and individual soldiers can take pride in knowing that they are part of an elite group of warfighters trained to serve the Nation at home and abroad and to defend the interests of our country and those of our allies. Conversely, those same individuals and groups may perform in a proportionately negative manner if they do not feel that their superiors and peers view them in a positive manner.

A word of caution

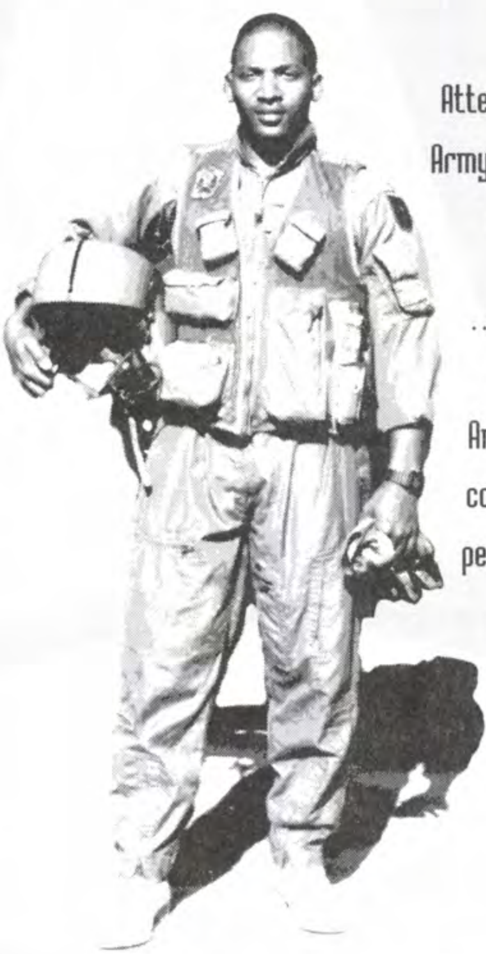
The Hawthorne effect can also work in reverse. Historically, there are higher rates of accidents during static displays and air shows. This can be explained because aircrews fly to the limits of their abilities and the capabilities of their aircraft (and sometimes beyond) to satisfy their perceived notion that the public expects them to put on an exciting show.

There is another equally important consideration regarding this phenomenon. While intense command interest in aviation safety issues is certainly important and does appear to "activate" the Hawthorne effect, commanders should be aware that they have in many cases done nothing more than buy time if they do not discover the root cause of an upward accident trend. The true causes of the rising accident rates cannot be eliminated or positively controlled until they are identified. Unidentified, the real problems will only lie dormant until the focus of the command has relaxed, then the same problems often reoccur.

This is not to say that the Hawthorne effect is a good or bad thing. Actually, it is neither. It is simply a phenomenon that can be used to affect human behavior. Understanding and effectively using the Hawthorne effect is the key to its positive application. We must constantly strive to convey to our soldiers that they are an elite group—the best-trained, best-equipped fighting force the world has ever known—and demand nothing short of excellence from them.

We are coming off a great year in Army aviation safety. But when the attention afforded our significant FY 95 accomplishments subsides and accident rates begin to rise, we must remember to focus our efforts on identifying the underlying causes. At the same time, we can rely on short-term fixes such as the Hawthorne effect to remind aviation team members that they are indeed an elite group of warfighters and that the Army leadership is counting on each of them to curtail any upward trend in accidents.

POCs: CW3 Alfred L. Rice, A Company, 1-212th, Aviation Training Brigade, Fort Rucker, AL, DSN 558-4064 (334-255-4064); and CW5 Windell Mock, Aviation Safety Manager, Office of the Director of Army Safety, DSN 225-7291 (703-697-7291)



Attention . . . put Army aircrewmembers in the limelight.

. . . [they] took pride in knowing that America's Army was counting on them to perform as disciplined professionals . . . .

Technical publications update

The following is a list of current aviation changes, revisions, and new technical publications:

Publication Number	New (N), Revision (R), Change (C)	Subject
MWO 1-1270-476-55-17	N	Modification of TADS Turret
MWO 1-1520-237-50-22	N	UH-60 Improved Airspeed System
MWO 1-1520-238-50-39	N	Phase Generator Wire Clamping, AH-64
MWO 1-1520-240-50-68	N	Install GPS AN/ANS 149(V)1
TB 1-1520-237-20-153	R	UH-60 Tail Rotor Pitch Change Shafts
TB 1-1520-239-20-161	N	Change of Retirement Life for M/R Blade Cuffs
TB 1-1520-238-20-42	R	Rec Insp of APU PTO Clutch
TB 1-1520-240-20-76	N	Torque Check of Lower Drive Link
TB 1-1520-248-20-32	N	One-Time Insp and Restack of ADEL Clamps
TB 1-2840-229-20-2	N	Sandy Environment or Combat Ops for T-53 Engine
TB 1-1520-210-20-26	N	Inspection of Fuel Boost Pump
TB 1-1520-237-20-166	N	Pitch Change Shafts
TB 1-1520-240-20-75	N	One-Time Inspection of Stratopower
TB 1-2835-205-20-2	N	Sandy Environment or Combat Ops for Gas Turbine Engine
TB 1-2835-208-20-2	N	Sandy Environment or Combat Ops for Gas Turbine Engine
TB 1-1520-238-30-8	N	Head Assy, Inst/Insp, AH-64
TB 43-0001-03-3	N	Aviation EIR Digest
TB 43-0001-03-4	N	Aviation EIR Digest
TB 43-0001-03-5	N	Aviation EIR Digest
TM 1-1270-476-23P	C2	TADS Assy, AH-64
TM 1-1500-328-23	R	Aero Equip Maint Management
TM 1-1510-223-MTF	N	RC-12N Maint Test Flight Manual
TM 1-1520-237-23P-1	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23P-2	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23P-3	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23P-4	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23P-5	R	EH/UH-60 Maint Manual
TM 1-1520-237-BD	R	EH/UH-60 Battle Damage
TM 1-1520-237-S	R	EH/UH-60 Shipping
TM 1-1520-237-MTF	C1	EH/UH-60 MTF Manual
TM 1-1520-237-10	C2	EH/UH-60 Operator's Manual
TM 1-1520-237-CL	C2	EH/UH-60 Checklist
TM 1-1520-237-23-1	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23-2	C2	EH/UH-60 Maint Manual
TM 1-1520-237-23-3	C1	EH/UH-60 Maint Manual

Publication Number	New (N), Revision (R), Change (C)	Subject
TM 1-1520-237-23-4	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23-5	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23-6	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23-7-1	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23-7-2	C1	EH/UH-60 Maint Manual
TM 1-1520-237-23-8	C1	EH/UH-60 Maint Manual
TM 1-1520-237-PMS-1	R	EH/UH-60 Maint Manual
TM 1-1520-237-T-1	C1	EH/UH-60 Maint Manual
TM 1-1520-237-T-2	C1	EH/UH-60 Maint Manual
TM 1-1520-238-10	C1	AH-64 Operator's Manual
TM 1-1520-238-CL	C1	AH-64 Checklist
TM 1-1520-238-23-1	C2	AH-64 Maint Manual
TM 1-1520-238-23-2	C1	AH-64 Maint Manual
TM 1-1520-238-23-3	C1	AH-64 Maint Manual
TM 1-1520-238-23-4	C4	AH-64 Maint Manual
TM 1-1520-238-23-6	C1	AH-64 Maint Manual
TM 1-1520-238-23-7-1	C1	AH-64 Maint Manual
TM 1-1520-238-23-7-2	C1	AH-64 Maint Manual
TM 1-1520-238-23-8	C1	AH-64 Maint Manual
TM 1-1520-238-23-9	C1	AH-64 Maint Manual
TM 1-1520-238-23P-1	R	AH-64 Maint Manual
TM 1-1520-238-23P-2	R	AH-64 Maint Manual
TM 1-1520-238-23P-3	R	AH-64 Maint Manual
TM 1-1520-238-23P-4	R	AH-64 Maint Manual
TM 1-1520-238-23P-5	R	AH-64 Maint Manual
TM 1-6625-736-13&P	N	Test Set, Electronic
TM 1-6625-3081-30P	C2	Elec Equip Test Fac, TADS/PNVS
TM 5-4930-234-13&P	C5	Closed Circuit Refueling Nozzle
TM 9-1270-476-30	C24	TADS Assy, 28,000 BTU/HR
TM 10-4930-247-13&P	C3	HTARS
TM 55-1500-345-23	C6	Painting & Marking Army Acft
TM 55-1520-210-23-2	C8	UH-1H/V, EH-1H/X Maint Manual
TM 55-1520-210-23-3	C7	UH-1H/V, EH-1H/X Maint Manual
TM 55-1520-228-23-2	C8	OH-50A/C Maint Manual
TM 55-1520-236-23P-3	C10	AH-1S (PROD) Maint Manual
TM 55-1520-240-10	C5	CH-47D Operator's Manual
TM 55-1520-240-CL	C3	CH-47D Checklist
TM 55-1520-240-PMD	C8	CH-47D Maint Manual
TM 55-1520-240-23-1	C56	CH-47D Maint Manual
TM 55-1520-240-23-2	C18	CH-47D Maint Manual
TM 55-1520-240-23-4	C33	CH-47D Maint Manual
TM 55-1520-240-23-6	C19	CH-47D Maint Manual

Publication Number	New (N), Revision (R), Change (C)	Subject
TM 55-1520-240-23-9	C17	CH-47D Maint Manual
TM 55-1520-240-23-10	C14	CH-47D Maint Manual
TM 55-1520-240-23P-1	C7	CH-47D Maint Manual
TM 55-1520-248-10	C7	OH-58D Operator's Manual
TM 55-1520-248-MTF	C4	OH-58D Maint Test Flight Manual

Publication Number	New (N), Revision (R), Change (C)	Subject
TM 55-1520-248-23-4	C5	OH-58D Maint Manual
TM 55-1520-248-23-7	C7	OH-58D Maint Manual
TM 55-1520-248-23-8-2	C2	OH-58D Maint Manual
TM 55-1520-248-23-9	C3	OH-58D Maint Manual

POC: CPT Peter Newell, Engineering Programs Branch, USASC, DSN 558-1235 (334-255-1235), fax DSN 558-9528 (334-255-9528)

Documentation for DA forms

ATCOM recently issued a maintenance information message (MIM) (GEN-95-001, 171756Z Aug 95) concerning documentation for DA forms governed by DA Pam 738-751: *Functional Users Manual for the Army Maintenance Management System—Aviation (TAMMS-A)* and DA Pam 738-50: *The Army Maintenance Management System (TAMMS)* update 14.

The purpose of the MIM is to alert aviation maintenance managers that—

■ DA Pam 738-750 maintenance management update 14 was published 1 August 1994. This update changed DA Form 2408-14: *Uncorrected Fault Record* dated October 1991 and DA Form 2407: *Maintenance Request*. The update also deleted DA Form 5504: *Maintenance Request Used for Standard Army Maintenance System (SAMS)*. The following instructions will be followed until the next DA Pam 738-751 is published:

◆ Without Army aviation approval, DA Form 2408-14 dated October 1991 was changed in June 1994 to meet the needs of ground equipment maintenance. The June 1994 version is similar to the October 1991 version, but it is not compatible with unit-level logistics system—aviation (ULLS-A) and the needs of Army aviation. Therefore, the following actions are authorized:

• The DA Form 2408-14 dated October 1991 is approved for aviation use. Stocks of DA Form 2408-14 dated October 1991 must not be destroyed.

• If the October 1991 version is not available, the DA Form 2408-14 dated June 1994 will be used. If the June 1994 version of the DA Form 2408-14 is used, ensure that the entry in column B (fault) includes the system, fault date, and fault.

• The October 1991 version of DA Form 2408-14 will be reissued as DA Form 2408-14-1 when DA Pam 738-751 is next revised.

◆ DA Form 5504: *Maintenance Request* used for SAMS reporting was deleted. Do not use.

◆ DA Form 2407: *Maintenance Request* was revised. This form is now used by SAMS units and non-SAMS units. The preparation instructions in the current edition of DA Pam 738-751 pertain to the August 1988 version of the DA Form 2407. Until the next revision of DA Pam 738-751 is published, aviation users should use the preparation instructions for the DA Form 5504 in DA Pam 738-751 for the new DA Form 2407. The new DA Form 2407 is similar and most of the blocks are compatible to the DA Form 5504 but are arranged somewhat differently.

■ The correct addresses for submission of DA Form 2410: *Component Removal and Repair/Overhaul Record,* DA Form 2408-19-3: *Engine Component Operating Hours Record,* and quality deficiency reports (QDRs) are as follows:

◆ DA Form 2410—Commander, U.S. Army Aviation & Troop Command, ATTN: AMSAT-I-MDO (2410), 4300 Goodfellow Blvd, St. Louis, MO 63120-1798.

◆ DA Form 2408-19-3—Commander, U.S. Army Aviation & Troop Command, ATTN: AMSAT-I-MDO (TACTS), 4300 Goodfellow Blvd, St. Louis, MO 63120-1798.

◆ QDR—Commander, U.S. Army Aviation & Troop Command, ATTN: AMSAT-I-MDO (QDR), 4300 Goodfellow Blvd, St. Louis, MO 63120-1798. This QDR address change affects paragraphs 3-6.A.(2), 3-6.C.(1), and 3-6.C.(3) of DA Pam 738-751.

■ AMSAV-M Form 188: *Serialized Parts Life Tracking System (SPLTS) Reporting* is no longer an acceptable form. It was deleted by DA Pam 738-751 dated 15 June 1992. DA Form 2408-19-3 is the correct form.

Points of contact

■ Maintenance—Ms. Ann Waldeck, DSN 693-1821 (314-263-1821).

■ Foreign military sales (FMS)—CW5 Jay Nance or Mr. Ron Van Rees, DSN 693-3326/3659 (314-263-2066/2067). ❑

Understanding ALSERP

The U.S. Army Aeromedical Research Laboratory (USAARL) established the aviation life support equipment retrieval program (ALSERP) in 1972 under the authority of AR 95-5: *Aircraft Accident Prevention and Reporting*. The purpose of the program was to evaluate and record the efficiency of aviation life support equipment (ALSE) in an aircraft accident environment.

The initial program was based on accident record analysis only. To accommodate more detailed analysis, the program has evolved into a laboratory-based examination of helmets and other ALSE by a selected interdisciplinary team of engineering, medical, and aviation safety experts.

ALSERP is not limited to but is primarily focused on rotary wing accident investigation. Its goal is to maintain or increase aircrew protection during aircraft impact scenarios by collecting injury and equipment-performance data, analyzing the data, and presenting trends to substantiate design improvements. The objectives of today's program are to determine whether ALSE performed as desired and if not, to develop concepts and criteria for design or remanufacturing improvements.

Individuals who are appointed to serve on a U.S. Army Safety Center (USASC) centralized accident investigation (CAI) team or local accident investigation team complete accident forms that present the injury data necessary in our research. They accomplish this by establishing the nature and cause of the trauma, correlating the distribution of victims and their injury patterns, and evaluating the application and use of human factors design engineering principles. Accident investigators also record in the accident report any item of ALSE or personnel protective equipment that is in any way implicated in the prevention or cause of an injury. Items that prevented injury, caused injury, or failed to perform as a function of design, manufacture, or use are shipped to USAARL for analysis (DA Pam 385-40: *Army Accident Investigation and Reporting)*.

Authorized by regulation and a letter of agreement with the USASC, USAARL participates when requested and as budget and personnel permit in all Army aviation accidents where flight crews are injured. In cases where we do not participate directly, we routinely provide consultant services to assist the investigators assigned to the investigation.

Given a brief sketch of the crash kinematics and type and degree of injury, we advise investigators on the pieces of ALSE that should be sent to the lab for further analysis. We help investigators determine crash kinematics, assess the performance of crashworthy seats and restraint systems, assess the survivability of the aircraft environment, and correlate the human-to-equipment response. Physical collection, investigation, and documentation of ALSERP data and equipment involved in an accident is a joint investigation team-USAARL effort.

The primary purpose of accident investigation is the prevention of future accidents and injury. It follows that a complementary effort between accident investigators and USAARL can better ensure comprehensive injury and accident data recording and analysis. If you are assigned to a CAI team or a local accident investigation board, call us and let us help you during the investigative process.

POCs: CW5 Joel J. Voisine or Mr. Joseph R. Licina, Aviation Life Support Equipment Retrieval Program Managers, USAARL, Fort Rucker, AL, DSN 558-6895/6893 (334-255-6895/6893)

Broken Wing award

The Broken Wing award is given in recognition of aircrewmembers who demonstrate a high degree of professional skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in AR 672-74: Army Accident Prevention Awards Program.

■ **CW3 Glenn A. Spilman, 603d Aviation Support Battalion, APO AE 09250.** While flying straight and level, the UH-1H crew heard a loud grinding sound coming from the rear of the cargo area. The aircraft yawed left, back to the right from the pilot's inputs, and began to descend. CW3 Spilman, the pilot-in-command, in the right seat took the flight controls, lowered the collective, and retarded the throttle. A loud pop was heard and smoke began coming from behind the dashboard. While smoke was pouring out, CW3 Spilman saw the only possible landing area was about 90 degrees to the left. As CW3 Spilman was turning the aircraft and making a mayday call, the pilot set the transponder to emergency. By this time, the cockpit was so full of smoke neither CW3 Spilman nor the pilot could see the dashboard much less the landing area. CW3 Spilman could only see a red and yellow glare coming through the smoke from the dashboard and trees out his door. Knowing there were numerous trees and the intended landing area was just at glide distance, CW3 Spilman maintained his airspeed to increase glide distance. Because of the smoke, he had to rely on what he felt, heard, and didn't hear to maintain control of the aircraft during the descent. At about 150 to 200 feet AGL, the smoke had stopped pouring into the cockpit and had dissipated to the point where CW3 Spilman was able to see the landing area, which was still ahead with some trees in the flight path. At about 100 feet AGL, he started to decelerate while maintaining enough forward airspeed to clear obstacles and reach the intended landing area. At about 15 feet AGL, CW3 Spilman pulled initial pitch to slow the rate of descent. With the ground getting closer, he could no longer hold the decelerating attitude. He then leveled the aircraft as he began to cushion. Because of the upslope condition and the very soft field from numerous rainshowers, the landing gear stuck into the ground, causing the crosstubes to rotate and the fuselage to land on its belly. CW3 Spilman then performed an emergency shutdown in response to the fire light and the crew chief calling out smoke. Inspection revealed that the nose reduction gear assembly most likely failed in flight from materiel failure or fatigue, causing the engine to fail.

■ **CW4 Kenneth W. Cowan, Army Aviation Support Facility, California Army National Guard, Stockton, CA 95205.** About 1 hour into the CH-47 general test flight, CW4 Cowan was performing a turbine engine analysis check (TEAC) on the No. 2 engine. This flight check requires tht the No. 1 engine be at idle producing zero torque while the tested engine produces maximum military power. CW4 Cowan was recording engine parameters and manipulating engine condition levers while the pilot maintained heading and altitude. The aircrew heard a loud bang, followed by another loud bang. The aircraft experienced a severe yaw. CW4 Cowan perceived the rapid rotor RPM decay as the No. 2 engine fire light illuminated and the flight engineer simultaneously announced a visible fire surrounding the No. 2 engine. CW4 Cowan immediately reduced the thrust lever and began an autorotation. Subsequently, the pilot reduced airspeed with aft cyclic which when coupled with the rapid thrust reduction, increased rotor RPM toward an overspeed. CW4 Cowan manipulated the thrust, stabilizing the RPM. He then performed the emergency engine shutdown procedure and activated the fire suppression system for the No. 2 engine while making an emergency call to the tower. CW4 Cowan brought the No. 1 engine on line to flight, directed the flight engineer to secure himself, and advised the pilot that the No. 1 engine was on line. After descending through 500 feet AGL at a 1,700-feet-per-minute autorotational rate of descent, CW4 Cowan applied power and landed the aircraft in an open pasture. After landing, CW4 Cowan executed an emergency engine shutdown and the crew evacuated the aircraft. Subsequent analysis indicated that the No. 2 engine experienced a catastrophic failure caused by the severance of the power turbine shaft. Part of the power tubine shaft failed against the gas generator shaft, which in turn failed and caused a seizure of the accessory gearbox and oil pump. These failures caused an explosion that disintegrated the last stage of the power turbine, which then exited through the exhaust. ❑

Height-velocity-avoid region

The UH-60 with its dual engines brought a safety margin to utility helicopter operations that wasn't possible with single-engine aircraft. However, as mission demands expand and new equipment is added, Black Hawks frequently operate at higher gross weights than in the past.

UH-60 crews should be aware that operating in the height-velocity-avoid regions can be hazardous to them too, if one engine becomes inoperative. The avoid regions vary based on gross weight and atmospheric conditions encountered.

Pilots should review the information in the operator's manual on the height-velocity-avoid regions for single-engine failure and avoid flying in these danger zones as much as possible.

POCs: Mr. Dennis Menckowski or Mr. Michael Lupo, Utility Helicopters Project Manager's Office, Aviation and Troop Command, DSN 693-3210 (314-263-3210)

Address verification

Because of new postal regulations, we are updating our distribution lists for *FlightFax*. The post office now requires building numbers, street addresses, and 9-digit zip codes. APO addresses should include unit, box, and CMR number as appropriate.

Please review and update your current mailing label and return the corrected label to us. If your address is correct, please return the existing label and so state. Return your label to Commander, U.S. Army Safety Center, ATTN: CSSC-IM, Bldg 4905, 5th Avenue, Fort Rucker, AL 36362-5363, or fax requested information to DSN 558-2266 (334-255-2266). ❑

Helicopter external load operations

The lack of standard pendants for hook up of certain loads presents a hazard to aircrews, ground crews, the lift helicopter, and the equipment being transported. Air delivery equipment (ADE) lines are commonly used as field-expedient pendants to provide long lines between the helicopter and the load. These nylon web straps are easily cut by the sharp edges of the load or an inappropriate shackle.

Using current hookup procedures and equipment, the close proximity of the lift helicopter to certain loads has resulted in the helicopter settling on the load, damaging it, damaging the helicopter, and in some cases, injuring hookup personnel. This condition is much more hazardous during NVG operations.

Older rigid reach pendants are difficult to hook up and can prevent the proper function of the helicopter cargo keeper. Roll pins have failed to secure the grab hook keeper, resulting in dropped loads.

The Aviation and Troop Command recently issued a safety of use message (SOUM-ATCOM-95-007, 141545Z Aug 95) to—

■ Identify standard lines and shackles to be used as long-line pendants and to prohibit the use of other unauthorized field-expedient pendants.

■ Require the use of reach pendants for specific external air transport (EAT) loads to provide the necessary clearance to accomplish the hookup quickly and safely.

■ Prohibit the use of the older aerial recovery kit reach pendants on the forward and aft hooks of the CH-47D.

■ Require the field modification of grab hooks to replace the roll pin with a bolt and lock nut.

■ Require the use of a castellated nut and cotter pin to secure the safety bolt on the apex fittings.

Points of contact

■ Technical—Mr. Jerome C. Smith, DSN 693-1676 (314-263-1676).

■ Logistical—Mr. Dick Harper, DSN 693-5362 (314-263-5362).

■ Safety—Mr. Brad Meyer, DSN 693-2085 (314-263-2085). ❑

Delayed implementation of survival radio requirement

AR 95-3: *Aviation: General Provisions, Training, Standardization and Resource Management*, dated 27 September 1990 and effective 26 October 1990, requires that each aircraft crewmember be equipped with a survival radio. The Department of the Army issued a message (HQDA message 081245Z Aug 95) superseding HQDA message 030920Z Aug 94 and authorizing delay in the complete implementation of paragraph 7-68 of AR 95-3 until 30 September 1996.

This delay is to allow redistribution of the AN/PRC-90 survival radios and fielding of the AN/PRC-112 survival radio. PM Aviation Electronic Combat (AEC) is currently fielding one AN/PRC-112 per aircraft. Additional AN/PRC-112 radios will be procured if additional funding becomes available.

In the interim, the pilot-in-command (PC) will continue to ensure that not less than one fully operational survival radio is on board the aircraft. This does not preclude crewmembers from carrying additional radios on board the aircraft as assets become available. In addition, the PC will ensure that crewmembers without radios have other means of signaling; for example, the L119 foliage penetration flare kit and/or a signal mirror.

Points of contact

■ HQDA, LTC Jim Budney, DSN 227-0487.

■ PM-AEC, Mr. Jim Macelderry, DSN 992-4605. ❑

STACOM
Standardization Communication

During recent assistance visits, Directorate of Evaluation and Standardization (DES) personnel discovered that some units are selecting 2000-series ATM tasks, modifying the task condition, and redesignating them as 3000-series tasks. For example, a unit had changed the *condition* of several 2000-series tasks to "orally" and listed them as 3000-series tasks to avoid the ATM's requirement to perform the tasks in the aircraft. Obviously, this practice saves time and money; however, it also allows unit personnel to be progressed to RL 1 status without ever having actually performed those particular tasks.

The U.S. Army Aviation Center, Aviation Training Brigade (ATB), the proponent for TC 1-210 and all ATMs, has determined that this practice is not authorized. Once a task is approved as a standard DA task, any modification must be requested by submitting a DA Form 2028: *Recommended Changes to Publications and Blank Forms*.

TC 1-210, paragraph 3-2c states, "Those tasks that the commander determines are essential to METL accomplishment *but are not in the ATMs* will be designated as additional tasks and listed separately. The commander assigns these tasks 3000-series numbers." In other words, 3000-series tasks are tasks required by a commander in order to support the unit's mission and have not been published as a standard DA task (not listed in the ATM).

The DES POC is CW4 Estrada, DSN 558-2442 (334-255-2442). The ATB POC is CW4 Johnson, DSN 558-3801 (334-255-3801).

STACOM 165 **October 1995**

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-1098/3504. Information published here generally precedes the formal staffing and distribution of Department of the Army official policy. This information is provided to all commanders to enhance aviation operations and training support.

William H. Bryan
Colonel, Aviation
Director of Evaluation and Standardization

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

Aviation flight accidents

Utility

UH-1 Class A

H series - While in cruise flight at 1,100 feet AGL, crew experienced suspected engine malfunction and executed autorotation. Aircraft came to rest in about 8 feet of water. No injuries.

UH-1 Class C

H series - During RL 3 training, IP told pilot to perform manual throttle (emergency governor) operations. Pilot induced engine overspeed that went to 7300 RPM before IP could apply corrective actions. Engine, main rotor hub, and tail rotor bolts and nuts replaced.

H series - While in flight, crew experienced increase in engine RPM (+6900), N1 (+101.5 percent) and rotor RPM (+356) for maximum of 5 seconds. Crew applied manual control of N2 and executed precautionary landing without further incident. Engine and drive train component replaced due to engine overspeed and drive train overtorque.

V series - Thermostat flow control failed while in the closed position during engine runup. Engine oil temperature gauge climbed to 140° before crew completed shutdown. Engine replaced.

UH-60 Class A

A series - Aircraft was lead in flight of two during NVG mission. At about 700 feet AGL, Chalk 2 observed a flash from Chalk 1's No. 2 engine. Chalk 2 then observed Chalk 1 in a high-speed descent to water impact. Four fatalities.

UH-60 Class D

A series - During level flight at 4,000 feet MSL and 120 knots, small electrical fire started in lower right corner of pilot's windshield (anti-ice connector). Crew noticed that pilot's windshield anti-ice switch was on and turned it off. Crew used hand-held fire extinguisher to extinguish fire and completed uneventful landing at heliport. Maintenance disconnected windshield anti-ice.

A series - IP demonstrated NVG approach to confined area along dirt road. Dust cloud developed on final approach, obstructing peripheral view of IP and crew chief sitting on right side. Approach terminated with tip path plane being very near bush on right side. During postflight, crew discovered damage to all four main rotor blade tip caps.

UH-60 Class E

A series - During maintenance test flight evaluation, crew was performing maximum power check and successfully completed No. 1 engine checks. During power check on No. 2 engine at 4,500 feet and OAT of 30°C with a TGT of 840° and NG of 99.3, crew heard a loud noise followed by failure of the No. 2 engine. TGT exceeded 1,000°, low RPM light illuminated, and audio activated. Pilot on controls entered autorotation while other pilot brought No. 1 engine back on line and performed emergency engine shutdown on No. 2 engine. Crew flew aircraft single engine back to base.

Attack

AH-1 Class E

E series - During cruise flight, No. 1 hydraulic caution and master caution lights illuminated. Crew heard loud noise from No. 1 hydraulic pump area and lost yaw control. Crew completed run-on landing. Inspection revealed hydraulic lock nut was loose. Lock nut and No. 1 hydraulic pump replaced.

AH-64 Class C

A series - During night system APART evaluation EP training, IP administered simulated engine failure at altitude. Aircraft incurred low airspeed and began to descend. As aircraft neared power lines, IP applied power to No. 2 engine and collective to arrest descent. Torque on No. 1 engine reached 134 percent before No. 2 engine came on line. Crew completed landing without further incident.

AH-64 Class E

A series - Upon advancing engine power levers to fly position, PC noted that No. 1 engine NP was exceeding normal limits. PC secured both engines. Maintenance replaced engine alternator.

Cargo

CH-47 Class C

D series - Aircraft was slingloading disabled UH-60A to home station when rotor blade tiedown broke, allowing UH-60 blades to flap. First blade snapped 2 feet from rotor hub, and second blade also flapped and sustained damage.

D series - During overwater level flight, clamshell doors blew off. Crew completed landing without further incident.

Observation

OH-58 Class A

A series - Aircraft struck large power lines and crashed inverted. Two fatalities.

OH-58 Class C

A series - While departing mission area in level flight to the east, PC observed small fixed wing aircraft descending at 12 o'clock position. PC took controls and initiated evasive maneuver. During immediate descent, he heard rotor noise and observed rotor RPM at 115 percent. PC increased collective, resumed power to flight, and executed precautionary landing without further incident.

D series - Tail rotor balancing weight severed and lodged into tail rotor blade. Crew completed landing without further damage. Gearbox mounting bolts and tail boom sustained damage.

D series - While conducting laser testing at 600 feet AGL, aircraft entered descent. When crew attempted to arrest descent, aircraft experienced overtorque of power train system.

OH-58 Class E

A series - During cruise flight at 2,000 feet MSL, transmission oil hot light illuminated. Crew landed aircraft at civilian airfield. During postflight, crew found transmission fluid on deck and running down side. During 100-hour inspection prior to flight, extra transmission oil had been added due to low indication. Extra oil caused foaming and overtemp. Inspection of sight glass revealed that clear plastic disc used during shipping had moved into a position that prevented oil from showing accurately.

Fixed wing

C-12 Class E

D series - On gear extension, red light remained on in gear handle and right main gear-down light did not illuminate. On sixth attempt using manual extension, right gear safe light illuminated and red lights extinguished in gear handle, but gear warning horn still sounded when crew reduced power. Gear was visually confirmed down, and crew completed landing and shutdown on runway. Inspection revealed that right main landing gear downlock switch had malfunctioned.

K series - During descent from FL 330, crew decreased power levers. No. 1 engine was producing popping noise and TGT indicated 100° hotter than No. 2 engine. When attempting to increase power, No. 1 engine torque would not increase above 20 percent, TGT would increase to upper limit (830°), N1 fluctuated from 60 to 90 percent, and popping noise would increase. Crew reduced power on No. 1 engine to idle, declared an emergency, received clearance to recovery base, and landed without further incident. Inspection revealed compressor turbine vane ring assembly was damaged.

C-26 Class E

B series - During cruise flight, high pressure hydraulic line ruptured, resulting in total hydraulic failure. Systems lost included landing gear, flaps, and nose wheel steering. Crew completed emergency procedures and landed without further incident.

EO-5 Class C

B series - During flight, cowling was loose. During subsequent preflight inspection, crew noted damage to props and spinner.

OV-1 Class E

D series - While climbing to 14,000 feet prior to level off, PC saw light flashes from right side of aircraft accompanied by popping sounds. Crew noted no abnormal cockpit indications. During power change at level off, crew still noted no abnormal indications. Observer in right seat observed flames coming from No. 2 engine exhaust. PC again noted no abnormal indications on engine instruments but elected to perform emergency procedure for engine fire in flight. Crew secured No. 2 engine and activated fire extinguishing system. PC executed uneventful single-engine approach and landing.

U-21 Class C

H series - While performing single-engine flight at altitude in landing configuration, operating engine experienced electrical failure. Landing gear was retracted, flaps would not retract, and lights dimmed. Troubleshooting procedures failed to restore electrical power. Engine failed to restart. Crew applied maximum power to good engine to sustain altitude. On final, emergency landing gear extension was successful. Engine experienced ITT reading of 775°C for 10 minutes (no torque reading available due to electrical failure).

H series - While conducting upper air work maneuvers during APART flight evaluation, pilot initiated go-around in landing configuration at altitude. After applying power and initiating climb, SP failed left engine with condition lever. Pilot initiated correct emergency procedure and gear retraction was uneventful. However, flaps would not retract. Crew noted loss of all AC electrical power. Right generator fail light dimmed. Attempt to restart left engine showed no ignition light. SP unsuccessfully attempted to secure radios with master avionics switch to off position. Crew manually lowered gear on final and completed uneventful landing.

FOD incidents

UH-1 Class F

H series - During flight, 7/16 quarter-inch drive socket that had inadvertently been left in tail rotor drive shaft housing came in contact with rotating rear 3 drive shaft couple, driving the socket down through skin into tail boom. Inspection revealed damage was limited to one tail rotor drive shaft clamp and sheet metal.

UH-60 Class F

A series - Crew failed to note that No. 2 engine inlet cover was still installed. Crew started engine, and No. 2 engine sustained FOD damage.

Aviation-ground accident

AH-64 Class C

A series - Aircraft experienced maintenance problems, and crew returned to base field at 1315. At approximately 1545, an unforecast thunderstorm struck field. An associated microburst produced high winds that tipped aircraft to the left. Rocket pod, which was mounted on outboard wing store, kept aircraft from turning over.

Safety messages

Aviation safety action maintenance messages

■ Aviation safety action maintenance mandatory message concerning revision to inspection and lubrication of the flight control rod end bearings (rolling element) on all CH-47D, MH-47D, and MH-47E aircraft required by CH-47-95-ASAM-05 (CH-47-95-ASAM-06, 211254Z Aug 95). Summary: CH-47-95-ASAM-05 required an inspection at every third phase. As a result of engineering analysis, the requirements of CH-47-95-ASAM-05 need revising. Implement the requirements of this message at the next phase inspection as required by CH-47-95-ASAM-05. This message supersedes CH-47-95-ASAM-05 entirely and makes the following changes:

◆ Inspect and lubricate bearings in paragraphs 6A, 6B, 6C, 6D, and 6E of this message at the next phase inspection and at the first and third phase inspection thereafter.

◆ Inspect the pedal box bearings (paragraphs 6F, 6G, and 6H) at the next phase inspection, and lubricate each time they are removed from the aircraft.

◆ Increases the number of parts to be inspected and the inspection criteria of the parts to be inspected. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time records check for MWO 1-1520-240-50-69, reinstallation of MWO 1-1520-240-50-69 for rotor heads that were modified in Europe, and recurring visual inspection for slipped bushings and/or cracked pitch housing lugs for rotor heads that have MWO 1-1520-240-50-69 applied (CH-47-95-ASAM-07, 061805Z Sep 95). Summary: After the application of MWO 1-1520-240-50-69 in Europe, a daily inspection found a slipped bushing in the lower lug of the pitch housing on an aircraft in Italy. The slipped bushing may have been caused by either improper interference between the bushing and lug or damage to the bore caused by improper installation techniques of the previous and/or current MWO. The purpose of this message is to require units to perform a one-time records check for MWO 1-1520-240-50-69 and a recurring visual inspection for slipped bushings and/or cracked pitch housing lugs for rotor heads that have MWO 1-1520-240-50-69 applied. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

The principle is this; no safety check can ever be routine, no matter how often performed, when the lives of men are involved. It is an insidious temptation to slight checks on regulations when things have been going safely for days—but this is the danger, because it dulls alertness.

—Major General Aubrey "Red" Newman
Follow Me, 1981

In this issue:

- A dream becomes a reality
- The Hawthorne effect and accident reduction . . .
- Technical publications update
- Documentation for DA forms
- Understanding ALSERP
- Broken Wing award
- Height-velocity-avoid region
- Address verification
- Helicopter external load operations
- Delayed implementation of survival radio requirement
- Stacom 165

Class A Accidents through September

		Class A Flight Accidents		Army Military Fatalities	
		94	95	94	95
1ST QTR	October	2	0	0	0
	November	3	0	0	0
	December	2	1	2	0
2D QTR	January	1	1	2	1
	February	2	0	0	0
	March	0	1	0	0
3D QTR	April	5	1	2	5
	May	0	2	0	2
	June	0	1	0	0
4TH QTR	July	4	1	5	0
	August	1	3	0	5
	September	1	1	0	0
	TOTAL	21	12	11	13

U.S. ARMY SAFETY CENTER

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Thomas J. Konitzer
Brigadier General, USA
Commanding General
U.S. Army Safety Cent

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*U.S. Government Printing

FlightFax
REPORT of ARMY AIRCRAFT ACCIDENTS
November 1995 ◆ Vol 24 ◆ No 2

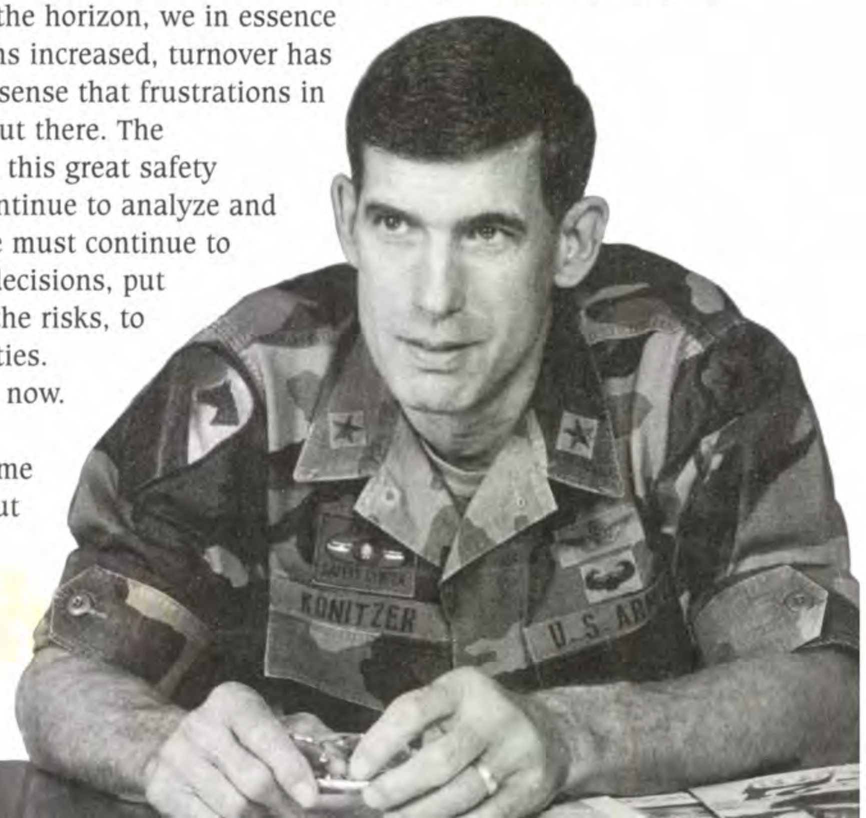
Breaking the 1.0 mark in aviation safety

Congratulations aviation team. What a fantastic year it was in aviation safety! By achieving a Class A aviation flight accident rate of .83 per 100,000 flying hours, you have put a new aviation safety mark on the wall.

Simply saying that FY 95 was a banner year for Army aviation with only 10 Class A accidents, seems somewhat an understatement when you consider how long it took to make the vision of breaking 1.0 a reality. Our Class A flight accident rate for FY 94 was 1.64. So we made a major leap forward in safety performance during FY 95. I think this tremendous safety performance can be attributed to the quality of soldiers, civilians, and leadership that we have in today's Army. You truly have your head in the game and are sensitive to the environment, the equipment you are operating and its capabilities and limitations, as well as your own capabilities and limitations. Every individual working hard and doing the right thing is what gave us the outstanding successes we had in FY 95. And we just need to continue to do that!

But almost before I can get the congratulations out of my mouth, I have to stand back in the reflective mode and issue a caution. We must not let euphoria cause us to lose sight of the hard work it will take to preserve that safety accomplishment and build on it for future years, specifically FY 96.

We must be realistic in our approach toward the Army today and how much change is truly affecting us. While we have seemingly decreased the threats on the horizon, we in essence have increased our missions. Not only have missions increased, turnover has increased, leader inexperience has increased, and I sense that frustrations in the field are increasing. All the warning signs are out there. The environment is ripe with conditions waiting to turn this great safety achievement in a negative direction if we do not continue to analyze and determine a course of action to take us forward. We must continue to identify hazards, assess risks, make the right risk decisions, put controls in place, and supervise. We must manage the risks, to do less is to fail in our force protection responsibilities.



We have a new aviation safety mark on the wall now. But we must never lose sight of one thing: any accidental loss is an unacceptable loss. We have some major challenges in our Army for this fiscal year. But with the quality people and leadership in our total Army force, and I want to emphasize total—Active, National Guard, and Reserve soldiers and civilians—all working together, safety will happen.

—BG Thomas J. Konitzer, Director of Army Safety

Making safety happen

The mission of our Army is to fight and win our Nation's wars. A study of statistics from our past major conflicts reveals that we have two enemies on the battlefield. One is *them*, but the other is *us*. In every modern war except Korea, the Army has lost more people and equipment because of accidents than due to enemy action. Accidental losses impose a drain on our combat capability that we simply cannot afford. We have got to deal with the "us" and reduce the hazards and risks to soldiers in order to preserve our warfighting abilities.

We recognize threats to our soldiers in combat and deal with the enemy through our capabilities and dynamics of combat power that we apply in the battlefield operating systems. Just as important is the integration of risk management into a closed-loop process starting with the planning process throughout execution and all the way through postoperations.

Becoming proactive

We have traditionally had a reactive approach toward safety. That is, we analyze statistics, gather information during accident investigations, and provide information to the units so they can go out and make sure that type of accident doesn't happen again. Over the years, an image of a pencil-necked geek with a clipboard looking at compliance as an external force and approach to safety has evolved.

We must transition to a proactive approach to safety in which we truly internalize the risk-management process and integrate it into everything we do. When we make risk management an intuitive way of thinking and personalize it by making it a way of life for every soldier and civilian, we can then look toward a future where safety is embedded in the Army's culture. Safety professionals will be an integral part of the warfighting team. They will be welcomed because they are not there in a compliance mode but are there for continuity and to assist in every way possible in the oversight of risk-management integration into all unit activities.

We have a responsibility to inculcate into the hearts and minds of every soldier and civilian their own responsibility to make safety happen. And if we can get everybody to fully embody the true meaning of risk management as a way of life and not as an afterthought, then we will have accomplished a major cultural change in safety. We are not there yet, but we are continuing to move in the right direction as individuals willingly begin accepting personal responsibility for making safety happen.

Individual responsibilities

There are some intangibles that we don't usually think of as safety related. But I think they are. Even if you are not directly responsible for people or equipment, you are responsible for three things: your appearance, your performance, and your conduct. All three have safety implications.

Appearance. Your appearance is not just how you look in a uniform or civilian clothes. It is your ability to maintain your readiness—both physical and mental—to perform your job.

The Army has fitness tests and other requirements to maintain and check the speed, strength, and stamina dimensions of soldier physical readiness. Our civilian work force needs to take physical readiness more seriously. There are health-risk appraisals and other programs to help them do that. But mental readiness is not so easily measured. It is an attitude that can be more powerful than the physical. It is what causes ordinary soldiers to do heroic deeds—or not. Mental readiness is what determines one's choice of fight or flight. The essence of mental readiness is an individual's beliefs, values, and attitude. This is the human dimension that causes people to behave in a disciplined, mature, and commonsense manner—or not. The warrior spirit is alive and well in every soldier. Some are moved by the spirit more than others. Soldiers need to temper the spirit that says "I can do anything" with self-discipline and sound judgment.

Soldiers, particularly those of you in the 18-to-25 age group (40 percent of our Army), tend to think you are invincible. "It will happen to anybody but me." My message to you is that you need to really understand the human dimensions and what you are physically capable of, realizing that we can't leap tall buildings in a single bound or step in front of locomotives or any other things that are physically unrealistic. As mere humans, we do have limitations that we need to recognize. We must learn to take our capabilities and limitations into consideration and do a match before every event on and off duty.

Performance. Proficiency in our technical and tactical skills is an individual responsibility. It is through knowing our strengths and weaknesses that we can best progress through the crawl-walk-run stages of performing tasks to safe standards. We sometimes lose sight of the axiom that "currency is not proficiency" and think that if we have done it once, we can do it again without preparation.

Conduct. We all are responsible for our actions 24 hours a day both on and off duty. Yet soldiers are falling short in fulfilling their responsibility to conduct safe operations. The leading cause of accidental death is attributed to failing to recognize hazards, underestimating personal risk, and overestimating personal ability.

Know yourself. Know your own strengths and weaknesses and then be able to temper the warrior spirit with a commonsense approach to life. You are a responsible individual expected to be able to apply judgment and sound decision making to whatever you do, integrating and applying risk management at the lowest levels. The five steps of the risk-management process can and should be applied to everything we do.

Leader responsibilities

Warrior leaders motivate soldiers and bring out the warrior spirit. Warrior leaders, therefore, have a responsibility to make safety happen by setting the conditions for their soldiers to crawl, walk, and run based upon capabilities, environment, METL, and METT-T. We have absolutely superb soldiers in the field, soldiers who will respond to great command leadership, but we have to make sure their "can do" is tempered with the proper approach: commonsense and proper risk-management integration.

Accepting responsibility

We have got to think with our heads . . . and we've got to think with our guts. Thinking with our head, we tend to look, we see, we smell, we hear, we put brainpower to work. But there is an intuitive factor as well. If something doesn't *feel* right, it probably isn't. And somebody ought to do something about it. Therefore, take time to listen to your gut as well.

Now this next thought is almost counter to the culture of our Army today in which we are a very disciplined organizational structure. We want soldiers to be disciplined and respond to leadership. But at the same time, we want soldiers to understand that accidents don't respect rank. Accidents can happen to anybody, including generals. Murphy lurks around every corner. Therefore, if a private is standing out there seeing a senior officer or NCO about to do something without having considered all the hazards/controls, then we want our soldiers today, regardless of their rank, to be able to step in, take action, and prevent an accident from happening. Now that is an interesting dynamic in relation to the culture under which we currently operate. When we achieve this type of situational awareness, we will also achieve the goal of embedding risk management as a way of life.

My responsibilities to you

I owe you a vision, along with inputs and outputs. My vision or focus for the Army's safety program is to mature what has been started: to take the risk-management process that is in the field, generally accepted yet not fully understood, and integrate it as a way of life for all of us.

We can no longer afford for safety to be an afterthought. It must be a part of everything we do: warfighting, doctrine, training, leader development, materiel development, personnel assignments, everything. Therefore, the Safety Center and the Army Safety Office are working on a short- and long-range strategy to effect a cultural change in the way the Army approaches safety through the integration of the risk-management process into all that we do.

My next responsibility to you is to listen to what you want from *your* Safety Center. By taking your accurate and timely inputs in the form of 285s and 2397s and analyzing them, we can best perform my other responsibility of providing you useful outputs in the form of products such as *FlightFax, Countermeasure,* and leader's guides. For example, one product for warfighters that is just off the press and ready for distribution is the *Leader's Guide to Force Protection Through Risk Management*, a comprehensive reference for the force-projection Army.

We also need to do a better job of capturing the good news stories and good ideas that are at work today, but we need your help. Please send us your safety ideas, close calls/near misses, and lessons learned.

My final commitment to you is to do a better job of getting out the word about emerging safety issues and insights gleaned during accident investigations. I intend to start using safety alert messages as a means of providing a warning order to the field. The purpose is not just to say that an accident has taken place but to rapidly communicate the emerging insights about what we have gathered from that accident that are useful to you in the field.

As the Director of Army Safety, I'm also going to inform the proponents and appropriate Army staff agencies of our emerging insights as they apply to their respective areas so that they in turn will be able to take corrective actions to fix identified problems. In essence, I am planning a two-pronged attack for the future to be able to ensure that we are getting information out as quickly as possible on safety issues so that we can help you, our customers, do your jobs better and eliminate or reduce as much as possible the second enemy on the battlefield.

We've made major accomplishments in safety. But we still have a lot of work to do. We are going to bring about a total safety cultural change, but not all at once. We are going to accomplish this goal by swallowing the elephant one toe at a time. We all have a responsibility, and, together as a team, we are going to **Make Safety Happen!**

—BG Thomas J. Konitzer, Director of Army Safety

Recap of FY 95 Class A flight accidents

■ **OV-1D**. The crew experienced VHF radio failure. The PC removed his O2 mask a couple of times to try to reseat his microphone and recycle the radio. When these attempts were unsuccessful, the PC, in accordance with the unit SOP, made a decision to discontinue the mission. He turned south and reduced engine power to 23 percent torque. While in a wings-level, 1,000- to 1,500-feet per minute rate of descent from 16,000 feet MSL with the power on both T53-L-701A engines reduced to 23 percent torque, the PC and technical observer (TO) saw the master caution light and numerous segment lights illuminate. When the PC advanced both power levers to the full forward position and did not hear, feel, or see any engine response, he determined that neither engine was producing power. Unable to find a suitable landing area, the PC decided the crew would eject. Both crewmembers safely ejected from the aircraft: the TO at approximately 1,200 feet, followed by the PC at approximately 800 feet. The aircraft continued its descent and impacted the ground. A postcrash fire consumed most of the fuselage, including the main fuel cell and the cockpit. It is suggested that the fuel cell sealant material clogged the engine fuel barrier filters and caused the engine to fail.

■ **UH-60A**. The aircraft was returning to the airfield at the end of an aircraft qualification course flight period when it experienced an abrupt, severe pitchdown of the nose. The crew was unable to fully recover from the near-vertical, nose-down descent, and the aircraft crashed into trees within seconds. The crewmember in the jump seat received fatal injuries and the front-seat occupants were seriously injured.

■ **AH-64A**. The PC, flying unaided, was transitioning from an air taxi to a hover taxi off an active runway in an area with limited contrast. During the transition, the aircraft impacted the ground in an 85-degree left-yaw attitude (nose of the aircraft was 85 degrees left of the direction of travel). The main rotor blades struck the ground and severed the tail boom. The aircraft came to rest upright with major damage to the fuselage, main rotor blades, and weapons systems. Both crewmembers sustained minor injuries.

■ **CH-47D**. During a maintenance test flight for completion of Phase 2 maintenance, one of the aft rotor blades contacted the upper cabin area, initiating an in-flight breakup. The aircraft was at about 140 knots and 1,100 feet AGL when the in-flight breakup began. A bushing had not been installed, and a drive arm assembly bolt failed due to fatigue. All five occupants received fatal injuries, and the aircraft was totally destroyed.

■ **OH-58A**. From a 3-foot hover, short of an inverted "Y," during a night orientation flight, the aircraft descended as it moved laterally to the right. The descending lateral movement continued to ground contact. The main rotor blades struck the ground, and the aircraft rolled onto its right side. The IP was fatally injured, and one of the two pilot trainees received minor injuries. The aircraft was extensively damaged.

■ **OH-58C**. During a night low-level flight at 500 feet AGL using AN/PVS-6 NVGs, the aircraft began a rapid climb in excess of 1,000 feet per minute. After climbing to approximately 2,000 feet AGL, the aircraft was observed in a rapid, near-vertical descent with zero or near-zero forward airspeed and low rotor RPM. The aircraft impacted the ground in a near-vertical descent. Both pilots were fatally injured, and the aircraft was destroyed by the impact and postcrash fire.

■ **AH-64A**. The aircraft was lead in a flight of five AH-64s conducting night-aided terrain flight at approximately 200 feet AGL when the tail rotor struck a set of power lines. The tail rotor drive shaft was severed, and the aircraft impacted a nearby building and semitrailers, causing extensive damage to the aircraft and major damage to the building and semitrailers. A minor postcrash fire was extinguished by another aircrew. There were no major injuries.

■ **UH-60A**. The aircraft was in straight and level NVG flight over water when the No. 2 engine suffered an internal materiel failure. The crew failed to maintain single-engine flight. The aircraft crashed into the water about 3 miles off the coast. All four crewmembers sustained fatal injuries. (See UH-60 writeup in "Investigators' Forum.")

■ **OH-58A**. While providing aerial security for a day counterdrug operation, the PC flew the aircraft into a known set of power lines. The main rotor blades struck the ground wire, resulting in sudden stoppage that sheared the mast and separated the main rotor system from the aircraft. The aircraft impacted the ground in a nose-low attitude, fatally injuring the PC and a law enforcement agent. (See OH-58 writeup in "Investigators' Forum.")

■ **OH-58D**. While at a 60-foot stationary OGE hover, the pilot was attempting to locate OPFOR infantry with the mast-mounted sight. Without announcing his intentions, the PC began engaging OPFOR with 2.75-inch rockets and allowed the aircraft to begin drifting rearward. The tail rotor contacted a tree, and tail rotor control was lost. The PC initiated an autorotation from an OGE hover into several trees. The aircraft impacted the ground and came to rest on its side. The crew received minor injuries. ❑

Aviation spare parts

Over the last year, the Army aviation team has achieved the best safety record ever. In order to continue this outstanding record, we want to make you aware of a situation that has just surfaced for the rotary wing fleet and that we are attacking head on.

Recently completed engineering testing of specific spare parts produced unacceptable results. We have looked in detail at about 196 flight safety parts (FSPs) to determine if there are any other parts that may be similarly affected. Based on our analysis, only one potential safety issue has been uncovered, and it is being worked through the safety-of-flight process. A safety-of-flight message was released on 3 November 1995 on the UH-60 forward bellcrank support assembly. (See message summary on page 11 of this issue of *FlightFax*.)

Additionally, the Aviation and Troop Command and PEO-Aviation, with assistance from the Aviation Center and Army Safety Center, are continuing an in-depth analysis of each part in order to be certain that our aircraft are safe. Our initial analysis included a historical search of all mishap data, which confirmed that there have been no accidents related to any of the 196 parts currently under investigation.

Additional information will be needed from your aircraft records to fully assess some of the parts involved. Your help in providing quick responses to requests for information from either the ATCOM logistics assistance representatives (LARs) or the program/product managers is needed to finalize this assessment as quickly as possible.

We are working an extended-hour 7-day-per-week schedule until we complete a risk assessment on each part involved, and we will immediately alert you through the safety-of-flight process of any safety issues discovered. I hope to have the risk assessment program completed in the next 4 to 5 weeks, depending on the availability of required parts data. I will keep you informed of our progress.

I want to assure you that we are taking every action to ensure the highest standard for aviation safety. If you have any questions, concerns, or information that you wish to communicate to us, please contact me direct at DSN 693-1002 (314-263-1002) or call the ATCOM command operations center at DSN 693-2066 (314-263-2066).

My personal thanks to each of you for your assistance in resolving this important safety issue.

—MG John J. Cusick, Commanding General, U.S. Army Aviation and Troop Command, adapted from message dated 032258Z Nov 95

The "Investigators' Forum" is written by accident investigators to provide an accident synopsis and major lessons learned from recent centralized accident investigations.

OH-58A+. While providing aerial security for a day counterdrug operation, the PC flew the aircraft into a known set of power lines. The main rotor blades struck the ground wire, resulting in sudden stoppage that sheared the mast and separated the main rotor system from the aircraft. The aircraft impacted the ground in a nose-low attitude, fatally injuring the PC and law enforcement agent (LEA).

■ *What happened.* The OH-58A+ was part of a flight of two and was proceeding ahead of the UH-1H to locate a marijuana plot. The PC identified the wire hazard to the UH-1H aircrew. As the UH-1H was inserting LEAs, an individual moved to the marijuana plot, pulled up the plants, and proceeded to flee on foot. The PC observed this activity, and as he informed the UH-1H, he maneuvered the OH-58 to maintain visual contact with the individual and subsequently struck the wire.

■ *Lessons learned.* This scenario reemphasizes the importance of maintaining situational awareness, especially when operating an aircraft single pilot without a qualified observer on board.

UH-60A. While conducting NVG overwater flight at 700 feet, one engine failed. The aircraft crashed into the sea, fatally injuring all four crewmembers and destroying the aircraft.

■ *What happened.* The crew selected for this mission was not appropriate because they were not NVG current, and the chain of command failed to perform risk management for the mission. The pilot had not flown NVGs for 75 days and had only 1 hour of NVG flight during the previous 117 days. The intent was to "sign the pilot off" during the first hour of straight and level flight as this courier mission was conducted. The flight required a high degree of proficiency as it was identified as imminent danger, requiring precise low-level urban and overwater flight on a zero illumination night. Two other crews who could easily have performed the same mission were available. When the accident crew encountered a malfunction on one engine, they failed to maintain single-engine flight and essentially flew the aircraft into the water at a high forward airspeed.

■ *Lessons learned.* Risk management is not merely a key word that commanders and inspectors want to hear regurgitated during visits. It is a process by which hazards are identified **AND** steps taken to reduce or minimize the risks. The latter is vital and equally important. In a message dated 27 July 1995, the Chief of Staff of the Army, General Dennis J. Reimer, wrote "The nature of our business will not allow for either complacency or a cavalier acceptance of risk."

Leaders must understand and actively participate in the risk reduction process and make all reasonable efforts to minimize unnecessary risks. In this instance, the chain of command identified the risk of using a non-NVG-current crew on a critical mission and had several options with other flight crews available but did nothing to reduce or eliminate the risk. The mission commander simply obtained the appropriate signature for the risk-assessment form. ❑

BOTTOM LINE:

Risk assessment does not equal Risk management

Tips on being an effective ASO

Before being assigned to the Army Safety Center, I was the unit aviation safety officer (ASO) for a small flight detachment. Prior to my departure from that unit, the Department of the Army assigned a young CW2 right out of the ASO course as my replacement. With no experience as an ASO, he asked me to draw upon my experiences as an "older and wiser" safety officer and give him some tips that would help him in his new job.

After carefully considering the young ASO's request, I jotted down the following tips that assisted me in effectively managing the commander's accident prevention program and kept me going in the right direction to help my unit reduce accidental losses.

■ **Be loyal to the command.** Keep your commander informed of what is going on in his or her accident prevention program. Inform the command of all regulatory requirements and give them options that will allow them to accomplish the mission safely and still comply with these requirements. By doing so, you maintain your credibility and the command is quick to support any ideas you have for improving safety in the unit.

■ **Set the example.** As the ASO, your subordinates, peers, and superiors will watch you to ensure you are practicing safety in everyday tasks. Be a soldier who always does the task "by-the-book," even when you think no one is watching. You can't expect everyone else to follow by-the-book procedures if you don't.

■ **Be a professional.** Don't let personalities get in the way of progress or doing your job. Treat everyone professionally, and don't display any unprofessional behavior. Remember to "praise in public, criticize in private." Alternative methods are available for dealing with individuals who are not receptive to safety or refuse to comply with safety requirements.

■ **Be a part of your unit.** Be visible in the unit area by continually talking to the soldiers and officers. Attend training meetings so you will know what is going on in the unit and have an opportunity to provide input to ensure unit training is executed safely. Soldiers in your unit need to know that you are *their* safety officer, and they need to know where to find you if they identify a safety issue or need help. With all the paperwork required, it's very easy to get into a rut of staying in the office.

■ **Be proactive, not reactive.** Don't wait until an accident happens before you take action to solve a problem or correct a deficiency. Actively applying risk management to everyday situations can help you identify, assess, and control hazards before they result in an injury or damaged equipment.

■ **Conduct professional and realistic safety training.** The easiest way to lose an audience and damage the safety program along with your credibility is to conduct training that is boring and puts everyone to sleep. Use guest speakers to give classes and demonstrations. Talk to higher-level safety personnel, your training officer and NCO, and your local training aids support center for ideas and support. Many resources are available that can assist you in providing exciting and informative training.

■ **Document everything.** The job's not done until the paperwork is complete. This includes documenting inspections, observations, and all accident and incident data. It will help you identify trends and initiate corrective action and prevention measures.

■ **Be familiar with everyone's job.** If you are familiar with everyone's job in the unit, it will be easier to determine the task error when an accident happens.

■ **Maintain and enforce a high standard.** Enforcing a high standard may prove to be difficult initially. But the sooner you begin enforcing the standard without compromise, the sooner it will become second nature for unit personnel to maintain the standard. Also by maintaining a high standard yourself, it will be easier to enforce the standard with unit personnel.

■ **Sell safety.** Talk about safety to someone in your unit every chance you get: when someone visits your office, as you walk through the hangar, or on the ramp. Explain the benefits of the safety program in terms of accident prevention, resource conservation, and mission accomplishment.

■ **Maintain an effective safety awards program.** This is one of the most important programs you maintain for your commander. By the unit commander recognizing those individuals whose performance meets or exceeds requirements with appropriate awards, the unit safety program becomes very visible and very important to unit personnel. It then becomes a contest to see who in the unit will receive the next safety award.

As you have considered these suggestions, you may have determined that being an effective safety officer requires being somewhat aggressive. It does. It is no easy task; it takes an enormous amount of hard work. But there is great personal reward and satisfaction in knowing that you played an active role in preventing someone from being killed or injured or unit equipment from being destroyed or damaged.

POC: CW4 Gary D. Braman, Investigations Division, USASC, DSN 558-9855 (334-255-9855)

Broken Wing award

The Broken Wing award is given in recognition of aircrewmembers who demonstrate a high degree of professional skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in AR 672-74: Army Accident Prevention Awards Program.

■ **CW3 Danny W. Cordell, E Company, 1st Battalion, 212th Aviation, Aviation Training Brigade, Fort Rucker, AL.** CW3 Cordell was conducting night/night vision goggle training in a UH-1H with two initial entry rotary wing students. While turning from base to final on the approach to Lowe Army Heliport with a student pilot on the controls, the engine RPM began to increase rapidly above 6600 RPM. Turbine speed (N1) and engine exhaust temperature indicator (EGT) also began a rapid increase. The RPM warning light illuminated, and the aircraft began a rapid right yaw. The aircraft was at 500 feet AGL over a swampy area with large trees on all sides and no forced landing areas available. CW3 Cordell immediately took the controls and simultaneously increased collective pitch and reduced the throttle in an attempt to regain control of the engine RPM. The RPM fluctuated rapidly between 6000 and 6400, causing the aircraft to yaw left to right numerous times. Unable to regain control of the RPM with the governor in the AUTO position and with the aircraft descending through 300 feet AGL, CW3 Cordell placed the governor switch in the EMER position. (The student pilot was unable to assist CW3 Cordell with aircraft control or governor switch placement due to the student's low flying-hour level and minimal experience in a darkened cockpit.) Placing the governor switch in the EMER position resulted in an RPM fluctuation between 5800 and 6000 RPM and reduced the severity of the yaw rate. Using coordinated throttle and collective adjustments, CW3 Cordell maintained aircraft control and landed with minimum power.

■ **CW3 James T. Heater, 3d Military Intelligence Battalion (Aerial Exploitation), 501st Military Intelligence Brigade, Unit #15217, APO AP 96271-0153.** During an OV-1D night mission, mission equipment malfunctioned and CW3 Heater made the decision to return to home base. The forecast for home-base weather was 1¼ miles' visibility and a scattered cloud layer at 500 feet. After executing the ILS approach down to the published decision height of 243 feet, the crew was unable to identify the airport runway environment. CW3 Heater applied power and initiated a successful go-around. At about 500 feet MSL on climbout during the go-around, the crew started to feel, hear, and see cockpit instrument indications of multiple engine surges and erratic operation. Still flying under IMC, the crew confirmed rapid fluctuations in engine oil pressure, engine oil temperature, torque, and EGT on the No. 1 engine. The surges continued and resulted in adverse asymmetric thrust and uncommanded yaw excursions. The technical observer assisted CW3 Heater by calling out checklist items and interpreting engine indications. In an effort to smooth out erratic engine operations and possibly save the engine from damage, CW3 Heater decided to retard the No. 1 engine power lever to flight idle and retard the No. 1 engine propeller RPM to minimum RPM. CW3 Heater declared an emergency and for the remainder of the flight operated single engine. The crew received radar vectors for another ILS approach. The second approach was also flown to the decision height, and the crew still could not visually acquire the runway. The crew initiated a single-engine go-around with 2 hours of fuel remaining. The intensity of rainshowers was increasing, and the aircrew was still IMC. During climbout after initiating the second go-around, CW3 Heater noticed that the RMI and the directional gyro had failed and were not moving to correspond with his control inputs. Faced with a compounded emergency situation and decreasing weather conditions, CW3 Heater leveled out at assigned altitude and attempted to place the No. 1 engine back on line to match up with the No. 2 engine. The same indications of surges and erratic operations persisted, and CW3 Heater secured the No. 1 engine. The crew then determined to make a no-gyro precision approach radar at another base. Still in IMC with increasing isolated thunderstorm activity, CW3 Heater advised approach control of their engine out and loss of gyro emergency situation. CW3 Heater initiated a single-engine no-gyro approach. At 400 feet above decision height and 1 mile from the threshold, the runway environment came into sight. The crew completed a successful single-engine landing. Maintenance inspection revealed problems with the electrical system and multiple malfunctions in the vertical instrument display system. Test pilots suspected that the unexplained surges were possible compressor stalls caused by the compressor ingestion of heavy rain. ❑

STACOM
Standardization Communication

Exportable training packets

The CH-47D nonrated crewmember exportable training packet (ETP) (2C-011-0002-A) has been published and mailed out to all Active, Reserve, and National Guard CH-47D TO&E units. The packet was mailed during August 1995 and consists of four books: an instructor book, student handout, training aids index, and the *CH-47D Theory of Operation Manual.*

Only 50 of these ETPs were printed, and 43 of them have been distributed to the units. If you have a copy that was sent to your unit, don't take it with you when you PCS. Just a reminder: TC 1-216 paragraph 2-1b requires units to use these ETP POIs and lesson plans to conduct their nonrated crewmember qualification training.

If your unit has not received a copy of this ETP, send an inquiry or request for the ETP to Commander, U.S. Army Aviation Center, ATTN: ATZQ-ESC, Building 5112, Lucky Star Street, Fort Rucker, Alabama 36362-0609 or contact SFC Robert D. Hagen, DSN 558-3475 (334-255-3475).

The utility aircraft ETPs are currently in the editing phase and should be printed and mailed in January 1996.

STACOM 166 November 1995

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208, DSN 558-1098/3504. Information published here generally precedes the formal staffing and distribution of Department of the Army official policy. This information is provided to all commanders to enhance aviation operations and training support.

William H. Bryan
Colonel, Aviation
Director of Evaluation and Standardization

ShortFAX
Keeping you up to date

TC 1-210 changes

The philosophy of the 1995 revision of TC 1-210: *Aircrew Training Program, Commander's Guide to Individual and Crew Standardization* is simplification and the elimination of ambiguity and "interpretation." The intent is to define the minimum requirements that must be met and then let commanders command. TC 1-210 will help commanders, trainers, and evaluators establish the unit aircrew training program (ATP) and individual aircrewmember training folders (IATFs) used by all crewmembers.

Focus

The focus of TC 1-210 is on individual training and evaluation. It establishes standards for individual training, and it also addresses crew and collective training to point the commander toward combined arms training. Although TC 1-210 does not establish training or evaluation standards for crew or collective training, current crew coordination training philosophy is incorporated.

Record-keeping procedures

The major change to the Commander's Guide is in record-keeping procedures. Blank, generic IATF forms are now found in TC 1-210 only. The forms section will be deleted from all future individual aircraft ATMs. Forms may be reproduced from TC 1-210 or requisitioned, and many will be available for electronic reproduction from CD-ROM or a 3.5-inch disk.

Central to the new record-keeping system is the Crew Member Training Record. This form will be handwritten in ink and will record significant events in the crewmember's career. It will be a permanent part of the IATF and will not be altered or removed.

Grade slips for "one-time" flight, written, or oral evaluations no longer exist. The results of one-time evaluations will be entered directly into the training record.

Training and evaluations requiring multiple flights (for example, refresher training or RL progression) will be recorded on a temporary grade slip that has room for multiple flights. This makes tracking the performance of each task much easier. Once the training and evaluation are complete, the results will be entered into the permanent training record. The training grade slip may then be destroyed.

Other significant changes

- FAC 3 minimums cannot be waived.
- Duties and responsibilities have been rewritten and new positions of responsibility added.
- Rated RL 3 crewmembers must fly with an IP/SP.
- The commander no longer determines the "most difficult mode of flight." Night or NVS may be substituted for day but cannot be substituted for each other.
- The guidelines for prorating flying hours have been changed and simplified.
- Paragraph 3-10, "OTHER EVALUATIONS," covers proficiency flight evaluations (which include the no-notice proficiency flight evaluation program), postmishap, and medical evaluations.
- Since the commander determines if a proficiency flight is needed, he or she also determines which tasks will be evaluated.
- For rated crewmembers newly assigned to a unit, any element of the APART (instrument or standardization evaluation or operator's manual written exam) not completed within the past year must be evaluated prior to progression to RL 1. Graduates of the Initial Entry Rotary Wing Course on their initial tour are exempt.

If you have questions or comments about the Commander's Guide or individual ATMs, contact CW4 William "Scott" Johnson, CW4 Robb Miller, or Ms. Connie Ecker at DSN 558-3801/2864 (334-255-3801/2864) or fax DSN 558-2463 (334-255-2463). The e-mail address is ATZQATBATM@rucker-emh4.army.mil, and the mailing address is Commander, U.S. Army Aviation Center, Aviation Training Brigade, ATTN: ATZQ-ATB-NS (ATM Section), Building 2802 Division Road, Fort Rucker, AL 36362-5218. ❑

Accident briefs

Information based on *preliminary* reports of aircraft accidents

Aviation flight accidents

Utility

UH-1 Class C

H series - IP was demonstrating low-level autorotation. During touchdown, both main rotor blades contacted tail rotor drive shaft cover, severing drive shaft near 42-degree gearbox. Major drive train components replaced.

M series - Left transmission cowling came open in flight. Main rotor blades sustained damage.

UH-60 Class D

A series - In staggered right formation, flight of five was conducting NVG troop insertion. Aircraft crossed set of wires and began downslope approach to unimproved landing zone. Due to wire obstacle and downsloping terrain, angle of descent was steeper and rate of closure was faster than crew had anticipated. Just prior to touchdown, Chalk 2 noted Chalk 1 in steep deceleration. Chalk 2 PC responded by decelerating to pitchup attitude of about 20 degrees. Decelerative attitude combined with downsloping terrain resulted in Chalk 2's horizontal stabilator striking ground. Touchdown appeared to be normal and stabilator functioned properly for remainder of flight. Damage to stabilator discovered during postflight inspection.

Attack

AH-64 Class A

A series - During RL progression training mission, IP brought aircraft to 70-foot OGE hover. As IP attempted target hand-off maneuver, aircraft drifted rearward and tail rotor blades struck overhanging limb of tree. Directional control of aircraft was lost. Aircraft continued rearward until vertical stabilizer (fin) and tail rotor were located within main vertical fork of tree. Main rotor blades began striking tree limbs. Aircraft spun right and crashed into trees. Minor injuries.

Cargo

CH-47 Class C

D series - While in cruise flight at 500 feet AGL and 150 knots, CE (flight engineer) announced that clamshell doors had departed aircraft. Crew felt slight input in controls, as if encountering light turbulence, and landed aircraft to inspect for damage. No damage found other than missing doors.

D series - Aircraft was struck by lightning during cruise flight. Crew completed precautionary landing without further incident.

Observation

OH-58 Class A

D series - While at 60-foot stationary OGE hover, PI was attempting to locate OPFOR infantry with mast-mounted sight. Without announcing his intentions, PC began engaging OPFOR with 2.75-inch rockets and allowed aircraft to begin drifting rearward. Tail rotor contacted tree, and tail rotor control was lost. PC initiated autorotation from OGE hover into several trees. Aircraft impacted ground and came to rest on its right side. Two minor injuries.

OH-58 Class C

A series - During simulated engine failure at 1,200 feet AGL, aircraft experienced rotor overspeed. Rotor blades replaced.

D series - Aircraft was about 5 feet above trees in combat position during zone reconnaissance for crew validation when crew felt severe tail rotor vibration. Crew flew aircraft about 500 meters forward of combat position, landed without further incident, and completed emergency engine shutdown. Inspection revealed damage to tail rotor blades and high-frequency antenna and numerous scratches on bottom of tail boom just below and aft of horizontal stabilizer.

D series - Postflight inspection revealed wrinkling in all four main rotor blades. IP reported that rotor RPM decreased during autorotation. Upon detecting no vibration, he completed autorotation and reduced power. Main rotor blades replaced.

D series - While operating in FARP, PI applied power to avoid loose cargo parachute that had not been recovered following airborne delivery of FARP equipment. Excessive power application resulted in overtorque.

OH-58 Class D

D series - Aircraft was operating at 100 percent Np and flat pitch. As CE (crew chief) attempted to exit aircraft, his foot caught cyclic and knocked it out of PI's hand. Main rotor tilted forward and left, striking FM antenna. PI shut down aircraft. Inspection revealed minor damage to all four main rotor blades and FM antenna was broken.

OH-58 Class E

D series - Aircraft was in cruise flight about 10 miles from airfield when PC noted that fuel decreased from 158 to 100 pounds indicated in 1 to 2 minutes. Seconds later, low fuel 20-minute caution light came on. Fuel gauge indicated 97 pounds of fuel. Within about 1 minute, fuel decreased to 28 pounds indicated. PC declared precautionary landing and initiated descent from 200 feet AGL. At about 100 feet AGL, fuel had decreased to 7 pounds indicated. PC decided not to continue approach to spot initially selected and turned aircraft into wind to prepare for possible forced landing. At about 6 feet AGL, engine flamed out due to fuel starvation. PC executed forced autorotational landing without power. Aircraft was not damaged. Just prior to engine flameout, crew had noted fuel boost pump fail caution message. MP (maintenance test pilot) determined internal bulges in the fuel cell reduced fuel capacity of cell by about 45 gallons, which allowed a total fuel capacity of 67 versus the normal 112 gallons. Fuel consumption checks conducted earlier during flight indicated normal fuel consumption rate and no problems. Inspection of unit aircraft revealed three additional aircraft with same problem. QDR submitted.

Training

TH-67 Class C

A series - During hover flight with student pilot on controls, aircraft drifted rearward and tail stinger contacted sod. IP took controls and landed aircraft under full power. All controls functioned properly. After shutting down aircraft, crew noted that vertical fin assembly had totally dislodged from tail boom (vertical fin struck no other component). Inspection revealed visible damage to upper and lower fairing and tail boom support assembly with minor damage to vertical fin.

A series - During sixth hovering autorotation, aircraft touched down nose low as student applied forward cyclic. Tail boom was wrinkled, spike plate dislodged, transmission on aft cowling was struck by push/pull tube, and isolation mount sustained damage.

Fixed wing

O-5 Class C

B series - During cruise flight at 15,000 feet MSL in icing conditions, crew observed bright flash and heard loud bang. Navigation systems were temporarily interrupted and then brought back on line. Crew suspected lightning strike and returned to base. Postflight inspection revealed mission equipment antenna had delaminated and other damage due to lightning strike.

Safety messages

Safety-of-flight messages

■ Safety-of-flight technical message concerning one-time inspection of lift link assembly on all AH-1 series aircraft (AH-1-96-01, 121752Z Oct 95). Summary: A procurement of the lift link assembly, P/N 212-030-104-5, was made, and during inspection prior to issuing, one of the assemblies was found to have not been heat treated and missing large amounts of cadmium plating. The purpose of this message is to conduct a one-time inspection of the lift link assembly to find and remove any suspect parts. Contact: Mr. Brad Myers, DSN 693-2438 (314-263-2438).

■ Safety-of-flight operational message concerning firing restriction for 2.75-inch folding fin aerial rockets (FFARs) with MK66 motors on all AH-64A/D aircraft (AH-64-95-02, 181620Z Sep 95). Summary: ATCOM has seen serious gas ingestion issues when firing the 2.75-inch FFAR with the MK66 motor on AH-1 and OH-58 aircraft. In these aircraft, gas ingestion has caused engine surges, compressor stalls, and catastrophic drive train failures. Regarding the AH-64A aircraft, no comprehensive testing of 2.75-inch FFAR with MK66 motors has been accomplished for this issue. In addition to the above concerns, this message results from two incidents where ingestion of exhaust gas from MK66 motors has been suspected in causing engine surges and/or compressor stalls on AH-64 aircraft. The purpose of this message is to restrict the firing of 2.75-inch FFAR with MK66 motors per paragraph 9B of this message pending the results of rocket firing tests. Contact: Mr. Jim Wilkins, DSN 693-9089 (314-263-9089).

■ Safety-of-flight technical message concerning change in retirement life of forward bellcrank support assembly, P/N 70400-08116-048, manufactured by Hicksville Machine Works and removal of specified serial-numbered forward bellcrank support assemblies on all UH/EH/MH-60 aircraft (UH-60-96-01, 032028Z Nov 95). Summary: Data from fatigue substantiation testing of the subject part has dictated that all UH/EH/MH-60 aircraft with the 70400-08116-048 forward bellcrank support assembly manufactured by Hicksville Machine Works (Cage 59384) will have their retirement life reduced from the currently published life of 1,800 hours to 500 hours. Additionally, specified serial-numbered support assemblies contained in this message will require removal due to a deficiency in shot peening after their repair. The purpose of this message is to inform users of the change to the published retirement life of the forward bellcrank assembly, P/N 70400-08116-048, manufactured by Hicksville Machine Works (Cage 59384) and removal of specified serial-numbered supports for return to depot. (Also see "Aviation Spare Parts" article in this issue of FlightFax.) Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

Aviation safety action messages

■ Aviation safety action maintenance message concerning verification of solid pins in shear pin activated decoupler (SPADs) and servocylinder installation in all AH-64 aircraft (AH-64-95-ASAM-06, 131500Z Sep 95). Summary: Due to incorrect serial number effectivities listings in TM 1-1520-238-23P, it is possible that incorrect pin and servocylinders may have been installed on certain AH-64A helicopters. A recent mishap investigation revealed that a shear pin, P/N 7-211514082, was incorrectly installed in a non-BUCS active AH-64 aircraft that should have had a solid pin, P/N 7-232310078-3, installed. If a shear pin has been installed in lieu of a solid pin on a non-BUCS active aircraft, a sheared pin could disable the axis. In addition, if a BUCS active servocylinder containing shear pins is installed on a non-BUCS aircraft, a sheared pin could disable control of the axis. TM 1-1520-238-23P contains incorrect serial number effectivity for pins and servocylinders and is currently being changed. Only solid pins, P/N 7-232310078-3, are authorized on aircraft S/N 82-23355 (PVO1) through 88-00199 (PV529). BUCS shear pins, P/N 7-211514082, are authorized only on aircraft S/N 88-00200 (PV530) and subsequent. BUCS active servocylinders are usable only on aircraft S/N 88-00200 (PV530) and subsequent. The purpose of this message is to require a one-time inspection of affected aircraft to ensure that the correct configuration of pin and servocylinders is installed. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action informational message concerning gas generator turbine rotor blade information for all UH-60A, EH-60A, and AH-64A with T700-GE-700 and T700-GE-701 engines (UH-60-95-ASAM-08, AH-64-95-ASAM-07, 191751Z Sep 95). Summary: This message is prompted by a recent in-flight single-engine shutdown in austere conditions. Initial indications are that shutdown occurred due to an undamped stage 1 or 2 gas generator (GG) turbine rotor blade failure. Although stress-reducing blade dampers have been introduced into production and installed when GG rotors and engines go through depot repair, there are still engines that have not been modified or that were modified with used blades. The purpose of this message is to emphasize the need for reviewing single-engine operation during flight planning, provide information to identify engines with undamped GG turbine blades or engines damped with used blades installed, and provide risk-reduction information. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning replacement of 70400-08159 series bolts on all EH/UH/MH-60L and MH-60K aircraft with the improved flight controls installed (UH-60-96-ASAM-01, 181408Z Oct 95). Summary: Because of dissimilar metals, specific 70400-08159 series bolts and attachment nuts located in the flight controls to swashplate linkage of aircraft with the improved flight controls are susceptible to galvanic corrosion. The purpose of this message is to require mandatory replacement of specific 70400-08159 series control system pivot bolts and attachment nuts peculiar to those aircraft with the improved flight controls installed at production. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning inspection of hose assembly, hydraulic primary system for chafing, P/N 7-311830102-5, on hose clamp, P/N HS4501SS09NB, on all AH-64 aircraft (AH-64-96-ASAM-01, 051916Z Oct 95). Summary: Recent hose failure has been attributed to the chafing of hose clamp, P/N HS4501SS09NB, on hose, P/N 7-311830102-5, (primary hydraulic pressure line). The hose was chafed completely through, and hydraulic pressure was lost. The cause of the failure is that the hose clamp was too large since it had been sized for the previous hose, which had a braided sleeve. The purpose of this message is to require units to replace the hose clamp, P/N HS4501SS09NB, with hose clamp, P/N M85052/1-7, and to inspect the primary pressure line, P/N 7-311830102-5, for chafing and damaged braid. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning inspection of aft vertical shaft on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-95-ASAM-08, 121859Z Sep 95). Summary: The 101st Airborne Division reported multiple aircraft that had rubbing damage to the aft vertical shafts on the surface that is adjacent to the dust seal on the top of the slider shaft. The purpose of this message is to require units to visually inspect the aft vertical shaft at the top of the slider shaft for wear adjacent to the dust seal on the shaft and inspect for proper clearance of the dust seals. In addition, a recurring visual inspection will be required at each phase. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action operational message concerning a training maneuver restriction for all OH-58D aircraft (OH-58-95-ASAM-09, 121818Z Sep 95). Summary: A review of recent engine-related incidents indicates that sudden, unannounced throttle chops could result in a forced landing. The purpose of this message is to impose restrictions on training maneuvers involving simulated engine failure (throttle chops) at hover and at altitude. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning inspection of door hinges on all OH-58A/C aircraft (OH-58-96-ASAM-01, 051926Z Oct 95). Summary: This message is prompted by a recent accident in which the lower pilot crew door hinge failed and the door separated from the aircraft. Investigation revealed that stress corrosion caused failure of lower pilot crew door hinge. Subsequently, the upper hinge failed due to overstress and the door separated from the aircraft in shallow (90 KIAS) climbing flight. The purpose of this message is to require units to inspect all hinges for corrosion and cracks. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

Aviation maintenance information messages

■ UH-1 revised message on hydraulic servocylinder purging procedure (UH-1-95-002R, 131604Z Oct 95). UH-1-95-001, 301655Z Jun 95, UH-1 Servocylinder Lockups at Fort Rucker, Alabama, requested reporting of total lockup of any UH-1 flight control servocylinder encountered during maintenance or operation of the UH-1. To date, no incidents have been reported outside of Fort Rucker. ATCOM's continuing investigation has revealed that the preservative fluid, MIL-H-6083, used to preserve new servos, P/N 205-076-056-107 only, may be a contributing factor. MIL-H-6083 contains an additive which could cause new servos to stick while in service. This MIM is to advise UH-1 users to purge new servos per instructions provided in this message. (Servos, P/N 205-076-099-7, are not affected.) This MIM applies only to new, never-installed servocylinders, P/N 205-076-056-107, from supply. Servocylinders currently installed on aircraft need not, repeat not, be removed for fluid purging. Contact: Mr. Fred Kershaw, DSN 693-1683 (314-263-1683) or Mr. Malcolm Fuller, DSN 693-5420 (314-263-5420).

■ OH-58D(I) message to correct mast torque signal conditioner setting (OH-58D(I)-95-003, 041626Z Oct 95). The current method for setting the mast torque signal conditioner is in error. The use of a translation table will be required to determine the proper setting of the mast torque signal conditioner for a given mast torsional stiffness. An incorrect setting will result in a mast torque reading that may vary up to plus or minus 9 percent. Instructions and the translation table are included in this MIM. Contact: Mr. Jesse T. Gambee, DSN 693-9888 (314-263-9888) or Mr. Stephen P. Dorey, DSN 693-5420 (314-263-5420).

■ OH-58D main rotor speed setting (OH-58D-95-004, 031449Z Oct 95). Currently the backup main rotor speed (Nr) digital readout on the multifunction display (MFD) is used as the primary reference for adjusting and maintaining the Nr by using the power turbine speed adjustment toggle switch mounted on the collective control head. Data acquired during flight testing from sensitive flight test instrumentation revealed that the main rotor speed displayed on the vertical scale indicator (VSI) and the MFD indicates approximately 1 percent higher than the actual Nr. This error is caused by the processing of the Nr signal, which provides information to both the VSI and MFD through the mast torque signal processor. The multiparameter display (MPD) Nr digital readout receives an independent Nr signal and displays the actual Nr. Testing has shown that a 1-percent increase in Nr improves transient rotor droop characteristics and benefits autorotational characteristics. Contact: Mr. Jesse T. Gambee, DSN 693-9888 (314-263-9888) or Mr. Stephen P. Dorey, DSN 693-5420 (314-263-5420).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

In this issue:

Class A Accidents through October

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

U.S. ARMY SAFETY CENTER

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Thomas J. Konitzer
Brigadier General, USA
Commanding General
U.S. Army Safety Center

*U.S. Government Printing Office: 1995 - 733-080/40002

FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS

December 1995 ◆ Vol 24 ◆ No 3

Closing the loop on risk management

As a rule, we in the aviation community do a good job of properly identifying hazards and subsequently completing a generic risk assessment. But far too often, we assess the risks and make little or no further effort to eliminate or control them. In essence, we stop managing risks as soon as the risk assessment is completed and a breakdown in the effectiveness of the risk-management process occurs.

Checking the boxes and adding up the numbers on a risk-assessment form is a useful tool, but it should not be the driver in a unit's risk-management program. For maximum effectiveness, risk management must be a closed-loop process: a cyclic five-step process that must start with planning and continue throughout execution, postoperations, and the after-action reviews.

Properly applied, risk management will allow commanders to achieve cost savings while still accomplishing their mission (see one commander's approach "Do you need to reevaluate your risk-management program" in this issue). While these cost savings include both personnel and equipment, protecting the force is always at the forefront of the Army's risk-management efforts.

Do you need to reevaluate your risk-management program?

Taking a closer look at your unit's risk-management program could help identify dysfunctional procedures and assist in achieving maximum cost savings.

As military organizations continue to transition to an austere fighting force, leadership must continually seek new and innovative methods to use shrinking resources wisely rather than reduce the number of personnel or the quality and quantity of training and equipment. Although some reductions are inevitable, implementing more effective operational methods and procedures can achieve cost savings and keep reductions to a minimum. One method is to ensure your unit's risk-management program is functioning effectively and efficiently. If it isn't, you're missing out on some potential cost savings.

Managing risks = cost savings

Risk management is a program that provides units with the potential to economize on resources by preserving personnel and equipment. Thus, one solution to enhancing force protection capabilities can be found in the accurate, thorough application of risk management during both training and combat.

Managing acceptable risk is one of the primary concerns facing the commander, staff, and subordinate leadership in conducting the unit's mission. Failure to adequately control the inherently high-risk activities associated with aviation operations in a peacetime or combat scenario has the potential to seriously degrade the unit's warfighting capability and ultimately can destroy any organization. Therefore, commanders must develop and tailor their unit's risk-management program based upon the unique aspects of the mission and capabilities of the organization. Consequently, commanders must also seek to establish a delicate balance between adequate safety margins to protect valuable and limited personnel assets and equipment while pursuing well-targeted, realistic training. The new TC 1-210: *Aircrew Training Program, Commander's Guide to Individual and Crew Standardization* assists the commander in formulating and executing a risk-management program.

My unit's situation

As the commander of an aeromedical evacuation company in the Georgia Army National Guard, I face the challenges typical of other Reserve Component organizations that seldom meet collectively to perform their mission. During a recent unit deployment where crew endurance was stretched, the need to review the unit's risk-management program became evident.

If a clear, accurate picture of the status of our risk-management program was to be obtained, it was necessary for the responses to come from the user level—a broad cross-section of the aviators themselves. Hence, I chose to use an aviation risk-management questionnaire as a method to obtain data for analysis.

The questionnaire

The questionnaire was divided into three sections. Section one contained a series of comprehensive questions on demographics to describe the population. The second section examined the respondents' risk-management training and experience level. The final section dealt with the respondents' perceptions, attitudes, and opinions about risk management.

Field testing proved invaluable to the success of the survey. As a result of the field test, I either modified or discarded several poorly worded questions, changed the instructions, and added more fixed-choice items.

Administering the survey

In a National Guard unit, the greatest number of people can best be captured during monthly multiple unit training assemblies. The dates, time, and location where the survey was to be administered were announced 1 month in advance, and a reminder was published in the monthly drill letter. The goal was to survey 100 percent of the warrant officer and commissioned officer aviators. However, during the scheduled 2-day survey period, only 75 percent of the total population were available.

I administered the survey by distributing numbered questionnaires and explaining the instructions, emphasizing anonymity and the need to accurately respond to all items. The location I used also serves as the pilots briefing room. Attendance at pilots briefings is mandatory. Thus, by administering the survey immediately following the morning pilots briefing, I was able to capture a maximum number of participants.

The results

Careful analysis of the data from the survey disclosed that our risk-management program had room for some improvements.

Aviators felt that they properly used risk-management procedures, and the majority believed that all or most identified risks were reduced or controlled through their efforts. All of the respondents indicated that they used the risk-assessment matrix as the primary tool with which to accomplish risk management. Analysis clearly indicated, however, that several respondents had difficulty in distinguishing between risk management and a risk assessment when using some form of a risk matrix. They operated under a misperception that "the matrix is the program."

Therein lay the problem. Our aviators had been doing what they had been taught, which was how to fill out the risk matrix. While the risk-assessment matrix is a tool that can be used in the risk-management process, it is not the only method for assessing and managing risks.

The risk assessment, typically a matrix, is a required form that must be completed when filing a flight plan with unit operations before flying. If not properly used and monitored, the form can evolve into a document in which little credence is placed in the degree of risk as indicated by the risk values. Thus, the routine nature of the matrix may tend to degenerate the importance placed on the risk values it reveals.

Risk assessment does not equal risk management

The key to achieving the delicate balance needed between adequate safety margins and realistic training is risk management. The cornerstone of the risk-management program is the *five*-step process (identify the hazards, assess the risks, develop controls and make a risk decision, implement controls, and supervise) that is being taught and practiced throughout the Active Army and Reserve Components and is now the central theme in force protection.

All units are routinely required to integrate the risk-management process in the planning stages and throughout the execution of their mission. However in some cases, risk management has not been fully implemented at the user level due in part to an inadequate comprehensive understanding of how to properly use it to complement the decision-making process.

Typically, we do a good job of properly identifying the hazards and subsequently completing a generic risk assessment in the form of a matrix or some other risk analysis quick reference. But too often, once we have assessed the risk, we stop doing risk management. We make little or no further effort to eliminate or control the risks we have just assessed.

I sense that an incomplete effort to develop controls and make a risk decision at the proper level, implement controls, and follow up with appropriate supervision is a familiar scenario. And unfortunately, it is a systemic pattern in causation analysis during accident investigations.

Why do we stop short in completing the last three steps in the risk-management process? We are left to wonder if we really do understand risk management. Can our soldiers, subordinate leaders, and commanders accurately target and apply the entire process correctly? I discovered that in my unit we were thoroughly identifying known potential hazards. However, the risk-management program in our unit was not always effectively reducing or controlling all identified risks.

The survey became the catalyst for an extraordinary bottom-up approach to reeducating our unit aviators through both formal and on-the-job training on how to properly and most effectively use risk management. Additionally, we appointed a risk-management officer to be responsible for training and maintaining aviator risk-management skills. Finally, we also discovered that the risk-assessment form was repetitious, ambiguous, and no longer accurately assessed our degree of risk prior to flight. Consequently, the form was modified to achieve a more credible determination of risk. For risk management to generate cost savings, we had to learn to go beyond simple risk assessment.

Do you suspect your risk-management program is in need of repair?

You, too, can find out. There is nothing magical or complicated about developing or administering a survey. With a little effort, some planning, and coordination, you might also be able to improve your safety program.

A by-product that also tends to emerge following the administration of a survey is that it promotes a healthy discussion among crewmembers that may be even more valuable than the actual survey results. Regardless of the method you use to administer it, a survey can successfully assist the command in adjusting training to compensate for crewmember deficiencies, help in reengineering the unit risk-management program if it needs it, and ultimately enable the command to more effectively and with greater confidence safely conduct the assigned mission.

As commanders, we must first ensure that everyone is trained in and thoroughly understands the risk-management process and rules and then place greater emphasis on strictly enforcing the use of the *entire* risk-management process within our units. Doing so can help us control accidental losses, which equates to a savings in both personnel assets and equipment costs. It is clear that we must devote more attention to our established risk-management programs if we wish to achieve and maintain an exemplary safety record.

—MAJ Frederick O. Stepat, 151st Medical Company, High Capacity Air Ambulance (Provisional), Georgia Army National Guard, DSN 925-5622 (770-919-5622)

"Trapped gas"

Have you ever closed out your fuel-consumption check on a long flight and felt confident that the remaining fuel was sufficient to complete your mission—only to be surprised by the amount of fuel that was *not* in your tank when you checked it later? Or perhaps you've been on a flight that was so short you hardly paid any attention at all to fuel-management procedures and suddenly discovered that you should have!

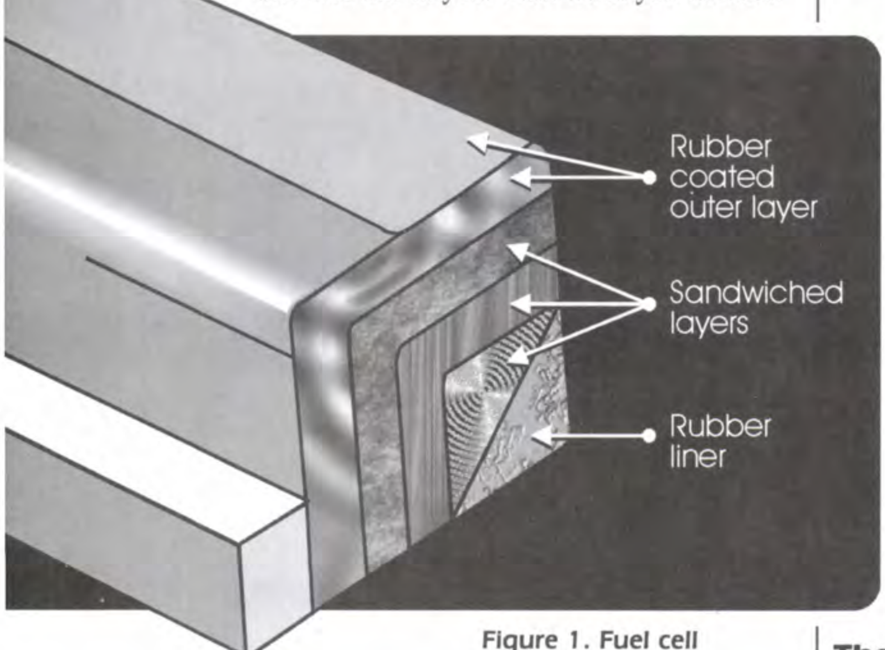


Figure 1. Fuel cell

Not enough fuel?

■ The crew of an OH-58A closed the fuel check, noted a 145-pounds-per-hour burn rate, and computed burnout and reserve times. Well before the computed reserve time, the 20-minute fuel light illuminated and was confirmed by the fuel gauge indication. The crew landed the aircraft without incident. When the aircraft was refueled, it took only 20 gallons to fill the 71.5-gallon tank.

■ The crew of an OH-58A noticed that the fuel level was suddenly at 200 pounds and turned back toward their home airfield. Ten minutes later, the gauge read 100 pounds and the 20-minute light was on. Three minutes later, they landed the aircraft with an indicated 50 pounds of fuel. The 71.5-gallon tank was refueled with only 35 gallons of fuel.

■ The crew of an OH-58C noticed their fuel consumption rate had increased significantly, aborted their mission, and headed for home base. The fuel burn rate continued to increase, and the crew landed the aircraft in mountainous terrain. The engine flamed out during shutdown due to fuel starvation. The 71.5-gallon tank was topped off with only 40 gallons of fuel.

Unusable fuel?

Why did these three aircraft experience low-fuel quantity and excessive fuel-burn-rate conditions, yet in each case landed with almost half a tank of fuel on board? The incidents are examples of one particular type of structural failure that could be catastrophic to someone who is slightly complacent about performing the simple steps of fuel management.

The fuel cell

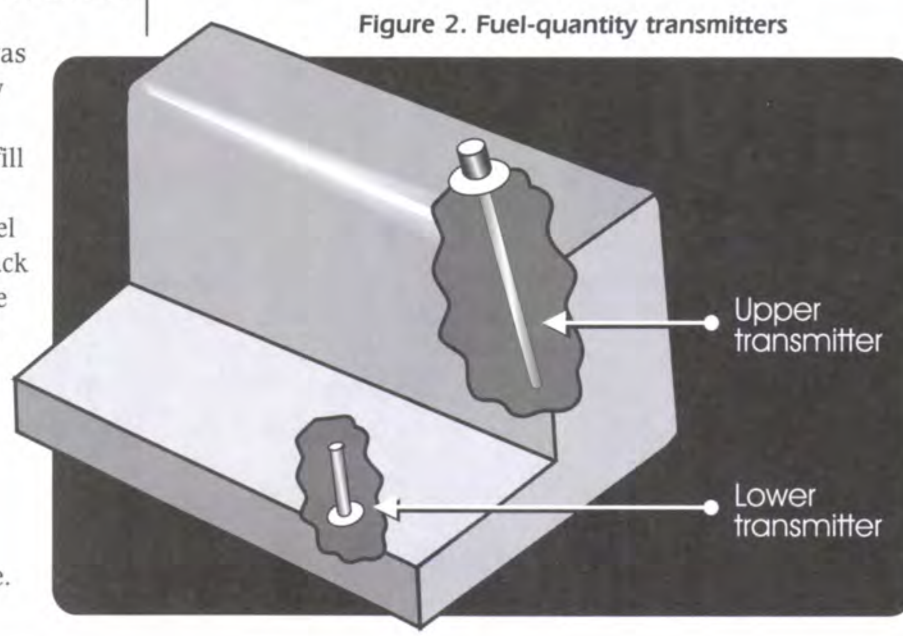
The fuel cell in OH-58A/C helicopters is a self-sealing bladder type. Sandwiched between an outer rubber-coated composite layer and an inner rubber liner, the self-sealing bladder is constructed of several layers of strong, flexible composite type material and a gel designed to act as a sealant in case of projectile penetration (figure 1).

In each of the described incidents, further investigation revealed that the inner liner of the fuel cell had deteriorated, allowing fuel to be trapped between the layers of the fuel cell.

The fuel-quantity transmitters

The fuel-quantity transmitters (figure 2) are located toward the center of the fuel cell, and based on the depth of the fuel, they measure the amount of fuel in the tank. In each of the incidents, more than half of the fuel was contained in the walls of the fuel cell. Once the fuel level fell below the level of the defect in the walls, the gauge indications were no longer reliable and the fuel consumption rate appeared to increase.

Figure 2. Fuel-quantity transmitters



Prevention measures

All U.S. Army aircraft using crashworthy fuel cells of this type are susceptible to deterioration and the possibility of having "trapped gas."

At present, the OH-58 fuel cell interior is inspected every 24 months. Is this really adequate considering that this rubber structure could be more than 20 years old in some aircraft? DA Form 2028s suggesting that the frequency of fuel cell inspection be increased have been submitted and are currently being evaluated.

In the meantime, there are precautions that you can take to lessen the chances of finding yourself in this situation or to help you recognize what is happening before it causes you to experience a catastrophic event.

■ **Take a fuel sample.** Take a fuel sample before every flight. If there is any sign that the fuel cell is deteriorating (for example, small black flakes present in the fuel), reject the aircraft and request that the fuel cell be inspected.

■ **Practice fuel management.** Frequently monitor the fuel quantity and consumption rate. Do not get so "wrapped up" in your mission or so complacent about your "short 1-hour flight" that you get surprised by unexpected limitations! If you notice an unusual fuel consumption rate or quantity indication, land the aircraft and find out what is wrong!

POC: CW2 Tracy L. Orfield, A Company, 1-212th, Aviation Training Brigade, Fort Rucker, AL, DSN 558-4605 (334-255-4605)

Avoiding wires: one PC's suggestion

"While conducting a night, low-level deep attack, the lead aircraft in a flight of five struck 200-foot power lines." This is how the account of an AH-64 accident in the "Investigators' Forum" section of the August 1995 issue of *FlightFax* begins. This scenario involving helicopters and wires is an all-too-familiar one.

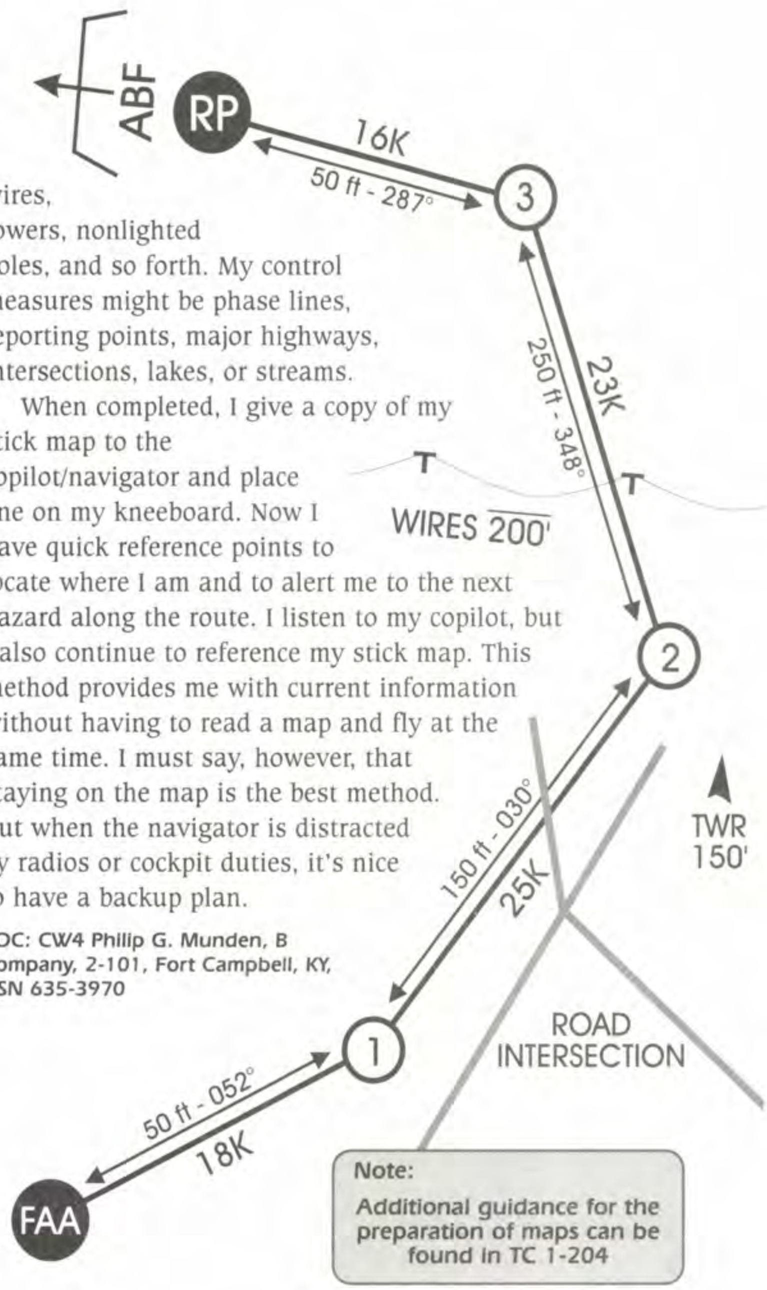
Whenever I read about this type of accident, I find myself asking, "How can aviators who have wires marked on their maps fly into wires 200 feet high?" Certainly it's possible that the navigator can get distracted, and when attention is divided, something like this can happen. But what was the person on the controls doing that prevented him or her from seeing the obstacle in time to make the necessary course correction? The costly results of these incidents leave no doubt that wires are not a contact sport. So what can we do to prevent wire strikes?

As an AH-64 PC, I know that I'm responsible for my aircraft and that it's my responsibility to do whatever it takes to protect both the crew and the aircraft I fly. Let me share a method that has helped me stay out of wires.

Using a computer program named "Rotor Nav" I construct my route planning card. I also print a "stick map" (see example) that depicts the route of flight. Using this stick map, I now have a tool that I can use to mark for reference any obstacles that may become an obstruction or a hazard in my flight path. Using a pen or pencil, I note wires, towers, nonlighted poles, and so forth. My control measures might be phase lines, reporting points, major highways, intersections, lakes, or streams.

When completed, I give a copy of my stick map to the copilot/navigator and place one on my kneeboard. Now I have quick reference points to locate where I am and to alert me to the next hazard along the route. I listen to my copilot, but I also continue to reference my stick map. This method provides me with current information without having to read a map and fly at the same time. I must say, however, that staying on the map is the best method. But when the navigator is distracted by radios or cockpit duties, it's nice to have a backup plan.

POC: CW4 Philip G. Munden, B Company, 2-101, Fort Campbell, KY, DSN 635-3970



Note:
Additional guidance for the preparation of maps can be found in TC 1-204

Resolving helmet-fitting problems


This unauthorized modification to a helmet liner resulted in a poorly fitting helmet.

A pilot was recently referred to the U.S. Army Aeromedical Research Laboratory (USAARL) because his aviation life support equipment (ALSE) technician had modified his SPH-4 helmet and it no longer fit snugly. A quick assessment revealed that the helmet liner was not the correct size and that it had been *made to fit* (see figure). This modification, however well intended, did not provide for a correctly fitted helmet. The helmet easily rotated forward on the pilot's head with very little force applied to the back of the helmet.

The helmet shell and liner are designed to distribute and attenuate crash forces to the head. In order for them to perform effectively, it is imperative that the helmet remain on the individual's head during a mishap sequence. An improperly fitted helmet rotates excessively, exposing the crewmember's head to impact injuries, which is the most common cause of death in helicopter accidents. There were 68 crewmember fatal head injuries in 37 aviation accidents over the past 10 years. Only through correct fitting, maintenance, and wear can the helmet perform as it was designed.

Checking the helmet for proper fit is the responsibility of the unit ALSE technician. FM 1-302: *Aviation Life Support Equipment (ALSE) for Army Aircrews* states that unauthorized modifications to the helmet are not allowed. AR 95-3: *General Provisions, Training, Standardization, and Resource Management* instructs flight surgeons to monitor the fitting of flight helmets. This system of checks is meant to ensure that the crewmember's helmet fits and functions correctly while performing normal flight duties and provides protection during a mishap.

USAARL is charged with providing Armywide technical support for individuals on flight status who have problems accommodating approved Army ALSE. Such support may involve special fitting of the flight helmet using the sling suspension assembly system, the installation of an approved universal earcup retention assembly, installation of a modified TPL™ system, or the use of other experimental and evolving technologies.

On a referral basis from ALSE technicians and flight surgeons worldwide, USAARL resolves helmet-fitting issues for approximately 50 crewmembers each year. If you or a fellow crewmember in your unit has a helmet-fitting problem that cannot be corrected locally, don't hesitate to call us.

POCs: CW5 Joel J. Voisine or Mr. Joseph R. Licina, Helmet Fitting Laboratory, USAARL, Fort Rucker, AL, DSN 558-6895/6893 (334-255-6895/6893)

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

OH-58D(I). The aircraft was at a stationary out-of-ground effect (OGE) hover. While the crew was engaged in an attack on OPFOR ground targets, the aircraft drifted rearward and made contact with a tree. Tail rotor control was lost, and the PC initiated an autorotation. The aircraft struck several more trees before ground contact. The aircraft was destroyed, and the pilots received minor injuries.

- *What happened.* The PC actively engaged OPFOR ground targets without announcing his intentions while the PI continued to operate the mast-mounted sight. As a result, both the PC and the PI were actively engaging targets without properly monitoring the position of the aircraft to ensure obstacle clearance.
- *Lessons learned.* Aircraft control is the primary consideration. The complexity of the OH-58D(I) systems and missions requirements makes proper crew coordination absolutely essential to aircraft safety and mission accomplishment.

OH-58D(I). As part of an APART evaluation, the PI was conducting a simulated engine failure from 1,000 feet MSL to an authorized airfield when the engine failed. The aircraft's rotor RPM deteriorated below normal operating RPM during the "termination with power" phase of the simulated forced landing. The IP attempted to recover the aircraft at approximately 100 feet AGL with low rotor RPM. The aircraft contacted the active runway tail low, causing damage to the tail boom section and aircraft landing system.

- *What happened.* When the engine "flamed out" during the initiation of the maneuver, the crew did not diagnose and adequately respond to an actual engine failure. As a result, the IP allowed the PI to initiate a higher-than-normal deceleration and adjust the collective, a technique used in this OH-58D to prevent an underspeed/overtorque during the "termination with power" phase of the maneuver.
- *Lessons learned.* Crewmembers must remember to announce required information **and** confirm actual conditions during the initiation of a simulated engine failure. The complexity of the audio and visual warning/caution/advisory tones and messages and the aircraft's aerodynamic characteristics make crew coordination paramount to successful recovery from an emergency condition. ❑

CY 95 FlightFax index

Aviation safety action messages

General

Utility

Attack

system for chafing, P/N 7-311830102-5, on hose clamp, P/N HS4501SS09NB—November

Cargo

- CH-47D, MH-47D, and MH-47E one-time and recurring daily inspection of thrust idler assembly—January
- CH-47D, MH-47D, and MH-47E one-time torque verification of the nuts securing the No. 1 and No. 2 power transfer unit motor/pump—February
- CH-47D, MH-47D, and MH-47E aircraft with engine transmissions utilizing Speco-manufactured gears—March
- CH-47D, MH-47D, and MH-47E one-time inspection for Stratopower pumps, NSN 1650-01-249-4341, and reporting for turnaround program—May
- CH-47D, MH-47D, and MH-47E inspection and lubrication of flight control rod end bearings—July
- CH-47D, MH-47D, and MH-47E revision to inspection and lubrication of the flight control rod end bearings—October
- CH-47D, MH-47D, and MH-47E inspection of aft vertical shaft—November
- CH-47, MH-47D, and MH-47E replacement of aft landing gear drag link assemblies susceptible to stress corrosion cracking—December

Observation

- OH-58D one-time inspection of directional control tubes—February
- OH-58D one-time inspection of pilot's seat web cover and copilot's seat cover assembly—March
- OH-58 one-time inspection of wire bundle and restack of Adel clamps near bus bar—April
- OH-58D, AH-64A/D, AH-1S/P/E/F, A/MH-6, and MH-60 Hydra rocket motor suspension and information—April, July
- OH-58A/C increase to engine oil change interval—June
- OH-58A/C inspection of bolt, shear, NSN 5306-00-944-7540, used in pylon installation—July
- OH-58D main rotor expandable blade bolt—September
- OH-58D training maneuver restriction—November
- OH-58A/C inspection of door hinges—November
- OH-58D power-off maneuver restriction—December

Fixed wing

- C-12F3 and C-12R windshield anti-ice operating instructions—July
- C-12F3 and C-12R flight limitations in icing conditions—July

Safety-of-flight messages

Utility

- UH-60A/L change to retirement life for certain main rotor blade cuffs—April
- UH/EH/MH-60 change in retirement life of forward bellcrank support assembly—November

Attack

- AH-64 tail rotor head assembly installation inspection—August
- AH-1 one-time inspection of lift link assembly—November
- AH-64A/D firing restriction for 2.75-inch FFARs—November
- AH-1 inspection of tail rotor hub assembly—December
- AH-1 one-time inspection of lift link assembly—December

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- CH-47D, MH-47D, and MH-47E one-time visual inspection of upper boost actuator serial numbers—January
- CH-47D, MH-47D, and MH-47E one-time visual inspection and torque check of lower drive link to the swashplate retaining hardware—June

Observation

- OH-58D one-time and recurring visual inspection of the tail boom and related restriction on forward indicated airspeed—March
- OH-58 revision to visual inspections of tail booms—May

Safety-of-use message

General

- Prohibited use of Breeze rescue hoists on U.S. Army helicopters—December

Aviation maintenance information messages

Utility

- EH/UH-60A and UH-60L aircraft—September
- UH-1 revised message on hydraulic servocylinder purging procedures—November

Attack

- AH-64 deactivation of rotor (blades) de-ice capability—September

Observation

- OH-58A/C inspection of force gradient assembly in the cyclic controls—September
- OH-58 mast torque signal conditioner setting—November
- OH-58 main rotor speed setting—November

CY 95 STACOM Index

STACOM 163, January

- Currency requirements

STACOM 164, July

- Night vision goggle maintenance
- Logging of NVG time
- HIRTA

STACOM 165, October

- Unauthorized practice of selecting 2000-series ATM tasks, modifying task condition, and redesignating them as 3000-series tasks

STACOM 166, November

- Exportable training packets

Accident briefs

Information based on *preliminary* reports of aircraft accidents

Aviation flight accidents

Utility

UH-60 Class C

A series - While in cruise flight during medevac IFR mission, crew experienced low rotor RPM due to dual-engine rollback. Crew executed forced landing to interstate. On final approach, opposing vehicular traffic noted aircraft was experiencing difficulty and halted to allow landing on roadway. On short final, aircraft underflew high-tension wires and touched down on road surface. Aircraft sustained damage to landing gear and belly.

V series - No. 1 generator and master caution lights illuminated during takeoff. Crew landed aircraft without further incident. Detecting electrical burning odor, crew completed emergency shutdown. Postflight inspection revealed that wire bundle had shorted out. Suspected damage to No. 1 generator and ECU.

UH-60 Class E

A series - During troubleshooting procedures for abnormal engine Np indications, mechanic disconnected two fuel lines from engine hydromechanical unit. Mechanic failed to reconnect or document disconnection of fuel lines. Unaware that fuel lines had been disconnected, MP attempted to start engine. Maintenance personnel observed fuel leaking from engine compartment. Aircraft secured without further incident.

Attack

AH-1 Class E

F series - During maintenance test flight, aircraft was descending from 10,000 feet when engine oil bypass light illuminated. Crew initiated autorotation procedures, reapplied power at 1,500 feet, and landed aircraft without further incident. Maintenance inspection revealed that 90-degree oil supply fitting had cracked. Engine had lost 7 quarts of oil.

AH-64 Class C

A series - On final approach to FARP, aircraft struck large bird and sustained damage to left wing and one main rotor blade.

A series - During readiness level progression training, aircraft tail rotor impacted windmill.

Cargo

CH-47 Class E

D series - After setting external load (HMMWV) on ground during NVG flight, aircraft drifted forward before load was released. Load was pulled on its side and sustained damage. No damage to aircraft.

Observation

OH-58 Class B

D series - As part of APART evaluation, PI was conducting simulated engine failure from 1,000 feet MSL to authorized airfield when engine failed. Aircraft rotor RPM deteriorated below normal operating RPM during the "termination with power" phase of simulated forced landing. IP attempted to recover aircraft at approximately 100 feet AGL with low rotor RPM. Aircraft landed hard and sustained damage to landing system, undercarriage, and tail boom section. No injuries. (See OH-58D(I) writeup in "Investigators' Forum.")

OH-58 Class C

A series - During standard autorotation, aircraft touched down hard.

A series - While executing low-level autorotation during transition training checkride, aircraft touched down on toes of skids and rocked rearward. Inspection revealed wrinkle damage to tail boom and scarring of drag pin fitting.

C series - Postflight inspection revealed damage to main rotor blades. Suspected tree strike.

Training

TH-67 Class C

A series - On ground contact during standard autorotation, aircraft experienced spike knock and subsequent pylon whirl. Inspection revealed damage to isolation mount, strike plate, and aft transmission cowling.

Aviation flight-related accident

Cargo

CH-47 Class C

D series - While conducting external NVG slingload operations, aircraft set M998 down on LZ. When slings were released, vehicle rolled into ravine. M998 brake was not set as required. No injuries; no aircraft damage.

Aviation-ground accident

OH-58 Class C

C series - PC was conducting engine runup for MOC following engine flush. During engine start, turbine output temperature (TOT) reached 1,000°F.

Safety messages

Aviation safety-of-flight messages

■ Safety-of-flight technical message concerning inspection of tail rotor hub assembly on all AH-1 series aircraft (AH-1-96-02, 132129Z Nov 95). Summary: An inspection conducted on a tail rotor hub assembly manufactured by Space Craft Incorporated (Cage OB3S3 was dimensionally out of tolerance. The purpose of this message is to require units to conduct a one-time inspection of tail rotor hub assemblies to find and remove any suspect assemblies. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Safety-of-flight technical message concerning one-time inspection of the lift link assembly on all AH-1 series aircraft (AH-1-96-03, 141520Z Nov 95). Summary: As a result of SOF message AH-1-96-01, additional serial numbers of serviceable lift links and information on identifying serviceable lift links were discovered. This message provides that information and supersedes SOF AH-1-96-01. The purpose of this message is to furnish additional lift link serial numbers and to require units to conduct a one-time inspection of the lift link assembly to find and remove any suspect parts. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

Aviation safety action messages

■ Aviation safety action maintenance mandatory message concerning replacement of aft landing gear drag link assemblies that are susceptible to stress-corrosion cracking on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-96-ASAM-01, 061726Z Nov 95). Summary: Several instances have been reported of failed aft landing gear drag links. The investigation revealed the cause to be stress corrosion cracking (SCC). The crack originated inside the bore where the link mates with the large pin attached to the aircraft frame. The crack continued to propagate until the link failed by overload. In some cases, the link failed with the aircraft sitting on the ground. The crack originated inside the assembly and was not externally visible until the link had completely failed. SCC can occur in aluminum alloys with certain combinations of section thickness, temper, tensile stresses, and environment. The new drag links, P/N 114L2323-5, are manufactured from aluminum alloys that are resistant to SCC. The link assembly, P/N 114L2329-2, includes the drag link, P/N 114L2323-5, and sleeve bushings, P/N 114L2357-1. A team from Corpus Christi Army Depot (CCAD) has traveled to all the Chinook units and inspected the two aft drag links. The inspection consisted of a conductivity measurement of the aluminum link. The measurements will separate susceptible links and those that are resistant to SCC. The links that could fail from SCC were painted/marked with a 1½-inch-high number "3." The links that are resistant to SCC were identified with the number "5." The purpose of this message is to require units to inspect the aft landing gear drag link for the number marked by CCAD within 60 days and replace the "3" configuration with a "5" configuration within 24 months from the date of this message. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action operational message concerning power-off maneuver restriction on all OH-58D aircraft (OH-58-96-ASAM-02, 081426Z Nov 95). Summary: During a recent OH-58D Kiowa Warrior training flight, a simulated forced landing was initiated on approach for landing. Normal autorotational procedures were initiated. At the power recovery transition prior to touchdown, the engine failed to respond and the aircraft impacted the ground and sustained significant damage. The purpose of this message is to impose restrictions on performing simulated engine failures at altitude until the complete circumstances of the above accident are identified. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

Safety-of-use message

■ Safety-of-use operational/technical message concerning prohibited use of Breeze hoists (BL-8300 series) on U.S. Army helicopters (SOUM-ATCOM-96-002, 071250Z Nov 95). Summary: The Breeze internal rescue hoist, BL-8300 series, has been restricted from use in Army helicopters. Recently there have been over 20 of the Breeze internal hoists sold in property disposal auctions. These hoists are being offered as serviceable by salvage dealers. Since there is a shortage of rescue hoists in the field, units may have or may in the future inadvertently procure the restricted hoist from salvage dealers. The purpose of this message is to alert UH-1 and UH-60 aircraft users that the restriction against the use of the Breeze Eastern internal rescue hoist has not been rescinded and to prohibit the use of Breeze Eastern internal rescue hoists (BL-8300 series). Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

It takes more than tanks and guns and planes to win. It takes more than masses of men. It takes more than heroism, more than self-sacrifice, more than leadership. Modern war requires trained minds. The days of unthinking masses of manpower are over. Individual intelligence, individual understanding, and individual initiative in all ranks will be powerful weapons in our ultimate success.

—General Brehon Somervell
Public Addresses, 1941-1942

In this issue:

- Closing the loop on risk management
- Do you need to reevaluate your risk-management program?
- "Trapped gas"
- Avoiding wires: one PC's suggestion
- Resolving helmet-fitting problems
- Investigators' Forum
- CY 95 *FlightFax* index
- CY 95 STACOM index

Class A Accidents through November

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

U.S. ARMY SAFETY CENTER

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REPORT of ARMY AIRCRAFT ACCIDENTS
December 1995 ◆ Vol 24 ◆ No 3

Closing the loop on risk management

As a rule, we in the aviation community do a good job of properly identifying hazards and subsequently completing a generic risk assessment. But far too often, we assess the risks and make little or no further effort to eliminate or control them. In essence, we stop managing risks as soon as the risk assessment is completed and a breakdown in the effectiveness of the risk-management process occurs.

Checking the boxes and adding up the numbers on a risk-assessment form is a useful tool, but it should not be the driver in a unit's risk-management program. For maximum effectiveness, risk management must be a closed-loop process: a cyclic five-step process that must start with planning and continue throughout execution, postoperations, and the after-action reviews.

Properly applied, risk management will allow commanders to achieve cost savings while still accomplishing their mission (see one commander's approach "Do you need to reevaluate your risk-management program" in this issue). While these cost savings include both personnel and equipment, protecting the force is always at the forefront of the Army's risk-management efforts.

Do you need to reevaluate your risk-management program?

Taking a closer look at your unit's risk-management program could help identify dysfunctional procedures and assist in achieving maximum cost savings.

As military organizations continue to transition to an austere fighting force, leadership must continually seek new and innovative methods to use shrinking resources wisely rather than reduce the number of personnel or the quality and quantity of training and equipment. Although some reductions are inevitable, implementing more effective operational methods and procedures can achieve cost savings and keep reductions to a minimum. One method is to ensure your unit's risk-management program is functioning effectively and efficiently. If it isn't, you're missing out on some potential cost savings.

Managing risks = cost savings

Risk management is a program that provides units with the potential to economize on resources by preserving personnel and equipment. Thus, one solution to enhancing force protection capabilities can be found in the accurate, thorough application of risk management during both training and combat.

Managing acceptable risk is one of the primary concerns facing the commander, staff, and subordinate leadership in conducting the unit's mission. Failure to adequately control the inherently high-risk activities associated with aviation operations in a peacetime or combat scenario has the potential to seriously degrade the unit's warfighting capability and ultimately can destroy any organization. Therefore, commanders must develop and tailor their unit's risk-management program based upon the unique aspects of the mission and capabilities of the organization. Consequently, commanders must also seek to establish a delicate balance between adequate safety margins to protect valuable and limited personnel assets and equipment while pursuing well-targeted, realistic training. The new TC 1-210: *Aircrew Training Program, Commander's Guide to Individual and Crew Standardization* assists the commander in formulating and executing a risk-management program.

My unit's situation

As the commander of an aeromedical evacuation company in the Georgia Army National Guard, I face the challenges typical of other Reserve Component organizations that seldom meet collectively to perform their mission. During a recent unit deployment where crew endurance was stretched, the need to review the unit's risk-management program became evident.

If a clear, accurate picture of the status of our risk-management program was to be obtained, it was necessary for the responses to come from the user level—a broad cross-section of the aviators themselves. Hence, I chose to use an aviation risk-management questionnaire as a method to obtain data for analysis.

The questionnaire

The questionnaire was divided into three sections. Section one contained a series of comprehensive questions on demographics to describe the population. The second section examined the respondents' risk-management training and experience level. The final section dealt with the respondents' perceptions, attitudes, and opinions about risk management.

Field testing proved invaluable to the success of the survey. As a result of the field test, I either modified or discarded several poorly worded questions, changed the instructions, and added more fixed-choice items.

Administering the survey

In a National Guard unit, the greatest number of people can best be captured during monthly multiple unit training assemblies. The dates, time, and location where the survey was to be administered were announced 1 month in advance, and a reminder was published in the monthly drill letter. The goal was to survey 100 percent of the warrant officer and commissioned officer aviators. However, during the scheduled 2-day survey period, only 75 percent of the total population were available.

I administered the survey by distributing numbered questionnaires and explaining the instructions, emphasizing anonymity and the need to accurately respond to all items. The location I used also serves as the pilots briefing room. Attendance at pilots briefings is mandatory. Thus, by administering the survey immediately following the morning pilots briefing, I was able to capture a maximum number of participants.

The results

Careful analysis of the data from the survey disclosed that our risk-management program had room for some improvements.

Aviators felt that they properly used risk-management procedures, and the majority believed that all or most identified risks were reduced or controlled through their efforts. All of the respondents indicated that they used the risk-assessment matrix as the primary tool with which to accomplish risk management. Analysis clearly indicated, however, that several respondents had difficulty in distinguishing between risk management and a risk assessment when using some form of a risk matrix. They operated under a misperception that "the matrix is the program."

Therein lay the problem. Our aviators had been doing what they had been taught, which was how to fill out the risk matrix. While the risk-assessment matrix is a tool that can be used in the risk-management process, it is not the only method for assessing and managing risks.

The risk assessment, typically a matrix, is a required form that must be completed when filing a flight plan with unit operations before flying. If not properly used and monitored, the form can evolve into a document in which little credence is placed in the degree of risk as indicated by the risk values. Thus, the routine nature of the matrix may tend to degenerate the importance placed on the risk values it reveals.

Risk assessment does not equal risk management

The key to achieving the delicate balance needed between adequate safety margins and realistic training is risk management. The cornerstone of the risk-management program is the *five*-step process (identify the hazards, assess the risks, develop controls and make a risk decision, implement controls, and supervise) that is being taught and practiced throughout the Active Army and Reserve Components and is now the central theme in force protection.

All units are routinely required to integrate the risk-management process in the planning stages and throughout the execution of their mission. However in some cases, risk management has not been fully implemented at the user level due in part to an inadequate comprehensive understanding of how to properly use it to complement the decision-making process.

Typically, we do a good job of properly identifying the hazards and subsequently completing a generic risk assessment in the form of a matrix or some other risk analysis quick reference. But too often, once we have assessed the risk, we stop doing risk management. We make little or no further effort to eliminate or control the risks we have just assessed.

I sense that an incomplete effort to develop controls and make a risk decision at the proper level, implement controls, and follow up with appropriate supervision is a familiar scenario. And unfortunately, it is a systemic pattern in causation analysis during accident investigations.

Why do we stop short in completing the last three steps in the risk-management process? We are left to wonder if we really do understand risk management. Can our soldiers, subordinate leaders, and commanders accurately target and apply the entire process correctly? I discovered that in my unit we were thoroughly identifying known potential hazards. However, the risk-management program in our unit was not always effectively reducing or controlling all identified risks.

The survey became the catalyst for an extraordinary bottom-up approach to reeducating our unit aviators through both formal and on-the-job training on how to properly and most effectively use risk management. Additionally, we appointed a risk-management officer to be responsible for training and maintaining aviator risk-management skills. Finally, we also discovered that the risk-assessment form was repetitious, ambiguous, and no longer accurately assessed our degree of risk prior to flight. Consequently, the form was modified to achieve a more credible determination of risk. For risk management to generate cost savings, we had to learn to go beyond simple risk assessment.

Do you suspect your risk-management program is in need of repair?

You, too, can find out. There is nothing magical or complicated about developing or administering a survey. With a little effort, some planning, and coordination, you might also be able to improve your safety program.

A by-product that also tends to emerge following the administration of a survey is that it promotes a healthy discussion among crewmembers that may be even more valuable than the actual survey results. Regardless of the method you use to administer it, a survey can successfully assist the command in adjusting training to compensate for crewmember deficiencies, help in reengineering the unit risk-management program if it needs it, and ultimately enable the command to more effectively and with greater confidence safely conduct the assigned mission.

As commanders, we must first ensure that everyone is trained in and thoroughly understands the risk-management process and rules and then place greater emphasis on strictly enforcing the use of the *entire* risk-management process within our units. Doing so can help us control accidental losses, which equates to a savings in both personnel assets and equipment costs. It is clear that we must devote more attention to our established risk-management programs if we wish to achieve and maintain an exemplary safety record.

—MAJ Frederick O. Stepat, 151st Medical Company, High Capacity Air Ambulance (Provisional), Georgia Army National Guard, DSN 925-5622 (770-919-5622)

"Trapped gas"

Have you ever closed out your fuel-consumption check on a long flight and felt confident that the remaining fuel was sufficient to complete your mission—only to be surprised by the amount of fuel that was *not* in your tank when you checked it later? Or perhaps you've been on a flight that was so short you hardly paid any attention at all to fuel-management procedures and suddenly discovered that you should have!

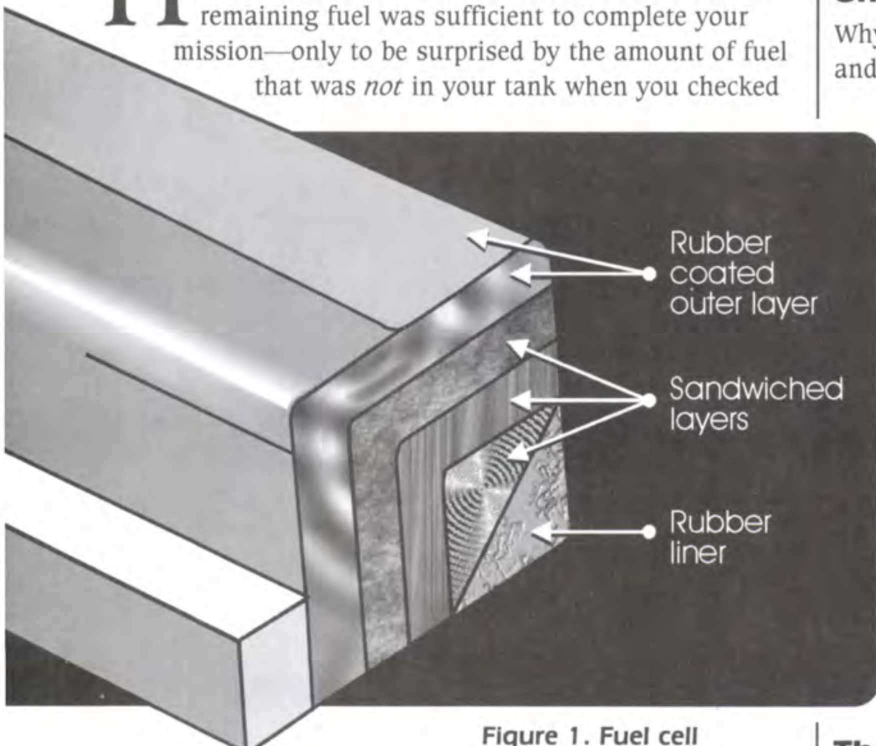


Figure 1. Fuel cell

Not enough fuel?

■ The crew of an OH-58A closed the fuel check, noted a 145-pounds-per-hour burn rate, and computed burnout and reserve times. Well before the computed reserve time, the 20-minute fuel light illuminated and was confirmed by the fuel gauge indication. The crew landed the aircraft without incident. When the aircraft was refueled, it took only 20 gallons to fill the 71.5-gallon tank.

■ The crew of an OH-58A noticed that the fuel level was suddenly at 200 pounds and turned back toward their home airfield. Ten minutes later, the gauge read 100 pounds and the 20-minute light was on. Three minutes later, they landed the aircraft with an indicated 50 pounds of fuel. The 71.5-gallon tank was refueled with only 35 gallons of fuel.

■ The crew of an OH-58C noticed their fuel consumption rate had increased significantly, aborted their mission, and headed for home base. The fuel burn rate continued to increase, and the crew landed the aircraft in mountainous terrain. The engine flamed out during shutdown due to fuel starvation. The 71.5-gallon tank was topped off with only 40 gallons of fuel.

Unusable fuel?

Why did these three aircraft experience low-fuel quantity and excessive fuel-burn-rate conditions, yet in each case landed with almost half a tank of fuel on board? The incidents are examples of one particular type of structural failure that could be catastrophic to someone who is slightly complacent about performing the simple steps of fuel management.

The fuel cell

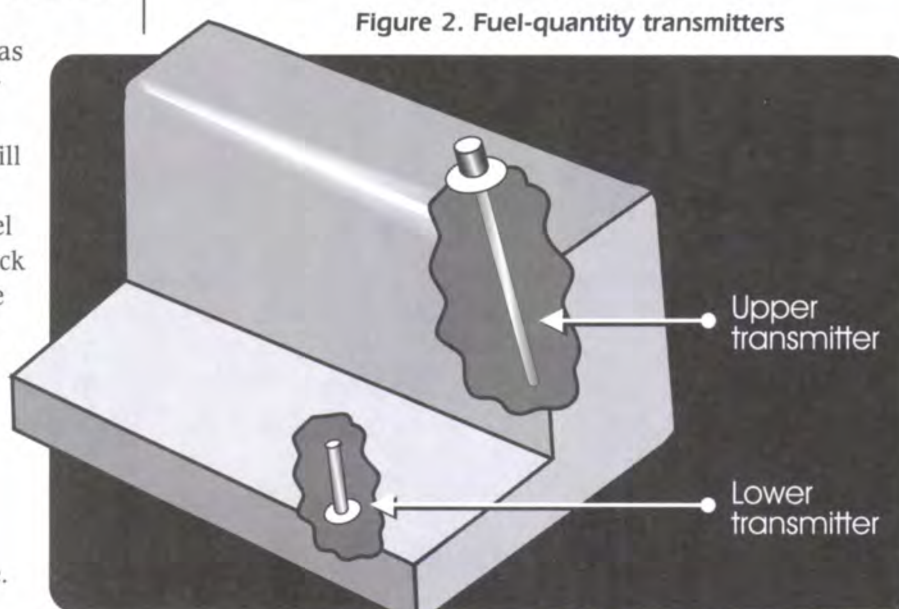
The fuel cell in OH-58A/C helicopters is a self-sealing bladder type. Sandwiched between an outer rubber-coated composite layer and an inner rubber liner, the self-sealing bladder is constructed of several layers of strong, flexible composite type material and a gel designed to act as a sealant in case of projectile penetration (figure 1).

In each of the described incidents, further investigation revealed that the inner liner of the fuel cell had deteriorated, allowing fuel to be trapped between the layers of the fuel cell.

The fuel-quantity transmitters

The fuel-quantity transmitters (figure 2) are located toward the center of the fuel cell, and based on the depth of the fuel, they measure the amount of fuel in the tank. In each of the incidents, more than half of the fuel was contained in the walls of the fuel cell. Once the fuel level fell below the level of the defect in the walls, the gauge indications were no longer reliable and the fuel consumption rate appeared to increase.

Figure 2. Fuel-quantity transmitters



Prevention measures

All U.S. Army aircraft using crashworthy fuel cells of this type are susceptible to deterioration and the possibility of having "trapped gas."

At present, the OH-58 fuel cell interior is inspected every 24 months. Is this really adequate considering that this rubber structure could be more than 20 years old in some aircraft? DA Form 2028s suggesting that the frequency of fuel cell inspection be increased have been submitted and are currently being evaluated.

In the meantime, there are precautions that you can take to lessen the chances of finding yourself in this situation or to help you recognize what is happening before it causes you to experience a catastrophic event.

- **Take a fuel sample.** Take a fuel sample before every flight. If there is any sign that the fuel cell is deteriorating (for example, small black flakes present in the fuel), reject the aircraft and request that the fuel cell be inspected.
- **Practice fuel management.** Frequently monitor the fuel quantity and consumption rate. Do not get so "wrapped up" in your mission or so complacent about your "short 1-hour flight" that you get surprised by unexpected limitations! If you notice an unusual fuel consumption rate or quantity indication, land the aircraft and find out what is wrong!

POC: CW2 Tracy L. Orfield, A Company, 1-212th, Aviation Training Brigade, Fort Rucker, AL, DSN 558-4605 (334-255-4605)

Avoiding wires: one PC's suggestion

"While conducting a night, low-level deep attack, the lead aircraft in a flight of five struck 200-foot power lines." This is how the account of an AH-64 accident in the "Investigators' Forum" section of the August 1995 issue of *FlightFax* begins. This scenario involving helicopters and wires is an all-too-familiar one.

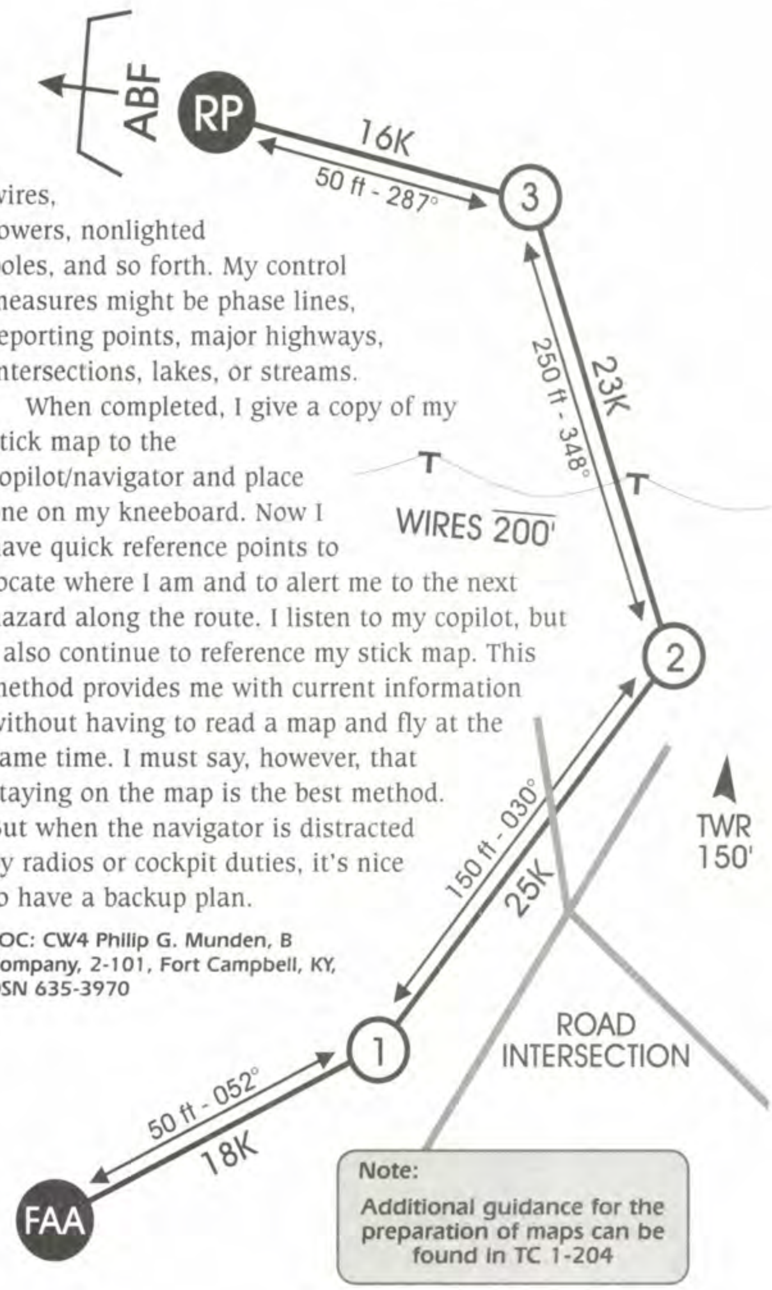
Whenever I read about this type of accident, I find myself asking, "How can aviators who have wires marked on their maps fly into wires 200 feet high?" Certainly it's possible that the navigator can get distracted, and when attention is divided, something like this can happen. But what was the person on the controls doing that prevented him or her from seeing the obstacle in time to make the necessary course correction? The costly results of these incidents leave no doubt that wires are not a contact sport. So what can we do to prevent wire strikes?

As an AH-64 PC, I know that I'm responsible for my aircraft and that it's my responsibility to do whatever it takes to protect both the crew and the aircraft I fly. Let me share a method that has helped me stay out of wires.

Using a computer program named "Rotor Nav" I construct my route planning card. I also print a "stick map" (see example) that depicts the route of flight. Using this stick map, I now have a tool that I can use to mark for reference any obstacles that may become an obstruction or a hazard in my flight path. Using a pen or pencil, I note wires, towers, nonlighted poles, and so forth. My control measures might be phase lines, reporting points, major highways, intersections, lakes, or streams.

When completed, I give a copy of my stick map to the copilot/navigator and place one on my kneeboard. Now I have quick reference points to locate where I am and to alert me to the next hazard along the route. I listen to my copilot, but I also continue to reference my stick map. This method provides me with current information without having to read a map and fly at the same time. I must say, however, that staying on the map is the best method. But when the navigator is distracted by radios or cockpit duties, it's nice to have a backup plan.

POC: CW4 Philip G. Munden, B Company, 2-101, Fort Campbell, KY, DSN 635-3970



Note:
Additional guidance for the preparation of maps can be found in TC 1-204

Resolving helmet-fitting problems

A pilot was recently referred to the U.S. Army Aeromedical Research Laboratory (USAARL) because his aviation life support equipment (ALSE) technician had modified his SPH-4 helmet and it no longer fit snugly. A quick assessment revealed that the helmet liner was not the correct size and that it had been *made to fit* (see figure). This modification, however well intended, did not provide for a correctly fitted helmet. The helmet easily rotated forward on the pilot's head with very little force applied to the back of the helmet.


This unauthorized modification to a helmet liner resulted in a poorly fitting helmet.

The helmet shell and liner are designed to distribute and attenuate crash forces to the head. In order for them to perform effectively, it is imperative that the helmet remain on the individual's head during a mishap sequence. An improperly fitted helmet rotates excessively, exposing the crewmember's head to impact injuries, which is the most common cause of death in helicopter accidents. There were 68 crewmember fatal head injuries in 37 aviation accidents over the past 10 years. Only through correct fitting, maintenance, and wear can the helmet perform as it was designed.

Checking the helmet for proper fit is the responsibility of the unit ALSE technician. FM 1-302: *Aviation Life Support Equipment (ALSE) for Army Aircrews* states that unauthorized modifications to the helmet are not allowed. AR 95-3: *General Provisions, Training, Standardization, and Resource Management* instructs flight surgeons to monitor the fitting of flight helmets. This system of checks is meant to ensure that the crewmember's helmet fits and functions correctly while performing normal flight duties and provides protection during a mishap.

USAARL is charged with providing Armywide technical support for individuals on flight status who have problems accommodating approved Army ALSE. Such support may involve special fitting of the flight helmet using the sling suspension assembly system, the installation of an approved universal earcup retention assembly, installation of a modified TPL™ system, or the use of other experimental and evolving technologies.

On a referral basis from ALSE technicians and flight surgeons worldwide, USAARL resolves helmet-fitting issues for approximately 50 crewmembers each year. If you or a fellow crewmember in your unit has a helmet-fitting problem that cannot be corrected locally, don't hesitate to call us.

POCs: CW5 Joel J. Voisine or Mr. Joseph R. Licina, Helmet Fitting Laboratory, USAARL, Fort Rucker, AL, DSN 558-6895/6893 (334-255-6895/6893)

INVESTIGATORS' FORUM

Lessons Learned

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

OH-58D(I). The aircraft was at a stationary out-of-ground effect (OGE) hover. While the crew was engaged in an attack on OPFOR ground targets, the aircraft drifted rearward and made contact with a tree. Tail rotor control was lost, and the PC initiated an autorotation. The aircraft struck several more trees before ground contact. The aircraft was destroyed, and the pilots received minor injuries.

• ***What happened.*** The PC actively engaged OPFOR ground targets without announcing his intentions while the PI continued to operate the mast-mounted sight. As a result, both the PC and the PI were actively engaging targets without properly monitoring the position of the aircraft to ensure obstacle clearance.

• ***Lessons learned.*** Aircraft control is the primary consideration. The complexity of the OH-58D(I) systems and missions requirements makes proper crew coordination absolutely essential to aircraft safety and mission accomplishment.

OH-58D(I). As part of an APART evaluation, the PI was conducting a simulated engine failure from 1,000 feet MSL to an authorized airfield when the engine failed. The aircraft's rotor RPM deteriorated below normal operating RPM during the "termination with power" phase of the simulated forced landing. The IP attempted to recover the aircraft at approximately 100 feet AGL with low rotor RPM. The aircraft contacted the active runway tail low, causing damage to the tail boom section and aircraft landing system.

• ***What happened.*** When the engine "flamed out" during the initiation of the maneuver, the crew did not diagnose and adequately respond to an actual engine failure. As a result, the IP allowed the PI to initiate a higher-than-normal deceleration and adjust the collective, a technique used in this OH-58D to prevent an underspeed/overtorque during the "termination with power" phase of the maneuver.

• ***Lessons learned.*** Crewmembers must remember to announce required information **and** confirm actual conditions during the initiation of a simulated engine failure. The complexity of the audio and visual warning/caution/advisory tones and messages and the aircraft's aerodynamic characteristics make crew coordination paramount to successful recovery from an emergency condition. ❑

CY 95 FlightFax index

Aviation safety action messages

General

Utility

Attack

system for chafing, P/N 7-311830102-5, on hose clamp, P/N HS4501SS09NB—November

Cargo

- CH-47D, MH-47D, and MH-47E one-time and recurring daily inspection of thrust idler assembly—January
- CH-47D, MH-47D, and MH-47E one-time torque verification of the nuts securing the No. 1 and No. 2 power transfer unit motor/pump—February
- CH-47D, MH-47D, and MH-47E aircraft with engine transmissions utilizing Speco-manufactured gears—March
- CH-47D, MH-47D, and MH-47E one-time inspection for Stratopower pumps, NSN 1650-01-249-4341, and reporting for turnaround program—May
- CH-47D, MH-47D, and MH-47E inspection and lubrication of flight control rod end bearings—July
- CH-47D, MH-47D, and MH-47E revision to inspection and lubrication of the flight control rod end bearings—October
- CH-47D, MH-47D, and MH-47E inspection of aft vertical shaft—November
- CH-47, MH-47D, and MH-47E replacement of aft landing gear drag link assemblies susceptible to stress corrosion cracking—December

Observation

- OH-58D one-time inspection of directional control tubes—February
- OH-58D one-time inspection of pilot's seat web cover and copilot's seat cover assembly—March
- OH-58 one-time inspection of wire bundle and restack of Adel clamps near bus bar—April
- OH-58D, AH-64A/D, AH-1S/P/E/F, A/MH-6, and MH-60 Hydra rocket motor suspension and information—April, July
- OH-58A/C increase to engine oil change interval—June
- OH-58A/C inspection of bolt, shear, NSN 5306-00-944-7540, used in pylon installation—July
- OH-58D main rotor expandable blade bolt—September
- OH-58D training maneuver restriction—November
- OH-58A/C inspection of door hinges—November
- OH-58D power-off maneuver restriction—December

Fixed wing

- C-12F3 and C-12R windshield anti-ice operating instructions—July
- C-12F3 and C-12R flight limitations in icing conditions—July

Safety-of-flight messages

Utility

- UH-60A/L change to retirement life for certain main rotor blade cuffs—April
- UH/EH/MH-60 change in retirement life of forward bellcrank support assembly—November

Attack

- AH-64 tail rotor head assembly installation inspection—August
- AH-1 one-time inspection of lift link assembly—November
- AH-64A/D firing restriction for 2.75-inch FFARs—November
- AH-1 inspection of tail rotor hub assembly—December
- AH-1 one-time inspection of lift link assembly—December

Cargo

- CH-47D, MH-47D, and MH-47E one-time visual inspection of upper boost actuator serial numbers—January
- CH-47D, MH-47D, and MH-47E one-time visual inspection and torque check of lower drive link to the swashplate retaining hardware—June

Observation

- OH-58D one-time and recurring visual inspection of the tail boom and related restriction on forward indicated airspeed—March
- OH-58 revision to visual inspections of tail booms—May

Safety-of-use message

General

- Prohibited use of Breeze rescue hoists on U.S. Army helicopters—December

Aviation maintenance information messages

Utility

- EH/UH-60A and UH-60L aircraft—September
- UH-1 revised message on hydraulic servocylinder purging procedures—November

Attack

- AH-64 deactivation of rotor (blades) de-ice capability—September

Observation

- OH-58A/C inspection of force gradient assembly in the cyclic controls—September
- OH-58 mast torque signal conditioner setting—November
- OH-58 main rotor speed setting—November

CY 95 STACOM Index

STACOM 163, January

- Currency requirements

STACOM 164, July

- Night vision goggle maintenance
- Logging of NVG time
- HIRTA

STACOM 165, October

- Unauthorized practice of selecting 2000-series ATM tasks, modifying task condition, and redesignating them as 3000-series tasks

STACOM 166, November

- Exportable training packets

Accident briefs

Information based on *preliminary* reports of aircraft accidents

Aviation flight accidents

Utility

UH-60 Class C

A series - While in cruise flight during medevac IFR mission, crew experienced low rotor RPM due to dual-engine rollback. Crew executed forced landing to interstate. On final approach, opposing vehicular traffic noted aircraft was experiencing difficulty and halted to allow landing on roadway. On short final, aircraft underflew high-tension wires and touched down on road surface. Aircraft sustained damage to landing gear and belly.

V series - No. 1 generator and master caution lights illuminated during takeoff. Crew landed aircraft without further incident. Detecting electrical burning odor, crew completed emergency shutdown. Postflight inspection revealed that wire bundle had shorted out. Suspected damage to No. 1 generator and ECU.

UH-60 Class E

A series - During troubleshooting procedures for abnormal engine Np indications, mechanic disconnected two fuel lines from engine hydromechanical unit. Mechanic failed to reconnect or document disconnection of fuel lines. Unaware that fuel lines had been disconnected, MP attempted to start engine. Maintenance personnel observed fuel leaking from engine compartment. Aircraft secured without further incident.

Attack

AH-1 Class E

F series - During maintenance test flight, aircraft was descending from 10,000 feet when engine oil bypass light illuminated. Crew initiated autorotation procedures, reapplied power at 1,500 feet, and landed aircraft without further incident. Maintenance inspection revealed that 90-degree oil supply fitting had cracked. Engine had lost 7 quarts of oil.

AH-64 Class C

A series - On final approach to FARP, aircraft struck large bird and sustained damage to left wing and one main rotor blade.

A series - During readiness level progression training, aircraft tail rotor impacted windmill.

Cargo

CH-47 Class E

D series - After setting external load (HMMWV) on ground during NVG flight, aircraft drifted forward before load was released. Load was pulled on its side and sustained damage. No damage to aircraft.

Observation

OH-58 Class B

D series - As part of APART evaluation, PI was conducting simulated engine failure from 1,000 feet MSL to authorized airfield when engine failed. Aircraft rotor RPM deteriorated below normal operating RPM during the "termination with power" phase of simulated forced landing. IP attempted to recover aircraft at approximately 100 feet AGL with low rotor RPM. Aircraft landed hard and sustained damage to landing system, undercarriage, and tail boom section. No injuries. (See OH-58D(I) writeup in "Investigators' Forum.")

OH-58 Class C

A series - During standard autorotation, aircraft touched down hard.

A series - While executing low-level autorotation during transition training checkride, aircraft touched down on toes of skids and rocked rearward. Inspection revealed wrinkle damage to tail boom and scarring of drag pin fitting.

C series - Postflight inspection revealed damage to main rotor blades. Suspected tree strike.

Training

TH-67 Class C

A series - On ground contact during standard autorotation, aircraft experienced spike knock and subsequent pylon whirl. Inspection revealed damage to isolation mount, strike plate, and aft transmission cowling.

Aviation flight-related accident

Cargo

CH-47 Class C

D series - While conducting external NVG slingload operations, aircraft set M998 down on LZ. When slings were released, vehicle rolled into ravine. M998 brake was not set as required. No injuries; no aircraft damage.

Aviation-ground accident

OH-58 Class C

C series - PC was conducting engine runup for MOC following engine flush. During engine start, turbine output temperature (TOT) reached 1,000°F.

Safety messages

Aviation safety-of-flight messages

■ Safety-of-flight technical message concerning inspection of tail rotor hub assembly on all AH-1 series aircraft (AH-1-96-02, 132129Z Nov 95). Summary: An inspection conducted on a tail rotor hub assembly manufactured by Space Craft Incorporated (Cage OB3S3 was dimensionally out of tolerance. The purpose of this message is to require units to conduct a one-time inspection of tail rotor hub assemblies to find and remove any suspect assemblies. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Safety-of-flight technical message concerning one-time inspection of the lift link assembly on all AH-1 series aircraft (AH-1-96-03, 141520Z Nov 95). Summary: As a result of SOF message AH-1-96-01, additional serial numbers of serviceable lift links and information on identifying serviceable lift links were discovered. This message provides that information and supersedes SOF AH-1-96-01. The purpose of this message is to furnish additional lift link serial numbers and to require units to conduct a one-time inspection of the lift link assembly to find and remove any suspect parts. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

Aviation safety action messages

■ Aviation safety action maintenance mandatory message concerning replacement of aft landing gear drag link assemblies that are susceptible to stress-corrosion cracking on all CH-47D, MH-47D, and MH-47E aircraft (CH-47-96-ASAM-01, 061726Z Nov 95). Summary: Several instances have been reported of failed aft landing gear drag links. The investigation revealed the cause to be stress corrosion cracking (SCC). The crack originated inside the bore where the link mates with the large pin attached to the aircraft frame. The crack continued to propagate until the link failed by overload. In some cases, the link failed with the aircraft sitting on the ground. The crack originated inside the assembly and was not externally visible until the link had completely failed. SCC can occur in aluminum alloys with certain combinations of section thickness, temper, tensile stresses, and environment. The new drag links, P/N 114L2323-5, are manufactured from aluminum alloys that are resistant to SCC. The link assembly, P/N 114L2329-2, includes the drag link, P/N 114L2323-5, and sleeve bushings, P/N 114L2357-1. A team from Corpus Christi Army Depot (CCAD) has traveled to all the Chinook units and inspected the two aft drag links. The inspection consisted of a conductivity measurement of the aluminum link. The measurements will separate susceptible links and those that are resistant to SCC. The links that could fail from SCC were painted/marked with a 1½-inch-high number "3." The links that are resistant to SCC were identified with the number "5." The purpose of this message is to require units to inspect the aft landing gear drag link for the number marked by CCAD within 60 days and replace the "3" configuration with a "5" configuration within 24 months from the date of this message. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action operational message concerning power-off maneuver restriction on all OH-58D aircraft (OH-58-96-ASAM-02, 081426Z Nov 95). Summary: During a recent OH-58D Kiowa Warrior training flight, a simulated forced landing was initiated on approach for landing. Normal autorotational procedures were initiated. At the power recovery transition prior to touchdown, the engine failed to respond and the aircraft impacted the ground and sustained significant damage. The purpose of this message is to impose restrictions on performing simulated engine failures at altitude until the complete circumstances of the above accident are identified. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

Safety-of-use message

■ Safety-of-use operational/technical message concerning prohibited use of Breeze hoists (BL-8300 series) on U.S. Army helicopters (SOUM-ATCOM-96-002, 071250Z Nov 95). Summary: The Breeze internal rescue hoist, BL-8300 series, has been restricted from use in Army helicopters. Recently there have been over 20 of the Breeze internal hoists sold in property disposal auctions. These hoists are being offered as serviceable by salvage dealers. Since there is a shortage of rescue hoists in the field, units may have or may in the future inadvertently procure the restricted hoist from salvage dealers. The purpose of this message is to alert UH-1 and UH-60 aircraft users that the restriction against the use of the Breeze Eastern internal rescue hoist has not been rescinded and to prohibit the use of Breeze Eastern internal rescue hoists (BL-8300 series). Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

For more information on selected accident briefs, call DSN 558-2119 (334-255-2119).

It takes more than tanks and guns and planes to win. It takes more than masses of men. It takes more than heroism, more than self-sacrifice, more than leadership. Modern war requires trained minds. The days of unthinking masses of manpower are over. Individual intelligence, individual understanding, and individual initiative in all ranks will be powerful weapons in our ultimate success.

—General Brehon Somervell
Public Addresses, 1941-1942

Class A Accidents through November

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

U.S. ARMY SAFETY CENTER

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