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Report of Army Aircraft Mishaps

FLIGHTFAX

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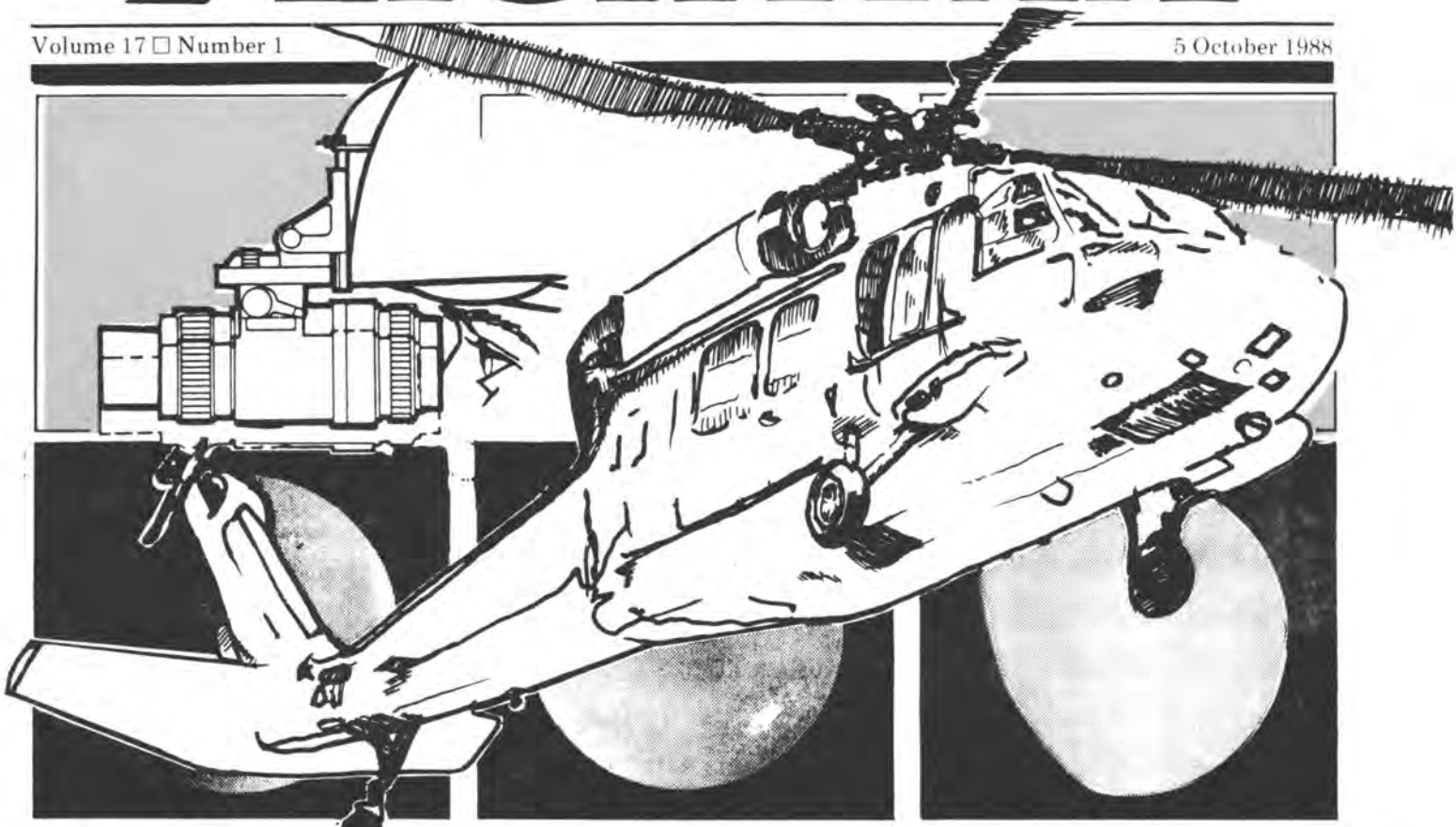

Maintenance and use of night vision devices

Recent Armywide standardization inspections and accident investigations have revealed deficiencies in maintenance and use of night vision goggles (NVGs) and the Aviator's Night Vision Imaging System (ANVIS).

The purpose of this article is to clarify requirements for modification, inspection, and use of AN/PVS-5 series NVGs and the ANVIS-6.

AN/PVS-5 series NVGs

Modification. Only two modifications are authorized for AN/PVS-5 series NVGs used in aviation operations. One is the modified face plate (MFP) described in the U.S. Army Aviation Center booklet: AN/PVS-5, 5A Night Vision Goggle Aviator Modifications, dated 10 Jun 83.

The other modification authorized for AN/PVS-5 NVGs in aviation use is the GX-5 flip-up described in an April 1987 booklet published by the Aviation Life Support Equipment Project Manager's Office, Aviation Systems Command (AVSCOM). The GX-5 fabrication instructions in TM 10-8415-206-12P on the SPH-4 helmet are incomplete. **Do not** use

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this reference to fabricate the GX-5.

No other modifications are authorized for AN/PVS-5 series NVGs in aviation use.

NOTE: See back page for how to order these booklets.

Testing and inspections.

High/low level light resolution test (reference AVSCOM message 061200Z Oct 87, subject: Night Vision Goggle (NVG) Operations). Preventive maintenance checks and services (PMCS) include the high/low level light resolution test, performed in accordance with TM 11-5855-238-20, on the TS-3895/UV ANVIS test set. This test **must be performed** at least every 90 days for AN/PVS-5 series NVGs in aviation use. AN/PVS-5 series NVGs for ground use only are to be tested at least every 120 days. For units with limited access to a TS-3895/UV test set, the alternate test procedure in PM-NVD message, 041500Z Feb 88, can be used in lieu of the resolution test at the stated intervals.

Preflight/pre-operational inspections. Ensure that NVGs with modified face plates are correctly modified in accordance with USAAVNC booklet dated 10 Jun 83 (see photograph). (Reference AVSCOM SOF message 87-01, 280030Z Mar 87, subject: Night Vision Goggle Operation.) Ensure that the GX-5 mount and mount assembly are modified in accordance with the AVSCOM booklet dated April 1987. Inspect the mount and assembly for serviceability.

A complete preflight check of NVGs must be performed before each use. Ensure that all knobs and clamps move freely. Inspect the lens for excessive scratches and pits. Ensure that all straps and snaps are in good repair.

NOTE: Check the AN/PVS-5A MFP single battery compartment to see if the top edge is rolled over to the inside. Any rolled-over edge must be removed or the compartment may be too tight for easy installation and removal of the larger-diameter lithium batteries.

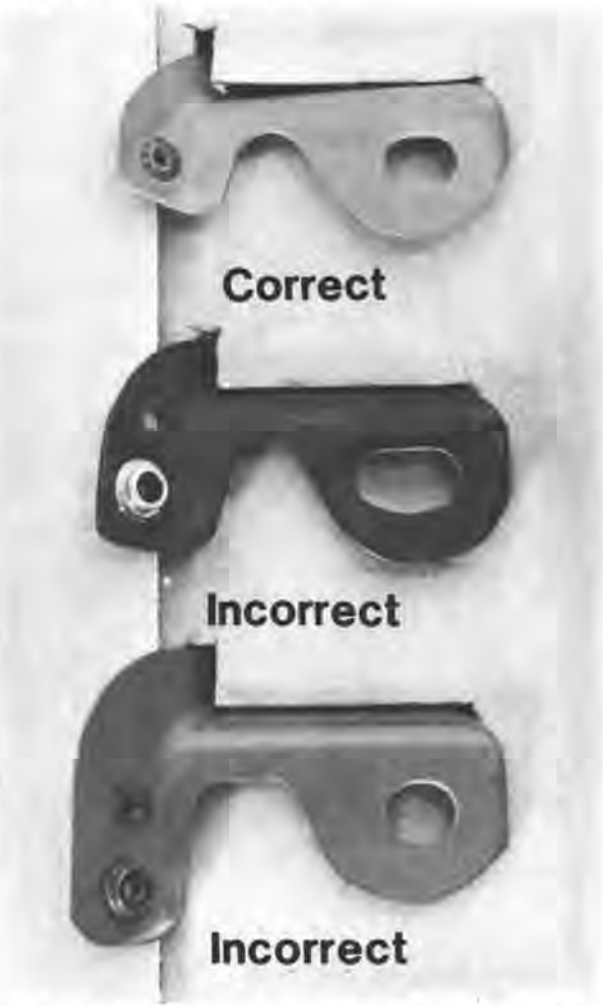
AN/AVS-6 ANVIS

Testing and inspections. There is a requirement to test the ANVIS for high/low level light resolution, using the TS-3895/UV test set, at least every 30 days. The alternate test procedure is **not** to be used since the test set is always issued with the ANVIS. This test is part of the monthly PMCS.

The high/low level light resolution tests on NVDs must be recorded on permanent records. Each unit must develop their own maintenance forms and records for NVDs until appropriate forms are included in DA Pam 738-751.

All operators of the TS-3895/UV test set must receive training on proper operation of the test set. Each installation is required to set up training and maintain certification records on each operator.

Preflight/pre-operational inspections. The ANVIS preflight check is much like that of the AN/PVS-5 in that you must ensure proper operation of all knobs, clamps, and levers. Also, inspect the ANVIS mount, mount assembly, and tubes for cracks or breaks.



The AN/PVS-5 night vision goggle faceplate shown at the top of this photograph has been properly modified. The faceplate in the middle has had a ⅜-inch male snap installed in place of the original No. 16 snap. The rear portion of the faceplate at the bottom of the photograph has been cut too long, which leaves a ⅜-inch male snap on a weakened attachment point. Improper modifications like the ones pictured here are the most common errors found during inspection of NVGs by evaluation and standardization personnel.

Other areas of concern

Nitrogen purging. In addition to the purging requirements specified in TM 11-5855-238-24 and TM 11-5855-263-30, nitrogen purging of the AN/PVS-5 series NVGs and AN/AVS-6 ANVIS is recommended at a minimum of every 90 days. This will increase image intensifier tube life. In humid climates, more frequent purging is highly recommended.

Inoperative focus adjustments. Some night vision devices inspected had inoperative objective and eyepiece focus controls and/or improper adjustment ranges. These focus controls had not been properly reassembled during or after maintenance. Maintenance on night vision devices must be performed in strict accordance with the appropriate technical manuals. Improper maintenance procedures can result in degraded performance of NVDs.

Use of rebuilt tubes in aviation AN/PVS-5 NVGs. CECOM message, 271800Z Apr 88, subject: AN/PVS-5 NVG Image Intensifier Tube MX-9916 Repair, states in paragraph 6 that tubes rebuilt by the Sacramento Army Depot (SAAD) are NOT to be used in aviation NVGs. SAAD-rebuilt tubes do not always meet aviation standards; only new tubes will be used to replace failed tubes in aviation NVGs.

Tube operation. Tube operation must be checked before each flight. If any of the following tube conditions exist, take appropriate action before using the NVDs. All nonflyable conditions should be written up on the appropriate maintenance form so that corrective action can be taken.

NOTE: In high ambient light, such as a lighted room, use black objective lens caps with a small off-center pinhole to perform preflight evaluations.

Shading. Both tubes should portray a perfect circle. If shading is present, you will not see a fully circular image. Shading always begins on the edges and moves inward. **Do not** fly if shading is present. Replace the NVD.

Edge glow. Edge glow is a bright area (sometimes sparkling) in the outer portion of the viewing area. To check for edge glow, the aviator can block out all light by cupping a hand over the lens. Do not fly if edge glow is present. Replace the NVD.

Bright spots. This condition is caused by a pinhole in the phosphorous screen. Spots may flicker or may appear constant. This can be checked by cupping a hand over the lens to block out all light. If bright spots or white dots are visible, do not fly. Replace the NVD.

Flashing, flickering, or intermittent operation. The NVD may appear to flicker on and off, or the output may flash. This can occur in one or both tubes. If there is more than one flicker, check for loose wires or battery cap or weak batteries. Do not fly unless this condition is corrected.

Black spots. Black spots or streaks are acceptable as long as they do not interfere with image viewing. No action is required if this occurs unless the spots or streaks are deemed excessive.

Fixed pattern noise (honeycomb). A faint honeycomb pattern occurs most often in high light levels or when viewing very bright lights. This condition is acceptable as long as the pattern does not interfere with image viewing or remains when in a dark environment.

Image distortion. This problem is more easily detected in low ambient light conditions when viewing the area illuminated by the infrared bandpass filtered light. Vertical objects such as trees or poles may appear to wave or bend when the aviator's head and the NVDs are moved vertically or horizontally. Ground surfaces in the direction of hover may appear to swell or sink. Ensure you are viewing through the center of the NVD when performing this check. Terminate flying with this NVD if this problem is encountered. This problem is in the intensifier itself and not in the optical lens.

Veiling glare. This condition—a loss or reduction of contrast—occurs only under certain circumstances. It

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is not readily apparent during a routine check of NVDs. The cause is an excessively scratched, pitted, or chipped objective lens. Dust, smudges, or fingerprints can also contribute to this condition; therefore, ensure the lens are clean. This condition can be compared to viewing automobile headlights or bright lights through a pink filter, head on. However, veiling glare occurs when peripheral light strikes the defective lens of an NVD at an angle, and light scatters instead of passing straight through the lens. If this condition is present, replace the NVD.

Adjustment techniques

Adjusting interpupillary distance. If NVD eyepieces are not properly aligned with the eyes, less than optimum resolution will be obtained. Proper alignment of the eyepieces is achieved when the distance between the tubes matches the distance between the user's pupils. When the interpupillary distance of the NVD is properly adjusted, the edges of the images in both tubes will be clear. When the edges are clear, the resultant binocular view through the tubes may appear as a single circle or as two circles, overlapped and slightly displaced laterally. Adjust interpupillary distance while focused at infinity under dark lighting conditions, with all lens caps removed. The following procedure should be used to adjust interpupillary distance.

- With the NVD mounted on the helmet, move the tubes away from the eyes as far as possible without losing full field of view. This makes edge clarity easier to judge.

NOTE: If a full field of view cannot be attained with the AN/PVS-5 series MFP mounted to the helmet, make this adjustment before mounting the device to the helmet. The inability to get a full field of view is caused by too much distance between the user's eyes and the eyepieces of the NVD. (ANVIS has sufficient aft adjustment to preclude this problem.) For a person with deep-set eyes, the MFP may not normally allow enough aft adjustment to get a full field of view. More aft adjustment can be achieved by elongating the holes in the sides of the MFP.

- Move the tubes closer together and farther apart. By closing one eye at a time, alternately observe the clarity of the edges of the circle with each eye. If the outside edges are blurred, the tubes are too close together. If the inside edges are blurred, the tubes are too far apart. If the upper or lower edges are blurred, the tubes should be tilted.
- Move the tubes closer to the eyes as desired for individual preference, without the eyelashes touching the eyepiece lenses. Recheck the tube tilt.

Adjusting binocular focus. Each NVD has a method for dioptric adjustment. This adjustment is used to correct visual refractive errors such as myopia (nearsightedness) and hyperopia (farsightedness). For the AN/PVS-5 series, this is accomplished with the diopter adjust ring, and for the AN/AVS-6 it is accomplished with the eyepiece focus ring. When setting the dioptric adjustment, it is possible to achieve a clear image in each eye (monocular) and yet have a blurred image or develop eyestrain when viewing with both eyes (binocular). This occurs when the dioptric adjustment is set for one eye while the other eye is closed or covered. In this situation, the eyes will tend to accommodate to a nearer distance than infinity, typically 1 to 3 feet. Over-accommodation and/or focus imbalance between the eyes can cause eyestrain and periodic blurred vision. To achieve a clear and relaxed binocular focus, the following sequence should be followed after focusing the tubes for each eye and after adjusting interpupillary distance.

- Focus at infinity and view a distant object.
- Slightly blur the image in one tube, left or right, with the focus knob (AN/PVS-5 series) or objective focus ring (AN/AVS-6). The amount of blur should allow recognition of general object shapes but not fine details in the blurred tube.
- With both eyes open, adjust the diopter adjust ring or eyepiece focus ring for the clearest image in the nonblurred tube.
- Return the blurred tube to infinity focus, blur the other tube, and repeat the process.

Counterweight system

The counterweight system consists of two elements: the weight bag and the counterweights.

Weight bag. The weight bag can be locally constructed from Nomex fabric, NSN 8305-00-935-6443. This high-temperature-resistant cloth may be requisitioned by the yard. A closing flap for the weight bag can be made by using velcro fastener loop tape, NSN 8315-00-450-9837. A 2-inch by 3-inch piece of tape should be sewn on the back of the weight bag to attach the bag to the SPH-4 helmet. The weight bag needs to be large enough to easily accommodate the counterweights that will be placed in it, without causing the weight bag to bulge.

Counterweights. Following are some things that should be considered when choosing materials to use as counterweights.

- Multiple weights, such as buckshot in ziplock pouches, are ideal for this purpose because the amount of weight can be easily adjusted for different helmet/I^2 night vision systems configurations. This type of weight allows the weight bag to more easily conform to the contour of the helmet, providing a larger area of attachment and increasing retention. The chances that the weight bag will become a missile hazard if it is dislodged during a crash are also lessened by use of buckshot in the weight bag.
- Tire weights, which are commonly used as counterweights, have sharp edges that reduce the life of the weight bag. They can also become missile hazards.

Amount of counterweight. The amount of counterweight needed will vary among individuals and among I^2 systems. The recommended initial weight is 12 ounces for the ANVIS, 18 ounces for AN/PVS-5 series NVGs, and 22 ounces for the AN/PVS-5 series NVGs with full faceplate/day filter. These recommended weights serve as a starting point from which necessary adjustments may be made. Individuals should add or remove weight as needed to achieve best balance and comfort, but the attached bag should never weigh more than 30 ounces.

Counterweight variables. Many variables affect the amount of weight needed to counterbalance an I^2 system. Variables that have a minor effect include helmet size, head shape, and helmet suspension type. The following factors have a major effect on the amount of counterweight required.

- Position of intensifier tubes—fore or aft. The farther away from the eyes the intensifiers are positioned, the more counterweight is required (table 1).
- Mounting the weight bag high on the velcro strip on the back of the helmet increases the amount of counterweight required (table 1). To keep the amount of head-supported weight to a minimum, the weight bag should be attached low on the back of the helmet. If a dual battery pack is used, the battery pack preferably should be mounted vertically above the weight bag. The velcro on the back of the helmet should be increased to 6 inches in length to properly accommodate the counterweight and a vertically-mounted dual battery pack.
- The flip-up feature of the GX-5 mount and the AN/AVS-6 mount shifts the center of gravity of the goggle tubes forward and upward away from the head/helmet center of gravity. This increases the amount of counterweight required (table 1). This requirement for additional weight mitigates the advantage of the flip-up feature to a certain extent, especially for the GX-5. Using the flip-up option may increase workload because of the out-of-balance system. The flip-up feature should not be used for extended periods of time.

TABLE 1.—Counterweight required for different NVD configurations

Factor	Weight Increase (Ounces)	Percentage Weight Increase
Weight bag mounted high	2.0	6-12
NVD forward	1.3-2.4	6-10
NVD in flipped-up position:		
GX-5 with AN/PVS-5A binocular assembly	9.0	35
GX-5 with AN/PVS—5B or C binocular assembly	9.0	36
AN/AVS-6	5.8	35

When in the operational area, and before the mission begins, all flight crewmembers should view through the other crewmembers' NVDs. This will serve to expose the crewmembers to the large acceptance differences that exist between like systems. The pilots at the flight controls should use the highest performance systems.

NVD batteries

Lithium BA 5567/U batteries have a longer usable life than mercury batteries. Therefore, the 10-hour limit that was based on mercury batteries has been increased to 15 hours for lithium batteries when used in a single-battery compartment application. (See 13 Jul 88 **Flightfax** for safety tips on use and storage of NVG lithium batteries.)

NOTE: Lithium BA 5567/U batteries from lot number DAAB7-84-C-H331 are not to be used. These remanufactured batteries are oversized and they can become stuck in the single-battery compartment.

AA alkaline BA-3058 batteries, when stored properly, can provide sufficient power in the ANVIS universal battery pack for up to 22 hours of use. Age of the batteries and storage conditions may shorten the batteries' useful lifespan.

In the original dual battery pack and the new universal battery pack, the same type of batteries must be used as primary and alternate. The low battery sensing circuit compares the battery in use with the spare. Because the mercury battery is 2.7 volts and the AA alkaline and lithium batteries are 3.0 volts, the light will give incorrect indications. Also, because the AA battery has a shallow light curve and the lithium has a sharp light curve, the lights may not function properly.

AN/AVS-6 ANVIS neck cord

The reason for this cord being on the ANVIS is probably that the AN/PVS-5 NVGs had a neck cord. Before making a decision about removing these cords, aviation unit commanders should weigh the advantages and disadvantages of the neck cord with respect to their own operational environment. (continued on back page)

MISHAP BRIEFS

Information based on preliminary reports of aircraft mishaps

Utility helicopters

UH-1 Class A

H series - Aircraft encountered brownout during takeoff and struck trees. While attempting to land, aircraft hit the ground and rolled onto its left side. 8840

H series - Aircrew encountered an emergency of unknown origin shortly after takeoff. Suspected cause is engine overspeed and failure. 8841

UH-1 Class D

V series - While moving to a different tactical site, medevac crew secured radio and power supply in a Stokes litter and attempted to move it down a steep hill using the aircraft's high performance hoist. Litter separated from the hoist and equipment dropped about 10 feet to the ground. Suspect load was incorrectly rigged.

V series - Aircraft was in forward flight at 6 to 8 KIAS while refilling water bucket with sea water. Bucket was caught in undertow, causing aircraft to assume a nose-low attitude and begin descending. When crew leveled aircraft and applied power, torque reached 52 psi. Sheet metal surrounding cargo hook was also damaged.

UH-1 Class E

H series - Three aircraft were making an unaided night approach to a landing zone. Crew of chalk 2 thought lead's approach was too steep and set up a shallower approach angle. During short final, IP of chalk 2 saw trees and pulled 55 pounds of torque while avoiding the trees. Searchlights were not being used during approach although the aircraft were operating with moon illumination at 11 percent.

Attack helicopters

AH-1 Class D

E series - Upon departure from LZ, aircraft was engaged by MILES. During evasive maneuvers, pilot misjudged clearance and allowed main rotor to strike tree limbs.

P series - After MILES engagement, aircraft was at a 5-foot hover over terrain with right upslope. While attempting evasive maneuver to the right, aircraft settled into slope. Right skid and front and rear crosstubes were damaged.

AH-64 Class E

A series - While conducting preflight before maintenance test flight for rotor vibrations, crew found lower retaining bolt on pitch change housing had backed out and retaining nut and washer were missing. Four additional retaining bolts were loose, and No. 4 main rotor pitch housing assembly had been damaged. Twelve of the remaining 25 AH-64s in the unit also had loose pitch housing assembly retaining bolts.

Cargo helicopters

CH-47 Class D

C series - During cruise flight, crew heard banging noise and crew chief saw right-side work platform strike engine tail cone. Aft work platform locking mechanism was broken.

D series - Crew chief was replacing hinges on two tunnel covers. After completing work on the first cover, she started work on the second one without fully securing the first cover. A CH-47 taxied by and blew the unsecured cover off.

CH-47 Class E

D series - During low level cruise flight, crew heard a loud, growling noise from forward transmission, accompanied by high-frequency vibration. After landing and shutdown, noise and vibration continued until rotors stopped. Caused by failure of No. 1 flight boost hydraulic pump.

Observation helicopters

OH-58 Class D

C series - Pilot made minimum power takeoff from a field site. Aircraft's nose dipped and lower wire strike protection system contacted ground. Pilot was discussing next phase of mission instead of concentrating on takeoff.

Fixed wing

C-12 Class D

D series - PIC failed to warn pilot on the controls about a maintenance stand that had been left on edge of taxiway. Right leading edge of wing was slightly damaged when it contacted the stand.

OV-1 Class D

D series - During descent through 14,500 feet msl, pilot felt slight vibration. Outboard upper cowling on left engine separated from aircraft and struck left horizontal stabilizer and left side of center vertical stabilizer. Pilot apparently did not secure forward cowling latch.

Maintenance

CH-47 Class E

C series - While aircraft was transporting M198 to a field site, oil began leaking from aft transmission. Crew made uneventful landing. Four self-locking nuts were found to be missing from outer lower internal gear mounting flanges. Six additional nuts were not properly torqued. Internal damage was suspected, and aft transmission was replaced.

For more information on selected mishap briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followup information on accidents previously reported

UH-1 Class A

Reported in 20 May 87 issue as 8733 - Aircraft was in straight and level cruise flight when the crew heard a loud pop. Instrument indications were normal, however, the crew felt vibration and the aircraft began a slow right turn with the nose pitched down about 10 degrees. There was no pedal response when the pilot attempted to correct the turn. The pilot reduced collective and rate of spin decreased, but the aircraft spun completely around 12 times while the pilot was attempting to maneuver it to a large clearing by a river. On final approach to the clearing, the tail boom and rotor blades struck trees and the aircraft came down in the river, half-submerged and resting on its right side. Suspect the tail rotor hanger bearing malfunctioned.

AH-64 Class A

Reported in 26 Aug 87 issue as 8750 - The aircraft was on a training flight to qualify the rated student pilot in the AH-64. While on the downwind leg of a traffic pattern at 100 KIAS, 600 feet agl, the IP was describing the electronic control unit lockout (ECU) procedure to the student, who was flying the aircraft. While the IP was discussing the ECU lockout procedure, the student had his attention focused on the engine chop control. When the IP directed him to initiate the ECU procedure, the student immediately activated the engine chop collar instead of performing the ECU procedures. When he activated the chop collar, both engines immediately went to idle. The student did not immediately tell the IP that he had activated the engine chop collar, and when the IP heard the low rpm audio warning, noted the change in engine noise, and saw the triple tachometer indications were below normal operating rpm, he interpreted the situation as a dual engine failure. The IP took the controls and began autorotation by lowering collective in an attempt to regain rpm. He turned the aircraft away from the traffic toward an open area, but he immediately saw he would not be able to reach the cleared area. He began maneuvering the aircraft for a landing in the trees. The aircraft was destroyed during the landing, but it came to rest upright and the crew escaped with minor injuries.

CH-47 Class C

Reported in 22 Apr 87 issue as 8728 - Downgraded from Class B. Aircraft was in cruise flight during return from troop haul mission. An excessive amount of fuel began venting overboard from the right fuel tank. The pilot did not know the fuel was coming from the overflow vent, and he elected to make a precautionary landing to determine cause of fuel loss. Pilot maintained high rate of airpeed during approach in an attempt to get the aircraft on the ground as fast as possible. This increased crew task load reduced the amount of time available to scan for hazards in the approach path. Just prior to termination of approach, the aircraft struck power lines and then continued to the ground in a running landing. Inspection of the right fuel tank and flapper valves failed to reveal any cause for excessive amount of vented fuel.

U.S. ARMY SAFETY CENTER

Report of Army aircraft mishaps published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is

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Disadvantages.

• When properly installed, the cord dangles at the side of each eye, causing distraction.

• If the cord is shortened to prevent such distraction, and the ANVIS is dislodged during a crash, the shortened cord will cause the ANVIS to remain tethered in front of the pilot's face. This defeats the breakaway feature of the ANVIS and can result in facial injuries.

• Whether short or long, the neck cord makes mounting and dismounting of the ANVIS cumbersome.

Advantages

• In a tight cockpit, such as those on the AH-1 or OH-58, the pilot may inadvertently bump some part of the cockpit structure and dislodge the ANVIS. If this happens, the neck cord would prevent the ANVIS from falling loose in the cockpit.

Sources of information

• For modified faceplate instructions on AN/PVS-5 series NVGs

Commander, Aviation Training Brigade
ATTN: ATZQ-ATB-O (CW3 Hunt)
Fort Rucker, AL 36362
(AUTOVON 558-4630/4632)

• For fabrication instructions on GX-5 flip-up

U.S. Army Aviation Systems Command
ATTN: AMCPM-ALSE (Jim Dittmer)
Federal Center, 4300 Goodfellow Blvd
St. Louis, MO 63120-1798
(AUTOVON 693-3573/3575)

• For information on use and disposition of NVG batteries

References:
AR 710-2, paragraph 2-3.
DA Pam 710-2-1, paragraph 3-6.
What You Should Know About Lithium Batteries, July 1985, and **Battery Disposition/Disposal Handbook,** November 1986.

Commander
U.S. Army Communications-Electronics Command
ATTN: AMSEL-SF-REE (Lou Soffer)
Fort Monmouth, NJ 07703-5000
(AUTOVON 995-3112)

• For information on alternate NVG test procedure for AN/PVS-5 series NVGs

Reference:
Message from Product Manager, Night Vision Devices, 041500Z Feb 88. (Copies are available through local CECOM representatives.)
Product Manager for Night Vision Devices
ATTN: AMCPEO (Doug Wiltse)
Fort Belvoir, VA 22060-5677
(AUTOVON 354-1088, commercial 703-664-1088)

FY89 Class A Mishaps
through 5 October

	Month	Class A Mishaps		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	1	0	0
	November	1		0	
	December	1		0	
2nd Qtr	January	2		0	
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	1	38	0

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Report of Army Aircraft Accidents

FLIGHTFAX

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What they didn't know...

While in terrain flight on a tactical mission, the PIC of the AH-1 banked right at a 45-degree angle. The aircraft began descending. The copilot was watching a nearby aircraft to avoid a possible midair collision, and the pilot was searching the ground for their destination. Neither immediately noticed the initial loss of altitude. When the pilot noticed their descent, he leveled the aircraft, but was unable to stop it. The AH-1 hit the ground at cruise speed, vaulted back into the air, hit the ground a second time, and rolled. Neither crewmember was seriously injured, but the aircraft was destroyed.

The pilot had 430 flying hours, 270 of which were in the AH-1. The copilot had 519 hours, 344 in the AH-1. Neither understood the extra power needed to maintain both airspeed and altitude while in a steep turn.

The unit's instructor pilot also was not familiar with altitude loss in sharp angles of bank and, therefore, had not provided

What they didn't know...

any additional training on the subject.

The "level turns" section of FM 1-203 discusses the relationship of various angles of bank to the power required to maintain level flight

while at constant airspeed. The manual further warns that turns requiring more power than is available can be made only at the expense of losing altitude.

As this pilot increased the angle of bank to 45 degrees, 41 percent **more** power was required above cruise torque to maintain level flight. Total torque needed was between 84 and 91 percent. Although 100 percent torque was available, the PIC didn't add power until impact was imminent.

The maneuver the pilot attempted was neither unusual nor excessive. In fact, it was a typical low-level battlefield maneuver. The requirement for some units to operate at low levels emphasizes the need for a solid background in aerodynamics as well as proper flying techniques.

Flight simulator training programs can be used to demonstrate critical aerodynamic phenomena to aviators whose mission requires low-level flight. In addition, mandatory ATM tasks would require pilots to demonstrate proficiency in steep turns before the mission demands it. ■

Aviators receive Broken Wing awards

The Broken Wing award is given in recognition of aircraft crewmembers 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.

•1LT Terence W. Reeves, 18th Aviation Brigade (Corps) (Airborne), Fort Bragg. An OH-58D was on an overwater NVG reconnaissance mission. After completing the mission, the crews of the OH-58 and two other aircraft decided to practice deck landings on a U.S. Navy frigate to maintain currency. The OH-58 completed two deck landings and then took off and entered a port delta pattern. The aircraft was about 60 feet above the water, flying at 70 knots, as LT Reeves, who was flying the aircraft from the left seat, entered a 10-degree bank and began turning to the left. The aircraft suddenly lost power, yawed, and shuddered. The low rpm audio sounded and the low-rotor and engine-out messages displayed. Rotor and Np began decreasing, and the crew heard two explosive sounds. The aircraft started descending, and all electrical power to the left seat was lost. LT Reeves put the aircraft into an autorotational profile and cut back on his airspeed in preparation for ditching without power. The aircraft was about 20 feet above the water when the engine sputtered and rumbled back to normal limits, and electrical power to the left seat was restored. LT Reeves made a mayday call while recovering the aircraft back to 60 feet and 50 KIAS. The crew decided to try to reach the ship, which was about 2 miles away, and make an emergency landing. After about 1 minute of stabilized flight, the same sequence of events was repeated. This happened four times as the aircraft limped toward the ship's deck. Just as the aircraft's nose reached the ship's fantail, the aircraft lost power for the fifth time, but LT Reeves was able to autorotate to the deck. Before an emergency shutdown could be made, the engine quit with the throttle in the full-open position. The fuel gauge showed 142 pounds, 41 pounds above the low-fuel warning. Fuel samples were found acceptable. Cause of the compressor stall has not been determined.

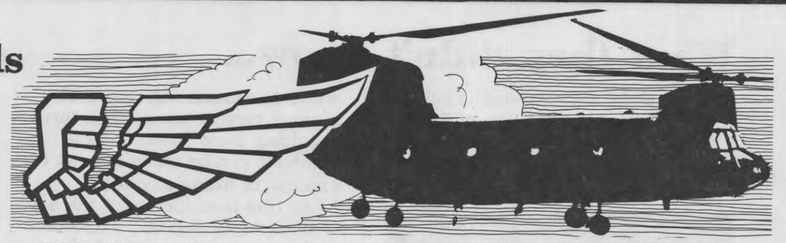
•CW2 Wilson B. Owens, 160th Special Operations Aviation Group (Airborne), 1st Special Operations Command (Airborne), Fort Campbell. During NVG flight at 90 knots, about 30 feet above water, the crew of an AH-6G heard a pop from the aircraft. A few minutes later the engine chip detector light came on, and CW2 Owens, the PIC, made a radio call to the flight lead to tell him what was happening. A decision was made that the flight would return to the point of origin. The AH-6, which had been trail in a flight of three, was maneuvered into chalk 2 position. If the engine failed, the trail aircraft would be able to follow the troubled aircraft down and rescue the crew. After a few minutes of flight with the aircraft again established in free cruise formation, a gradual but constant rise in turbine outlet temperature (TOT) was noted. CW2 Owens climbed to an altitude of about 75 feet, with airspeed at 80 knots, to give himself adequate time to react in case the engine failed. After another 5 minutes, the TOT had risen to 722 degrees C at 36 percent torque. Engine oil pressure dropped to 50 psi and continued to decrease. About 5 minutes after the oil pressure dropped, the engine failed. CW2 Owens responded to the aircraft's left yaw and the change in engine noise and decrease in N2 and Nr by entering NVG autorotation, knowing that the autorotation would terminate in 2-to 4-foot seas. While CW2 Owens concentrated on flying the powerless aircraft, the other pilot kept him apprised of Nr, airspeed, and radar altitude. With flawless cockpit coordination, CW2 Owens flared the aircraft, simultaneously building kinetic rotor energy, while dissipating forward airspeed to zero. He applied cushioning pitch to arrive at 2 to 3 feet above the water level with zero forward airspeed and low rotor rpm. The aircraft descended vertically into the sea, landing gently on a swell. CW2 Owens applied right lateral cyclic and the rotor slapped the waves, quickly coming to a full stop. The crew immediately exited, swam clear of the sinking aircraft, and were rescued by the trail aircraft. Inspection of the recovered aircraft indicated that Nos. 6 and 8 bearings in the engine power turbine section failed. The cause has not been determined. The rotating labyrinth seal overheated and caused the power turbine section to seize.

•CW2 Alfred A. Johnson, 4th Squadron, 4th Cavalry, 3d Infantry Division, APO New York 09033. CW3 Johnson was IP of an AH-1F on a night terrain flight training mission. The aircraft was in low-level cruise flight at about 500 feet agl when the crew encountered instrument meteorological conditions (IMC). CW2 Johnson, who was in the front seat, took the controls and initiated inadvertent IMC procedures. About 15 seconds after the onset of the emergency, CW2 Johnson smelled smoke, which ➤

FLIGHTFAX

Broken Wing awards

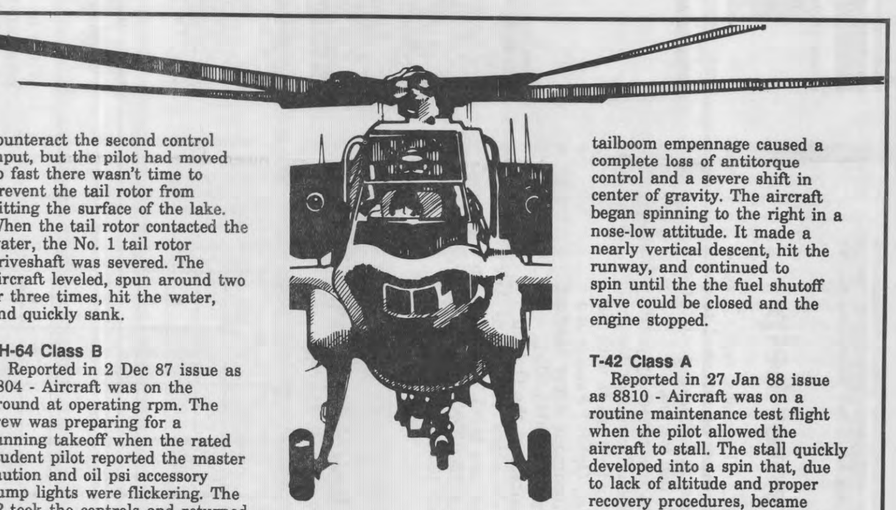
was confirmed by the other pilot. Then a short in the wiring caused his instrument lights to go out. The aircraft was at 2,000 feet agl and climbing at 90 knots when he passed the controls to the pilot in the back seat. It took CW2 Johnson about 10 seconds to get his flashlight and focus it on his instrument panel. By that time, the Cobra was at near zero airspeed and descending at 1,500 fpm in an excessive nose-low attitude. Holding his flashlight between his knees so that he could see the instruments, CW2 Johnson took the controls and recovered the aircraft at about 500 feet agl. The pilot in the rear seat had experienced vertigo and, although he had no radio magnetic indicator (RMI) in the front seat and his only lighting was the flashlight, CW2 Johnson decided to remain on the controls. He reinitiated the climb and continued under radar control to an airfield where he made a no-gyro ground control approach to a safe landing.



•CW2 William E. Fox and CW2 Paul D. Marshall, 7th Battalion, 101st Aviation Regiment, Fort Campbell. CW2 Marshall was the pilot and CW2 Fox was the copilot of a CH-47D supporting a joint task force. The aircraft had flown for about 4 1/2 hours that day slingloading equipment and transporting troops. The aircraft was in cruise flight at about 2,400 feet agl during the return flight from a resupply mission when the crew chief reported smoke in the aft cabin area. CW2 Fox was on the controls, and he immediately began a left descending turn to avoid a mountain in his flight path and began searching for a place to land. Within a few seconds, both pilots detected smoke in the cockpit. CW2 Fox reported he had sighted a landing area. CW2 Marshall was examining the instruments for an indication of what was causing the smoke. Finding no indication of a malfunction, CW2 Marshall turned and looked through the companionway of the aircraft to evaluate the situation. Seeing the entire cabin area was filled with thick smoke, he made two mayday calls, but received no response. CW2 Fox continued a descending left spiral toward the landing area, a cornfield one-quarter-mile square surrounded by steep foothills and mountains. The aircraft was still 1,000 feet agl–only 30 seconds had passed since the smoke was first reported–and the cockpit was engulfed by smoke. Noticing the smoke smelled of rubber, and having found no instrument indications as to the source of the smoke, the pilots acted on the assumption that it was caused by some kind of electrical malfunction. CW2 Marshall told CW2 Fox that he was killing electrical power, and he turned off both main generators. This left the aircraft without the automatic flight control system, fuel pumps, gyros, and radios. Simultaneously, CW2 Fox placed the aircraft in a left slip which quickly cleared the cockpit of smoke and increased visibility. As the smoke decreased, both pilots noticed the transmission chip detector light had come on. The crew chief told the pilots the combining gearbox latch and both the left and right lower debris latches had tripped. These indications led the pilots to conclude the combining transmission was failing. CW2 Fox reduced power to 15 percent to expedite emergency descent, while maintaining a load on the transmission to prevent seizure. CW2 Marshall turned the No. 1 main generator on long enough to make distress calls, then turned it off again. The aircraft was now about 200 feet above the emergency landing area. CW2 Marshall began calling radar altimeter and airspeed indications to CW2 Fox who was banking the aircraft left to align it with the longest axis of the landing area. The aircraft was descending rapidly and forward airspeed was about 100 knots. CW2 Fox stated he would have to begin deceleration or the aircraft would overfly the landing area. CW2 Marshall told him to place the aircraft in a hard right sideslip to dissipate airspeed. When the aircraft was placed in a 40-degree sideslip, its speed rapidly decreased. At about 70 feet agl, the aircraft was in a rapid vertical descent with less than 10 knots forward airspeed, and was properly aligned for landing. CW2 Fox began pulling cushioning power to slow the 1,500- to 1,700-foot rate of descent while CW2 Marshall told the crew and passenger in the rear of the aircraft to assume the crash position. As CW2 Fox pulled cushioning power, the cockpit rapidly filled with smoke and the pilots heard a metallic grinding noise from the drive train area. CW2 Fox continued to pull cushioning power while maintaining landing attitude. Although visibility was reduced because of the smoke, both pilots could see the landing area. The aircraft landed hard on all four wheels and bounced back into the air. CW2 Fox continued to apply power as the aircraft landed a second time with its aft tires digging into the ground. Feeling the aft landing gear on the ground, CW2 Fox reduced power to bring the forward landing wheels down. As the forward landing gear contacted the ground, CW2 Marshall placed the engine condition levers in the full off position, bringing the aircraft to a stop. The enlisted crew and passenger got out of the aircraft, followed by the pilots after emergency shutdown had been completed. Aside from the failed combining gearbox, the only damage to the aircraft was a small puncture to the underside where the aircraft had hit a stump during landing. ■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents



Utility helicopters

UH-1 Class E

H series - Master caution and main generator lights came on during flight. Voltage regulator was out of adjustment.

H series - Aircraft was being filmed by a camera crew located in an LZ. During descent, aircrew allowed main rotor blade to hit a tree branch.

H series - Aircraft was at flight idle after normal start. Crew chief noticed fuel spraying in engine compartment and motioned pilot to shut down aircraft. Caused by failure in fuel line.

H series - During before-start check, pilot noticed excessive motoring in tail rotor pedals. Caused by binding of control nut assembly.

H series - Engine chip detector and master caution lights came on during flight. Caused by fuzz on chip detector plug.

H series - Aircraft was being run up. Just before liftoff, master caution and transmission oil pressure lights came on and transmission oil pressure gauge indicated zero. All transmission oil was lost when transmission oil cooler ruptured.

UH-60 Class E

A series - Aircraft was on short final. Sand and small rocks from gusty winds and rotor downwash broke windows of a nearby guardhouse. A civilian, who was unfamiliar with the amount of turbulence caused by a landing UH-60, was blown back from the guardhouse door. The woman tripped and fell, breaking her leg.

A series - During flight with 15 passengers on board, torque on No. 2 engine dropped to near zero. Torque on No. 1 engine was climbing rapidly. When power and airspeed were reduced to keep torque on No. 1 engine within limits, No. 2 engine would not pick up the load. Crew returned to airfield and made a roll-on landing.

A series - Aircraft was in cruise flight during NVG PIC checkride. No. 2 generator light came on and generator would not reset. Caused by failure of generator control unit.

A series - Stabilator failed during roll-on landing. Chafed wires at AFCS panel connection for the stabilator had caused stabilator power circuit breaker to pop.

Observation helicopters

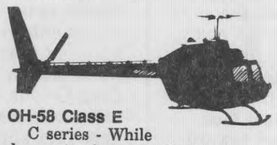
OH-58 Class D

A series - Pilot caused hot start when he attempted to start aircraft in plus 6° OAT. Pilot should have used APU for cold weather start.

A series - During preflight for MOC, pilot noticed safety cable on short tail rotor drive shaft cover was broken. He checked cover to be sure it was fastened and asked the crew chief to confirm cover was secure. During runup, the crew heard loud bangs, and the crew chief told the pilot the drive shaft cover had flown into the tail rotor. Suspect last fastener was bent and appeared locked, but later failed. This caused other fasteners to fail, and cowling came open and hit the tail rotor.

C series - Pilot left door open during start. Rotorwash from a hovering aircraft blew door off.

D series - During cruise flight, the crew heard a loud pop and saw there was a large hole in the left crew door window. The door began separating, but the observer grabbed hold of it and held on until the pilot could land. Tops and bottoms of the door hinge halves were reversed (the bottom half had been used at the top and the top at the bottom). This caused misalignment of the jettison rod and prevented it from being fully seated when the door was installed. Inspection of other aircraft revealed some were received from the factory with the hinge halves reversed. Hinge halves are also being received through the parts system with inadequate markings. This could cause maintenance personnel to reverse the hinge halves during installation.



OH-58 Class E

C series - While demonstrating a confined area takeoff during a training mission, the IP misjudged clearance, and the main rotor hit a tree.

Fixed wing

T-42 Class D

A series - Aircraft was flying through a terminal control area at 650 feet msl. The crew was advised a 747 was descending to 700 feet about 15 miles ahead of their aircraft. About 5 minutes later, the Army aircraft entered severe turbulence. The turbulence was probably from the wake of the 747 which was still 9 miles away. T-42's left rear window was damaged when struck by an object from the cargo compartment.

U-8 Class E

F series - Aircraft lost power on left engine during final approach. Caused by fuel starvation to engine. Pilot may have improperly positioned fuel selector switch while changing from auxiliary to main fuel tank in preparation for landing.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followup information

on accidents previously reported

UH-1 Class A

Reported in 10 Feb 88 issue as 8811 - Aircraft was in an out-of-ground-effect hover at 25 feet above snow-covered terrain. The copilot had his attention on an aircraft that was passing to his front, and he failed to notice that his own aircraft was drifting backward and descending. As the aircraft contacted the ground, The PIC took the controls and abruptly applied collective. The aircraft rose to about 50 feet and began spinning to the right. Immediately before taking the controls, the PIC had had his attention focused inside the cockpit. In the excitement of the emergency and the environmental conditions of fog and snow, he did not have enough time to acquire visual cues, reference points, or to assimilate instrument indications. He became disoriented and lost control of the aircraft. The helicopter was destroyed when it hit the ground and rolled onto its left side.

UH-1 Class A

Reported in 29 Jun 88 issue as 8822 - During overwater rescue hoist training, a one-man survival raft was blown into the air by the helicopter's rotorwash. When the propeller of a safety boat cut the lanyard attaching the sea anchor to the raft, Air Force para-rescue personnel did not take time to reattach the sea anchor because they didn't think it was necessary. The sea anchor is designed to stabilize the raft in windy or heavy seas. If it had been attached and deployed, the raft would not have blown up into the air with such violence that it became a hazard to the aircraft. Seeing the raft rapidly ascending toward the aircraft's rotors, the pilot increased collective pitch and initiated an aft cyclic movement to back the aircraft away from the airborne raft. When the raft continued to ascend toward the rotor system, the pilot quickly initiated a second aft cyclic movement. This time the movement was excessive. The IP tried to counteract the second control input, but the pilot had moved so fast there wasn't time to prevent the tail rotor from hitting the surface of the lake. When the tail rotor contacted the water, the No. 1 tail rotor driveshaft was severed. The aircraft leveled, spun around two or three times, hit the water, and quickly sank.

AH-64 Class B

Reported in 2 Dec 87 issue as 8804 - Aircraft was on the ground at operating rpm. The crew was preparing for a running takeoff when the rated student pilot reported the master caution and oil psi accessory pump lights were flickering. The IP took the controls and returned the aircraft to parking. Before shutting down the engine, he told the student pilot to start the APU carefully because he knew the accessory pump was near the APU and it might cause a fire if the pump was leaking. When the APU was engaged, smoke billowed from the aircraft. The IP saw the crew chief signaling him to shut down the aircraft and waving for the fire trucks. The IP shouted to the student, who was "in the bag" and could not see out of the aircraft, to get out–the aircraft was on fire. In his haste to get out of the aircraft, the student kicked the cyclic out of the IP's hand, and the main rotor blades contacted the pilot night vision sensor (PNVS) turret. The warning lights were caused by failure of the shaft-driven compressor. The thrust bearing and oil slinger had failed, causing about 2 1/2 gallons of transmission oil to be pumped overboard. When the IP saw smoke billowing from the aircraft and the crew chief's signals, he assumed the aircraft was on fire. His urgency in shouting to the student pilot to get out caused the student to panic. The IP was caught off guard when the student pilot's foot hit the cyclic, and the damage to the PNVS turret was the result.

OH-6 Class B

Reported in 27 Oct 87 issue as 8801 - Upgraded to Class A. Aircraft's tailboom separated during climbout after aircraft had completed a low level, normal airspeed autorotation. Cause of separation was a main rotor strike on the tailboom during the previous autorotation. The blade strike on the tailboom apparently resulted from decay of rotor rpm combined with a slightly skid-heel-low touchdown. Loss of the aft portion of the tailboom empennage caused a complete loss of antitorque control and a severe shift in center of gravity. The aircraft began spinning to the right in a nose-low attitude. It made a nearly vertical descent, hit the runway, and continued to spin until the the fuel shutoff valve could be closed and the engine stopped.

T-42 Class A

Reported in 27 Jan 88 issue as 8810 - Aircraft was on a routine maintenance test flight when the pilot allowed the aircraft to stall. The stall quickly developed into a spin that, due to lack of altitude and proper recovery procedures, became uncontrollable. The aircraft was destroyed when it hit the ground, and the three people on board were killed. The exact circumstances that caused the aircraft to enter a stall/spin are unknown. ■

U.S. ARMY SAFETY CENTER

Spectacle lens study needs your help

In the 4 May 1988 issue of **Flightfax**, we published an announcement that the Optical Fabrication Laboratory, Fitzsimons Army Medical Center, would be studying use of polycarbonate lenses for eyeglasses. Aviators–active duty status, National Guard, and Army Reserve–who fly regularly and wear glasses were asked to participate in a test to evaluate use of the new material. Only 200 aviators out of an estimated 3,800 who wear glasses have responded. To encourage greater participation, the study has been extended to 1 May 1989. Because of the importance of this program, aviators are again being urged to participate by reporting to their local optometry clinic to order glasses with polycarbonate lenses.

Aviators who have a current prescription can order glasses with the polycarbonate lenses without making a doctor's appointment. Those who need a new prescription should make an appointment for a complete optometric examination.

Each participating aviator will receive one pair of glasses (clear lenses only) with polycarbonate lenses. These glasses are in addition to the standard authorized number of glasses issued to aviators. A letter of instruction will accompany the glasses. After wearing the glasses for 6 months, participants will be asked to complete a questionnaire and return it with the glasses to the Optical Fabrication Laboratory.

The only special instructions for use of test glasses are that they be worn whenever night vision goggles are used, and they should be cleaned by washing rather than being wiped clean while dry. Other than that, the test glasses should be worn and cared for just as any other clear-lensed glasses would be. If, at any time, the test glasses become unserviceable, they should be returned to the optometry clinic for replacement. All glasses, regardless of their condition, must be returned to the Optical Fabrication Laboratory at the end of the 6-month test period.

Aviators who are presently participating in the study should complete the questionnaire and return it with the glasses to Chief, Optical Fabrication Laboratory, Fitzsimons Army Medical Center, Aurora, CO 80045-5001.

Points of contact at the Optical Fabrication Laboratory, Fitzsimons Army Medical Center, are MSG Thibodeau and Mr. Johnson, AUTOVON 943-8158/8725, commercial 303-361-8158/8725. ■

FY89 Class A Accidents through 8 March

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	0	18	0
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	12	38	11

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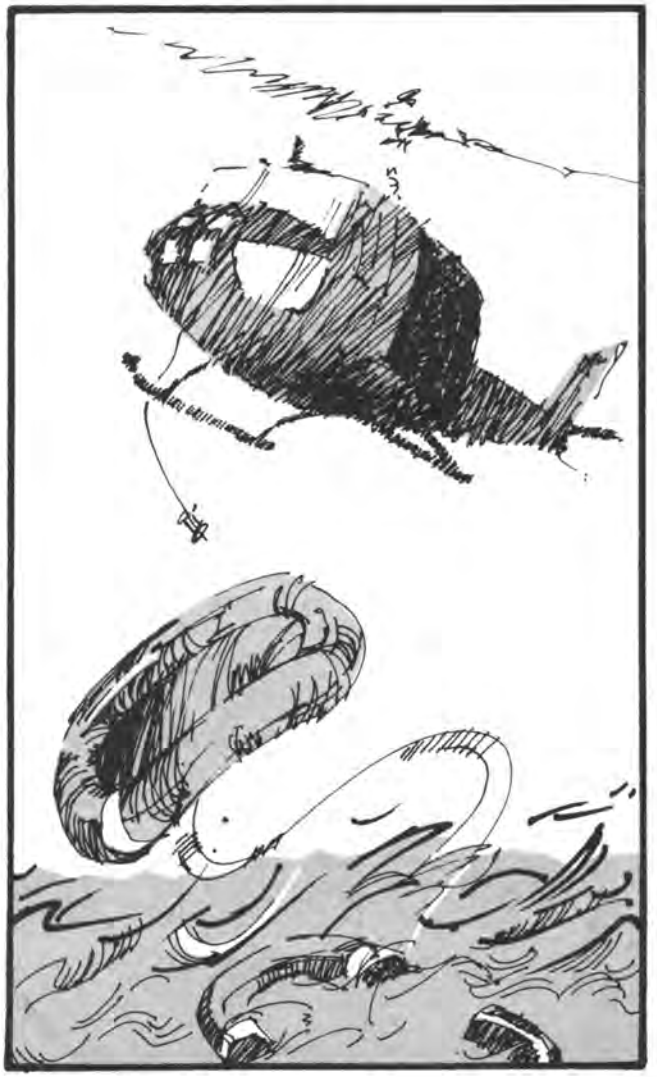
Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 11 22 March 1989

Training can make the difference in living and dying



This is an accident where there is good news and bad news. The good news is the crew survived. The bad news is we lost a helicopter.

The bad news

The UH-1V was on a VFR overwater hoist training mission. After several training runs, the crew stopped for lunch, refueled, and the pilots switched places. When the aircraft again took off from the staging site on a lake, there were five Army aircrewmembers and two Air Force parajumpers on board.

After flying a high orbit search pattern, the crew simulated spotting a downed survivor. The UT, supervised by the IP, made a low, slow pass over the target area, which was marked by a Stokes litter and a one-man rubber raft, and dropped off the two parajumpers.

On the next approach, the aircraft was supposed to pick up one of the parajumpers. As it neared the target, the aircraft was about 15 feet above the water, moving at what was described as a brisk walking pace. As the hoist was lowered in ►

Training can make the difference . . .

preparation for the pickup, the raft, which was attached to the litter, came loose and became airborne.

When the pilot saw the rubber raft suddenly begin rising toward the helicopter's rotors, he applied aft cyclic in an attempt to back the aircraft away and avoid contact. That put the aircraft in a tail-low attitude. The IP thought they had enough altitude for the aircraft to remain clear of the water and get out of the way of the raft. When the raft rose above the level of the aircraft, the pilot abruptly applied additional aft cyclic, catching the IP by surprise. The IP tried to counter with forward cyclic and increased collective, but it was too late; the tail rotor hit the water. The helicopter leveled, spun to the right two or three times, then hit the water again in a level attitude. It immediately rolled left and sank in 3 to 5 seconds.

The investigation revealed that during the earlier dropoffs and pickups, a sea anchor had been attached to the raft. But when the helicopter's rotorwash almost pulled the deployed sea anchor from the water, the parajumpers hooked the raft to the Stokes litter. As the raft and Stokes litter were being deployed for the afternoon training, the propeller on the safety boat cut the line to the sea anchor. Since they were securing the raft to the Stokes litter as they had that morning, the parajumpers weren't concerned about the loss of the sea anchor. But as the helicopter hovered over the raft and litter, the rotorwash caused the raft to flail against the litter restraint straps, and the strap's release mechanism probably caught on the wire mesh of the litter. This caused the release to open, and the freed raft blew up toward the aircraft.

The good news

The mission required both cargo doors to be open, and the aircraft sank within seconds. Both pilots opened their doors as the aircraft began sinking, and the IP and enlisted crewmember on the right side of the aircraft had little trouble getting out. The pilot and the other two enlisted crewmembers were pulled down by the sinking aircraft because they had difficulty releasing themselves from their harnesses and restraining straps. All the crewmembers surfaced and were pulled into the boat by the parajumpers.

Because of the rapidity with which the aircraft sank after hitting the water, there was a good chance of fatalities in this accident. However, during a risk control assessment of this training mission, the commander had recognized the potential hazards of overwater flight. As a result, he mandated that all aircrewmembers receive water survival training before flying the mission. A water survival course was developed and conducted, using Air Force para-rescue personnel as instructors. Investigators concluded that techniques the crewmembers learned during this training probably saved their lives. ■

Alternative test procedure for AN/PVS-5 NVGs

Preventive maintenance checks and services (PMCS) for NVGs include the high/low-level light resolution test, performed in accordance with TM 11-5855-238-20, using the TS-3895/UV ANVIS test set. This test must be performed at least every 90 days for AN/PVS-5 series NVGs in aviation use. However, some units do not have access to the test set. For those units, there is an alternate test procedure that can be used to satisfy the NVG testing requirements until fielding of the TS-3895/UV has been completed. This alternative test uses a comparison method of testing. An illuminated resolution test chart is used to compare the low light level performance of NVGs to a control NVG that has passed the TS-3895/UV low-light test within the past 30 days. NVGs that pass the comparison test are certified for 90-day use in aviation; those that don't pass are evacuated for testing on the TS-3895/UV test set.

The alternative test must be performed by individuals with 20/20 uncorrected vision (no glasses). Following are step-by-step instructions for completing the test.

Setup

• **Test facility** (figure 1). Minimum dimensions 6x14 feet, completely light tight. Verify light-tight condition by using NVGs to check for light leaks. Do not continue with test procedure until light leaks have been sealed. Failure to use light-tight room will invalidate test results.

• **Resolution target.** High contrast, 38x50-inch Air Force tri-bar resolution pattern. (Suggested source: RIT P&E Center, 1 Lomb Memorial Drive, Rochester, NY 14623. Part number 2-118-10, 38x50-Inch Air Force Tri-Bar High Contrast Resolution Test Chart, $25.)

• **Light source** (figures 2 and 3). Wooden box, 2x2x2 feet with 1x1-foot cutout covered with a white cloth (tee shirt or sheet). Center 60-watt frosted light bulb in cutout. Paint inside with flat white paint, and make all joints light tight (check with NVGs). Variac transformer must have voltage range from 0 to line voltage output. (Suggested source: Type CN-16/U, Lin #09635, NSN 5950-00-617-9235, $160). Do not use a solid-state dimmer control; it does not have adequate low voltage stability.

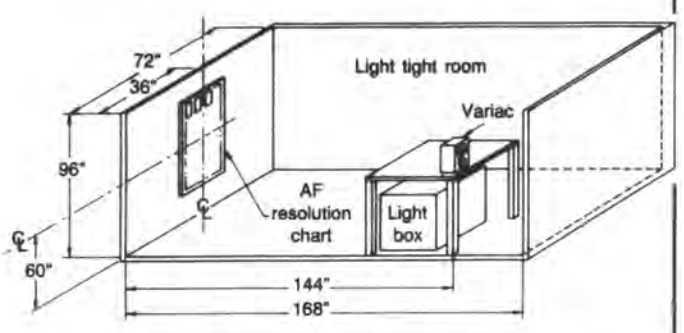


Figure 1. Test facility

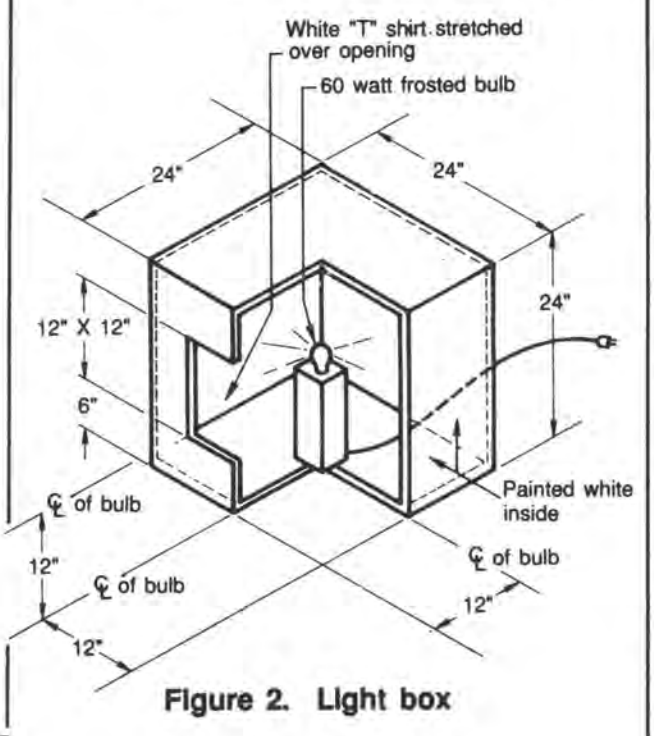


Figure 2. Light box

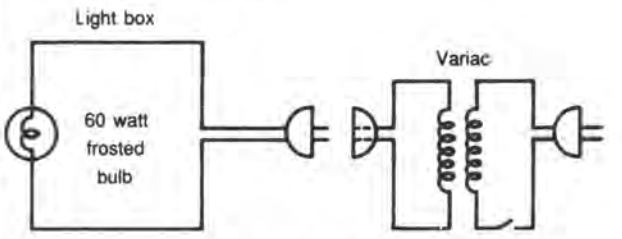


Figure 3. Electrical schematic of light box and variac

• **Table.** Large enough to accommodate seven NVGs, flashlight, and the variac light control.

• **Flashlight.** For operator's convenience only. Not used for testing NVGs. Do not use chemlights; they cannot be turned off completely during test.

• **Batteries.** New batteries for seven NVGs.

• **Personnel.** Observer/tester with 20/20 uncorrected vision (no glasses).

• **Night light.** Small incandescent night light used to illuminate resolution chart for focusing NVGs only.

• **Lens caps.** Fourteen objective and fourteen eyepiece lens caps for seven NVGs. Tape over back of lens caps if they pass light (i.e., pin holes or transparent caps). Like pairs of lens caps may be connected with string so they can be found easily in the dark.

• **NVGs.** TEST NVGs (those that are to be tested), and two candidate CONTROL NVGs. For use as candidate CONTROL NVGs, select two sets of NVGs that have passed the TS-3895/UV test set high and low light level resolution tests within the past 30 days. It is important to select control NVGs that JUST ►

FLIGHTFAX

passed. Selecting a high-performance system will set the pass/fail criteria artificially high, and many NVGs that are performing adequately will fail the alternative performance test.

• **Miscellaneous.** Lens cleaning materials, and tags with string (shoe tags) for marking NVGs.

Testing procedure

Room lights on

• Thoroughly clean the objective and eyepiece lenses on all TEST NVGs.

• Arrange candidate CONTROL NVGs and the first five TEST NVGs on a table exactly 12 feet from the resolution chart. (Test only five NVGs at a time.) Tag the candidate CONTROL NVGs so they can be distinguished from TEST NVGs in the dark. The variac control and the flashlight should also be placed conveniently on the table. Observer should stand behind the table opposite the test chart.

• Adjust variac to mid range, and ensure light source is functioning properly.

• Install new batteries in all NVGs, CONTROL and TEST NVGs.

Room lights off

• Turn off light box.

• Check room for light leaks using NVGs, and seal any leaks before proceeding further. The room must be completely light tight.

• Turn on light box, and set variac to mid range.

• Focus all NVGs that are on the table in the following manner:

- Remove objective and eyepiece lens caps from ONE tube of a candidate CONTROL NVG.
- Turn on NVG.
- Focus the objective lens, then the eyepiece (diopter adjustment). Continue focusing until best focus is obtained on the small patterns of the resolution chart. Keep both eyes open during focusing and testing. The lens caps will prevent unwanted light from entering the idle eye. (Squinting or closing one eye can cause variability of test results. Look directly through the center of the eyepiece lens; failure to do so will cause variability in the test results.)
- Replace the eyepiece and objective lens caps while ensuring the focus setting is not disturbed.
- Repeat on the other tube.
- Repeat this critical focus procedure on the other candidate CONTROL NVG and on the five TEST NVGs before proceeding.

• Select the CONTROL NVG. Both candidate CONTROL NVGs have been tested on the TS-3895/UV test set within the past 30 days and have passed the high and low light level resolution tests. Select one as the CONTROL NVG in the following manner:

- Remove the objective and eyepiece lens caps from one tube of a candidate CONTROL NVG, and turn on NVG.
- Adjust variac light control to a minimum.
- Set the light source for the high light level test condition. While observing the resolution chart through the candidate CONTROL NVG, adjust the variac to increase the light level. As the light level is increased, you will be able to resolve smaller and smaller test patterns. Stop increasing the light level when increases in the light level do not allow you to see any smaller patterns.
- Note the smallest pattern you can resolve with this tube. (See figure 4. The top test pattern is too clear and the bottom test pattern is too fuzzy. The center test pattern is just right.) Remember the number/location of this test pattern.
- Replace the lens caps and repeat the selection procedure with the other three tubes of the candidate CONTROL NVGs.
- Compare all four tubes of the CONTROL NVGs. Select the candidate CONTROL NVG tube that resolves only the LARGER resolution patterns using the high light level. This candidate NVG has the poorest resolution capability but meets minimum standards of the TS-3895/UV. This NVG tube will be the CONTROL NVG for the rest of the test. Only this tube is used for the CONTROL NVG; the other tube remains capped.

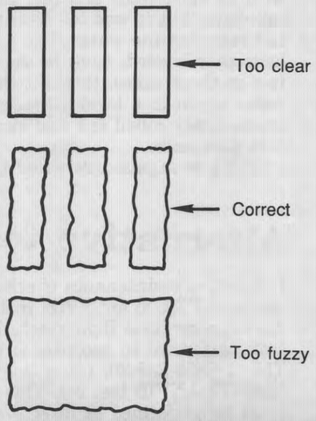


Figure 4. Sample patterns

• To establish pass/fail criteria for TEST NVGs, select a resolution pattern eight sizes larger than the one identified as the high light level resolution limit. Dim the light level until this larger test pattern can just be seen by the CONTROL NVG tube. This is the low light level resolution setting. The resolution pattern one size larger than this is the PASS/FAIL criteria for the remainder of the NVGs to be tested. Turn off the CONTROL NVG, mark it, and set it aside.

• To perform the test, uncap the objective and eyepiece lenses on one tube of a TEST NVG, being careful not to defocus the lenses. Turn on the TEST NVG and observe the resolution pattern. If you can see a smaller test pattern than the pass/fail criteria pattern, the TEST NVG passes. If you cannot see the pass/fail criteria pattern, the TEST NVG tube fails. If the TEST NVG passes the test, replace both lens caps. If it fails, replace only the eyepiece lens cap; do not replace the objective lens cap. Repeat the procedure for the second tube of the TEST NVG.

• Test the remaining TEST NVGs on the table by repeating the procedure.

Room lights on

• Identify NVGs with one or two objective lens caps missing as "Failed low light resolution test," and evacuate to maintenance for further testing on the TS-3895/UV.

• Remove batteries from the five TEST NVGs.

• Stow the five TEST NVGs and the unused candidate CONTROL NVG. Retain CONTROL NVG on the table to check light level.

• Place the next five TEST NVGs on the table and insert batteries.

• Ensure all lens caps are installed.

• Turn on small night light.

Room lights off

• Adjust night light so it illuminates the resolution chart. The TEST NVGs can then be focused without changing the low light level setting on the variac.

• Complete the focusing procedure followed for the first five TEST NVGs.

• When all five TEST NVGs are focused, turn off night light.

• Check the low light level setting for the CONTROL NVG. If the light level has increased, you will be able to see smaller patterns than the pass/fail criteria. If the light level has decreased, you will not be able to see the pattern larger than the pass/fail criteria. If the light level has changed, you must repeat the low light level setup procedure described above. If the light level has not changed, continue with the testing procedure. ■

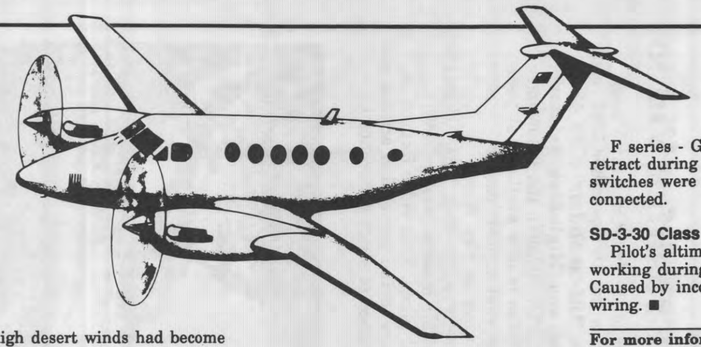
–Point of contact: CW3 Gary Helmer, Directorate of Evaluation and Standardization, U.S. Army Aviation Center, AUTOVON 558-2442/6309.

FY89 Class A Accidents through 22 March

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	3	18	0
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	15	38	11

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents



Utility helicopters

UH-1 Class E

H series - During postflight inspection, pilot noticed hole in right side of aircraft fuselage and underside. Crew did not feel or hear aircraft contact anything to cause damage.

H series - During coastdown, collective was increased to prevent rotor bounce, but collective would not increase more than 2 inches. Screw was found in collective friction brake area. Damage to screw indicated it had been lodged in collective system. Source of screw could not be determined.

UH-60 Class D

A series - During passenger loading, crew chief instructed passengers not to try to open aircraft doors at destination LZ. When aircraft landed, one of the passengers attempted to open the left cargo door, releasing the emergency exit windows. A window was cracked when one of the passengers stepped on it.

A series - Aircraft was part of a flight of seven airlifting assault troops. Aircraft landed but was still operating. Crew chief was standing outside left cargo door supervising dismounting passengers when he saw one of them drop an individual-issue-size cardboard box of blank ammunition. When he attempted to throw the box to the passenger, the box was drawn up through the rotor system.

A series - After hot refueling and shutdown, fuel was seen leaking from underside of aircraft. Caused by overpressurization during hot refueling.

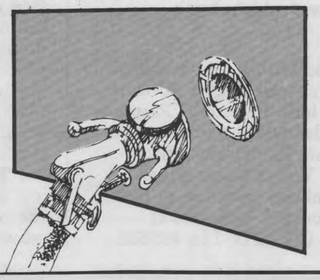
UH-60 Class E

A series - During medevac mission, oil pressure on No. 2 engine fluctuated between 50 and 130 psi. Caused by defective engine electrical harness.

Attack helicopters

AH-1 Class D

E series - During hot refueling, refueler started procedure before copilot could get out of aircraft to act as fire guard. Fuel hose was not fully connected to the nozzle, and when fuel was turned on, the pressure caused the hose to disconnect and spray fuel on the copilot who was climbing out of the cockpit. Fuel also sprayed the pilot who was still in the cockpit.



AH-64 Class D

A series - Crew noticed burning odor during flight, but there was no smoke. After about 5 minutes, odor dissipated. Crew was performing NOE flight when master caution and oil hot, nose gearbox 2, lights came on. Crew accelerated aircraft above single-engine airspeed, brought No. 2 engine to idle, and made a roll-on landing. Maintenance found a bolt used to plug hole when gearbox was painted at the factory had been left in gearbox. Bolt went into fan, destroying it and causing nose gearbox to overheat.

A series - During cruise flight, copilot noticed PNVS turret jiggling in its mount. PNVS turret alignment pin was missing and the hole was elongated. TADS frame showed signs of gouging.

A series - During postflight, after acceptance test flight, crew discovered main rotor droop stop liner had dropped and rotated, damaging static wicks.

AH-64 Class E

A series - When fumes began coming through ECS and SDC light came on, crew shut down aircraft. Caused by SDC failure. Parts from SDC housing were found close to a major fuel line.

Cargo helicopters

CH-47 Class E

C series - Left fuel pressure and Nos. 1 and 2 rectifier, generator, and SAS caution lights came on while aircraft was operating with engine condition levers in ground position and APU running. Caused by failure of accessory gearbox.

D series - Forward transmission chip light came on during cruise flight. Forward transmission was replaced.

D series - During autorotation check, No. 2 engine would not recover from 60 percent N1 to normal flight condition. Rotor rpm dropped to 92 percent during recovery. Aircraft made a roll-on landing.

Observation helicopters

OH-58 Class D

C series - Hovering AH-1 blew copilot's door off OH-58. Door was shut but not properly secured.

Fixed wing

C-12 Class E

D series - When landing gear was extended, left main landing gear down light did not illuminate and the landing gear warning lights came on. Gear was manually lowered. Left gear well was packed with ice and snow.

OV-1 Class E

D series - Nos. 1 and 2 generators went off line during cruise flight and would not reset. Maintenance found No. 2 generator was offset by one and one-half volts, causing it to kick the No. 1 generator off line.

SD-3-30 Class E

When gear was raised after takeoff, nose gear continued to indicate down and locked. Crew lowered gear and got normal down and locked indication. Aircraft made uneventful landing. Nose gear locking pin had not been removed before takeoff.

U-21 Class D

A series - While aircraft was taxiing to parking area, IP heard a loud pop from left side of aircraft. Engine was immediately shut down. FOD to one propeller blade was found during postflight. Small rocks blown by high desert winds had become trapped between cracks in taxiway. One of the rocks was picked up by propeller wash.

U-21 Class E

A series - Aircraft was accelerating after takeoff. At 180 KIAS, rudder pedals began rapid oscillation. When airspeed was decreased to 120 KIAS, oscillation stopped. Postflight inspection revealed bolt attaching rudder trim rod to rudder trim tab had apparently come off in flight.

Maintenance

UH-1 Class E

H series - Aircraft was completing a practice instrument approach in VMC conditions when cockpit started filling with smoke. Smoke cleared when heater was turned off. Mechanic failed to connect cannon plug to heater system sensor after working on heater.

OV-1 Class D

D series - About 30 seconds after takeoff on test flight, hydraulic system failed during gear retraction. During field unit repair, aluminum tubing had been used instead of the required stainless steel tubing. When a fitting cracked, all hydraulic fluid was lost.

D series - Right main landing gear would not fully retract after takeoff. Improperly installed lower right shrink rod had come loose, preventing gear from retracting.

U-21 Class E

C series - During engine runup, crew smelled burning rubber and saw smoke coming from under right seat. Wires from No. 2 starter generator to engine deice were incorrectly connected, causing wires to overheat.

F series - Gear would not retract during climbout. Squat switches were not properly connected.

SD-3-30 Class E

Pilot's altimeter light was not working during taxi for takeoff. Caused by incorrectly connected wiring. ■

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is for acc[illegible] prevention purposes only.

Safety videos available

NVG distortion evaluation

On 17 March, AVSCOM issued a message requiring a one-time evaluation of all AN/PVS-5A/B/C night vision goggles and AN/AVS-6 Aviators Night Vision Imaging Systems (ANVIS). At least two of the most experienced NVG IPs or SIPs in each aviation unit using NVGs or ANVIS were selected to conduct the distortion evaluation. Instructions spelled out in the message are demonstrated in a videotape that was also distributed.

Although the videotape was developed to aid those performing the one-time evaluation required by the 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.

The videotape **"NVG Distortion Evaluation"** (TVT 46-18, PIN 708321) is available at audiovisual support offices Armywide.

Two previously produced videotapes on night vision goggle training and operations are also available at local audiovisual support offices.

•**"Flying Goggles: A Special Report"** (TVT 46-15, PIN 707999). Targeted at operational pilots, this video 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). Targeted at aviation unit commanders, this video focuses on the development of a night operations SOP for a typical UH-60 unit. ■

New Crashfax Video

In addition to the two Crashfax Videos announced in the 16 November 1988 issue of *Flightfax*, **"UH-60 Midair"** (CFV 46-1, PIN 707996) and **"High-Risk Aviator"** (CFV 46-2, PIN 707997), the following Crashfax Video is now available at your local audiovisual support center.

•**"Surviving in the Wire Environment"** (CFV 46-3, PIN 708002) is targeted at air mission leaders and operational pilots. This video focuses on five key wire strike prevention actions and the importance of strict adherence to standards.

These Crashfax Videos are not typical "safety films." They are short and to the point re-creations of real accidents. They don't just tell what happened, they show what happened. These videos 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. ■

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Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 12 5 April 1989

Emergency locator transmitters: A historical perspective

In the early 1970s, Congress enacted a law to install emergency locator transmitters (ELTs) on general aviation aircraft. These aircraft normally fly on single-ship missions without flight plans and benefit of flight following. Commercial airlines and military fixed wing aircraft are not required to have ELTs because they are continuously tracked by the FAA's air traffic control system. Helicopters are also exempt from the FAA ELT requirement.

Over the years, installation of ELTs in all Army aircraft has been advocated by some, while others oppose the idea. Current policy allows commanders to install ELTs on aircraft that routinely operate in remote/isolated locations and on a case-by-case basis. (Airworthiness releases from Aviation Systems Command are required before ELTs are installed in aircraft.)

Among the reasons cited for not installing ELTs in all Army aircraft are–

•Army aircraft normally operate within the confines of military reservations or on standard flight routes. Mission planning, briefing, brief-backs, and mission execution coupled with flight following offer the best possibility for timely location of downed aircraft.

•ELTs would not be used during combat. Downed aircrews would use survival radios, which permit movement to evade capture and improve the possibility of rescue. The personnel locator system (PLS) and the more capable PRC-112 survival radio, which will be fielded this year, will provide aircrew location and rescue capability in peacetime as well as combat.

One type of ELT being installed in Army aircraft

Emergency locator transmitters..

•A standardized ELT for Armywide use would require a full-scale development program, which is not currently programmed or funded. Initiation of an R&D program for ELTs would force termination of the current procurement process.

•Future developmental military aircraft and commercial aircraft such as the C-12, which has been adopted for military use, will probably have ELTs installed.

•Army aircraft are not equipped with any type of "homing" equipment for ELTs.

An ELT might have made the difference

Since FY 80, Army Safety Center investigators have cited the lack of ELTs in eight aviation accident investigations. In some of these cases, a delay in locating the downed aircraft could have made a difference in life and death.

•The pilot, copilot, and one passenger of a UH-1 were killed when the aircraft crashed in a heavily wooded mountainous area. Another passenger, who had loosened his seatbelt before the crash, was injured when he was thrown out, and he was unable to get to the crew chief pinned in the wreckage. The next day, with the help of the surviving passenger, the crew chief was able to free himself. The two survivors had walked about three-quarters of the way down the mountain before an Air Force aircraft picked up a transmission from their survival radio. Several civilian aircraft had overflown the crash without hearing the radio, which transmits on UHF 282.8 and guard frequency 243.0. (Few civilian aircraft are equipped with UHF.) The aircraft was not equipped with an ELT.

•Two civilian contractor test pilots were performing a test flight in a UH-60 when the aircraft lost tail rotor thrust. Both pilots suffered disabling back injuries when the aircraft autorotated into 35-foot trees. The pilots had been in continuous contact with the field at which the aircraft was based. Although search and rescue aircraft were immediately launched, it was 1 hour and 40 minutes before the survivors were found. The pilots' attempt to contact search aircraft with the downed aircraft's radios was unsuccessful, and the survival radio was inoperative due to corrosion of the battery cap. There was no ELT on the aircraft.

•The IP of an OH-58 was conducting combat skills training with an aeroscout observer. The aircraft was flying at low-level over a heavily wooded area when the power takeoff gear in the accessory gearbox failed, and the IP was forced to autorotate. The IP was killed when the aircraft fell about 30 feet through the trees and hit the ground. The seriously injured student observer was unable to free himself from the wreckage or reach the survival radio, which was in the IP's survival vest. The aircraft was not equipped with an ELT. Although search and rescue actions began as soon as it became apparent the aircraft was overdue, the wreckage was not located for 3 hours and 20 minutes after the crash. Fortunately, the injured crewmember survived.

Problem areas

•**False alarms.** As many as 95 percent of ELT alarms are false alarms. Some of these alarms occur during ELT shipment. ELT's are very sensitive to maneuver and landing dynamics, weapons firing, and hard door slams.

•**Unreliability of equipment.** In seven out of ten civil aviation crashes, the ELTs fail to work.

•**Emergency-frequency jamming.** When an ELT alarm is activated, emergency frequency 243.0 is essentially jammed by the ELT alarm signal until the alarm is deactivated.

•**Lack of standardized Army procedures.** ELTs are nonstandard NDI items.

--There are no Army publications with shipping instructions for ELTs.

--There has been no formal testing by the Army.

--There are no standardized Army procedures for ELT use.

--There are no standardized Army procedures to deal with ELT activations/false alarms. There have been reports of slow response by Army units after duty hours when notified of ELT alarms. In some cases duty officers are not aware of actions to be taken when notified of ELT alarms.

The Army currently has ELT **locators** only at Fort Bragg, NC, Fort Rucker, AL, and Fort Wainwright, AK.

Status of ELTs in Army aircraft

•Currently there are more than 2,000 ELTs at various Army installations and National Guard locations.

•Procurement is through local purchase by the units wanting ELTs.

•Airworthiness releases are being issued on a case-by-case basis to units/stations by type aircraft.

•Installation is being accomplished using manufacturer's procedures and instructions as well as those contained in the airworthiness releases.

Current and future actions

•Effort has begun to develop standardized ELT procedures for use Armywide.

•Work is under way by Army Aviation Systems Command on a standardized airworthiness release format for ELT installation in different aircraft.

•MACOMs and using units should develop SOPs for ELT use and locating ELTs when notified of an ELT alarm activation.

•A hand-held ELT locator directional finder is an NDI item available commercially.

•A personnel locator system (PLS) currently in production can be used to directionally locate ELTs with an activated alarm on frequency 243.0. Fielding of the PLS and the PRC-112 survival radio will provide the Army with an aircrew location and rescue capability in peacetime as well as combat. ■

Warning to aviators on operating characteristics of the PRC-90 survival radio and ELTs

A 1986 midair collision of two UH-60 helicopters generated concern about the operational characteristics of the emergency locator transmitter (ELT) and the survival radio (PRC-90). Although the electronic devices were working, this accident highlighted the need for aircrewmembers to understand and use the proper operating procedures for this equipment.

When the crew of one of the downed aircraft attempted to use their PRC-90 radio, all they could hear were beacon noises from the ELT. The ELT was operating on 243.0 MHz, the same frequency they were using for the radio.

The following operational characteristics of the ELT and PRC-90 radio must be kept in mind.

•The ELT transmits on VHF 121.5 and UHF 243.0 MHz.

•The survival radio beacon mode transmits on 243.0 MHz and has voice transmitting and receiving capability on 243.0 and 282.8 MHz.

To prevent problems in operating this equipment, turn off the ELT and select 243.0 MHz on the PRC-90 for voice communication. If the ELT is operating and is inaccessible, select 282.8 MHz (alternate frequency) on the PRC-90 for voice transmission.

Remember, these line-of-sight transmissions are blocked by terrain features. Rescue aircraft must ensure adequate altitude to compensate for the line-of-sight limitation, and they must remember to monitor the appropriate guard frequencies. ■

FLIGHTFAX

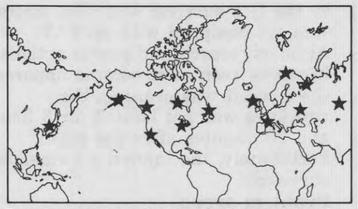
COSPAS/SARSAT: Guardian angel of the skies

COSPAS (a Russian abbreviation for Space System for Search of Vessels in Distress) and SARSAT (Search and Rescue Satellite-Aided Tracking System) are examples of international cooperation that transcends political and geographical boundaries.

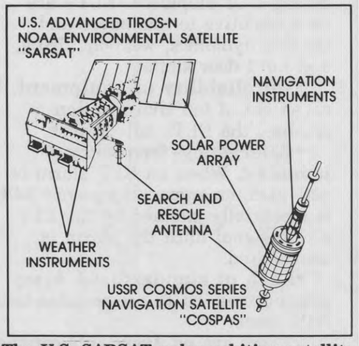
The COSPAS/SARSAT program was founded by the United States, Canada, France, and the Soviet Union. Other countries have since joined the program, including Bulgaria, Denmark, Finland, Norway, and the United Kingdom. Additional countries are negotiating for participation.

As SARSAT and the Soviet Union's COSPAS satellites circle the earth, their antennas pick up signals from downed aircraft, boats in distress, and other emergency situations. These distress signals are retransmitted from the satellites to ground-based local user terminals (LUTs). There are 13 local user terminals: 3 in the United States; 3 in Canada; 1 each in France, Norway, and the United Kingdom; and 4 in the Soviet Union. Signals are processed at the LUTs, and the location of the aviator or mariner in distress is recorded and sent to mission control centers (MCCs). From the MCC, the information is forwarded to the rescue coordination center (RCC) closest to the accident site or to an MCC in another country.

The MCC for the United States is located at Scott Air Force Base, IL. At the USMCC, data from emergency locator transmitters



Local user terminals are located in the United States, Canada, the United Kingdom, France, Norway, and the Soviet Union.



The U.S. SARSAT polar orbiting satellite circles the earth every 102 minutes. The U.S.S.R. COSPAS polar orbiting satellite circles the earth every 105 minutes. The circular orbit of both satellites permits uniform data collection.

(ELTs) on aircraft are sorted geographically and transmitted to the U.S. Air Force RCC–also located at Scott–and to the Alaska Air Command RCC at Elmendorf Air Force Base. Data from emergency position indicating radio beacons (EPIRBs) in marine vessels are geographically sorted and distributed to 11 U.S. Coast Guard RCCs. Search and rescue (SAR) forces are sent out by either the Air Force or Coast Guard.

In the first 3 years of the test and evaluation period, more than 500 lives were saved with the help of the COSPAS/SARSAT satellites.

The common operational COSPAS/SARSAT ELT and EPIRB radio frequency is 121.5 Megahertz (MHz). This frequency provides the location of an aviator or mariner in distress with an accuracy of 5 to 10 miles. Almost half the world is covered and ready to receive emergency distress signals on this frequency.

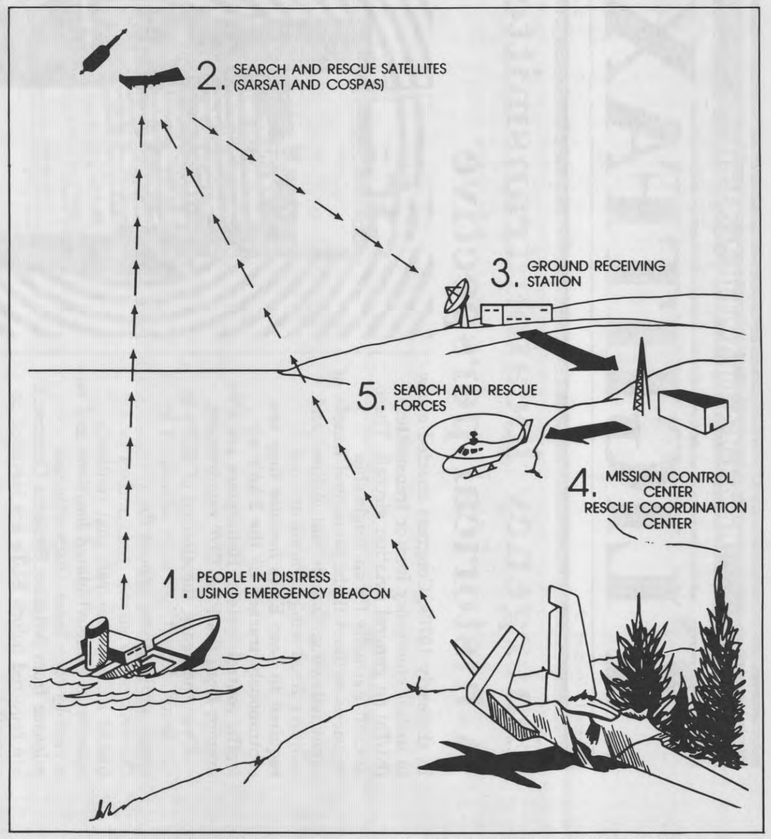
The new ELT EPIRB 406 MHz radio frequency will provide the location of an aviator or mariner in distress with an accuracy of 1 to 3 miles. The 406 MHz signals are also stored aboard the spacecraft for later relay to the next available station, giving it the capability to cover the entire globe. The 406 MHz transmits a digital signal containing information unique to that particular beacon such as identification, type of vehicle (aircraft or surface vessel), and country code.

False alarms of ELT and EPIRB are a very real problem. When a false alarm is caused by unintentional activation of the ELT or EPIRB beacon through improper handling, equipment failure, or incorrect mounting, disposal, testing, or shipment, SAR forces must track down the distress signal. This wastes expensive resources and, until the beacon can be located and turned off, it can prevent a real distress signal from being heard.

To assist in lowering the false-alarm rate, pilots and mariners should–

- Add an ELT/EPIRB check to all "shutdown" procedure lists.
- Monitor the 121.5/243 MHz channel before leaving the craft to ensure that the ELT/EPIRB is not transmitting a signal.
- Limit the duration of tests to only a few seconds at authorized times.
- Avoid unnecessary use of the emergency channel for voice transmissions.
- Remove the battery before storage, shipment, or disposal of an ELT or EPIRB. All ELTs and EPIRBS have the potential for sending a false alarm. Removal of the batteries eliminates this potential. ■

–Adapted from information furnished by the National Oceanic and Atmospheric Administration National Environmental Satellite, Data, and Information Service and the National Aeronautics and Space Administration.



Signals from an ELT or EPIRB are received by the SARSAT and/or COSPAS satellites and retransmitted to a ground receiving station. The location of the person in distress is passed on to mission control or rescue coordination centers.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class A

H series - Aircraft was chalk 4 in five-ship formation conducting an NVG air assault to a frozen lake. Flight landed in a staggered right formation.

Accident aircraft touched down and slid about 309 feet. PIC attempted to stop the aircraft by applying aerodynamic braking but was unable to stop. The aircraft's main rotors hit the rotors of one of the other aircraft, damaging both aircraft. 8912

UH-1 Class D

H series - During postflight inspection, No. 1 tail rotor drive shaft cover was found open. Front latch on No. 2 tail rotor drive shaft cover was unlocked. No. 2 tail rotor drive shaft showed signs of scoring.

UH-1 Class E

H series - The crew was unable to locate grid coordinates for which they were searching. The PIC was unsure of his position but did not tell the copilot. About 10 minutes later, the 20-minute fuel light came on. The PIC spotted an airfield and landed.

H series - Tail rotor pedals became stiff during flight and appeared to lose hydraulics. Caused by failure of tail rotor servo.

H series - When maintenance test pilot turned hydraulic power off and back on during hydraulics check, power was not restored within required time limit. Caused by failure of irreversible valve.

H series - A nearby hovering aircraft blew pilot's door shut, breaking sliding window.

H series - Transmission oil line chafed against transmission housing and began leaking. Maintenance replaced oil line.

UH-60 Class C

A series - During cruise flight before a combat assault maneuver, passenger opened aircraft door. Instead of guiding the door back to the stop as he had been briefed, he released the door and it slammed back against the stop, breaking the stop. The door came off its track and was drawn up through the main rotor blades.

UH-60 Class D

A series - After refueling, refueler jerked fuel nozzle up and down to remove it from fuel port. Two screw heads were broken off closed circuit fuel port.

A series - Puncture in stabilator was found during preflight. Suspect stabilator struck something while crew was executing NOE decelerations during flight the previous night.

A series - Aircraft brakes were serviced before flight. During taxi, pilot noticed brakes seemed to be dragging, then left main tire blew out. Master cylinder had been overfilled.

A series - When windshield anti-ice was turned on during flight, copilot's windshield cracked. OAT was 10°C.

Attack helicopters

AH-1 Class A

S series - Aircraft was chalk 3 in a flight of four. The PIC, who was flying the aircraft from the front seat, told the pilot they had trouble. Crew of chalk 4 saw the accident aircraft begin to fishtail, and the tail rotor appeared to be slowing down. PIC attempted to make what appeared to be a running landing. Front tip of left skid contacted the ground, and the aircraft came to rest inverted. The PIC was killed. 8913

AH-64 Class B

A series - Visual display unit failed during landing, and the radar jammer power supply light came on. PIC reset circuit breaker on radar jammer and taxied to parking. Upon shutdown, pilot smelled smoke. During postflight inspection, crew discovered wiring bundle had chafed on radar jammer power supply. Wiring bundle shorted out, causing extensive damage to the line replaceable units in left-hand forward avionics bay. 8914

Cargo helicopters

CH-47 Class B

D series - During an NVG air assault mission, lead aircraft in flight of three encountered brownout while on approach for landing. Aircraft was traveling at about 10 knots when it struck a berm. 8915

CH-47 Class D

D series - Driver of an M1008 failed to follow flight engineer's instructions. His NCOIC, who was guiding the vehicle, misjudged clearance, and the vehicle tore soundproofing on right aft side of aircraft.

D series - Aircraft was flying over forest en route to field location. Pilot failed to see tree in his path, and aircraft struck top of tree. Right lower windshield and searchlight were broken.

D series - During taxi, crewmember saw tunnel covers of aircraft parked on adjacent taxiway had opened. Unsecured tunnel covers on the unattended aircraft were damaged.

CH-47 Class E

C series - No. 1 engine transmission hot and master caution lights came on during low-level NVG flight. Broken wire in harness leading to sensing unit was shorting out, causing false indication.

D series - While attempting to hook up an external load, pilot saw utility hydraulic light come on, and utility hydraulic system pressure dropped. Load had not been hooked up, and aircraft immediately landed. Caused by failure of utility hydraulic system pump.

D series - When No. 1 engine condition lever was advanced from ground to flight position during HIT check, engine failed to respond. Caused by failure of minimum beep resistor.

D series - Broken VOR antenna was found during postflight inspection. Suspect antenna was broken during upslope landing on pinnacle.

D series - During cruise flight, flight engineer saw fluid leaking from No. 2 flight boost module. Aircraft landed and maintenance found auxiliary ground power unit line leading into No. 2 flight boost module was leaking at connecting fitting.

Observation helicopters

OH-58 Class A

C series - Aircraft was westbound when it took off after refueling at a FARP. Turning back to the east, the aircraft began a left bank, descended, and crashed into trees. 8916

Fixed wing

U-8 Class D

F series - PIC turned short from taxiway to runway, and right wheel slipped off runway and sank in soft mud. When PIC applied power to extract the aircraft, the right propeller hit a runway light, damaging the blades.

OV-1 Class E

D series - Master caution and fuel boost lights came on during flight. Indicated fuel level was 1,600 pounds. Caused by failure of aft fuel boost pump.

U-8 Class E

F series - During takeoff, with landing gear partially retracted, aircraft had a complete electrical failure. PIC immediately turned and leveled off to avoid IMC with known icing conditions. Aircraft reentered traffic pattern, and pilot pumped landing gear down. Aircraft made a no-flap landing at the airfield. Suspect failure of voltage regulator.

U-21 Class E

C series - During cruise flight, right bleed air line failure light came on. Caused by failure of bleed air sensor line.

Safety messages

- Safety-of-flight maintenance mandatory message concerning one-time replacement of P/N AN320-5 and AN320-6 slotted nuts on all UH-1C/M, UH-1H/V, and EH-1H/X series aircraft. Contact: Dong K. Nguyen, AUTOVON 693-9089, commercial 314-263-9089

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety

Aviation Center fleet to receive ELTs

Work is under way to install emergency locator transmitters (ELTs) in all training helicopters at the U.S. Army Aviation Center. ELTs have already been installed in 227 UH-1 aircraft. In addition to the Hueys, airworthiness releases have been received for the OH-58A-C models, UH-60, and AH-1 aircraft. Still awaiting airworthiness release from Army Aviation Systems Command (AVSCOM) are the Aviation Center's AH-64, CH-47D, and OH-58D aircraft.

SFC Bruce Swarthout, NCOIC Lowe AAF Aircraft Logistics Maintenance Division, inserts an ELT into its bracket on a UH-1 helicopter.

Following receipt of guidance/clarification from AVSCOM, a qualitative electromagnetic compatibility (EMC) test will be performed on UH-60, AH-1, AH-64, OH-58D, and CH-47D aircraft in the Aviation Center fleet.

The ELT being installed in helicopters at the Aviation Center has a beacon range of 600+ miles with the SARSAT satellite, and is designed to withstand shock in excess of 1,000 G's.

The Aviation Training Brigade at Fort Rucker has begun training aviators and student pilots on ELTs. Included in this training are preflight and postflight inspections and in-flight procedures. The training also covers Aviation Center search and rescue operations. Direction finding equipment has been located in each of the aviation training battalions and the medevac flight detachment. ■

–Point of contact for ELT information at AVSCOM is Mr. Al Reese, Aviation Electronics Management Office, AUTOVON 693-1391, commercial 314-263-1391.

FY89 Class A Accidents through 5 April

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	18	38	11

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 Number 13 19 April 1989

Peak training months ahead call for increased vigilance

During the first half of FY 89, there were 16 Class A aviation accidents. That is five more than for the same period in FY 88. The brighter side of the picture is that during the same period, there have been 17 fewer fatalities this fiscal year.

Last year from April through September–which includes the peak summer training months–there were 21 Class A aviation accidents. Preventing a similar surge in accidents this year calls for increased vigilance by everyone from commanders and operations people who perform risk control mission planning, to the aviators who fly the mission, and ground support personnel who ensure the aircraft are ready to fly.

As the tempo of summer training increases, Army aircraft will be flying more troop lifts and transporting more equipment. At the same time, hotter temperatures and, in some cases, high humidity will be taking their toll on people and aircraft. With the additional demands placed on crews and aircraft during the peak exposure months that lie ahead, there must be a corresponding increase in attention to all details of pre-mission planning.

Peak training ahead . . .

Hot weather flying can produce some unpleasant surprises for the inexperienced aviator or even an experienced pilot who has recently come from a cold or temperate climate to one where the temperatures soar in the summer.

Pressure altitude

The air in our atmosphere is subjected to pressure from the weight of the air above it. Therefore, air close to the earth's surface is subject to greater pressure and is denser than air at higher altitudes. However, when air is heated, it expands, and thin air provides less lift for aircraft. This effect of temperature on pressure altitude brings us to the problem of density altitude (DA).

Density altitude

Simply put, DA is pressure altitude corrected for nonstandard temperature. Standard temperature in the United States is 59°F, based on the year-round sea level temperature averages. Under standard atmospheric conditions, each level of air in the atmosphere has a specific density, and under standard conditions, pressure altitude and density altitude identify the same level.

Since aircraft performance data at any level is based upon air density under standard day conditions, such performance data applies to air density levels that may not be identical with altimeter indications. Under conditions higher or lower than standard, these levels cannot be determined directly from the altimeter. For example, if the temperature is above standard, the expansion of air raises the density levels.

The atmosphere of an airfield with an elevation of 300 to 500 feet can actually be between minus 1,000 and plus 4,000 feet when measured in terms of density altitude, depending on weather and time of day.

In desert country where the nights are cold and the days extremely hot, the shifts in DA can be truly amazing. This can be disastrous for the uninitiated.

A load a helicopter can handle with ease in cool temperatures can prove too much when the temperature is high. This can be particularly critical during confined area landings and takeoffs, while hovering, or during autorotation. And the effects of DA don't wait until the temperature reaches 100° at 1400 in the afternoon. The performance of a helicopter can be affected as soon as 1 hour after sunrise.

With hot weather already here in some parts of the world, the pilot who wants his aircraft to perform as he asks it to should remember some basic rules:

- Compute DA <u>before</u> weight and balance.
- Always assume DA is a little higher than it probably is.
- Study the DA tables in the operator's manual.
- Act accordingly.

Weight and balance

The crew of a UH-1 was scheduled to transport eight soldiers in MOPP-4 gear to a field training site to conduct a radiological survey. After briefing the mission the night before the accident, the platoon leader asked about a PPC (performance planning card). The copilot pulled out a PPC from the lower pocket of his flight suit and held it up, giving the impression that it was complete. It wasn't. At the time, the copilot didn't even know the exact number of

passengers or what the weather would be like for the mission. Actually, only the departure portion of the PPC had been completed, and it was incorrect. The copilot had estimated his gross weight at 9,100 pounds. He used 33°C for temperature, 1,060 feet for pressure altitude, and a CAL factor of 61.7. With this information, he determined the maximum torque available was 50 psi CAL and 51 psi indicated, and the maximum allowable GWT IGE was 9,500 pounds. The actual figures at takeoff were–gross weight 9,100 pounds, temperature 30°C, pressure altitude 800 feet, and a CAL factor of 59.7. The pilot did not check the PPC, leaving it up to the copilot to complete.

The copilot was flying the aircraft the next day when it took off at 1030 hours. He completed a 5-foot hover check, and the indicated torque was about 33 psi. The flight was uneventful until about 1045 hours when the copilot began a final approach to an unimproved LZ to drop off passengers. After spotting some metal stakes in the area where he initially intended to land, he discussed the situation with the pilot and selected a landing area to the aircraft's right rear. He had continued his deceleration while selecting a new landing area. Using right cyclic and pedal, he began a right 180-degree turn with the aircraft at an altitude of about 35 feet. The aircraft went into a nose-low right spin and was only 15 feet agl when the copilot initiated an autorotation. The spin stopped, but the copilot applied collective pitch too soon as he attempted to cushion the aircraft. Rotor rpm decayed, and the aircraft landed hard.

The copilot had allowed the aircraft to go below effective translational lift in an OGE configuration with high gross weight and high free air temperature. The aircraft was 558 pounds over the maximum allowable gross weight of 8,400 for the flight conditions induced by the copilot.

Winds

Add wind to the effects of high temperature and humidity, and summer flying gets even more complicated.

A helicopter was making an approach to a ridgeline to the northeast. About 10 feet from touchdown, the nose tucked and the aircraft spun to the right. The pilot tried applying full left pedal, but there was no effect. He allowed the aircraft to continue forward and added additional forward cyclic. As the aircraft continued to spin right, both the low rpm audio and warning light came on. The aircraft spun around twice and the tail rotor hit the opposite slope. The aircraft crashed and rolled down the slope.

A wind gust from the southerly quadrant had caught the aircraft in a downwind condition during a time of high power demand. In addition, the pressure altitude was relatively high. The pilot's corrective actions–left pedal, forward cyclic–were too little, too late, or both.

A review of the basic principles in chapter 4, FM 1-202: Environmental Flight, on wind indicators might be in order before an encounter tests your coping skills as it did in the following incident.

After making a reconnaissance of a forest fire, an Army helicopter flew to a pond to pick up water. As the aircraft descended, its rate of descent became excessive. The copilot, who was on the controls, pulled collective, attempting to arrest the rate of descent. The left pedal went all the way to the stop, and the pilots said it felt like the bottom had fallen out. As torque dropped through 65 pounds, the pilot got on the controls, reduced collective, and flew to the nearest landing area. The aircraft apparently was in a downwind condition when the copilot allowed an excessive sink rate to develop.

Understanding the effects of such things as density altitude and winds on aircraft operations isn't enough. Only through meticulous planning for every phase of the flight, considering all of the conditions that may be encountered, can accidents like these be avoided, particularly under the stresses of field training and hot weather flying. ■

FLIGHTFAX

Hot weather operations call for special care for your aircraft

The following tips for taking care of aircraft in the desert were originally developed from lessons learned at the National Training Center at Fort Irwin, CA. But high temperatures, dry winds, and dusty conditions can be encountered almost anywhere. With the increase in field operations, increased attention to your aircraft on the ground can prevent a lot of grief later on.

• Keep the aircraft clean. That reduces the wear and tear caused by a buildup of sand and dirt.

• Use protective covers between flights to protect the aircraft from excess heat and to stop sand and dirt from getting into moving parts.

• Wipe oil and grease off engine decks and cowling-covered parts.

• Make sure all filters and air cleaners are inspected and cleaned daily.

• Cover radios and receivers with dust covers whenever possible. Clean ventilating ports and channels to stop overheating.

• Blow sand and dirt out of instrument panels, switches, flight controls and cables.

• Tape all openings or seams around windows, chin bubbles, and access panels. Be sure you don't stop airflow that's needed to cool parts.

• Clean all fuel, oil, and instrument filters daily.

• Lubricate the main and tail rotors after every flight or at least daily.

• Ensure that lubricant and fuel containers are covered when not in use.

• Replace damaged sealant around windows, doors, and chin bubbles.

• Remove the oil cooler compartment access panel daily, and clean caked dirt and sand off the fan's inner lip.

Windows

If the aircraft's windows are pitted or crazed, the pilots won't be able to see reference points. Keep the windows clean and covered when the aircraft is parked.

Don't let covers touch the windshield. Protect windows with Styrofoam, newspaper, cardboard or any other non-abrasive material–then attach the cover.

Contamination

Add oil and hydraulic fluid directly from their original unopened containers. That helps stop sand and dirt from getting into the helicopter's lubrication and hydraulic systems.

When a POL can is opened, NEVER save what's left. Don't pour it down the nearest drain, though. Follow your local SOP when disposing of leftover oil.

Lubrication

Grease acts almost like a magnet for sand and dirt. A combination of grease, sand, and dirt forms a paste that grinds and wears lubricated parts. Wipe off excess grease every time you apply lubricant.

Inspect and purge all lubricated bearings daily.

Rotor blades

High winds combined with sand or dirt landing pads can sandblast the paint off a helicopter's blades in a flash. Stay on top of blade erosion by inspecting the blades after every flight.

You can slow erosion by covering the leading edge of main rotor blades with pressure sensitive tape, NSN 7510-00-145-0171. Before you try this, however, remember to get approval from–U.S. Army Aviation Systems Command, ATTN: AMSAV-E, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798

To apply the tape:

• Clean the blades with aliphatic naphtha, NSN 6810-00-238-8119.

• UH-1H and AH-1S mechanics should first put a 2-foot-long piece of tape on the bottom of the blade.

continued on back page ➤

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class A

M series - Aircraft was at 100 feet agl and 80 KIAS. While in a 30-degree bank abeam of landing site, low rpm light and audio came on. Aircraft hit hard in a level attitude, slid about 100 yards, and came to rest on its top left side. 8917

UH-1 Class C

H series - Aircraft was hovering IGE at about 1-foot skid height. A strong gust of wind lifted the aircraft's tail, causing the lower WSPD to contact the ground. The pilot corrected with aft cyclic and lowered the collective to put the aircraft on the ground. The aircraft landed hard and rocked back, causing the main rotor to contact the top WSPD.

UH-1 Class D

V series - While at a hover, the aircraft drifted aft and settled to the ground. Pilot applied collective just as aircraft contacted the ground. Wind began gusting to 35 mph just before the incident occurred.

UH-1 Class E

H series - Aircraft had flown about 3 miles after picking up a slingload. The helicopter was about 150 feet agl at 40 KIAS when it shuddered and ascended about 150 feet. Load had released.

H series - During initial stages of start procedures, crew felt two bumps from rear of aircraft. Crew had left tiedown hanging on main rotor.

UH-60 Class A

A series - After departing range control, crew encountered reduced visibility. While attempting to land in an open field, aircraft contacted several trees before hitting the ground and coming to rest on its right side. One passenger was seriously injured. 8918

UH-60 Class C

A series - While waiting for hot refueling, PIC contacted lead aircraft, stating he was critically low on fuel. Pilot of lead aircraft told the PIC that a refueling point was open, and he could take it. The PIC began taxiing to the right front without contacting the tower. As he taxied forward, the main rotor blades of his aircraft contacted the main rotor blades of another aircraft.

UH-60 Class D

A series - During preflight, crew noted abrasions and a hole worn in the trailing edge of stabilator. While demonstrating NOE decelerations the previous day, IP allowed aircraft's tail to get too low, and stabilator contacted runway.

A series - After landing, passenger pulled emergency exit handle on left cargo door, jettisoning both windows. One window was cracked when it hit the ground.

Attack helicopters

AH-1 Class B

F series - Aircraft was maneuvering at 80 KIAS, 300 feet agl, while attempting to rendezvous with a flight of UH-60s during combat assault training operations. As the aircraft flew around side of steep mountain, it hit and cut one of seven 1-inch power lines. After hitting the wire, the crew experienced control feedback and severe vibration. The PIC made a power-on autorotation to a field about 600 meters in front of the aircraft. 8919

AH-1 Class C

S series - Aircraft had shut down, but blades were still in motion. An OH-58 picked up to a hover behind the Cobra. Pilot of OH-58 had full aft cyclic applied, attempting to maintain position. Suspect tail wind coupled with rotorwash from the OH-58 caused the AH-1's main rotor blade to flap down and strike the tail boom, tearing the main rotor blade at root.

AH-64 Class D

A series - During postflight following acceptance test flight, crew discovered main rotor static ring had fallen, damaging static wicks.

A series - Aircraft was hovering in an open field following simulated missile engagement. As aircraft was repositioned to next firing position, main rotor blades struck a 50-foot tree, causing damage to all four main rotor blades.

Observation helicopters

OH-6 Class C

A series - During runup for test flight, engine came apart at the exhaust collector and power turbine flanges. Parts from engine went through fuselage and tail rotor drive shaft. One main rotor blade was also damaged by debris.

G series - While pilot, who was operating the aircraft from the right seat, was backing aircraft into parking spot, he allowed the aircraft's main rotor blades to hit a security light pole at edge of parking ramp.

OH-6 Class D

A series - While taxiing from runway, IP initiated a simulated engine failure at a hover. Pilot landed and, while aircraft was sliding forward on the ground, pad on right skid tube caught on frame of taxiway light. When the aircraft abruptly stopped forward movement, its nose pitched down, rear portion of the skids left the ground, and the aircraft begin a swing to the left. IP applied corrective action and stabilized the aircraft.

A series - Aircraft was in cruise flight at 300 feet agl in marginal VFR weather. When rainshower was encountered, windscreens fogged up, and crew lost sight of the ground. While observer attempted to clear right windscreen, pilot decided to land in a field. During approach, using color contrast as his only reference, pilot allowed tail rotor to hit top of a large tree about 150 feet agl. He continued approach until loss of tail rotor effectiveness caused a gradual loss of directional control at about 20 feet agl. He initiated a hovering autorotation, and the aircraft landed with no further damage. Vent tube for cabin heat/defogger had vibrated loose at joint.

OH-58 Class A

A series - Aircraft was destroyed when its main rotor blade struck a sand dune during NOE flight in support of tactical training exercise. Pilot was seriously injured. 8920

C series - During attack team training mission, crew conducted evasive maneuver to avoid MILES engagement. Aircraft struck the side of a wash, hit the ground, and rolled over. 8921

OH-58 Class D

A series - Pilot attempted to start aircraft with one blade tiedown hanging from rotor blade. Tiedown struck vertical fin stabilizer, ripping off a 1-inch strip.

A series - Damage to aircraft aft of left cargo door was found during postflight. Damage apparently was caused by an extension strap from a sleeping bag left hanging outside the door.

OH-58 Class E

C series - Aircraft was in a right bank during NOE flight about 20 feet agl. When the pilot saw a single wire in his path, he tried to fly under it. The main rotors cut the wire. Ground unit had strung the wire between trees. Bright sunlight and vegetation in background prevented the pilot from seeing the wire until just before he hit it.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followup information

on accidents previously reported

UH-1 Class A

Reported in 4 May 88 issue as 8813 - The aircraft was on a troop transport mission over mountainous terrain. The crew was flying up a valley looking for a place to cross a ridgeline to get to a refueling point. Fuel indicators showed 400 pounds of fuel remaining when the master caution light came on and the 20-minute fuel light flickered. The PIC noted the time and continued the flight because the 20-minute light had been written up as erroneous, and he thought his fuel quantity indicating system was accurate. A couple of minutes later, the 20-minute light flickered again. After about 10 more minutes of flight, the PIC found there was not enough cloud clearance to make a safe crossing, and he began looking for a place to land. Spotting a field, he began a slow right turn, but the master caution light flashed on and fuel pressure

dropped to zero. The fuel indicators showed the aircraft still had 265 pounds of fuel. Actually there were only 12 gallons of fuel in the tanks. When the aircraft went into the turn, air was ingested into the engine-driven fuel pump and the engine failed. The pilot attempted to autorotate, but the terrain was unfavorable, and the aircraft hit hard. The aircraft was destroyed and the 10 people on board were injured.

UH-1 Class A

Reported in 29 Jun 88 issue as 8821 - The aircraft was in cruise flight during a low-level training mission. When the aircraft began a descent into a valley, the combination of a 30-knot right quartering tailwind, a downdraft, and a right turn caused the aircraft's rate of descent to rapidly increase. Unprepared for the turbulent conditions he had encountered, the pilot was unable to arrest the rate of descent and recover the aircraft in time to prevent a crash. The three crewmembers and two passengers were injured.

UH-60 Class A

Reported in 1 Jun 88 issue as 8820 - The crew of a UH-60, (aircraft No. 1) hovered out of parking and turned into the path of another UH-60 (aircraft No. 2) hovering along an uncontrolled runway. Both aircraft were destroyed when their main rotor blades intermeshed. Crews of both aircraft were wearing NVGs. Space allowed between parked aircraft, obstacles, and the active runway was inadequate for the crew of aircraft No. 1 to make a 90-degree turn to clear the aircraft and check for traffic on the runway as it hovered out of parking. The IP of aircraft No. 1 made a radio call that his aircraft was repositioning out of parking, but he didn't wait for a response. The IP of aircraft No. 2, which was hovering along the runway, had forgotten to make a radio call that he was coming out of parking and taking the runway. His failure to make a call prevented the crew of aircraft No. 1 from knowing there was traffic on the runway.

OH-58 Class A

Reported in 1 May 88 issue as 8818 - The mission was to provide combat skills training for an aeroscout observer. The aircraft was flying a low-level navigation route at about 60 KIAS, 400 feet agl, over a heavily wooded area. The crew heard a bang from the aircraft's rear and the engine-out audio and light came on. The power takeoff helical gearshaft, located in the engine accessory gearbox that provides engine power to the drive train, had failed due to fatigue. As a result, the engine was no longer powering the rotor system, and the IP was forced to autorotate into a heavily wooded area. The aircraft fell about 30 feet through the trees and hit the ground, killing the IP. The aircraft was destroyed and the observer was injured.

OV-1 Class B

Reported in 4 May 88 issue as 8819 - While performing a night tactical traffic pattern approach and landing (360-degree overhead), the pilot allowed the aircraft to touch down with an excessive rate of descent. The hard landing made the right wing fail and flex down, causing the right main landing gear to become unlocked and begin to retract. With the gear partially retracted, the pilot lost directional control, and the aircraft veered to the right and off the runway. The aircraft came to a stop 30 feet from the right edge of the runway and 1,200 feet beyond the initial touchdown point. The aircraft was damaged, but the two occupants were uninjured. The pilot was inadequately trained to perform the task he was attempting, and he did not perform the maneuver in accordance with the Aircrew Training Manual, FC 1-217.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Direct communication is authorized by AR 10-29.

C. A. Hennies
Brigadier General, USA
Commanding General
U.S. Army Safety Center

Hot weather operations . . .

• Cut the tape to fit the leading edge of the blade, measuring from the outboard edge of the blade doubler to the tip of the main rotor blade. Apply the tape from inboard to outboard.

• Use a heat gun to make the tape stick to the blade. Don't let the gun exceed 200°F during installation.

Temperature changes

If you're headed for the real desert with your aircraft, remember that the desert is a land of extremes. Temperatures can top 100°F during the day and dip below 50°F at night.

These temperature changes cause O-rings, seals, and gaskets to continually expand and contract. If they warp out of shape, the seals won't seal. Watch for leaks, and change the seals when you find one.

Engine temperature

You can expect your engines to run hot in the desert. Keep oil temperature down by flushing the engine like the aircraft's -23 manual says. If the engine is using more oil than it normally would, change the oil. That will reduce engine wear. ■

–Reprinted from the March 1987 issue of PS Magazine

UH-60 APU starting procedures

At a recent meeting of a Black Hawk System Safety Working Group, it was noted that some pilots are starting the UH-60 auxiliary power unit (APU) during normal in-flight operations. This practice is contrary to the UH-60A operators manual which does not provide for in-flight starting of the APU in other than emergency situations (the APU is not flight certified). Operation of the APU during ground taxi is also contrary to the operator's manual and causes unnecessary damage to the APU due to dirt and debris being ingested.

Black Hawk pilots are reminded that, under normal operating conditions, the APU should be started only when performing preflight cockpit equipment checks or during the parking and shutdown sequence, as specified in paragraphs 8-21 and 8-34 of the operator's manual. ■

–Point of contact: LTC Ronald Radcliff, Systems Engineering Division, AUTOVON 558-3943, commercial 205-255-3943.

FY89 Class A Accidents through 19 April

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	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	18	38	11

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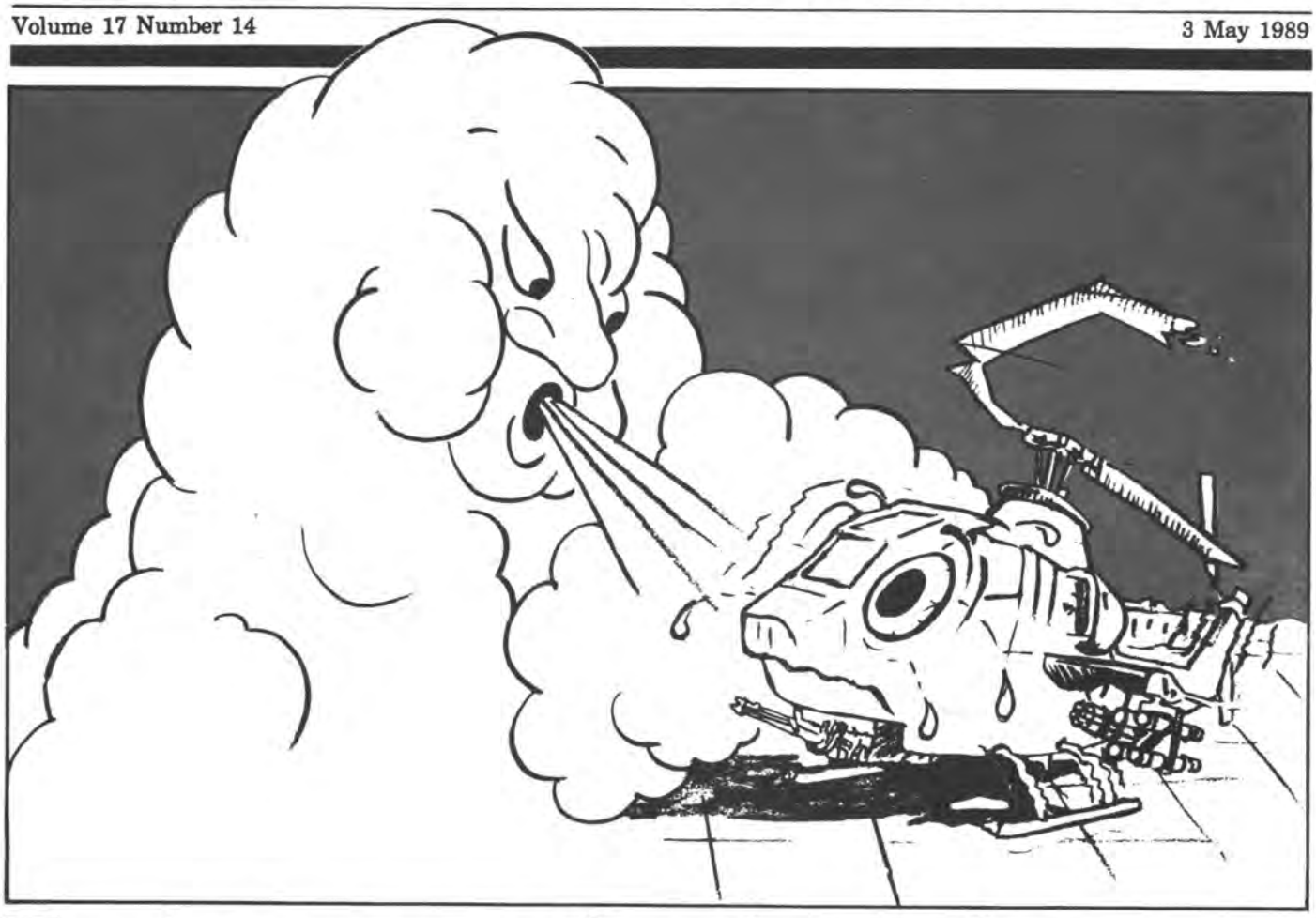
Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 Number 14 3 May 1989



Fast communication of weather advisories critical

Recently, fifteen helicopters were damaged to the tune of $64,000-plus when a fast-moving storm front passed through the installation with winds believed to be around 80 mph. While most of the aircraft damage involved sheet metal dents and tears and broken-out chin bubbles, one Cobra had major damage.

This is not an isolated incident. This and other recent storm-damage incidents underline the critical importance of fast communication of weather advisory information.

Any delay in getting the word out greatly increases the chances of aircraft damage. Installations should review their local notification procedures to ensure that every unit that has to take action to protect aircraft has enough warning—and time—to do so. And units should ensure they have established emergency-action procedures to be taken immediately upon receipt of a severe weather warning. ■

Chances for brownout increase during summer

"The best procedure to minimize blowing sand and dust is a running landing. If the terrain does not permit a running landing, an approach to touchdown should be made. A landing should not be made to a hover."
—FM 1-202: Environmental Flight, paragraph 2-16a

That's pretty straightforward language, and its message is simple: "If you can't land ahead of your own rotor-induced dust, make an approach to touchdown, and above all don't hover." So, it must follow that accidents involving brownout only happen to inexperienced pilots, right? Wrong.

Brownout can happen to anybody. All it takes is a moment's indecision, a little hesitation, and the aircraft can be engulfed in dust. The pilot can't see the ground, the trees, or other aircraft—in other words, he's virtually blind.

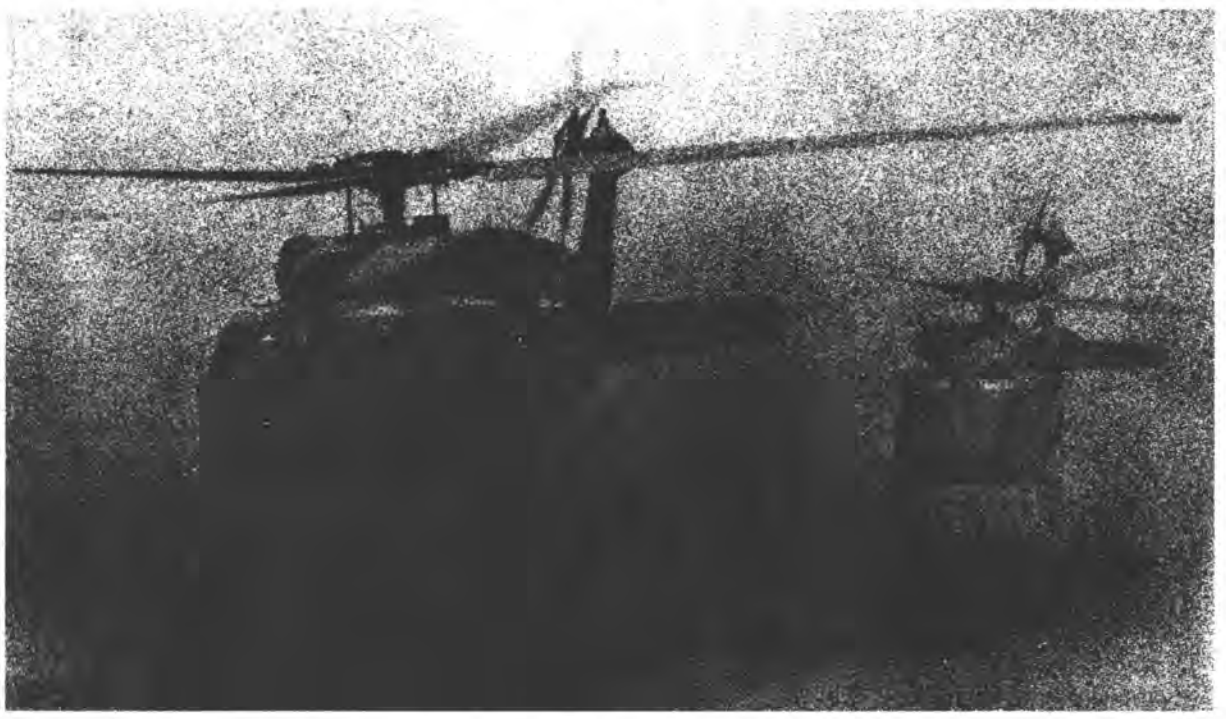
One such aviator had more than 6,200 hours in helicopters. During the briefing on the day troop lift mission, the crew had been warned that the landing zone was dusty and could be a hazard.

The flight of four UH-60s completed four troop lifts into the LZ before returning to the airfield to refuel. Each time they landed was almost a brownout. They could see the aircraft ahead, but that was about all.

After hot refueling, they picked up another load of troops and returned to the LZ in a staggered left formation. As the lead aircraft touched down in the LZ, dust began blowing up. The copilot of the second aircraft terminated his approach approximately 2 to 3 rotor disks from the lead aircraft. He was about

This Black Hawk was loaded with troops when it became engulfed in dust while hovering and crashed.

15 feet above the ground because he had spotted a small tree off to the left side under the aircraft. The copilot brought the aircraft to a hover and began sliding to the right to move away from the tree before landing. The aircraft became engulfed in its own rotor-induced dust, and he lost sight of the horizon and the ground under the aircraft. He could still see the lead aircraft on the ground, but it was partially obscured by the blowing dust. The aircraft began descending, hit the ground hard, and rolled onto its left side.



The aviator in another accident had almost 4,700 hours of rotary wing time. He was the PIC of the lead aircraft in a flight of four UH-

Fatigue contributed to slowed reactions and a poor decision that led to this brownout accident.

60s. All four crewmembers were wearing night vision goggles during a night tactical training mission to transport three ranger platoons and fire support teams.

The flight completed three takeoffs and landings, moving the ranger platoons from one field site to another. While airborne, the aircraft were in a loose trail formation at about 200 feet agl and 120 KIAS. During each takeoff and landing, the flight encountered rotor-induced blowing sand and dust. After dropping off the third ranger platoon, the flight divided into two elements to extract ranger fire support teams from two different locations. After picking up the fire support teams, the flight reformed in the air in its original configuration and proceeded to the last LZ to make the final dropoff.

The PIC of the lead aircraft initiated a normal approach to the LZ. The aircraft searchlight, with a Grimes (pink) filter, was extended and illuminated. During the approach, the PIC saw ruts in the sand. He hesitated in lowering collective, but continued the approach. When the aircraft became engulfed in rotor-induced sand and dust, the PIC lost sight of the ground. The aircraft drifted forward and to the right. The right main landing gear contacted slightly elevated terrain, rolled right, and came to rest inverted.

This PIC had been working a day schedule before the accident, but was changed to nights for this mission. The abrupt change in working hours caused him to wake up at the normal time on the day of the accident, and he had been awake for 18 hours. He did not recognize the effect the change in his work schedule could have on his performance, and he did not attempt to rest so that he could comply with the unit crew endurance policy. During the earlier flights, he had been navigating, always a demanding task. The mission was almost over when he took the controls for the last flight of the night. He was trained in and capable of performing the approach and landing maneuver, but his decision-making ability and reactions were slowed by fatigue.

Neither of these aviators had ever had an accident. They were competent and highly experienced, but a few seconds' hesitation made the difference in having and not having an accident. ■

FY89 Class A Accidents through 3 May

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	1	4	0
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	19	38	11

Lithium battery warning for NVD

A report by an aviation unit of an additional incident involving venting of lithium batteries (BA-5567/U) used in AN/PVS-5 night vision goggles and AN/AVS-6 ANVIS night vision devices has led the U.S. Army Communications-Electronics Command (CECOM) to issue a safety-of-use advisory message (SOU 89-03-01, 031800Z Mar 89). Fortunately this incident occurred on the ground and no injuries resulted.

Some dual battery packs for the AN/AVS-6 night vision device can use the BA-3058/U "AA"-size alkaline battery. CECOM recommends that this battery be used when possible. A dual battery pack with "AA" capability can be identified by the sticker at the top of the back which reads "Battery installation instructions...."

SOU 89-03-01 reiterates screening and deadlining instructions in the following messages previously issued by CECOM—

•AMSEL-SF-REE, 131800Z Dec 88, subject: Safety-of-use message (88-12-02), advisory, operational, BA-5567/U lithium.

•AMSEL-SF-REE, 031800Z Feb 89, subject: Safety-of-use message (89-02-01), advisory, operational, BA-5567/U lithium-sulfur dioxide (Li-SO2) batteries.

SOU 89-03-01 also includes the manufacturer's date codes (MFD) of additional batteries recently identified through laboratory analysis as potentially defective: 0886D, 0887E, 0987C, 0987D, 1087A, 1087B, and 1087C.

Activities that store or use BA-5567/U Li-S02 batteries (except DESCOM depots for whom SOU 89-03-01 provides special instructions) are required to screen stocks of Li-SO2 batteries to identify all BA-5567/U batteries manufactured by SAFT America, Inc. under contracts shown in figure 1.

These batteries are to be suspended from use until final disposition procedures have been determined. Quantities and locations of all batteries on hand from these suspended MFDs are to be reported to Commander, CECOM, ATTN; AMSEL-SF-REE, Fort Monmouth, NJ, or by DATAFAX (201) 542-7161 or (201) 544-2667.

Users of BA-5567/U batteries should inspect for leakage all stock manufactured by SAFT under the contracts listed in figure 1. To identify leaking batteries—

•Open the shipping package containing individually packaged batteries.

•Remove each individually packaged battery (do not open sealed plastic bag) and inspect each battery for signs of leaking (yellow-brown stain on the packaging or liquid inside the plastic bag).

Leaking batteries should be deadlined and quantitites reported to Commander, CECOM, ATTN: AMSEL-PA-MA-D, using a quality deficiency report (QDR) in accordance with Joint Services Regulation DLAR 4155.24 (AR 702-7).

Users are **not** to return batteries identified under this screening process to local supply points. Deadlined batteries will be stored in a well-ventilated area and separated from other hazardous materials since a potential exists for these batteries to vent sulfur dioxide gas. The CECOM safety office should be notified immediately if a venting incident should occur.

Final disposition instructions on all deadlined batteries will be provided in the close-out action on the QDR.

For a list of equipment in which BA-5567/U Li-SO2 batteries are used, see figure 2.

POC at the CECOM Safety Office is Mr. L. Soffer, AUTOVON 995-3112, commercial 201-544-3112. POC at CECOM, AMSEL-PA-ET, is Mr. Patrick Lyman, AUTOVON 992-3932, commercial 201-532-3932. ■

Contract	MFD
DAAB07-85-C H332	0187A, 0587E, 0886D
DAAB07-86-C-C029	0887E, 0987A, 0987B, 0987C, 0987D, 1087A, 1087B, 1087C, 1087D, and 1187A

Figure 1. Batteries manufactured by SAFT America, Inc. under these contracts are suspended from use.

Nomenclature	NSN	Line
AN/AVS-6(V)1 (ANVIS)	5855-01-138-4749	AO6352
AN/PVS-5C (NVG)	5844-01-228-0936	NO4456
AN/AVS-6(V)2 (ANVIS)	5855-01-138-4748	AO6420
AN/CYZ-7	7610-01-277-2578	Z25291
AN/GRC-213	5820-01-128-3935	R30895
AN/PSC-3	5820-01-145-4943	R38403
AN/PVS-4	5855-00-629-5334	NO4732
AN/PVS-5 and 5A (NVG)	5855-00-150-1820	NO4456
AN/PVS-5B (NVG)	5855-01-228-0938	NO4456
AN/PVS-7A	5855-01-228-0939	NO5482
AN/PVS-7B	5855-01-228-0937	NO5482
AN/TVS-5	5855-00-629-5327	NO4956
AN/VVS-2(V)1A	5855-01-096-0871	N/A
AN/VVS-2(V)2A	5855-01-096-0870	N/A
AN/VVS-2(V)3	5855-01-105-7793	N/A
KIR-1C/TSEC	5810-01-273-7819	N/A
KIT-1C/TSEC	5810-01-273-7820	N/A
KOK-12/TSEC	5810-01-208-4210	250432

Figure 2. Equipment using BA 5567/U lithium batteries.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class C

H series - During a shallow approach to a dirt soccer field, copilot allowed excessive rate of closure to develop. On short final, crew encountered blowing dust and lost sight of the ground. Aircraft hit the ground and skidded 28 feet. Skid and crosstube assembly collapsed, and aircraft came to rest on its underside.

H series - During hover, crew noted vibrations followed by a yaw. Crew performed hovering autorotation and emergency shutdown. Suspect catastrophic internal engine failure.

V series - While on approach into unimproved confined area at night, aircraft's main rotor blades struck tree limbs.

UH-1 Class D

H series - Pilot took off over rising terrain into setting sun. Feeling the aircraft sink as it neared the top of the ridge, and spotting a tree in his flight path, pilot added power and aft cyclic. He heard a thud as the right synchronized elevator hit the tree and immediately landed.

UH-1 Class E

H series - While aircraft hovered to parking, its rotorwash, combined with wind gusts up to 18 knots, blew an unsecured maintenance stand into a parked aircraft.

UH-60 Class C

A series - During deployment, flight of five aircraft was diverted to an alternate airfield because of weather. During turn to final, PIC saw bifilar weight come off aircraft, and lateral vibration developed. Weight had detached from bifilar assembly and struck main rotor blade.

UH-60 Class D

A series - Aircraft developed vertical vibration after takeoff, and crew returned to heliport. Caused by broken antiflap cam.

A series - During an NVG artillery raid, aircraft made a normal approach to a dusty LZ and came to a hover. As the slingload was lowered, the aircraft was engulfed by dust from the trail aircraft. The crew

had trouble determining the aircraft's drift, and the crew chief told the pilots to release the slingload, which was already on the ground. The aircraft was still moving forward when the sling was released, causing the slingloaded howitzer to roll over.

Attack helicopters

AH-1 Class D

E series - Crew had been practicing desert landings. Aircraft was climbing through 100 feet agl when N2 dropped to 93 percent and low rpm audio sounded. Pilot reduced power and turned aircraft toward LZ. N2 returned to 100 percent, but during approach, N1 and N2 dropped. At 25 feet agl, crew heard a loud report from the engine, and aircraft began to buffet and yaw while entering brownout condition. Using radar altimeter to determine altitude, pilot increased collective at 10 feet agl to cushion landing. Dirt and sand had clogged the bleed band actuator, holding it in the open position.

F series - Aircraft was overtorqued while remasking during range firing. Crew failed to anticipate settling of aircraft during descent. Main rotor trunnion bolts were replaced.

F series - When aircraft began descending while unmasking during gunnery training, pilot applied collective and overtorqued engine. Main rotor trunnion bolts were replaced.

AH-64 Class D

A series - Crew chief saw sparks coming from APU drive shaft during MOC for shaft-driven compressor. APU bipod had failed at upper weld, allowing torque and weight of APU to be concentrated at tripod. Then tripod mount failed, and shift of APU caused damage to anti-flail collar and drive shaft.

Cargo helicopters

CH-47 Class C

C series - Aircraft was hovering about 20 feet agl when a crewmember reported the right main fuel tank had ruptured. When fuel cell overpressurized in flight, fuel pod cracked open, causing some spillage of fuel and sheet metal damage to right side of airframe.

D series - Aircraft was at a 50-foot OGE hover while slingloading a 2 1/2-ton truck. As the pilot attempted takeoff, he heard a loud popping noise, and the crew chief reported the aft right sling leg had broken away from its hard point. As the pilot began a descent, the aft left sling leg also broke away. The front of the truck abruptly tipped up, almost hitting the bottom of the aircraft. The crew chief released the load, and the aircraft landed. The aircraft was undamaged, but damage to the truck was extensive.

CH-47 Class D

C series - Aircraft was making a night approach to unlighted POL area with a slingload of two blivets. During short final, aircraft flew over a tent. The tent collapsed and caught fire from tent stove, but occupant extinguished fire. Aircraft's arrival was not expected, and inverted "Y" was not illuminated. Aircrew did not recognize tent under camouflage.

D series - Copilot placed map on dash while making an entry into the doppler. Map was sucked out of copilot's window, striking and breaking the radio antenna standoff mount.

D series - Aircraft was transitioning to forward flight from OGE hover with two full blivits of fuel. The PIC felt a thump and saw the master caution and segment lights come on. Passenger's foot had hit the cargo release switch on the floor, releasing the load.

D series - Aircraft was attempting to slingload an AH-1 damaged by wire strike. When aircraft accelerated to 50 KIAS, drogue chute separated and load oscillated violently. PIC brought aircraft to hover to get load under control, then hovered to a road and set load down.

Observation helicopters

OH-58 Class C

A series - Aircraft came to a 2-foot hover after refueling, and ground guide signaled crew to back out of refueling site. Grounding cable was still secured to the aircraft. Crew lost control of aircraft and it landed hard, spreading the skids and damaging tail boom and tail rotor.

OH-58 Class D

A series - Aircraft was about 30 feet agl when it struck a piece of commo wire strung from a tree and across a road to the top of a range flagpole. The wire slid up the windscreen, breaking the FAT gauge before being cut by the aircraft's upper wire cutter. Pilot failed to see wire against dark background on the horizon.

C series - Aircraft was in slow forward hover when landing searchlight, which was in the stowed position, fell off. Vibration caused screws holding light to back out. Landing light was not properly inspected in accordance with safety-of-flight message OH-58 88-02.

C series - During aerial observer (AO) training, AO allowed aircraft to begin drifting to the right after touching down slightly right of runway center line. As aircraft neared edge of runway, IP took controls, applied left cyclic, and lowered collective to full-down position. The aircraft shuddered and lunged forward, drifting farther to the right. IP applied collective and stabilized aircraft at a hover. IP reported his right skid was missing and hovered to parking to await assistance. After hovering for about 25 minutes while sandbag platform was constructed, aircraft landed. Investigation revealed crew had allowed the aircraft to slide from runway onto shoulder. As the aircraft went from the runway surface to the shoulder, the right skid slid across steel covers on holes

where helipad lights had been removed. Bolts holding the covers in place stuck up about 1/2-inch above the runway surface. Aircraft's right skid was torn off when it slid across the covers.

Fixed wing

C-12 Class D

D series - Crew heard a noise while aircraft was being ground run. After shutdown, damage to two blades of No. 1 prop was found. Taxi marker had broken loose from runway and hit propeller.

C-12 Class E

C series - Smoke filled aircraft during flight. Crew and passengers donned oxygen masks and smoke elimination procedures were performed. Maintenance replaced forward vent blower.

U-21 Class E

A series - As power was reduced during final approach, torque on No. 2 engine remained at 800 pounds. Pilot executed a go-around. Torque could not be decreased using power lever and engine was shut down. Aircraft made uneventful single-engine landing. Cotter key on aft end of 11-inch rod had snagged on oil cooler line, jamming fuel control linkage. Cotter key was shortened and oil line repositioned.

Maintenance

UH-1 Class D

H series - Aircraft was in cruise flight at 90 KIAS, 2,000 feet msl. When master caution and transmission lights came on and PIC saw transmission oil pressure was steadily dropping, he took the controls and landed. An aluminum elbow tube had been installed on coupling half of quick disconnect instead of the correct steel part. When the elbow cracked, oil leaked out.

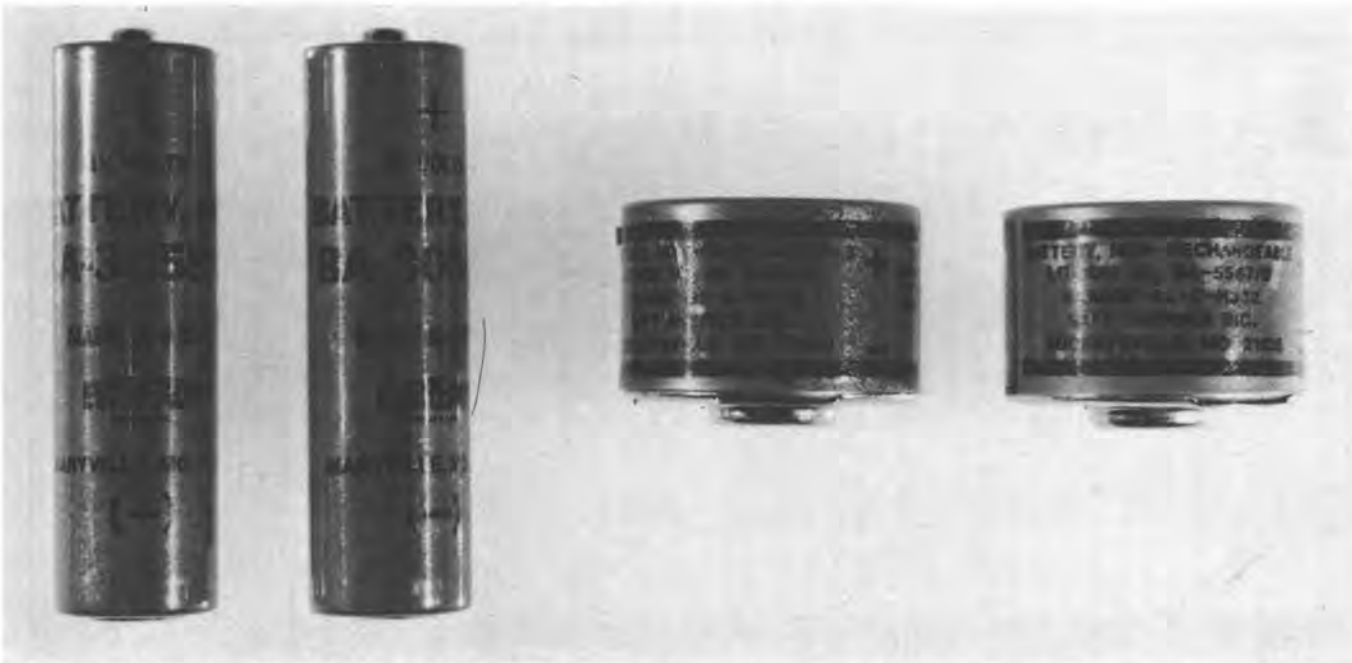
Safety messages

•Safety-of-flight emergency message concerning immediate grounding of UH-1H/V and EH-1H/X series aircraft (UH-1-89-04, 220003Z Apr 89). Summary: AVSCOM has recently received two Category I deficiency reports concerning NAS 1785-8-44 bolts. Both reported complete failure of one of the four bolts on each of the two hub assemblies. Results of analytical investigation show the cause of failure is stress corrosion cracking originating from corrosion pits on the bolt shank. The purpose of this message is to immediately ground UH-1H/V and EH-1H/X aircraft with MWO 55-1520-242-50-1 applied until corrective action can be completely identified. Contact: Dave Scott, AUTOVON 693-9089, commercial 314-263-9089.

•Safety-of-flight technical message concerning one-time and recurring inspection of NAS 1785-8-44 bolts on all UH-1H/V and EH-1HX series aircraft (UH-1-89-05, 252258Z Apr 89). Summary: The purpose of this message is to require a one-time inspection of NAS 1785-8-44 bolts for presence of corrosion preventive compound, damaged threads, lack of sealing compound, application of zinc chromate, and evidence of corrosion. Bolts will be replaced if they have not had corrosion preventive compound applied, have had zinc chromate applied, or show evidence of corrosion or damage to threads. Serviceable bolts will be reinstalled using the correct torque and corrosion preventive measures. Use of an additional washer is authorized on pillow blocks showing signs of nuts bottoming out on the bolt shank. Contact: Roger Heidenreich, AUTOVON 693-9089, commercial 314-263-9089.

•Aviation life support equipment (ALSE) advisory message (ALSE 89-1, 021230Z May 89) concerning delayed implementation of paragraph 7-6b, AR 95-3, regarding requirement that each aircraft crewmember be equipped with a survival radio. Complete implementation of paragraph 7-6b has been delayed until 30 Sep 89. This delay is to allow complete distribution of the PRC 90-2 and redistribution of the PRC 90 radio. Redistribution is an important part of the program. Units receiving PRC 90-2 radios should promptly return their PRC 90s for redistribution. PICs 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 aircraft as assets become available. In addition, the PIC will ensure that crewmembers without radios have other signaling devices such as L119 foliage penetration flare kit and/or a signaling mirror. Contact: LTC David L. Meeks, AUTOVON 227-0487.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.



Alkaline batteries (left) can provide 22 hours of use in the ANVIS universal battery pack. Lithium batteries (right) provide 15 hours of use in a single-battery compartment application.

Lifespan differs for NVD batteries

Usable lifespan

Questions from the field indicate there is some uncertainty about the usable life of different batteries used in NVDs.

Lithium BA 5567/U batteries have a longer usable life than mercury batteries. Therefore, the 10-hour limit for mercury batteries has been increased to 15 hours for lithium batteries when used in a single-battery compartment application.

AA alkaline BA-3058/U batteries, when stored properly, can provide sufficient power in the ANVIS universal battery pack for up to 22 hours of use. Age of the batteries and storage conditions may shorten the batteries' useful lifespan.

Use the same type batteries

In the original dual battery pack and the new universal battery pack, the same type of batteries must be used as primary and alternate. The low battery sensing circuit compares the battery in use with the spare. Because the mercury battery is 2.7 volts and the AA alkaline and lithium batteries are 3.0 volts, the light will give incorrect indications. Also, because the AA battery has a shallow light curve and the lithium has a sharp light curve, the lights may not function properly unless the primary and alternate batteries are the same type. ■

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 Number 15 17 May 1989

Don't take a chance...use the checklist

Overlooking some small detail of a checklist may seem like a minor infraction when compared to taking a deliberate chance with an aircraft by flying too low and too fast for conditions or failing to complete a performance planning card and overloading an aircraft. But is it really so different? The difference in taking a deliberate chance and starting an aircraft with the blades tied down because of failure to follow a checklist is often in the degree of damage that results. Both are violations of procedures.

In the following incidents, somebody—and often more than one somebody—failed to do something they should have done. Fortunately, no great harm resulted in most of these cases, but it doesn't pay to count on that. Pay attention to the little things—they can destroy an aircraft and, worse, they can kill you.

continued on next page ➤

Don't take a chance...use the checklist

•When an attempt was made to start a UH-1 with the inlet cover installed, the bulkhead at the plenium chamber flexed into the drive shaft. Cost of damage to the sheet metal, drive shaft, and subsequent FOD to the engine was nearly $65,000.

•During the start sequence, the crew chief of a UH-1 cleared the aircraft from his position at the right cabin door. The engine had accelerated to 20 percent N1 when the crew chief told the pilot to stop the aircraft. The main rotor blades were still tied down.

•The PIC of an AH-1 felt the aircraft shudder during start procedures and heard the crew chief yell, "Stop!" The aircraft shuddered again as it was shut down. The tiedown rope was hanging from a main rotor blade.

•While the engine of a UH-60 was being run up through 75 percent rpm, a circular metal object was dislodged from the aircraft's roof and hit the tail rotor. Flexible couplings left on top of the main rotor deice distributor cover were not discovered when the aircraft was preflighted.

•During runup of a UH-1, the crew chief saw a piece of lead fly out of the engine exhaust. Several more pieces were found inside the tailpipe. The aircraft's blades had been tracked and balanced the day before. Balance lead left on the blade grip fell off when the blade began turning.

•Fifteen minutes before quitting time, a maintenance test pilot was asked to do a MOC on one more aircraft. He told the crew chief to get the UH-1 ready and he would be right out. When the pilot arrived at the aircraft, the tiedowns and covers, except for the pitot and inlet covers,

had been removed. The crew chief was on top of the aircraft removing the pitot cover. The pilot assumed he would also remove the inlet cover. While the pilot was strapping in and performing the pre-start check, the crew chief climbed down, did a second check, and cleared the pilot to start the aircraft. When the engine reached 76 percent N1, the sound of metal contacting metal was heard. The intake cover had not been removed.

•Another UH-1 took off with the drive shaft cover on the vertical fin open. The crew chief had failed to secure the cover, and the pilot missed the open cover during preflight.

•During postflight, a rupture was found in the hydraulic pressure line to the left cyclic servo. The line had chafed on the cyclic control tube linkage until a hole was worn in the line. That didn't happen during one flight, or even two, and the crew chief should have spotted what was happening long before the line was worn through.

Some of these incidents resulted from maintenance personnel not doing their jobs properly or crew chiefs who overlooked something, but, let's face it, the final responsibility is the pilot's. Probably the greatest compliment that can be paid an aviator is: "He's so picky when he preflights an aircraft, you'd think he was planning to buy the blamed thing."

These are just a few examples of recent incidents that have occurred when deficiencies were overlooked during preflight inspections. Fortunately, most of them were minor but, sooner or later, you can be sure that a serious accident will occur if corrective measures are not taken to ensure preflight inspections are properly accomplished. The solution is simple—make no assumptions, take nothing for granted, use your checklists. ■

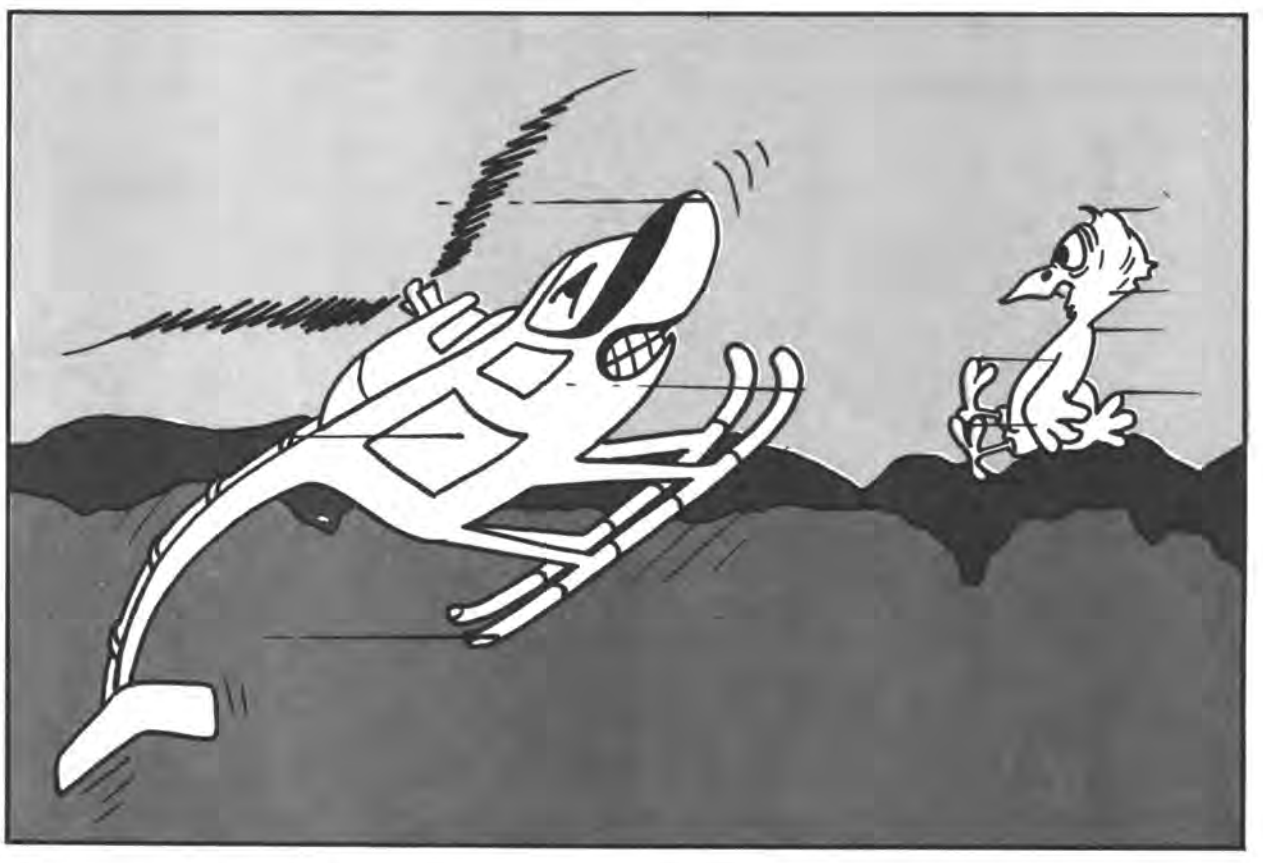
Sharing airspace with the feathered foe

When airspace is populated by both mechanical and feathered birds, an occasional collision is almost inevitable. Usually when it happens, the feathered bird's last act is to leave the mechanical bird a memento of their untimely meeting:

•The AH-64 was in cruise flight at 300 feet agl when a bird collided with its main rotor blades. The bird then struck the front canopy in front of the CPG station. The front canopy shattered, showering the copilot with shards of glass and bird debris. Cost of repair was nearly $2,000.

•The UH-60 in cruise flight at 100 feet agl hit a bird. A slight lateral vibration prompted the crew to land in an open field. Damage to two opposite rotor blade tip caps totaled more than $5,600.

•Immediately after takeoff, at 500 feet agl, the C-12 crew heard and felt a heavy thud in the airframe. Wing damage was noted on the right side, and a slight vibration developed. Postflight inspection revealed a large dent that broke the skin on the leading edge of the right wing. A bird strike was confirmed from residual matter on the



damaged part of the wing. Damage totaled more than $4,700.

•The OH-58 was cruising at 1,000 feet agl when a bird came down through the rotor disk and hit the left side of the ram air grill. Damage to the ram air intake and left side of the nose cone totaled more than $5,000.

These are examples of the 136 collisions between birds and Army

continued on next page ➤

Sharing airspace with the feathered foe

aircraft reported during fiscal years 1987, 1988, and the first half of 1989. They involved all types of aircraft (mostly helicopters) and occurred year round (mostly in the spring and fall), at all altitudes (mostly below 1,000 feet), all over the world (mostly in the States), at all times of the day and night (mostly during the day), and during all phases of flight (mostly during cruise). They also involved all sizes and kinds of birds—eagles, sea gulls, sparrows, vultures, hawks, owls, ducks, doves, bats, buzzards, parrots, pigeons, pheasants, and a host of unidentified birds. They did their damage singly, in pairs, and in flocks.

Any Army aviator who has suddenly found his lap full of bird and shattered windshield will tell you it's an experience you want to avoid.

While there is no guaranteed way to avoid birds, keeping the following points in mind may reduce the possibility and the severity of a bird strike:

•Watch for birds while taxiing for takeoff. If possible, don't take off or land if flocks of birds are on or adjacent to the runway.

•Try not to fly within 30 miles of wildlife refuges.

•During cruise, watch for flocks of birds and try to climb above them. A bird will usually try to avoid a collision by diving or sideslipping to lose altitude.

•Remember that flocking birds may fly between their roosting and feeding areas during the early morning and evening.

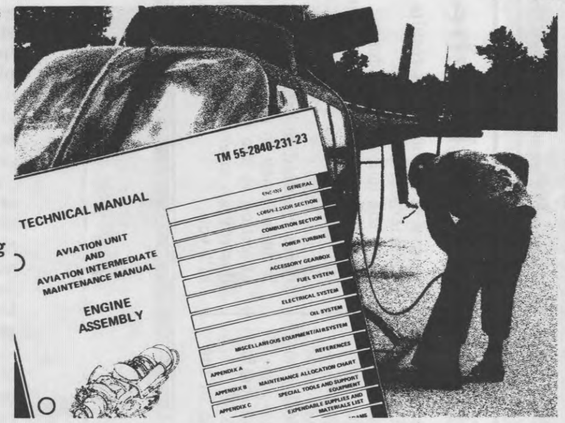
•If possible, avoid flying low in the vicinity of swamps, garbage dumps, wooded hilly areas, or other places that may be attractive to birds.

Birds are a hazard not only in flight. They also like to set up housekeeping in engines, cowls, wheel wells, and other aircraft nooks and crannies. Aviation units have reported that nests removed from aircraft in the morning were sometimes rebuilt by early afternoon. All places where birds might build nests should be checked before each flight, particularly during migration seasons.

You certainly can't predict what a bird will do, and there may come a day when you are not able to avoid hitting one. Just be sure you are wearing your helmet visor down to protect your eyes and face from glass and bird fragments. ■

FLIGHTFAX

Confidence can't replace the book



Aviators have to have confidence or they would never strap themselves into a cockpit and take off with their lives depending on their own skill and that of their fellow crewmembers and maintenance personnel. However, problems arise when confidence overcomes good judgment and someone abandons the "book."

One such aviator was not long out of flight school. He was only at readiness level 2, but he had participated in two engine flush operations, and he decided to lend his assistance to the maintenance section in doing an engine flush on an OH-58C. In spite of his limited experience, however, he didn't review the procedures in the dash 23, depending instead on his memory. That was a serious mistake.

When the crew chief arrived at the helicopter, the pilot was already seated at the controls. There was no briefing or overview of the maintenance procedure they were about to do. Using the aircraft checklist, the pilot began the before-start procedures. That was another mistake.

To perform an engine flush, the dash 23 for the OH-58C says the igniter circuit breaker should be out and the fuel and throttle off. Instead, the circuit breaker was in and the fuel on, things that are required when starting the engine but are completely wrong when performing an engine flush. In addition, the throttle was not completely closed. This was a series of mistakes. The pilot should have motored the engine without ignition or fuel.

On his first attempt to flush the engine, the pilot forgot to install the ignition key, and the flush was aborted. After the crew chief secured a key, the pilot began a second attempt. With an APU attached, the pilot energized the starter while the crew chief pumped the water solution through the engine.

The pilot was monitoring the gauges, including the N1 gauge. When the crew chief told him to stop the engine, the pilot noted that the turbine outlet temperature (TOT) had reached approximately 800° C. He failed to recognize the connection between the high TOT and the improper procedures he was using to flush the engine. This was another serious mistake. During a normal engine flush, there should be no rise in TOT.

During the next attempt to flush the engine, the pilot saw the TOT rising past the 900° mark and realized a hot start was imminent. At about the same time, the crew chief saw fire coming from the exhaust stacks and yelled "Cut, cut. . .fire!" Then he grabbed the aircraft's fire extinguisher and put out the fire.

The pilot ensured the throttle was off, pulled the fuel handle back to the off position, and released the starter button. Another mistake—this is not in accordance with the prescribed emergency procedures. He should have kept the starter engaged.

Another crew chief had removed the APU from the aircraft, and the pilot turned on the battery and prepared to press the starter, if necessary. He saw that the TOT had reached 927°—the maximum allowed for a start—for about 2 seconds.

By this time, the flames had been extinguished, and the emergency was under control. The pilot turned the battery off and reported the incident to maintenance personnel. Investigation revealed the only damage was to the igniter plug, which had to be replaced. The engine was reassembled, and the aircraft was test flown and released for flight.

This incident should never have happened. An inexperienced aviator was allowed to participate in a maintenance operation without ensuring a briefing was conducted on what was to be done and how. Furthermore, exact written procedures exist in the dash 23, but, because of overconfidence on the part of the pilot, they were not used.

Whether an aircraft is on the ground or in flight, the principle is the same: procedures have been developed, tested, and provided for safe operations. Use them—do it by the book. ■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class C

H series - Aircraft was trail in flight of four. When aircraft leveled off at 6,300 feet, crew noted egt was 590° C and heard several bangs from the engine.

More than $73,000 in damage was found to engine, gearboxes, drive train, and tail rotor hub assembly. Aircraft had been operating in extremely sandy conditions.

UH-1 Class D

H series - Main rotor blade was untied so it would not hit overhead lights when aircraft was ground-handled out of hangar. When ground handlers pushed down on aircraft's tail, main rotor blade flexed up and hit the overhead light. Light swung down and broke aircraft's left chin bubble.

H series - During static display, aircraft's left engine cowling was open and secured. Left cargo door had been slid back to prevent spectators from handling engine components. Aft cargo door window cracked when wind gust caused engine compartment door to hit it.

H series - Skid was bent when aircraft landed on a rock during night landing on rough hilltop.

UH-1 Class E

H series - During base line TEAC, crew noticed strong odor of fuel in cockpit. Fuel was seeping through bulkhead around transmission area. Caused by loose fitting at fuel transmitter.

UH-60 Class D

A series - As copilot made a pinnacle approach, pilot decided aircraft's tail wheel should be on pinnacle before troops disembarked. Aircraft was picked up to a hover and moved forward. After return to base, punctures from landing on rocks were found in sheetmetal of aft fuselage.

A series - MILES light was broken from mount when it struck a rock during landing on rough terrain in dusty conditions.

A series - During NVG mission, copilot made an approach to rough, dusty LZ. While rolling to a stop, aircraft hit a ditch at right angle to approach path. MILES strobe light was broken off, and searchlight lens shattered.

A series - After landing in desert PZ, aircraft rolled back slightly. Searchlight was broken when it hit a rock.

A series - During ground runup, aircraft rolled off raised concrete pad. Wire strike deflectors were bent.

A series - While delivering 5-gallon cans of water to crews fighting forest fires, aircrew had to make a downwind approach to a sloping confined area on a ridgeline. Slope prevented landing and, knowing some cans were destroyed when they slid down the slope during previous drops, the PIC placed the upslope wheel on the ground and hovered while the crew chief set the cans on the ground. A change in tailwind caused the aircraft to drift left, and the main rotor blades struck a burned tree stump.

UH-60 Class E

A series - Crew heard a loud bang during cruise flight and landed. Pilot had failed to secure his door before takeoff, and it came open during flight.

Attack helicopters

AH-1 Class D

F series - When aircraft approached tree line during NOE training mission, IP saw four buzzards fly up from a tree into his flight path. During attempt to avoid birds by rolling aircraft left, both main rotor blades struck tree limbs.

Cargo helicopters

CH-47 Class D

D series - Crew heard loud bang during engine start. Aft rotor blade had hit tunnel cover. Winds were reported from 210 degrees at 10 knots.

D series - Crew moved two internal loads and landed for the third lift. Soldiers began loading a trailer without waiting for directions from the FE. Upper bow of trailer contacted and damaged airframe.

D series - Cabin escape panel flew off during final approach and could not be recovered.

CH-47 Class E

D series - Transmission chip detector light came on during external load mission. Aircraft made uneventful landing, and transmission was replaced.

D series - During climbout from field site, No. 2 engine torque dropped to zero. N1 and PTIT also dropped. Caused by failure of fuel control.

D series - During VMC approach at about 50 feet agl, crew heard a slight pop followed by moderate lateral vibration. Leading edge of main rotor blade had debonded.

CH-54 Class E

A series - No. 2 rectifier light came on during flight and crew noted jump in flight controls. Rectifier light went out, and No. 2 generator light came on. When No. 2 generator failed to come back on line after resetting, it was shut off and aircraft landed. Caused by sheared shaft in No. 2 generator.

Observation helicopters

OH-58 Class D

A series - Rotorwash from hovering UH-1 caught open door of OH-58, breaking it off at hinges.

C series - Pilot encountered inadvertent IMC while flying at 80 KIAS. UT initiated VHIRP procedures. At 1,000 feet, he regained sight of the ground to his left and entered a left bank to maintain VMC. Aircraft was still in a left bank and nose low when it again entered clouds at 30 to 35 feet. UT transitioned to instruments and attempted to recover aircraft. Airspeed dropped rapidly to zero and trim ball was extreme left. UT applied full left pedal and forward cyclic. Aircraft went into a dive, and the UT overtorqued the engine while trying to arrest the 1,000 fpm rate of descent.

Fixed wing

OV-1 Class E

D series - No. 2 inverter light came on during climbout. Caused by failure of inverter.

D series - Immediately after takeoff, AFCS and backup compass lights came on followed by off flags on the gyrocompass and a master caution light. During landing, No. 2 generator light came on and generator dropped off line. Caused by failure of both voltage regulators.

U-8 Class E

F series - While conducting an APART evaluation, SP shut off No. 2 engine to simulate in-flight engine failure. Pilot feathered No. 2 propeller. When SP initiated restart procedures, No. 2 propeller would not come out of feather. Aircraft made uneventful single-engine landing.

U-21 Class E

A series - Large bird struck right propeller during final approach at 500 feet agl, 110 KIAS.

A series - When No. 1 engine was started, smoke began coming into cockpit from underneath instrument panel. Ground sensing wire on voltage regulator shorted on hot lead of starter generator, causing wire to overheat.

UV-18 Class D

A series - Aircraft landed hard on packed snow. Aircraft was configured for soft field landing with full flaps and 200 to 300 fpm rate of descent. Airspeed at touchdown was between 65 and 70 KIAS. As main gear touched down on snow, crew pulled power and used full aft yoke pressure to keep nose gear off snow. After rolling about 300 feet, main gear hit hard-packed snow ridge and bounced up tail high. When tail came back down, main and nose gear broke through packed snow. After bouncing once more, aircraft came to a stop just short of an 8- to 10-inch ice shelf covered by a foot of snow.

Maintenance

UH-1 Class D

H series - During masking/unmasking maneuver, crew heard a grinding noise and felt aircraft vibrate. Hydraulics light came on and controls were stiff. Improperly routed hydraulic line chafed until it ruptured.

UH-1 Class E

H series - When aircraft was started following maintenance, rag used to block engine intake when it was removed from the aircraft was ingested into the engine.

AH-1 Class D

P series - After 100-hour service and lube check, aircraft was run up for a 15-minute MOC. When tail rotor drive shaft cover was opened for next preflight, a plastic detergent bottle was found lodged against the drive shaft.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363.

Polycarbonate lens study extended

Thanks to aviators Armywide, participation has increased in a study by the Optical Fabrication Laboratory, Fitzsimons Army Medical Center on the use of polycarbonate lenses for eyeglasses.

The study, which began in June of 1988, will end on 1 September 1989.

Glass lenses shattered on impact with simulated NVG tubes during drop test from a height of 5 inches

Aviators—active duty status, National Guard, and Army Reserve—who fly regularly and wear glasses are being asked to take part in this test to evaluate use of the new material.

Aviators who meet these criteria are urged to participate by reporting to their local optometry clinic to order glasses with polycarbonate lenses. (See the 4 May 1988 and 8 March 1989 issues of Flightfax for further details.)

Aviators who begin participating in the study now will still wear the polycarbonate lenses for the full 6 months. At the end of that time, they will be asked to complete a questionnaire and return it with the lenses for evaluation.

Aviators who have already completed the 6-month test period should return the completed questionnaire and the eyeglasses to: Chief, Optical Fabrication Laboratory, Fitzsimons Army Medical Center, Aurora, CO 80045-5001.

Points of contact at the Optical Fabrication Laboratory, Fitzsimons Army Medical Center, are MSG Thibodeau and Mr. Johnson, AUTOVON 943-8158-8725, commercial 303-361-8158/8725. ■

FY89 Class A Accidents through 17 May

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	20	38	11

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 16 31 May 1989

There are no routine missions

After completing the day's gunnery training, the PIC of an AH-1F was scheduled to conduct orientation flights for some of the unit crew chiefs. He completed two uneventful flights, then took off on the last flight of the day with the crew chief in the front seat.

After stopping to refuel, the PIC began flying along a tank trail at treetop level. It was the same route he had flown during the previous flights. He was familiar with the route, and he knew a turn to the right was coming up.

As he put the aircraft into a steep banked right turn, he was headed west, directly into the sun. The glare on the aircraft's windscreen made it hard to see what was directly ahead but, instead of searching for hazards by looking out the sides of the aircraft, the PIC continued to look through the windscreen, while explaining to the crew chief in detail what he was doing. As the aircraft descended in the turn, its main rotor blades hit the tops of several trees at about 57 feet above ground level. The helicopter spun 180 degrees, heading back the way it had come. After the first tree strike, the main rotor drive shaft began breaking up, and all power was lost. The blades continued to hit more trees, the main transmission tore free, and tail rotor drive was lost.

The aircraft continued rearward for about 300 feet before settling into the trees, breaking several 12-inch tree trunks as it descended.

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...no routine missions

One 9-inch tree trunk penetrated the fuselage just aft of the ammo bay, causing extensive damage to the fuselage and components; however, because it was impaled on the tree, the aircraft hit the ground with minimal G forces. The helicopter came to rest upright, and the uninjured PIC and passenger got out without assistance. A postcrash fire in the engine transmission area was extinguished by nearby firefighters, but the aircraft was destroyed by the crash and fire.

This PIC had a total of 453 flight hours. Since qualifying in the AH-1 some 20 months earlier, he had accumulated 113 hours of flight time in the aircraft. He had been a PIC for about a month.

Normally, missions such as this one–giving crew chiefs orientation rides–would have been flown by unit IPs, but the unit commander decided all the PICs could fly the orientation missions. His reasoning was that the mission was simple; the PICs knew the area, and they wouldn't have to navigate, just follow the tank trail. They would be flying during daylight, and the weather was good.

Too many accidents happen during simple missions. When the commander did his risk control assessment, should he have allowed a relatively inexperienced pilot who had only recently qualified to fly single-pilot missions in the AH-1 to conduct orientation rides with a nonrated passenger?

The pilot had already flown the mission twice that afternoon. Did that make him too comfortable? Was he too sure that he could fly the mission without giving his undivided attention to his flying?

All too often it is the routine, the tasks we are familiar with to the point that they don't require us to sit on the edge of our seats anymore, the ones where we don't have to concentrate on every aspect of our flying, that reach out and trip us up. There should be no routine missions in Army aviation. Every flight should be flown as if it is the only one that matters. It is, because every flight can be the last one. ■

Close call during hot refueling

A recent accident during hot refueling of an AH-1P had the potential to be catastrophic. But thanks to quick action by the aircrew, injury to the refueler and damage to the aircraft were greatly minimized.

The aircraft taxied into a POL facility for hot refueling. The pilot, who was occupying the rear seat, got out of the aircraft as required by FM 10-68: Aircraft Refueling and the unit SOP. The IP remained in the front seat to prepare the aircraft for refueling.

The pilot, who was acting as fire guard, was standing about 5 feet from the refueler as he inserted the refueling nozzle into the aircraft's closed circuit refueling port. After some momentary difficulty fitting the nozzle into the receptacle, the refueler appeared satisfied the nozzle was properly seated, and he rotated the flow control handle to the flow position. He apparently thought everything was proceeding normally. The pilot, however, noticed a small red button at the back of the nozzle was still extended. This red indicator button is supposed to pop up when the tank is full and flow shuts off automatically.

About 15 seconds after the refueler started the flow of fuel, he appeared to be checking the security of the nozzle by rotating the nozzle while the flow handle was still in the flow position. Suddenly, the nozzle disconnected from the receptacle, and the full flow of fuel sprayed over the refueler, into the engine inlet, and over most of the aircraft's right side.

The fuel ignited almost instantly, and fire engulfed the right side of the aircraft from the synchronized elevator to the transmission. When the fuel caught fire, the refueler began backing away from the aircraft still holding the nozzle, but the bonding plug was still attached. Without realizing the back blast from the nozzle had saturated his gloves, he reached for the bonding plug. Then his gloves caught fire.

The refueler panicked, dropped the still-flowing nozzle, and ran. The pilot pulled the pin of the fire extinguisher and began spraying the fire while yelling to the IP to get out.

By the time the IP could get out of the aircraft, the refueler had realized he was running away from the only source of help, and he turned back toward the aircraft. The IP caught up with him, knocked him to the ground in front of the aircraft, and the pilot extinguished his burning clothing with the CO_2 fire extinguisher. The refueler's injuries were limited to second-degree burns on his hands and arms.

Using the emergency cutoff switch, the flow of fuel was stopped and, with the assistance of other personnel in the refueling area, the flight crew was able to extinguish the fire.

Investigation by Troop Support Command revealed the incident was caused by a malfunction of the refueling nozzle.

Training

One of the greatest hazards to people who work in potential danger areas, such as refueling, is that their work can become routine. This leads to relaxation of vigilance and results in carelessness. One of the ways to guard against this happening is through training.

There are two ways training can protect people who work around hazards such as fuel. First, continuous training makes the proper reaction to a fire or emergency habitual and instantaneous. The refueler in the incident just described panicked and ran away from the very people who could help him.

Another benefit of training is that periodic exposure to a fuel fire reminds everyone this is an ever-present hazard when fuel is being handled.

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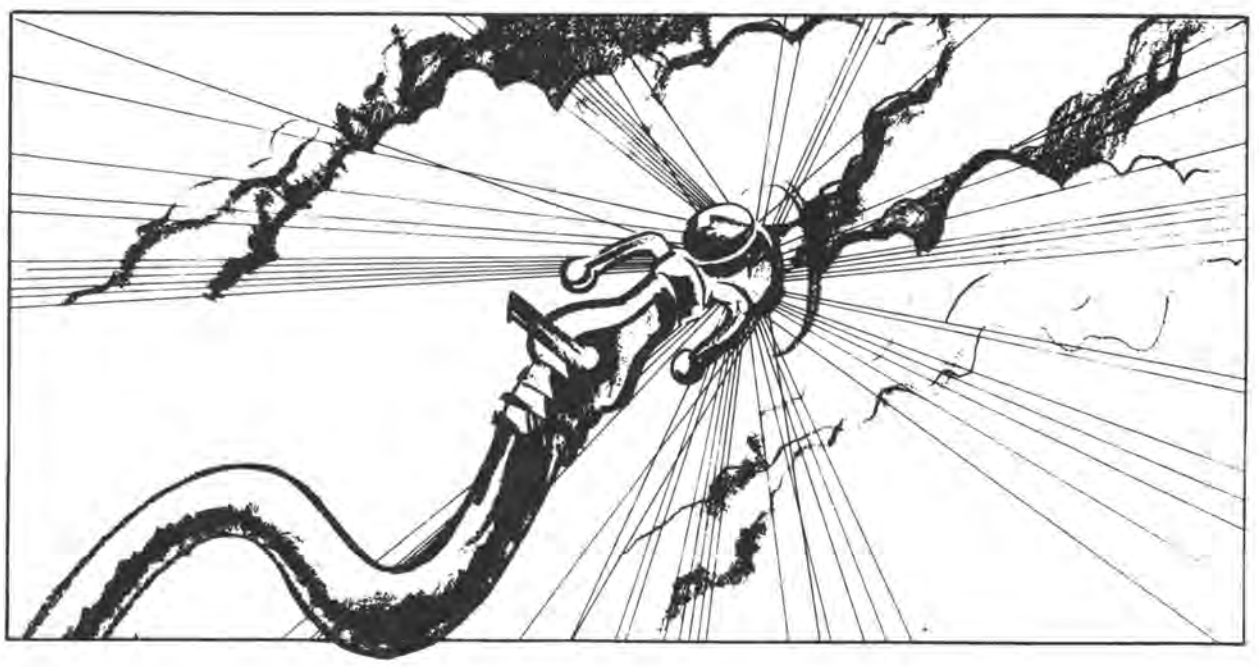
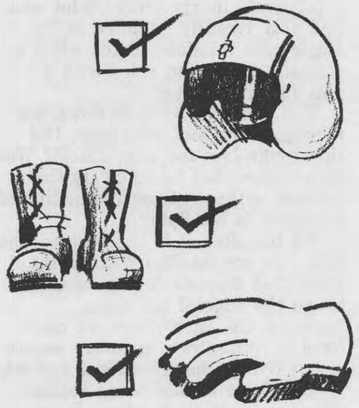


Close call...



Protective clothing and equipment

People who handle fuel must wear the proper protective clothing, including helmets, goggles and hearing protection, gloves, and boots.

•**Uniform.** According to FM 10-68, there is no special uniform for personnel handling aviation fuels. Therefore, the standard combat uniform is often worn by refuelers.

Issue No. 30 at the 1984 Army Aviation Policy Committee meeting requested fire retardant clothing be made available for fuel handlers. The Army Safety Center recommends that coveralls worn by explosives handlers be worn also by fuel handlers. The coveralls, explosive handler, are listed in DA Pam 385-3 and CTA 50-900, page 09-028, as line item number F 31850. The cost is $18.74 each.

SB 700-20 lists the coveralls with the following NSNs:

8415-00-280-2455 XS
8415-00-279-8719 SM
8415-00-279-8720 MED
8415-00-279-8721 LRG
8415-00-279-8722 XLG

or:

8415-00-809-9401 XS
8415-00-577-4063 SM
8415-00-577-4064 MED
8415-00-577-4065 LRG
8415-00-809-9400 XLG

For more information, contact Paul Borges at the U.S. Army Natick Research and Development Center, AUTOVON 256-4689.

Aircrewmembers are reminded that fire-retardant flight suits lose their protective properties when saturated with fuel. They should be removed as specified in Chapter 7, FM 10-68, and laundered.

•**Flyer's helmet.** All aircraft refueling personnel are authorized to wear the flyer's helmet (LIN K34252). This helmet protects the wearer's head from flying debris but not from rotor blade impact. The built-in ear pieces protect from hearing loss and contain receivers which, with an attached microphone, provide communication capability with the pilot in the aircraft during refueling. Visors on these helmets protect the wearer's eyes and make use of goggles unnecessary. Aircrewmembers should also remember to wear their helmets during refueling.

•**Motorcyclist's helmet.** A motorcyclist's crash helmet may be worn if a flyer's helmet is not available. This helmet is authorized by CTA 50-900 for ground crewmembers who work in rapid refueling and for persons who work at jobs where there is danger of head injury from flying debris.

•**Goggles and hearing protection.** Goggles and earplugs should be worn with the motorcyclist's helmet. Visors on these helmets should also be worn down during refueling operations.

•**Gloves.** Personnel who handle fuel should wear leather gloves to protect their hands; however, these gloves do not offer fire protection. Aircrewmembers should wear their flame-retardant flight gloves when around refueling operations. These gloves are not resistant to fuel, but they do give some protection to the skin. The gloves lose their fire-retardant quality after being soaked with fuel and should be replaced.

•**Boots.** Fuel handlers should wear standard rubber-soled, leather combat boots. The soles of these boots will not spark on a hard surface or slip on oily surfaces. The boots should not have any type of metal taps or cleats. Such metal can cause a spark when hit against a hard surface. Fuel tanks on helicopters are vented under the body of the aircraft and fuel vapors are heavier than air. This makes any spark at ground level extremely hazardous. Combat boots are not resistant to flammable liquids and can become fuel saturated. If the boots become soaked with fuel, they should be replaced.

•**Wear of clothing and personal items.** Shirt sleeves should be worn rolled down and buttoned, and shirts should be tucked into trousers. Do not wear or carry loose items of clothing. Do not carry anything in shirt pockets. Such items could fall out and cause sparks or drop into a fuel tank. Do not wear jewelry that might spark against metal surfaces.

FM 10-68 covers many additional areas of safety during refueling operations, including bonding and grounding procedures. Refueling personnel should be familiar with this manual and exercise extreme caution at all times when working around fuel and refueling aircraft. ■

FY89 Class A Accidents through 31 May

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	20	38	11

FLIGHTFAX

So tired you could just die...

You're irritable and headachy. Your eyes burn and itch. It's difficult to concentrate. Your arms and legs don't seem to go where your brain tells them, and they're so heavy you can hardly move them. You just can't keep your mouth shut from yawning. You're so tired you could just die.

Fatigue. It can be mental. It can be physical. It affects everyone from time to time, and it isn't always easy to spot.

Physical fatigue may be noticeable before mental fatigue. But however and whenever it's felt, fatigue impairs. The most typical types of impairment involve slowed reaction time, impairment of reasoning and decision making, errors of omission, lapse of attention, and erratic performance.

Tasks that are most vulnerable to fatigue are those that are uninteresting and monotonous, those that are being learned, those that are work-paced rather than being self-paced, those that involve a high workload, those that require continuous and steady performance, and those in which there is little feedback to the worker. While muscular strength is not directly affected by sleep loss, mental fatigue and the ability to perform physical and mental tasks are.

Fatigue and flying, a bad mix

Pilots who are tired before they take off are particularly vulnerable to error. One such tired pilot flew his OH-58 aircraft into a small rise while attempting to land at night on an open, snow-covered field. Neither the pilot nor the passenger was injured, but the helicopter was destroyed.

At the time of the accident, the unit was well into the second day of a field exercise that had begun with an early alert the previous morning. The unit was training hard following a period of bad weather in which they had not been able to fly. The pilot's flight activities and duty hours were extensive. In the 48 hours before the accident, the pilot

had flown 15.4 hours during his 29 hours of duty.

Using the day low-level flight factor of 1.3 from the Crew Endurance Scheduling Guide (AR 95-3), his factored flight time computed to 20.02 hours, exceeding the recommended 15 hours.

The pilot simply misjudged the terrain clearance and allowed the aircraft to hit the ground. Fatigue and the resulting loss of mental alertness may have caused his misperception.

If the crew endurance guide is not violated, fatigue is usually assumed not to be present. If the guide is violated, fatigue is usually assumed to be present. Unfortunately, it's just not that simple and, as set forth in the new AR 95-3, commanders should consider the advice of flight surgeons and aviation safety officers in setting limits for specific operations or time periods.

Fatigue can be very hard to detect, but it affects pilots in many ways. It produces odd judgment errors, inattention, carelessness, sloppiness, slowed or inappropriate reactions, overconfidence, and a tendency to forget or omit. But it is caused by more than loss of sleep. The body's natural reaction to high-stress situations and poor diet, hydration, and health practices can all lead to fatigue.

Stressed right out of the sky

The pilot of a CH-47 struck power lines while attempting a precautionary landing. Anxiety had led the pilot to maintain excessive airspeed during the approach in an attempt to get the aircraft on the ground as fast as possible. While there were no injuries, damages exceeded $60,000.

This accident occurred near the end of the last day of a training exercise. Some crewmembers had missed meals because of their duties. Both the pilot and copilot of this aircraft had personal problems that caused additional stress: one was changing jobs; the other was getting a divorce. Their mission was complete, the sun was setting, and they were on their way home. This is a typical setting for a tired and overstressed crew to become lax and lose their ability to react to an in-flight emergency.

You are what you eat

As Mom probably told you, you really are what you eat. You thought she only wanted to get you to eat those veggies, but the human body in flight is subject to stresses that can be increased by eating improperly before flying. The wrong foods may retard digestion and lead to physical discomfort while in the air.

Candy bars and other high-calorie, low-nutrition snacks may give a quick "sugar high," but the ultimate result may be a low that comes at the wrong time. The right foods and eating habits are essential to efficiency, alertness, and safety.

Nutritious postflight meals combat fatigue, restore the body to peak physical condition, and shorten recovery time between missions. Food has a relaxing effect and a meal, if only a light one, should be eaten soon after landing.

continued on back page ➤

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft mishaps

Utility helicopters

UH-1 Class C

H series - Engine compressor stalled while aircraft was at cruise altitude 200 feet agl. Aircraft yawed and rpm bled off. Stall ceased when power was reduced, and aircraft made a run-on landing.

V series - Aircraft was in autorotation following simulated engine failure during cruise flight. When throttle was applied during power recovery, engine failed. Crew successfully completed autorotation to landing.

UH-60 Class A

A series - While aircraft was approaching an airfield for landing, the No. 1 low-fuel light flickered. Shortly, the No. 1 low-fuel pressure light illuminated, followed by the engine-out light and audio. As the pilot continued toward the airfield, rotor rpm continually decayed, and the aircraft descended steadily to impact in a soccer field between two warehouses. The aircraft struck one of the warehouses, flipped onto its left side and slid approximately 100 meters before coming to a stop. 8922

Attack helicopters

AH-1 Class B

P series - IP was demonstrating approach during NVG training flight. On short final, crew felt a slight right yaw followed by a 35- to 45-degree yaw as aircraft pitched nose down and rolled right. IP rolled off throttle and entered autorotation. Aircraft hit the ground, left skid low, and bounced onto the right skid, breaking it off. Helicopter rolled right and came to rest on its right side. 8923

AH-64 Class B

A series - During flight, smoke entered cockpits and crew could smell odor of electrical fire and feel heat. There were no warning lights. Pilot made immediate landing in open field, began shutdown, and told copilot to get out. Generators, power levers, and battery switch were moved to the off position. As the pilot placed cyclic between his knees so that he could disconnect his helmet, the copilot's left leg bumped his cyclic, which was in the stowed position. The main rotor system went full forward, and two main rotor blades struck the PNVS. 8924

A series - While aircraft was downwind during IP training, No. 1 engine went into overspeed and shut down at about 120 percent NP. No. 2 engine went to 112 percent for 3 to 5 seconds, then returned to normal. After a single-engine landing, crew noted shaft-driven compressor light had come on. 8925

Observation helicopters

OH-58 Class A

C series - During aerial observer training, IP landed aircraft on level ground at a tactical landing site. Student observer took the controls and attempted to bring the aircraft to a hover. Left skid came off the ground, aircraft rolled onto its right side, and main rotor blades struck the ground. Aircraft was destroyed. 8926

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followups

UH-60 Class B

Reported in 29 Jun 88 issue as 8823 - While the aircraft was en route to perform a reconnaissance of the area where a fast rope rappelling demonstration would take place, the stabilator twice failed in the automatic mode. On both occasions, it was corrected by applying emergency procedures. On the next day, as the aircraft was en route to the demonstration site, the stabilator caution light and audio twice indicated a reversion from the automatic to the manual mode. Again, emergency procedures were applied. After landing and rigging for the fast rope mission, the aircraft took off and climbed to 60 feet and 80 KIAS. When the helicopter was 316 feet from the intended fast rope area, the IP began a 30-degree deceleration and reduced power for a quick stop. The stabilator caution light and warning horn again activated. The IP further increased deceleration and continued his descent. As the aircraft approached the ground, the IP increased collective, and the low rpm audio and light came on. The IP continued to increase power to cushion the aircraft onto the ground. The aircraft hit tail wheel first in a level attitude and rebounded forward for 3½ feet. The main rotors hit a tree directly in front of the aircraft, severing about 1 foot of each rotor blade. The crew executed an emergency shutdown, but as the rotor blades slowed, they again hit the tree, breaking one of the blades 3 feet forward of the main rotor hub. When the stabilator malfunctioned during the most critical part of the approach, the pilots' attention was directed inside the cockpit and divided between the situation there, the spectators' safety, and flying the aircraft.

OH-58 Class A

Reported in 13 Jul 88 issue as 8833 - The pilot was flying 3 to 5 feet above the surface of a lake at 90 to 100 knots. While talking to the copilot about his requirements for the remainder of the flight, he directed his attention inside the cockpit. He had allowed himself too little margin for error at such low altitude and high airspeed, and the aircraft struck the surface of the lake with explosive force. The pilot was killed. Although he was aware of the 400-foot restriction for the OH-58A, he frequently flew below the restricted altitude. Six operational hazard reports had been filed against the pilot during the year before the accident occurred. (See 10 Aug 88 issue of Flightfax for details).

...you could just die

The pause that really refreshes

An important part of good nutrition is proper hydration. Dehydration can result in decreased coordination, narrowed span of attention, and acceptance of lower standards of performance. Thirst is not an adequate indicator of the body's need for fluids, especially during periods of intense stress. Water loss needs to be corrected by drinking water or juice at frequent intervals.

Alcohol and coffee are both strong diuretics. Pilots who drink a few beers the night before flying, even when the alcohol is consumed within regulations, may awaken the next morning with dry mouths. If they then "kick-start" themselves with a couple of cups of coffee, they're compounding the problem. These pilots may take off badly dehydrated.

In addition, caffeine is a powerful central nervous system stimulant. One cup contains 100 to 200 milligrams of caffeine. Caffeine can cause, among other symptoms, irritability, nervousness, nausea, and feelings of fatigue.

Caffeine also comes in tea, many soft drinks, several over-the-counter stimulants, and some pain medications. When consumed in large quantities before flying, caffeine can give a pilot a "caffeine high"—a tolerable, but slightly uncomfortable buzz or burst of energy. But when the buzz fizzles, so can energy and efficiency. It's best to find substitutes for alcohol and to drink caffeinated drinks only in moderation. Milk, fruit and vegetable juices, club soda, and water are still the best choices.

Smoke pollutes more than the air

"If you haven't started smoking, don't. If you have, quit." Those are the words from aviation physiologists these days. Smokers are more susceptible to fatigue. The more you smoke, the less oxygen goes to your brain. If you can't quit entirely, at least cut down before flights.

In addition to causing fatigue, smoking substantially reduces night vision. Oxygen saturation of the blood at sea level is about 98 percent. Anything less than 87 percent saturation results in a reduction in night vision. A heavy smoker may have considerably lower levels than 87 percent.

In the final analysis, there is a relationship between fatigue and fitness. Aviators should consider themselves athletes and "train" accordingly, remembering the old adage, "all things in moderation." Good eating habits, proper rest, exercise, and common sense help pilots get in shape and stay in shape. Pilots who are in good physical shape are better able to withstand the stresses and strains that come from a challenging job, and they bounce back more quickly from the fatigue that comes with a challenging mission. ■

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 Number 17 14 June 1989

This giant CH-47 was no match for storms and high winds that struck Fort Hood in early May.

New procedures

Protecting Army aircraft from severe storm and wind damage

During the past two months, fast-moving storms accompanied by extremely high winds have dealt a harsh blow to Army aircraft at Fort Hood, TX, and Fort Polk, LA. In both instances, severe storm warnings had been issued and current procedures were being followed to protect the aircraft. Despite these measures, extensive and costly damage to aircraft occurred, resulting in a serious loss to the Army in combat readiness and resources.

In a message dated 092246Z Jun 89, General Robert W. Riscassi, Vice Chief of Staff, Army, outlines actions to be taken Armywide to prevent future severe weather damage to Army aircraft. Effective immediately, when notified the potential exists for severe storms with winds in excess of 50 knots, all Army aviation units will implement the following actions

continued on next page ►

Protecting Army aircraft

and procedures to protect aircraft. **This guidance supersedes procedures prescribed in technical manuals.**

•If aircraft cannot be safely evacuated, they will be placed in hangars according to the following priority: OH-58D/C, AH-64A, UH-60A, all series of AH-1s, UH-1V/H, and CH-47D/C. Priority for special operations aircraft is: MH/AH-6, MH-60, MH-47, and OH-6. Whenever feasible, helicopters with more than two main rotor blades will have the blades removed or folded so that as many aircraft as possible may be placed in the hangars.

•Currently, hangars are designed to accommodate about 20 percent of assigned aircraft for maintenance. However, during weather emergencies, such as those that occurred at Forts Hood and Polk, hangars should be able to accommodate 40 to 50 percent of the assigned helicopters.

•Aircraft that must remain outside will be tied down and moored in accordance with the appropriate technical manual procedures. When feasible, helicopters with multiple main rotor blades will have the blades removed and will be turned facing into the forecast wind direction before mooring.

Another victim of severe weather, this UH-1 awaits repair of its tail boom.

•Army aircraft located in areas that routinely experience severe windstorms will tie down and moor aircraft after the last flight of the day regardless of weather forecast.

•Every installation with Army aviation units will have secure mooring points for all assigned aircraft. Installations without sufficient mooring points will take immediate action to have the required mooring points installed.

•In addition to using all available shelters, aviation units will take advantage of the protection afforded by such artificial barriers as revetments, berms, and igloos. Equipment such as trucks, buses, tanks, and armored carriers can also provide some shelter from the wind to parked aircraft. Installations will be surveyed to identify potential revetments, igloos, and other forms of shelter that might be used to protect aircraft.

Future actions

Army Materiel Command will take the lead in the following actions:

•Procurement of main rotor blade racks for all helicopters whose blades can be folded.

•Development of procedures and standards to be used in case of high winds to assure the Army is doing everything feasible to eliminate or reduce damage to aircraft.

•Review of procedures and standards used by other U.S. and Allied military services as well as commercial aviation for possible application to Army needs.

Army Materiel Command, Aviation Systems Command, and Program Executive Officer/Aviation are evaluating current tiedown and mooring procedures. Where necessary, procedures will be developed to meet the requirements imposed by the variety of new high-cost aircraft in today's Army aviation units.

Point of contact at Headquarters, Department of the Army, DALO-AV, is LTC Dennis Williamson, AUTOVON 227-0487, commercial 202-697-0487. ■

Helicopter fuel cell maintenance calls for extreme caution

In a recent accident, a contract maintenance employee died inside the fuel cell of an AH-64 Apache helicopter. The employee arrived for work ahead of schedule and, instead of waiting for other employees, he entered the fuel cell where he was later found.

TM 55-1520-238-23-6, dated 7 Jun 88, is the Aviation Unit and Intermediate Maintenance Manual for the AH-64A helicopter. The manual specifies the type of clothing and equipment required to protect personnel working on fuel cells and outlines procedures to be followed, including the requirement for safety standby personnel and use of a respirator during maintenance.

A message issued by Training and Doctrine Command, 181700Z May 89, subject: Aviation Fuel Cell Safety Requirements, further amplifies paragraph 10-2-2 of TM 55-1520-238-23-6 and stipulates conditions that must be met by personnel under TRADOC control before entering the fuel cells of rotary wing aircraft.

•Fuel cell will be drained and dry before personnel enter. The cell may be purged with an explosive-proof exhaust ventilation system to facilitate drying.

A soldier, wearing the proper protective equipment, receives instructions from a technical inspector before performing fuel cell maintenance on an AH-64 helicopter. During work on the cell, the soldier on the right will stand by with a fire extinguisher.

•A minimum of two people will be standing by, one manning a fire extinguisher as outlined in TM 55-1520-238-23-6 and one in a position to observe and render assistance to personnel in the fuel cell.

•Appropriate protective clothing will be worn. This includes rubber-soled boots (or preferably rubber boots), rubber gloves, and coveralls/flight suits.

•A full-face respirator with an air supply will be used in lieu of the respirator, air filtering, paint spray (NSN 4240-00-022-2524) prescribed in the TM. The air supplied for breathing purposes must meet breathing air quality standards. The

continued on next page ►

Helicopter fuel cell maintenance

respirator, paint spray, is not a full-face respirator nor does it provide breathable air.

•Before entering a fuel cell, a visual inspection will be made, using an intrinsically safe light. Appropriate test equipment will be used to analyze the atmosphere in the fuel cell. The lower explosive limit will not exceed zero percent and the oxygen level in the fuel cell must be at least 20 percent. If units are unsure how to test for the atmosphere, they should contact their installation safety office or industrial hygienist.

•Local procedures for entering fuel cells should be reviewed and approved by the installation safety office and installation medical authority before implementation.

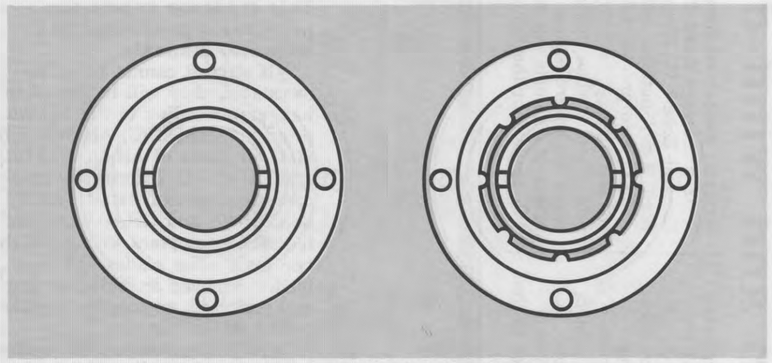
•A rescue plan must be developed to cover emergencies.

Point of contact for this message at TRADOC is Major Camp, AUTOVON 680-3217. ■

Check AN/PVS-5 NVGs for deficiencies in objective lens mount assemblies

Reports to Communications-Electronics Command (CECOM) from the field have revealed that objective lens mount assemblies manufactured under contract DAAB07-87-C-F016 and used with AN/PVS-5 and 5A night vision goggles have a materiel deficiency that may prevent correct focusing of the NVGs. NOTE: Some repaired AN/PVS-5B and C NVGs may have AN/PVS-5/5A lens assemblies since repair parts are not yet available for the B and C models. Therefore, those NVG systems may also be affected.

The back portion of these lens assemblies lacks a retaining ring that acts as a stop when focusing the goggles for close viewing. Without this stop, the objective lens assembly can travel too far forward and may detach from the threaded portion of the objective lens mounting collar. Once detached, the objective lens assembly cannot be returned to infinity focus.



At left is an objective lens mount assembly (OLMA) without the required retaining ring. The OLMA at right has the retaining ring. These views are from the back and are only possible when the OLMA is not attached to the image intensifier assembly.

This situation could create a hazard when users focus their NVGs to close range and then attempt to focus back to the far range (infinity focus). Aviators are reminded that tasks requiring them to look inside the cockpit during NVG flight, such as reading a map, should be performed by looking under their NVGs, not by refocusing the goggles.

Safety-of-use message CECOM 89-06-01, 061700Z Jun 89, requires all units—ground and aviation—to inspect all of their AN/PVS-5 NVGs. Objective lens assemblies with four-digit serial numbers ranging from 0001 through 4356 stamped on a label located on the outside of the objective lens assembly do not have the required retaining ring, and must be immediately removed from service and turned in to maintenance for consolidation and shipment to Sacramento Army Depot. In order to receive proper credit, units should include a DA Form 1348 when turning in objective lens assemblies for return to the depot.

Specific procedures for inspection and shipment of deficient objective lens assemblies to Sacramento Army Depot for repair are included in the safety-of-use message.

Future deliveries of objective lens assemblies will begin with serial number 4357, and the letters "RC" in white lettering will appear below the serial number label, indicating the assemblies have been repaired by the contractor. ■

—Point of contact: Mr. Jay Hanrahan, CECOM Safety Office, AUTOVON 992-0084.

FY89 Class A Accidents through 14 June

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4	1	4	0
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	21	38	11

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class D

H series - Aircraft was chalk 3 in four-aircraft airmobile operation. When copilot reduced power during final, aircraft slowed through effective translational lift and developed excessive vertical sink rate. Engine was overtorqued when copilot increased power to arrest rate of descent.

H series - During landing at a field site, empty sandbag was drawn up into main rotor blade.

UH-1 Class E

H series - Increasing odor of fuel was noted by crew during flight. Caused by deteriorated return fuel line.

H series - Engine chip detector light came on and oil pressure dropped to zero during landing.

UH-60 Class C

A series - During emplacement of 105mm howitzer, pilot wearing NVGs lost sight of the ground because of blowing dust in the LZ. Load was released when aircraft control became questionable. Howitzer was damaged when it dropped about 2 feet to the ground.

A series - During short final, crew felt vibrations from the main rotor. A few seconds later, pilot saw something fall from the rotor system. Blade was damaged when anti-flap housing cam broke off during flight.

UH-60 Class D

A series - Aircraft was on final approach to LZ to pick up M102 and gun crew. Seeing the gun and gun crew were waiting in his intended landing area, the PIC

continued approach to a clear area. As the aircraft came to a hover, it encountered blowing dust. The PIC continued approach to the ground, and underside of aircraft was damaged when it hit a pile of rocks concealed in the grass.

A series - After hookup of M101A1 howitzer, pilot allowed aircraft to drift forward of the load. When load came off the ground, the forward position of the helicopter, combined with a sling leg caught on the gun's sighting mount, caused the howitzer to tip forward, and the barrel hit the ground. At the same time, the gun's lunette came up and hit the bottom of the aircraft.

UH-60 Class E

A series - During cruise flight, low rotor and master caution lights came on, accompanied by low rpm audio. All indications returned to normal when collective was reduced. Caused by loose connector to wire bundle.

A series - Aircraft was being hovered to parking during heavy rainshowers. Fire warning and No. 2 engine-off lights came on. Caused by moisture in fire detector cannon plug.

A series - While aircraft was being taxied from parking, ground personnel heard a chirping sound. Caused by debonding of main rotor blade.

A series - Master caution and trim failure lights came on during takeoff, and yaw trim would not release. Caused by failure of yaw trim servo.

Attack helicopters

AH-64 Class B

A series - While aircraft was downwind during IP training, No. 1 engine went into overspeed and shut down at about 120 percent NP. No. 2 engine went to 112 percent for 3 to 5 seconds, then returned to normal. After a single-engine landing, crew noted shaft-driven compressor light had come on. 8925

Cargo helicopters

CH-47 Class D

D series - No. 3 tunnel cover came off during takeoff. Dzus fastener retaining spring failed due to corrosion.

CH-47 Class E

C series - During flight, PIC noticed No. 1 engine N1 gauge and engine oil pressure gauge registered zero. Engine chip detector light came on, and PIC secured engine and began precautionary landing. During approach, No. 2 engine developed high-side beep trim failure. After landing, metal particles were found in No. 1 engine tail cone.

C series - After aircraft reached cruise flight, No. 1 engine torque needle split. Rpm rose to 230 when engine condition lever was moved from flight to between flight and ground position. Cannon plug was replaced and loose N1 and N2 activator mounting bracket tightened.

CH-54 Class E

A series - First-stage servo light came on during cruise flight. IP took controls and cross-checked instruments. First-stage pressure gauge indicated within normal limits. IP completed emergency procedure for first-stage flight control hydraulic failure and landed aircraft. Caused by failure of first-stage flight control hydraulic pressure switch.

Fixed wing

C-7 Class D

A series - Aircraft was at 200 feet agl after takeoff when cargo door separated. Jettison mechanism latch was improperly safetied.

OV-1 Class E

D series - When PIC reduced power, No. 2 engine compressor began to stall. Egt rose to about 650° C for 2 seconds as PIC continued to reduce power. Compressor stall ceased and egt returned to normal. Variable inlet guide vanes were not properly adjusted.

U-21 Class C

A series - Aircraft was in cruise flight at 14,000 feet agl when crew saw lightning bolt off left wing tip and smelled burning odor. Left outboard flap panel, tip of rudder, anti-collision light, and left engine were damaged.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followup information

on accidents previously reported

AH-1 Class A

Reported in 29 Jun 88 issue as 8824 - The aircraft was at a 40-foot out-of-ground-effect hover. During the salvo firing of 18 pairs of 2.75 FFAR rockets with MK66 rocket motors, hot and disturbed air flowed across the tail rotor, causing momentary loss of tail rotor effectiveness. When the last of the rockets had left the tube, the tail rotor abruptly regained effectiveness. The abrupt change of directional forces caused the tail boom to twist and buckle just forward of the 42-degree gearbox. The twisting and buckling caused the No. 4 tail rotor drive shaft to shift forward about 2½ inches. The clamp from this drive shaft struck the No. 3 hanger bearing support, fracturing it and pushing it forward into the No. 3 drive shaft, causing it to compress. The tail rotor drive shafts are designed to withstand torsion loads but not compression loads. When the compression load was combined with the torsion load, the drive shaft failed, causing a complete loss of tail rotor thrust. This caused the aircraft to go into an

abrupt and violent right spin. Loss of directional control forced the PIC to attempt an autorotative descent under adverse conditions. The aircraft was destroyed when it hit the ground with a high vertical rate of descent and rolled over.

AH-1 Class A

Reported in 29 Jun 88 issue as 8825 - The purpose of the daylight training mission was to give orientation flights to selected crew chiefs. After two uneventful flights, the aircraft, with the PIC and a crew chief on board, took off on the third flight. After refueling, the aircraft was flying over a tank trail when the PIC entered a steep banked right turn. The aircraft was heading into the sun and visibility straight ahead was reduced because of the glare. The PIC failed to adequately search his lateral field of view for hazards because he had his attention on talking to the passenger in the front seat. As a result, he allowed the main rotor to strike trees and the aircraft crashed.

AH-1 Class A

Reported in 29 Jun 88 issue as 8826 - While performing high-speed dives, the pilot exceeded the maximum authorized dive angle and failed to complete a recovery before reaching 1,000 feet agl. When the pilot initiated a dive recovery at less than 400 feet agl, he was unable to arrest the descent. The aircraft was destroyed when it crashed into trees and burned. The pilot and passenger were killed.

AH-1 Class B

Reported in 4 May 88 issue as 8815 - Arriving at a forward area refueling site, the helicoper was engulfed in rotor-induced blowing snow as the IP began an approach to a sloping, snow-covered field. The right skid landed on the uphill side of an 8-degree slope and the aircraft began to roll left. The IP felt the slope was excessive and tried to abort his landing. He lost all outside references in the blowing snow, and the helicopter drifted left into a tree line. As the IP attempted to fly out of the whiteout condition, the aircraft's main rotor blade hit the trees.

OH-58 Class A

Reported in 29 Jun 88 issue as 8831 - The aircraft was on a tactical night unit training mission using NVGs. The purpose of the mission was to conduct NOE maneuvers, locate targets, and conduct target hand-offs to attack aircraft. As he began crossing an open field at about 20 feet agl and 10 knots with 7 percent ambient light, the PIC realized he did not have sufficient light to accurately judge his height above the ground, airspeed, or attitude. Recognizing he needed the infrared light on immediately, he reached across to the copilot's collective on the right side of the aircraft where the light switch was located. While he was attempting to switch the light on, the aircraft began descending. Just before it hit the ground, the PIC realized what was happening and tried to increase collective. But the aircraft hit the ground, rebounded about 10 feet into the air, then hit the ground again, left skid first.

OH-58 Class A

Reported in 29 Jun 88 issue as 8830 - The aircraft was on a VFR service mission in conjunction with aviator training requirements. In addition to the pilot, there was a civilian Army employee on board. The first leg of the flight was uneventful. After refueling, the pilot took off without obtaining an updated weather forecast. Twelve nautical miles from the airfield, the aircraft entered instrument meteorological conditions and crashed into a wooded mountainside, killing the pilot and the passenger.

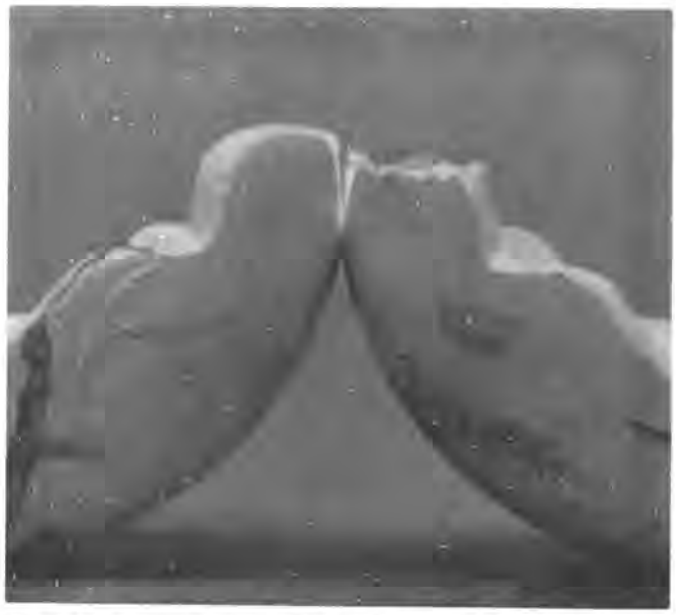
C. A. Hennies
Brigadier General, USA
Commanding General
U.S. Army Safety Center

Check SPH-4 foam helmet liners for unauthorized modifications

Examination by the U.S. Army Aeromedical Research Laboratory (USAARL) of SPH-4 helmets worn by crewmembers during the crash of an OH-58C helicopter revealed the front edge of the foam liner had been cut away approximately 1/2 to 3/4 inch.

Although no formal maintenance work order was ever issued, some helmet liners were modified in this manner to allow full-face AN/PVS-5 night vision goggles to be worn. With the subsequent suspension of full-face goggles for flight operations and approval and authorization in June 1983 of the modified face plate for AN/PVS-5 NVGs, modification of the SPH-4 helmet foam liner was no longer needed or authorized.

Modification of the foam liner significantly reduces the crash attenuation effectiveness provided by the helmet. Any helmets that have been modified in this manner should have a new foam helmet liner or the new thermoplastic liner installed.



At left is an SPH-4 foam helmet liner before modification. Any helmet with a liner that has been modified by cutting away the front edge as shown at right should have a new foam liner or thermoplastic liner installed.

Point of contact at USAARL is MAJ John V. Barson, AUTOVON 558-6881, commercial 205-255-6881. ■

AH-64 HARS operating notes

At a recent meeting of the Apache Action Team, it was noted that some AH-64 aviators may be unintentionally causing problems with the Heading Attitude Reference System (HARS) during ground operations.

HARS operating characteristics require strict attention to the notes contained in TM 55-1520-238-10, paragraphs 3-52 and 3-53.

Movement of the aircraft heading or position with the HARS control switch in an align mode causes major errors in the HARS characterization of operating parameters. Failure to realign the HARS after the aircraft has been moved will result in unsatisfactory navigation system performance. Also, failure to place the HARS control switch to an align mode when the helicopter is to remain stationary on the ground (longer than 1 minute) allows HARS to continue to gyrocompass. Due to the absence of valid doppler velocities, HARS will drift. If this is allowed to occur, drift errors may become large enough to cause damage and require replacement of the HARS. ■

–Point of contact: CW4 Sanford D. Breckons, HHD, 1-14th Aviation (Standards), U.S. Army Aviation Center, Fort Rucker, AL 36362-5000, AUTOVON 558-2690, commercial 205-255-2690.

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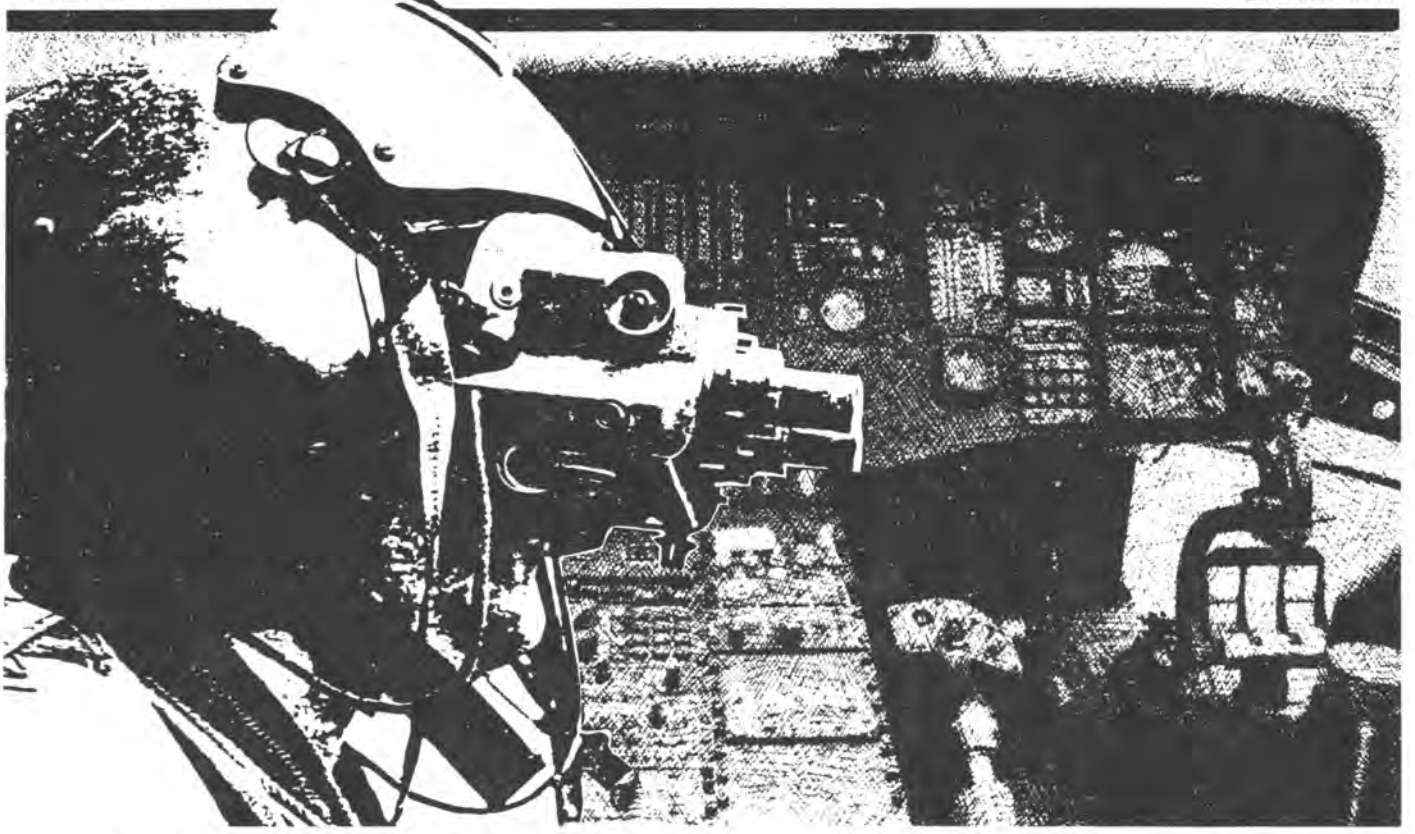
Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 Number 18 28 June 1989



Night vision goggle training

Analysis of night vision goggle (NVG) accidents and surveys of units in the field have brought to light a few keys to safe and effective NVG operations. The impact of regulatory guidance and some ideas of how to approach the training challenge at the company/battalion level are derived from what we have observed successful units doing on a daily basis.

Background

The stage was set in a June 1984 DA message on NVG training and operations. This message specified an Army goal of 100-percent NVG qualification, with 50-percent NVG currency in TOE positions in most aviation units (20 percent in cargo units). This blanket policy, which also formed a portion of a unit's training readiness under unit status reporting, impacted on all helicopter-equipped units without regard for their actual mission and resourcing. The goal served as a mark on the wall for the Army as a whole.

To date, NVG qualification is not yet complete (primarily in the National Guard and Army Reserve units, due to limited equipment issue), and an extension has been granted annually for accomplishing this goal.

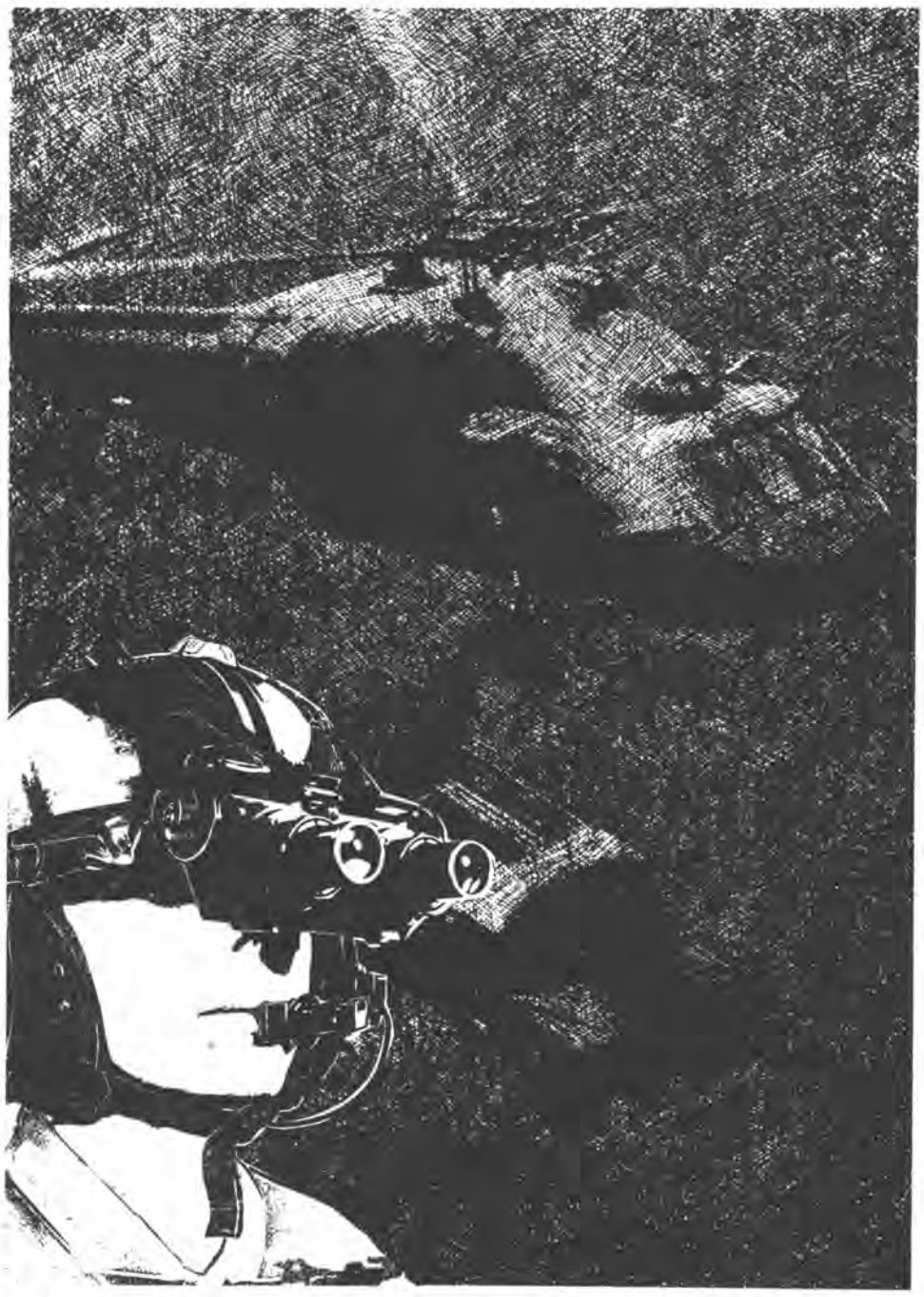
DA specified NVG qualification

Night vision goggle training

and currency requirements. But field commanders must design a goggle training and qualification program that can be accomplished within existing resources while maintaining aviator proficiency in unit flight missions.

Units should have established standards for mission performance that can be demonstrated and flawlessly executed before crews are sent out to transport troops, fire, or slingload equipment. This is true of day missions, but is especially critical at night under NVGs.

One commander demonstrated his standard for releasing crews to move troops during NVG operations by asking IPs if they would let these same crews transport their own son or daughter into a dusty LZ on a night of low illumination. What this standard lacks in detail it makes up for in impact, and it puts the performance standard into a perspective that anyone can readily understand. Responsibility for establishing proficiency standards and ensuring this high level is maintained belongs to commanders. While minimums can be legislated or directed from above, in the end it is the leaders and trainers of our aviation force who have to make these calls of judgment. It is the translation of the "what to do" to the "how we do it" that is our challenge.



The challenge

Depending on the mission environment and individual expertise, the required 1 hour of NVG flight in an aircraft or simulator every 45 days and 9 hours required in each semiannual period may not be enough to provide an aviator the needed level of NVG proficiency.

It is the commander's call to determine what NVG training, in addition to the minimum requirements, their aviators need. To establish and maintain a good NVG training program, there are some key points to consider.

• **Know your mission.** Ensure that your command group and the command group of your customers understand both your capabilities and your limitations when negotiating support methods. What the division or corps commander has in mind as an aviation unit's mission may be completely different from that envisioned by the unit commander. This can significantly alter the unit's training objective. Everyone in the chain of command must have a clear understanding of what the mission is and what demands are placed on aircrews for NVG proficiency. FM 25-100, Training the Force, discusses how commanders choose from among all possible missions to establish the unit's mission-essential task list (METL).

• **Balance resources with the mission.** Leader involvement in the mission and sound risk management and control are key to this process.

The "come as you are" war is still an undeniable fact of life. Yet, all too often, units are trying to maintain unrealistic numbers of NVG-current aviators in light of the level of resourcing. This is true in terms of both people and equipment. Fielding of NVGs is tied to production levels that cannot be changed overnight. Nor do we expect the percentage of fill of aviators, crewmembers, and maintenance personnel to improve significantly in the near future.

Some types of missions require additional crewmembers. If a unit's operations are characterized by single aircraft working in tight LZs, one set of eyes under NVGs in the rear of the aircraft probably isn't enough. This mission requirement (if so determined) is not resourced in our structure. To accomplish this type of mission, the commander will divert and train someone to do it. The question is: How many crews can you man, train, and maintain proficiency?

• **Consider unit integrity when assigning missions.** The unique conditions associated with night operations demand special handling. As an example, in the separate companies with a lift mission, consideration should be given to making one platoon the night operations platoon and providing the time and resources for them to become expert in the mission. This is far preferable to having two or three platoons that are marginally trained in both day and night operations. The long-term benefit is the establishment of a body of knowledge in NVG operations that covers the total training spectrum of individual and collective expertise.

The challenge comes when the mission requirement exceeds the capability of one unit. Whether it is a troop transport, cav/attack, or equipment lift operation, the battalion and/or brigade commander must consolidate people and equipment or provide special task-organized units to get the mission done. In either case, the bottom line is that NVG operations are not part-time business, and special training requirements exist for NVG operations. Necessary resources must be committed if operations are to be safe and successful.

Recent studies on human ability to change cycles from day operations to night operations show that it requires time to reach peak performance. Similar to jet lag, the body needs approximately one adjustment day for each hour the operational cycle is changed. It is probably easier to move from morning missions to early morning than to switch from morning to evening or night. The bottom line is to avoid frequent swings in the day/night cycle by protecting the maintenance and training schedules.

• **Determine the unit standard that must be met for the aviator to be proficient,** keeping in mind that clear differences exist between proficiency and qualification/currency. If the required sustainment training for NVGs isn't considered sufficient to provide the needed level of proficiency, how much training is enough? This is a question that must be answered by the commander. It is his training program. The commander, with the assistance of IPs and unit trainers, must determine what has to be done and how often.

While considering what training will be done and how often, there are

continued on back page

FLIGHTFAX

He failed to fly by the standard...just this once

An OH-58 was scheduled to perform a service mission transporting an Army civilian employee to a conference. When the flight operations officer noticed that one of the unit PICs had also requested a mission for VFR proficiency training, he decided one flight could accomplish both purposes.

On the day before the scheduled mission, the PIC had the day off. He completed all of his pre-mission planning at home, then reported to flight operations for the mission briefing. Takeoff was planned for early the next morning.

The PIC had a healthy respect for weather in the area, and he knew that it would likely be foggy early in the morning. He wasn't overly concerned, however; he had flown the route numerous times without any problem.

When he received a weather briefing at 0555 the next day, weather conditions were VFR with a minimum ceiling of 1,000 feet. Due to fog, minimum visibility along the route of flight would be 1,000 meters. He checked the weather again just before takeoff, and conditions had deteriorated to a 900-foot ceiling. Minimum visibility was still 1,000 meters. The weather forecaster warned that fog could be a major weather problem in the direction he would be flying, particularly around sunrise.

The aircraft took off under special VFR clearance a little after 0700. About 40 minutes later, the PIC landed at an en route airport to pick up his passenger and refuel. During the stop, he never updated his original weather information.

The pilot and passenger were killed when this OH-58 entered IMC and crashed into the side of a mountain.

Approximately 15 minutes after the OH-58 took off on the second leg of the mission, the PIC radioed the airfield tower that he had entered inadvertent IMC. A short time later, he again called the tower, his voice revealing his concern about the situation. Seconds later, the aircraft, which was in near-level cruise flight, hit the side of a mountain about 100 feet below the crest.

After striking several large trees, the aircraft hit the ground on a 40-degree incline and rebounded downslope, coming to rest on its right side. The helicopter was destroyed and both occupants were killed.

This PIC was known in the unit for his thoroughness. Whether planning, preflighting, or actually carrying out the mission, he had a habit of doublechecking everything, and he was respected for his flying abilities. He was not a risk taker; he took his flying and the weather very seriously. On several occasions when the weather was just above legal minimums, he would call a halt and wait for conditions to improve.

The training standard regarding weather updates is both clear and practical, and there is no doubt that the PIC was aware of the standard. It is taught during flight school and reinforced during unit-level training. He was also aware of the local supplement to AR 95-1 that required that weather updates be made at en route stops or at least every 2 hours.

The PIC's familiarity with the route and the fact that he had encountered no weather problems on the first leg of the flight probably contributed to his failure to recheck the weather at his last en route stop. If he had asked for a weather update, he would have known that VFR conditions no longer existed along his route. In addition, another aircraft had advised the control tower that weather in the vicinity of the airfield was deteriorating. The OH-58 PIC should have been monitoring this frequency as he prepared to leave the airfield.

When he encountered IMC after taking off on the second leg of the flight, the PIC failed to follow established procedures. He did not adjust power and establish a climb to 4,500 feet as outlined in the local supplement to AR 95-1 for the area. We can only speculate that his apprehension and concern upon entering IMC caused him to react improperly to the situation. He was a solo pilot in an aircraft that was not instrument certified. The fact that he knew about the IMC limitations of his aircraft is borne out by his actions during previous dual-pilot flights when he decided to avoid IMC either by landing or returning to home base. He probably attempted to avoid climbing in hopes of reestablishing VFR conditions.

The standards for weather updates and inadvertent IMC procedures were clear. There is no doubt that an aviator with this PIC's professional reputation was aware of them. This pilot was knowledgeable, he had outstanding flying ability, and he was cautious. This was a good pilot who made a bad decision: He failed to fly by the standard just this once, and he paid for his mistake with his life. ■

It could have been worse

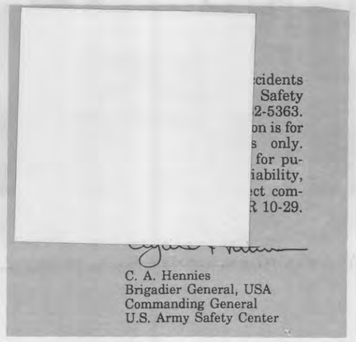
Recently, a UH-60 was undergoing an idle speed leak check following extended phase maintenance. The gust lock was in place when the pilot engaged the No. 2 engine starter during a normal start cycle. The engine, which was at idle speed, suddenly accelerated from 64 to 74 percent, and the blades began turning.

The flight engineer (FE), who was standing on the No. 2 engine cowling was struck in the back of the head by the main rotor blade. Fortunately, he was wearing his SPH-4 helmet, and he wasn't injured.

The FE dropped to a prone position on the engine cowling as the maintenance test pilot initiated an emergency shutdown of the engine. The FE slid off the engine cowling and was assisted to the ground by a crew chief. A few seconds later, the engine decelerated and coasted to a stop.

Gust locks are intended to prevent a helicopter's blades from turning when the helicopter is parked. The gust lock is designed to withstand torque from **one** engine at **idle** , allowing engine maintenance to be performed. Gust locks should not be depended upon to prevent the blades from turning when the engine is running.

This FE was lucky to get away with nothing more than a mild headache. Without the protection of his flight helmet, it might have been a different story. ■



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C. A. Hennies
Brigadier General, USA
Commanding General
U.S. Army Safety Center

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class C

H series - During taxi for takeoff, helicopter's rotorwash, coupled with high winds, caused a Cessna 150 to flip over. The unoccupied fixed wing aircraft was not tied down.

UH-1 Class D

H series - During cruise flight, pilot cracked copilot's windshield when he attempted to kill a bee with the aircraft logbook.

H series - SP was performing a standard autorotation while the IP monitored the controls. Everything was normal until SP applied initial pitch. Aircraft nose turned 5 to 16 degrees right of the runway heading. When SP was told to increase left pedal, he responded with excessive left pedal and forward cyclic. Aircraft was damaged during hard landing.

UH-1 Class E

H series - Cyclic and collective seemed stiff during hover operations. Cyclic fore and aft force gradient was adjusted too tight.

H series - Copilot increased torque from 38 to 40 pounds, and N2 dropped to 6200 rpm. N1 stabilized at 90 percent rpm. Crew used N2 linear actuator switch to increase rpm to 6600 and made a running landing. N2 was out of rig.

UH-60 Class D

A series - While taxiing to parking, crew allowed a main rotor blade to hit a tree, damaging the blade tip cap. Parking area was surrounded by trees on all sides. No ground guides were available. One of the pilots or crew chief should have gotten out of the aircraft and acted as ground guide. Parking area was too small for the number of aircraft.

A series - Aircraft was in chalk 2 position while transporting an M102 howitzer during an artillery demonstration. Crew felt the aircraft jerk when the front leg of the sling released. Aircraft flew to nearest available area to put the howitzer on the ground. When the howitzer touched down, it rolled over, damaging the gun sight. Slingload was improperly rigged.

UH-60 Class E

A series - After No. 1 engine started normally, crew attempted to start No. 2 engine. When starter was energized, crew heard loud banging noise and felt aircraft vibrate. Copilot thought noise was caused by droop stop contact and attempted to center cyclic. Crew chief identified noise as coming from engine area. Caused by internal failure of engine starter assembly.

A series - Crew chief noticed vibration during flight at 1,000 feet agl. Left step cover had torn loose.

A series - While attempting to lift 6,000 pounds, aircraft's tgt rose to 936° with torque at 93 to 94 percent. Load was released and aircraft landed.

Attack helicopters

AH-1 Class B

F series - After being picked up to a hover, aircraft rolled to the right and hit the ground inverted. 8927

AH-1 Class D

F series - PC was flying aircraft during battle drill while CP was using TSU to acquire possible target. Both canopies were coated with moisture and dirt. When CP looked up from TSU, he saw a tree in front of the aircraft and yelled to the PC, who hadn't seen the tree. Aircraft's right side hit tree.

P series - During nondirectional beacon holding, engine chip light came on. IP took controls, declared precautionary landing, and initiated approach to airfield parking area. During termination of approach, IP misjudged height of parking apron and rear portion of right skid tube was damaged when it contacted the edge of cement parking area.

AH-64 Class C

A series - During postflight inspection, crew found all four tail rotor blades were damaged and tail boom showed scuff marks, indicating a tree strike. Crew had noticed no indication during flight that a tree strike had occurred. Investigation continues.

AH-64 Class E

A series - While downwind, IP retarded No. 2 engine to idle for simulated single-engine operations. Master caution and engine fuel psi lights came on. IP saw NP and NR decreasing through 94 percent and lowered collective to enter autorotation. No. 2 power lever was placed in fly position, collective was increased, and torque rose to 122 percent. Descent was stopped 30 feet AHO. IP confirmed No. 1 engine had quit and performed a roll-on landing. Problem could not be duplicated.

Cargo helicopters

CH-47 Class D

C series - Aircraft was chalk 3 in a flight of four when the right aft cabin window popped out.

C series - While attempting to drive a jeep up the ramp into aircraft, driver failed to heed aircrewmember's directions to stop. Ramp extensions were not lined up, and ramp hinge broke when jeep hit the ramp.

CH-54 Class E

B series - During slingload of C-46 fuselage, right front engine mount on load broke and load began violent downward swing. Left engine mount failed and load continued to swing down and rearward, causing tail section to separate. Load was jettisoned into wooded area.

Observation helicopters

OH-6 Class C

A series - During final approach to uncontrolled airport, aircraft turned to avoid fixed wing aircraft in traffic pattern. Immediately after turn, engine failed, and autorotation was initiated to a cultivated field with a 10-degree slope. Aircraft hit ground tail first then rocked forward onto front of skids. Main rotor blades severed aircraft's tailboom. Aircraft became airborne, spun 170 degrees, and landed upright.

OH-58 Class D

C series - During contour flight along a river, pilot checked terrain to his left and noted it was 25 to 30 feet. When he looked back to the front of the aircraft, he saw reflection off a wire spanning the river about 30 feet ahead. He immediately pulled aft cyclic and increased collective. Wire struck UHF antenna, missed WSPS, and broke on the right front jacking point. The pilot had failed to do a high recon of the river for obstacles.

B series - Damage to all four main rotor blades was discovered after landing. Severe denting of blades began 1 foot inboard from the blade tip and extended approximately 2 feet farther inboard. Crew had noticed no abnormal control responses during the flight.

Fixed wing

C-12 Class E

C series - During postflight inspection, signs of bird strike were found on No. 2 engine inlet and right side air-to-air exchanger inlet.

OV-1 Class E

D series - No. 2 fire handle light came on during flight. Caused by water in No. 2 fire light cannon plug.

D series - During attempt to restart No. 1 engine after engine out, egt went to 770°. Engine was secured and aircraft landed.

D series - Fuel in right drop tank would not transfer. Caused by failure of transfer pump.

Safety messages

Aviation life support equipment (ALSE) advisory message (ALSE 89-2, 121030Z Jun 89) concerning signal kit, foliage penetrate, (L119), NSN 1370-00-490-7362, used in SRU-21/P survival vest and Mohawk survival vest. Armament, Munitions, and Chemical Command is still experiencing a shortage of these signal kits. Delivery is not expected until the last quarter of FY 89. A waiver is granted to substitute, using signal kit (L116) type 185, NSN 1370-00-319-7560, until signal kit L119 becomes available, but not to extend beyond 1 Jan 90. Contact: Jim Angelos, AUTOVON 693-3574, commercial 314-263-3574.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Night vision goggle training

significant boundaries placed on what logically can be done. At the lower limit are the minimum number of hours specified in each aircraft ATM that must be accomplished during each semiannual period in various modes of flight as well as certain flights that must be accomplished (standardization evaluation, instruments, NVGs, etc.). At the upper limit is the flying-hour resource constraint. While a commander might like to have each aviator fly 30 to 40 hours every month for training and overall proficiency, most units will have about 10 hours each month for typical line aviators. Hours to support a well-documented program will stand a better chance for approval of your flying-hour program.

• **Train to the mission standard.** The key is to train as efficiently as possible and train to the mission. Our flying-hour resource is too precious to waste on events that cannot be tied to mission-oriented proficiency. Options include specifying increased minimum hours for NVG proficiency and providing more detailed guidance for the training to be accomplished before considering an aviator fully mission trained. Our more complex aircraft fleet demands that we battle-roster our crews to enhance cockpit communications and coordination. Our accidents at night indicate that momentary lapses of both pilots' attention being inside the cockpit are a leading cause factor. Unit-level training in crew coordination and standardization can best fix this problem. Instructor pilots can monitor compliance. Also, if crews must be changed, provide some training time before scheduling for more difficult missions.

Given all this, unit commanders sometimes are reluctant to add to the minimums because this impacts on unit readiness status and detracts from their flexibility to accomplish all the missions at hand. However, commanders have to make the call to provide for their operational mission capability and training because no one else can.

Bring your full team to bear on the training challenge:

• Know the mission.

• Set standards appropriate to the mission.

• Train to the mission standard.

• Focus training on both individual proficiency and collective unit proficiency.

• Protect the unit training and maintenance schedule.

• Battle-roster crews.

–LTC Dennis D. Cross, Prevention Programs Division, AV 558-3901

FY89 Class A Accidents through 28 June

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	5
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4	3	4	9
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	23	38	19

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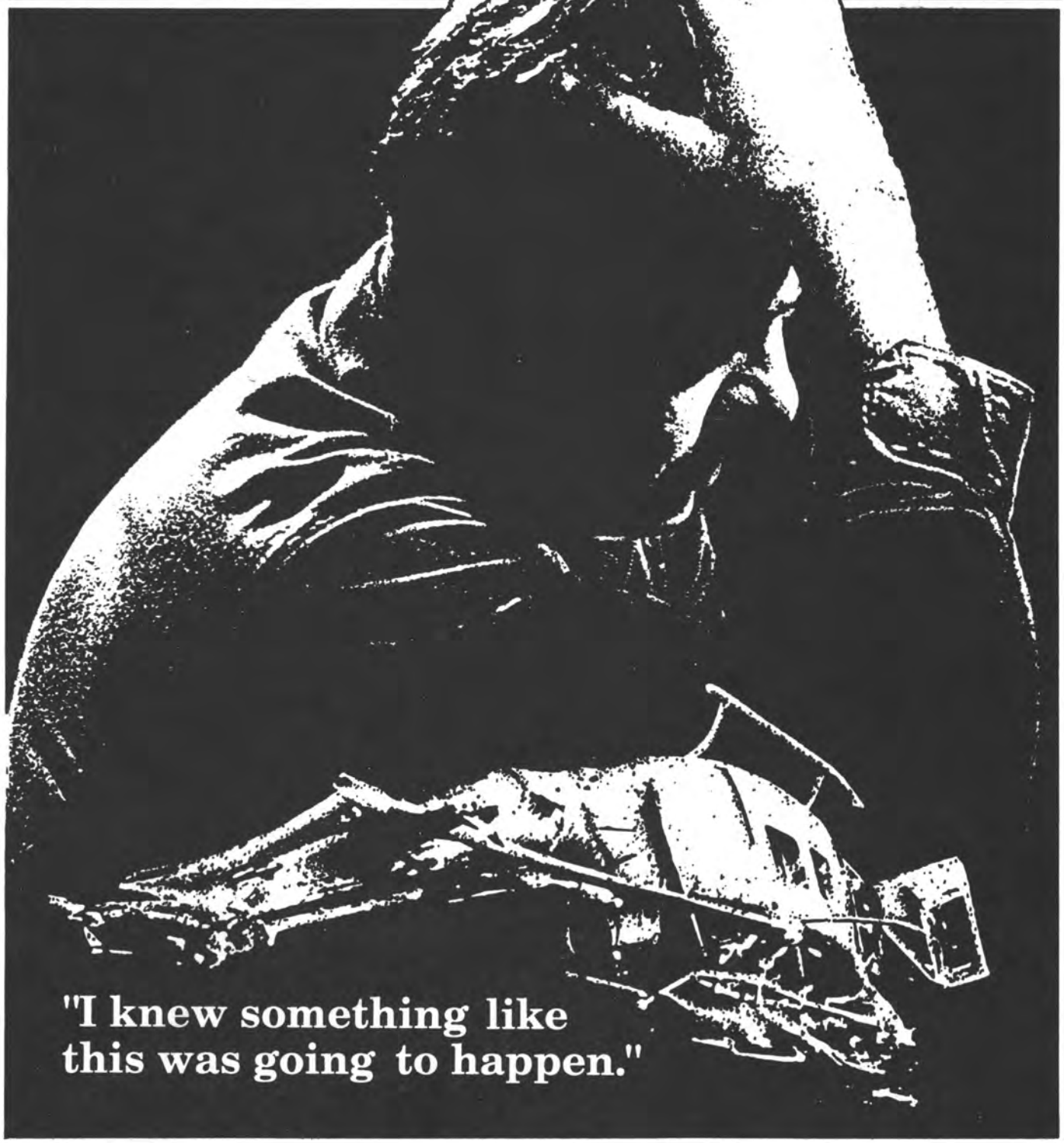
Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 19 12 July 1989



Are you your brother's keeper?

If you had a brother who was known as a reckless driver, would you hand over your car keys to him? Would you just say, "Well, that's the way he is" and not even try to change his behavior or stop him from driving? Would you just let him kill himself and maybe someone else? Of course the answer is "No," and the reason is simple: He's your brother...and you are your brother's keeper.

Everyone in Army aviation is part of your family too. In this family, your brothers fly aircraft, maintain aircraft, rearm and refuel, and drive Army vehicles. And most of them do it safely most of the time. But some of the time—for some reason—they abandon their professionalism and they take chances, unnecessary risks. They push themselves and their equipment beyond safe limits. And they have accidents.

After one of these accidents, it's not unusual to hear other aviators in the unit say, "I knew something like this was going to happen." They knew something was wrong. They had seen things or had heard people talking about things the accident aviator did, but they didn't ***do*** anything, and another aviator or another member of our Army family died.

In FY 88, Army aviation accidents took 38 lives. Thus far this fiscal year, there have been 21 more aviation fatalities. In some of these cases, somebody knew of an unsafe practice, an unsafe attitude, but nobody said or did anything to correct it, and somebody died.

Awareness of an unsafe practice or attitude is the first step in preventing an accident. But awareness alone is not enough. Someone must care...care enough to take action to prevent that unsafe practice or attitude from causing an accident.

Aviators knew about an AH-1 pilot in their unit who had a habit of letting his aircraft get below the minimum recovery level of 1,000 feet before trying to recover from a high-speed dive. They talked about it among themselves. They also knew that when he flew this way he was usually the PIC and outranked the other crewmember—or the other person on board wasn't rated in Cobras.

They knew he flew this way, but he was an experienced aviator—with 992 hours of flight time, 812 of them in Cobras—and everybody thought he knew what he was doing. Nobody did anything to stop him. Then, one day, with a nonrated observer on board, he let the aircraft descend below 400 feet during a high-speed dive, and he couldn't recover it. The helicopter crashed into trees and burned, killing both the aviator and the observer.

There had been plenty of warning signs about this pilot's flying, and people in the unit knew he was a high-risk aviator, but they didn't do anything.

Risk takers don't change on their own. In fact, the longer this kind of behavior goes uncorrected, the more likely it is to continue until an accident happens. People knew this pilot was taking unnecessary risks, but nobody was willing to be his brother's keeper. As a result, he got away with taking chances until he took one too many, and two people died.

Two experienced PICs were returning to a field training site in Cobras. It hadn't been a very exciting day. The night crews were getting most of the missions, and the day crews were frankly bored. They decided to liven things up a little by buzzing the tactical operations center (TOC) at about 50 feet.

As the aircraft passed over the TOC at 120 knots, the first aircraft made a break to the left and turned toward the landing site.

The second aircraft made a break to the right. After making the turn, the copilot, who had only 125 hours of experience after completing flight school, increased collective and used aft cyclic to initiate a climb. The helicopter's nose dropped, and the aircraft rolled right and entered a high rate of descent. When the PIC saw what was happening, he tried to tell the copilot what to do, but he was basing his instructions on what he as a pilot with 975 hours in helicopters would have done. The copilot tried to follow his instructions, but he wasn't skilled enough to recover the aircraft, and it hit trees and crashed.

This PIC's current platoon leader and two previous platoon leaders knew that he sometimes "cowboyed" aircraft. He had been informally counselled several times for conducting flight maneuvers that exceeded aircraft limitations. But because he was a proficient aviator, the less-experienced platoon leaders failed to go far enough. They did not formally counsel him or take him off PIC status. They also failed in their responsibility to let the unit commander know he had a high-risk aviator on his hands.

Tough caring means making tough decisions about the professional performance of other members of the unit. It means policing yourself and your fellow soldiers. The first time someone disregards a procedure or fails to perform to standard, someone must care enough to take immediate and positive action to change the aviator's behavior or change his job.

A UH-1, with a crew of three and two passengers, was returning to home station. The pilot, a maintenance technician with 3,000 rotary wing hours, more than 1,600 of them in UH-1Hs, told the copilot, who was new in the area, he was going to show him some beautiful scenery during the flight.

He had been flying at about 500 feet, but when he sighted a bay with a large boat at anchor, he descended to about 100 feet above the water to let everybody take a closer look. The Huey was flying at about 100 knots when it hit wires. The pilot was able to make it to land, but during approach the helicopter's nose pitched down, and it began spinning to the right. The aircraft hit the ground and rolled onto its right side, injuring everyone on board.

It was common knowledge in the unit that this pilot liked to fly low and fast. In fact, some of the other aviators refused to fly with him. He had been verbally counseled by his unit commander but, in spite of his reputation, no one took the trouble to check to see if he had a record of doing this kind of thing in his previous unit. continued on back page ➤

FLIGHTFAX

Wild stuff

A sincere commitment to being our brother's keeper would be a good first step toward solving a problem that is as old as aviation itself: pilots ignoring their own and their aircraft's limitations to prove something to themselves or to others. It is difficult to bring to mind a type of accident that is more tragic than one in which a pilot flies a perfectly good aircraft into the ground for no other reason than lack of professional flight discipline. A brief review of a few such accidents should help us to help our brothers understand and resist the temptation to show their stuff in wild abandon. ■

While flying 10 to 15 feet agl at 85 knots on a routine observation mission, the pilot of this OH-58 impulsively decided to execute a cyclic climb followed by an abrupt descending left turn with excessive left bank and a nose-low attitude. This unauthorized aerobatic maneuver terminated when the helicopter hit the top of a large Army truck on the ground. The aircraft continued along the flight path, hitting the ground 100 feet beyond the truck. The cockpit separated and continued along the flight path for another 100 feet. Miraculously, both the pilot and his seriously injured passenger survived.

The pilot of this UH-1 was performing an unauthorized maneuver when he lost control and crashed. The aircraft was acting as a target for a tank crew when the pilot decided to experiment with gunship tactics for which he had not been trained. After completing his pass at 50 knots and 50 feet agl, the pilot tried to make an extremely tight turn to reverse course and pass back along the other side of the tank. This maneuver was described as resembling a hammerhead stall. He ended up in a nose-low attitude with insufficient altitude to recover. The aircraft hit a sand dune and then bounced across several others before coming to rest 221 feet away. Two of the three occupants were seriously injured.

The minimum altitude for this AH-1's last mission—an orientation flight—was 100 feet agl, but the pilot had made two successful gun runs, recovering at approximately 30 feet agl each time. On the third dive, at 80 to 100 knots, he misjudged terrain clearance and hit the ground. The Cobra bounced back into the air and crashed inverted 1,140 feet away. The pilot was killed, and his passenger was seriously injured.

The crew of this UH-1 had wanted to give their passengers an exciting orientation ride. The aircraft was last seen in a nose-high climb, with a 180-degree turn at the top, followed by a nose-low descent. The maneuver was described as similar to a return-to-target. Following this unauthorized aerobatic maneuver, the tail rotor hit a tree and the aircraft crashed and burned. All 10 occupants—4 crewmembers and 6 passengers—were killed.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class A

H series - Tail rotor components apparently were lost during flight. Crew maneuvered aircraft in semi-controlled flight to bottom of ravine due to lack of suitable landing areas. Aircraft was destroyed. 8928

H series - Aircraft entered IMC during unaided administrative night flight. Weather was below VFR minimums. During attempted instrument approach to an airfield, crew executed missed approach procedure and crashed while attempting another approach. All six personnel on board were killed. 8929

UH-1 Class B

H series - Aircraft was No. 3 in flight of 5 UH-1s in VFR cruise flight at 580 feet agl. Hydraulic system light came on and crew felt feedback in controls. Crew initiated emergency procedure for hydraulics failure and, seconds later, rpm light came on and audio sounded. After determining that engine had failed, crew initiated autorotation to small logging area. Aircraft landed hard, bounced, and came to rest on its right side. 8930

H series - Aircraft was conducting NVG terrain flight approaches to an inverted "Y" on a

dry lake bed. While directing his attention to other aircraft, PIC allowed his aircraft to descend and hit the ground. 8931

UH-60 Class C

A series - Tail wheel could not be locked during termination of single-ship NVG mission. Damage to fuselage and tail boom was found during postflight inspection. Aircraft had hit a tree during tactical insertion.

UH-60 Class D

A series - Aircraft was chalk 3 during NVG mission to move an artillery battery. Illumination was zero, and light rain was falling. After hooking up external load of M102, using extended slings, aircraft was brought to a hover. Crew chief told pilot aircraft was drifting rearward. While scanning for visual cues, pilot failed to arrest drift. PIC realized aircraft was drifting but was confident pilot would take action. M102 was damaged when it turned onto its side.

A series - Transmission oil pressure increased into precautionary range and stayed there during 10-minute flight to airfield. Maintenance replaced transmission oil pressure switch.

Attack helicopters

AH-1 Class B

F series - While engaged in simulated rocket firing at about 50 feet agl, crew allowed aircraft to drift rearward and hit a 65-foot tree. Aircraft began vibrating, yawed right, descended rapidly, and landed hard on a 15-degree slope covered by small trees. 8932

AH-1 Class D

F series - Refueler attempted to force CCR nozzle into port during hot refueling, breaking retainer ring on CCR port.

F series - Aircraft was being repositioned for takeoff from a confined area during an NVG training mission. UT, who was flying from the gunner position, allowed aircraft's tail rotor to hit a tree.

AH-64 Class B

A series - Engine failed while aircraft was at a 5-foot hover. IP took controls, lowered collective, and added forward cyclic to make a roll-on landing. Remaining engine compensated for power loss, resulting in main rotor overspeed. 8933

AH-64 Class D

A series - Main rotor blades were damaged when aircraft struck a wire during low-level flight.

A series - No. 2 tail rotor drive shaft cover was damaged when it came open during flight.

Cargo helicopters

CH-47 Class D

D series - Pilot focused attention on POL handlers directing him into landing point for hot refueling. He allowed aircraft to creep forward, and main rotor blades struck small trees.

CH-47 Class E

C series - During hover, crewmember reported hydraulic leak in aft end of aircraft. By the time aircraft landed, hydraulic fluid was spraying into aft cabin area. Filler cap on No. 2 reservoir was not properly secured.

C series - Aircraft was in cruise flight during vehicle recovery mission when transmission oil pressure light came on and cabin began filling with smoke from No. 1 engine. Engine was shut down and aircraft landed. When a screw head insert failed, oil leaked from No. 1 transmission and was ingested by engine.

Observation helicopters

OH-6 Class C

A series - Aircraft was flying at low level over a river while searching for a missing child. Visibility decreased when light rain was encountered, and pilot initiated a climb at 25 to 30 KIAS. Aircraft struck and broke a 1¼-inch diameter power lines. Aircraft landed with no further damage.

OH-58 Class A

C series - During cruise flight, aircraft struck high-tension wires and crashed. All three people on the aircraft were killed. 8934

OH-58 Class C

C series - After hovering through 50-foot opening between trees during tactical training exercise, aircraft's main rotor blade struck tree branch along tank trail.

OH-58 Class D

A series - Pilot landed with forward ground speed to minimize dust in assembly area. Dents in tail rotor blade were found during postflight inspection. Tail rotor apparently hit a bush during landing.

Fixed wing

C-12 Class D

C series - During taxi for takeoff, right propeller blades hit barrier cone that had been weighted down with cargo strap.

OV-1 Class E

D series - During climb, No. 2 engine ring cowl anti-ice system began arcing. Caused by failure of No. 2 engine ac deice generator voltage regulator.

D series - Fuel would not transfer from right drop tank during flight. Caused by failure of transfer pump.

U-21 Class D

A series - During takeoff roll, pilot heard loud noise and felt vibration in pedals. Nose gear tire was punctured by FOD.

U-21 Class E

H series - When pilot applied reverse thrust and brakes during landing rollout, left brake pedal went to the stops. Aircraft was stopped using reverse thrust. During postflight, crew discovered left main tire was covered with brake fluid. Caused by failure of seals inside left wheel brake cylinder assembly.

Maintenance

UH-1 Class E

H series - Engine flamed out during runup. After shutdown, crew found main fuel line was disconnected at fuel filter.

Safety messages

•Safety-of-flight operational message concerning protection of Army aircraft from severe storm and wind damage (GEN-89-03, 191300Z Jun 89). Contact: Lyell Myers, AUTOVON 693-9089, commercial 314-263-9089.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363.

. . . your brother's keeper?

He did, and it was in his records, but nobody was concerned enough to look. He had even been grounded for a while as a result of a similar incident in his previous unit. If someone had cared, if someone had checked, this accident might never have happened.

The punishment has to fit the crime. Evidently, a short period of grounding did not bother this pilot very much. When he arrived in the new unit, he continued to fly the way he had before. Even when he was reported and counselled, nobody brought up his past record, so he really had no reason to change. He had gotten away with it before with no serious consequences. Undisciplined behavior never corrects itself. It continues until someone is killed or someone cares enough to take action.

When aviators like these are in a unit, it's never a secret. People know. People talk. The question is, "How much do they care?" Do they care enough to do the tough thing—the caring, professional thing—and report a fellow aviator? That's tough to do, but it's not as tough as wondering after there's been an accident if there was something you could have done that would have saved someone's life.

Are you your brother's keeper? In Army aviation, you have to be. To stand by and watch a fellow aviator endanger himself and others without doing something about it is a violation of the special trust and responsibility we have to be our brother's keeper. And it's not enough just to be our brother's keeper; we must also be a brother who's easy to keep by setting high standards of performance in everything we do, in our professional performance of duty and our personal commitment as a member of the Army family. ■

The consequences of our silence

"We should all bear one thing in mind when we talk about a troop who 'rode one in.' He called upon the sum of all his knowledge and made a judgment. He believed in it so strongly that he knowingly bet his life on it. That he was mistaken in his judgment is a tragedy, not stupidity. Every supervisor and contemporary who ever spoke to him had an opportunity to influence his judgment, so a little bit of all of us goes in with every troop we lose."

We don't know who wrote this—the author is unknown—but it should open the door to self-examination for all of us.

We need to honestly assess our "brother's keeper" attitude. How seriously do we take our professional and personal responsibility for the safe-keeping of our fellow aviators? When we see substandard performance, a reckless attitude, do we look the other way and hope nothing bad happens? Do we avoid personal conflict by convincing ourselves that a fellow aviator's lack of professionalism is none of our business?

On the other hand, how receptive are we to being kept by our brothers? How would we react to a fellow aviator calling our hand about a breach of flight discipline or an occasional failure to perform to standard? Would we take offense, or would we take it to heart as a sign of caring?

We hesitate to confront our brothers for many reasons. Confrontation is hard. But even harder is living with the consequences of our silence.

Think about it. ■

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 2 19 October 1988

Copilot's actions contribute to LTE

The unit had self-deployed and arrived at their forward deployment position. The next day, six crews were given a blanket mission briefing to conduct local area orientation flights, followed by a range recon for the upcoming exercise.

One of the OH-58s arrived at the first set of battle positions. The copilot, who was on the controls from the right seat, brought the aircraft to a high hover. As his airspeed decreased to about 5 to 10 knots, he felt the aircraft shudder and the airframe seemed to want to kick to the right. Questioning the controllability of the aircraft, he applied left pedal, made a go-around, and came to another high hover. This time the aircraft was heading into the wind.

After conducting a recon of the area, the OH-58 moved on to the other battle positions. Arriving at the intended area of operations, the copilot put the aircraft into a slow hover at about 200 feet agl, on a heading of 110 degrees. The aircraft started to buck right again. Recognizing he had only marginal control of the helicopter, the copilot initiated a right turn, away from another aircraft to his left. He intended to get some airspeed and come back around for another pass, but the turn developed into a rapid right spin.

The PIC took the controls and applied full left pedal, forward cyclic, and collective in an attempt to fly out of

Copilot's actions contribute to LTE

the spin. The aircraft continued spinning to the right and assumed an excessive nose-low attitude. The PIC applied aft cyclic in an attempt to level the aircraft, but it continued to spin right and hit the ground on a heading of 185 degrees.

The problem

The first time the aircraft shuddered and yawed to the right, the copilot was able to correct the yaw by applying left pedal. When he again brought the 2,662-pound aircraft to a high hover, on a heading of approximately 110 degrees with a left crosswind, he had created a condition conducive to loss of tail rotor effectiveness. When the aircraft yawed to the right and the copilot turned to the right and applied power, it was the wrong thing to do. His decision to make a right downwind turn increased the severity of the right yaw, and the aircraft entered a rapid uncommanded right spin and crashed. Initiating a right turn under these conditions is contrary to the guidance in paragraph 8-61.4, TM 55-1520-235-10 which states "...the helicopter will attempt to make a sudden quick yaw to the right. This yaw is usually correctable if immediate additional **left** pedal is applied. Correct and timely pilot response to an uncommanded right yaw is critical. If the response is incorrect or slow, the yaw rate may rapidly increase to a point where recovery may not be possible in the terrain flight regime."

The copilot was qualified but not current in the OH-58 aircraft. His currency had expired when he

attended the AH-1 qualification course and was assigned the AH-1 as his primary aircraft. At the time of the accident, he had 449 hours of flight time, 126 of them in OH-58s. During the past 17 months, he had been transferred from one duty assignment to another four times. Each change affected his primary aircraft flight assignment. He had gone from the UH-1 to the OH-58, to the AH-1, and back to the OH-58. While this did not directly contribute to the accident, he had not been able to accumulate consistent training and experience in the OH-58C aircraft. As a result, the copilot was in Army Readiness Level (ARL) 3 status which meant he was not authorized to be at the controls of an aircraft unless there was an instructor pilot, standardization pilot, instrument flight examiner, unit trainer, or maintenance test flight evaluator in the cockpit with him.

When the aircraft entered the rapid uncommanded right spin, the PIC took the controls and initiated emergency procedures for LTE. He increased the severity of the spin when he applied excessive forward cyclic, which subsequently required application of aft cyclic and increased power to arrest the rate of descent. This caused the engine to droop and decreased available tail rotor thrust.

Flight tests and operational experience verify that the OH-58 aircraft has inadequate directional control when it is being operated at low airspeed and in sideward flight. The Army has designed a product improvement modification, MWO 55-1520-228-50-25, that will correct the inadequate directional control problem. The accident aircraft had not received the tail rotor modification.

The fix

- Aviators, particularly low-flight-time aviators, should be stabilized in one primary aircraft until they have gained experience and progressed through ARL 1.
- Duty changes of junior officers should be minimized until they have gained experience and proficiency in their primary aircraft.
- Installation of the OH-58 tail rotor modification should be expedited Armywide. At the time this accident occurred, only 202 OH-58s throughout the Army had received the tail rotor modification.
- Application of correct emergency procedures for LTE in accordance with paragraph 9-25.1, TM 55-1520-228-10, may have reduced the severity of this accident. □

CH-47D NVG lighting control panels causing problems

A human-engineering problem has surfaced in the CH-47D fleet that could result in temporary visual incapacitation of the cockpit crew. Several instances have been reported of pilots confusing two different overhead switch panel configurations currently found in CH-47D aircraft.

Approximately 40 percent of CH-47D helicopters are outfitted with the "Interim NVG" lighting system (Figure 1-A) while 60 percent have the fully NVG-compatible Nightfix Phase II lighting system (Figure 1-B). Unfortunately, the locations of the bottom anti-collision light switch and the interior dome light switch were reversed on the two lighting systems.

Pilots accustomed to blindly reaching up with the left hand to identify and actuate the bottom anticollision light switch have inadvertently actuated the bright white interior dome light in the newer NVG configuration. In the instances reported, this caused shutdown of the pilots' night vision goggles, resulting in loss of practically all visual cues and near-panic while the crew tried to locate and deactivate the switch.

Units that have aircraft with both cockpit configurations are currently

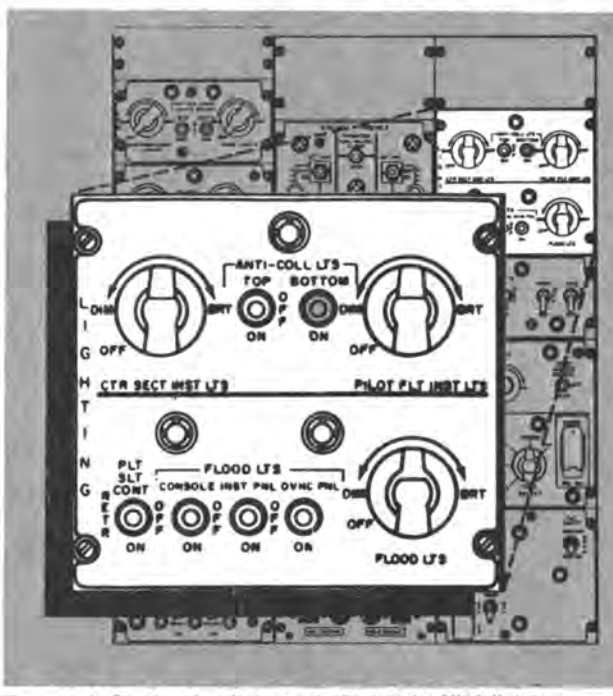

Figure 1-A. Overhead switch panel with interim NVG lighting.

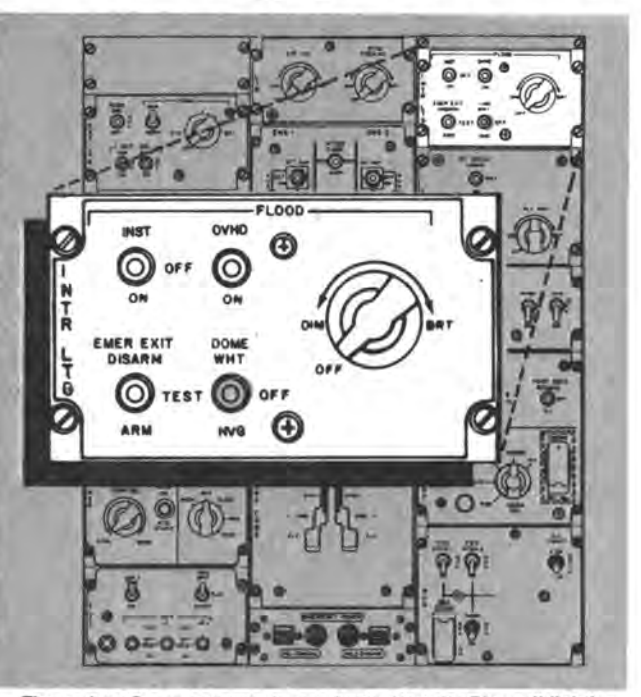

Figure 1-B. Overhead switch panel with Nightfix Phase II lighting.

at highest risk of negative habit transfer. However, as all CH-47s are upgraded over the next several years to the full Phase II NVG lighting system, a significant hazard will exist as flight crews relearn these blind cockpit procedures.

CH-47 pilots should be aware of this potential hazard, and be alert during premission briefing/preflight to the cockpit switchology of their assigned aircraft. Safety meetings are a good forum in which to discuss these new hazards inadvertently generated by improvements to Army aircraft.

The Army Safety Center always welcomes comments from the field regarding safety hazards in newly fielded systems. □

—MAJ John S. Crowley, Systems Engineering, AV 558-3943/6219

The thermoplastic helmet liner: A reality at last

For the last 4 years, the U.S. Army Aeromedical Research Laboratory (USAARL) has been conducting studies aimed at alleviating the age-old problem of helmet "hot spots." As the use of night vision goggles (NVG) has increased, so have complaints by aviators of headaches, hot spots, and helmet instability.

In 1984, the Gentex Corporation introduced a new product known as the thermoplastic liner. This product, known as the TPL, was tested and approved for its crashworthiness properties and has been used by USAARL to alleviate medical problems caused by poor helmet fit. Aviators who have experienced hot spots or headaches caused by the SPH-4 flight helmet know only too well that these problems are annoying to say the least, and at the most border on being a safety-of-flight issue.

Success with the "problem fit" program and use of the TPL led USAARL to push for acceptance of the TPL as an improvement to the existing SPH helmet series. As is true with any item entering the Army system, the TPL must pass the standard battery of tests to ensure its acceptability under all conditions in which it could conceivably be used.

On 1 June 1987, the U.S. Army Aviation Test Board completed its study on the TPL and forwarded the

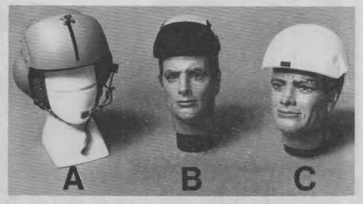

Figure 1. Hotspots or headaches experienced by aviators wearing SPH-4 helmets (A) may be alleviated by use of the thermoplastic liner (B) which was initially developed and approved for its crashworthiness properties. An energy-absorbing styrofoam liner (C) is also included in the thermoplastic installation kit.

results to the U.S. Army Natick Research, Development, and Engineering Center. In November of 1987, the Type-Classification Review Board was held by the Program Manager for Clothing and Individual Equipment, and the TPL received acceptance as an approved item of aviation life support equipment (ALSE).

In July of 1988, the Defense Property Supply Center assigned three national stock numbers (NSN) to the three sizes of the TPL. These three sizes—small-regular, regular, and extra large—are provided to fit the full range of aviators currently wearing the SPH series of helmets. Units may now order the TPL installation kits through official supply channels. Until the NSN are included in the AMDF, units should use the following message from the U.S. Army Support Activity, Philadelphia, PA, as authority for ordering the TPL installation kits: CDRUSASPTA 112219Z Jul 88, STRAP-LM. The kits may also be obtained through local purchase channels on a sole source basis from the Gentex Corporation, P.O. Box 315, Carbondale, PA 18407. NSNs for the TPL modification kits are:

—Small-regular, NSN 8415-01-281-5497

—Regular, NSN 8415-01-281-5498

—Extra large, NSN 8415-01-281-5499

Until this item is stocked at the DPSC level, units should consider consolidating their orders with those of other units to take advantage of volume cost reductions offered by the manufacturer. The approximate cost of the TPL is $60. However, units should call Gentex at commercial number 717-282-3550 to confirm the exact price of their order.

Because the TPL is a newly recognized ALSE item, not much information is available for ALSE technicians in the field about the care and installation of the TPL. The U.S. Army Aviation Systems Command (AVSCOM) is currently rewriting the SPH-4 operator's manual to include installation, care, and inspection criteria for the new TPL. Within the next month, the Life Support Equipment Branch, USAARL, will complete a videotape on installation instructions for the TPL. As soon as the tape is available, a notice will be published in *Flightfax* about how the tape can be obtained.

Another good-news note is that testing is presently underway at Fort Rucker on the improved SPH-4 helmet. This helmet includes a Kevlar TM shell, crushable earcups, adjustable retention assembly, dual visors, a thicker energy-absorbing liner, and the TPL.

Following the customer test for form, fit, and function, a Type Classification Review Panel will be held in November of this year. If testing is successful, the Army will procure a retrofit kit to install all of the items listed, with the exception of the shell, on the current inventory of SPH-4 helmets. When current usage of SPH-4s depletes the DPSC stockage of helmets, the improved SPH-4 will be purchased as a unit.

This helmet exceeds the safety performance of the current SPH-4 in all areas of technical testing (crash-force attenuation, helmet retention characteristics, overall weight, adaptability to dual-visor laser protection, and hearing attenuation).

Information on this or other matters regarding ALSE may be obtained by writing MAJ Dan Gower or MAJ John Barson, U.S. Army Aeromedical Research Laboratory, P.O. Box 577, Fort Rucker, AL 36362-5292, or by calling MAJ Gower (AUTOVON 558-6943) or MAJ Barson (AUTOVON 558-6881). Commercial numbers are 205-255-6943/6881. □

—MAJ Daniel Gower, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL

AN/PVS-5 night vision goggles

Publications on AN/PVS-5 NVGs do not provide a photograph of the AN/PVS-5A, 5B, and 5C models together. As a result, the different models are often misidentified. In the photograph below, the three models are shown side-by-side for identification purposes.

The principal difference between the B and C models is the light sensor which is clearly visible at the lower left of the C model's face plate.

FY89 Class A Mishaps
through 19 October

	Month	Class A Mishaps		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	1	0	0
	November	1		0	
	December	1		0	
2nd Qtr	January	2		0	
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	1	38	0

The three models of AN/PVS-5 night vision goggles. From the left, the AN/PVS-5C, AN/PVS-5B, and AN/PVS-5A.

MISHAP BRIEFS

Information based on preliminary reports of aircraft mishaps

Utility helicopters

UH-1 Class D

H series - During postflight inspection, crew found oil on tail boom in vicinity of 42-degree gearbox. Aircraft had been run up then shut down for a special oil sample to be taken. Mechanic replenished oil in gearbox but failed to replace the oil cap, and PIC failed to ensure cap was installed when he preflighted aircraft.

H series - Aircraft landed at LZ. During stability check, aircraft rocked. Right skid tube was bent when it landed on a rock.

V series - During preflight, crew chief closed cowlings on tail rotor vertical fin and drive shaft but failed to secure fasteners. Pilot was diverted to run up another aircraft and failed to remind crew chief to fasten cowling. During walkaround at night, pilot failed to see fasteners were not secured. Pilot discovered damaged cowlings after an hour of NOE and contour NVG flight.

UH-1 Class E

M series - Aircraft was on approach about 40 feet agl and 150 meters from tactical training area. Crew heard a loud bang. Parachute flare had been drawn into main rotor system.

UH-60 Class D

A series - Crew failed to center cyclic upon touchdown of main wheels during roll-on landing. Main rotor blades struck the ALQ-144 jammer, gouging trailing edge of main rotor blades.

A series - During takeoff from field site, copilot allowed aircraft to drift and main rotor blades hit a tree.

A series - During flight, pilot moved his hand from collective to ICS box switch. When he returned his hand to the collective, he inadvertently pressed the emergency jettison switch and released a 500-gallon fuel blivet and two multileg chain sling sets.

Attack helicopters

AH-1 Class C

S series - Damage to leading edge of each main rotor blade was found during postflight inspection. Crew had been engaged in tactical NOE operations with MILES, but was unaware of blade strike.

AH-1 Class D

F series - IP in front seat was on telescopic sight unit. During NOE turn near high-tension wires, pilot moved right to avoid wires and main rotor blades struck a tree.

AH-1 Class E

F series - During final approach to field site, lower wire cutter caught and cut a strand of commo wire. Ground unit had strung wire across open field and failed to mark location.

F series - Aircraft was repositioning from tactical FARP to parking when another aircraft came around a cut in tree line. PIC in front seat of first aircraft took evasive action, applied power to climb over tree line, and overtorqued aircraft.

AH-64 Class C

A series - During terrain flight, aircraft struck electrical power line about 100 feet agl.

AH-64 Class E

A series - After student change, Ng would not go above 10 percent. Maintenance found crack in shaft-driven compressor.

Cargo helicopters

CH-47 Class C

C series - Aircraft systems were normal during runup through item 35. When APU was switched to off position, caution lights came on for No. 1 and No. 2 generator rectifiers. Both generator shafts had sheared.

CH-47 Class D

C series - When aft landing gear touched down during running landing, crew felt vibrations and pilot brought aircraft to a hover. Aircraft was flown to home base and landed on pallets and mattress cushion. Inspection revealed left aft drag brace had broken in half.

D series - Rotors were slow to begin turning when No. 1 engine was started during runup. As engines were accelerated to flight, No. 1 engine N1 hung at about 68 percent, indicating possible failure of engine transmission clutch to engage. After shutdown, investigation showed engine transmissions were equipped with test sprag clutches. Test hours were almost complete, and engine transmissions were removed and sent to manufacturer for analysis.

D series - During flight, flight engineer heard grinding noise from forward transmission. After landing, inspection revealed out-of-tolerance movement of forward transmission input shaft. Forward transmission was replaced.

CH-54 Class C

B series - Aircraft landed to a confined area with slight forward slope. Transmission oil pressure light came on. Tail rotor drive shaft was severed. Three main rotor tip caps and two tail rotor blades showed gouges.

CH-54 Class E

A series - During short final at 50 feet agl, 20 KIAS, chip detector light came on. IP took controls and set load down. Caused by failure of main gearbox.

A series - After takeoff with 8,000-pound concrete block practice load, flight engineer noticed oil on back window. Aircraft returned to takeoff point, dropped load, and landed. Large amount of oil near transmission was caused by cracked fitting on transmission oil line.

Observation helicopters

OH-6 Class C

A series - During cruise flight at about 1,000 feet agl, low fuel light flickered then burned steadily. Pilot initiated a power-on approach, but at 50 feet agl, 20 KIAS, aircraft's engine failed. Pilot entered autorotation to intended landing site. When aircraft touched down, tail skid and tail rotor contacted the ground. Aircraft pivoted about 60 degrees and came to rest upright. The tail boom separated and main rotor blades were damaged by flying debris from tail section.

OH-58 Class D

C series - During cruise flight, pilot transferred controls to copilot while he studied his map. Copilot initiated a climb and overtorqued the aircraft to 112 percent. Copilot was not rated in the aircraft.

OH-58 Class E

A series - During flight, engine-out light and audio came on. PIC began a descent and made a landing with power. After crew got out, they found fire and smoke coming from exhaust stacks. Fire was extinguished by crew. Investigation continues.

C series - During three attempts to start aircraft with different batteries, turbine outlet temperature (TOT) rose to 950° C for 1 second. Momentary delay after throttle was rolled back slightly resulted in high TOT.

C series - During an out-of-ground-effect hover check at 50 feet agl, aircraft indicated 102 percent torque. During last 90 degrees of the OGE check, the aircraft climbed an additional 30 feet. When collective was reduced, the aircraft began to descend and slide backwards. When IP informed the pilot, pilot applied excessive collective to slow rate of descent. Torquemeter indicated 102 percent. IP took the controls and landed.

C series - During cruise flight to gunnery range, pilot diverted his attention from flying the aircraft to a line of thunderstorms parallel to his flight path. When he looked back inside, he saw the aircraft had descended 100 to 150 feet below assigned corridor altitude. Pilot applied power to climb back to assigned altitude. Aircraft overtorqued for 5 to 15 seconds.

C series - Crew was looking for enemy tanks during field exercise. Copilot allowed the aircraft to drift and main rotor blades hit trees.

C series - During low-level flight, cyclic began binding fore and aft. Pilot thought cyclic might have been hitting on kneeboard and continued flight. A short time later, cyclic froze in forward position. Pilot pulled aft cyclic and cyclic broke loose. Pilot slowed airspeed and made a running landing, skidding about 60 feet. Caused by binding in magnetic brake.

Fixed wing

C-7 Class D

A series - Engine began running rough during climbout and oil and vapor began coming from engine breather. After normal landing, engine case was found full of oil. Suspect failure of oil scavenger system.

C-12 Class E

C series - During SIP evaluation, No. 1 engine was shut down with condition lever for simulated engine failure. Engine would not restart, and aircraft made a single-engine landing.

C series - During touchdown after an ILS approach with reduced visibility, crew saw a flock of seagulls on runway. Aircraft could not safely make a go-around. Several birds were struck, but there was no damage to the aircraft.

C series - During maintenance test flight to check No. 1 prop autofeather system, No. 1 prop would not come out of feather. Aircraft landed with prop feathered. Once on the ground, the prop came out of feather. Caused by failure of dump valve.

OV-1 Class E

D series - During IP training, IP felt abnormal feedback in aircraft controls. Student IP had not retracted flaps after slow flight maneuvers and aircraft was flown above 180 KIAS.

U-21 Class E

F series - During landing, crew noticed vibration from right main gear during rollout. Caused by broken torque knee.

Safety messages

- Maintenance information message concerning inspection of tail rotor drive shaft spline wear indicator on UH-60 aircraft (UH-60-88-MIM-09, 272100Z Sep 88).
- HQDA, DALO-AV, 271945Z Sep 88. AR 95-17: The Army Aviation Life Support System Program, requires in paragraph 2-9b that each aircraft crewmember be equipped with a survival radio. Message from HQDA, DALO-AV, 291504Z Apr 88 delayed implementation of this requirement until 30 Sep 88. This message authorizes further delay until 30 Jan 89 to allow complete distribution of the PRC 90-2 and redistribution of the PRC 90. In the interim, the PIC 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 as assets become available. The PIC will ensure crewmembers without radios have other signaling devices such as L119 foliage penetration flare kits and/or a signaling mirror. Contact: MAJ Pete Notarianni, AUTOVON 227-0487.

For more i
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SPH-4 helmet alert

The Aviation Life Support Equipment Retrieval Program has identified a problem with the retention harness of the SPH-4 helmet.

The stitching that connects the retention tabs to the retention assembly (figure 1) fails below design specifications when it is a linear-type stitch (figure 2, part A). The stitching connecting the retention tabs to the retention assembly should be a bar stitch (figure 2, part B). Universal retention harnesses with linear-type stitching should be changed out immediately.

Failure of the stitching in only one of the four retention tabs permits enough displacement or rotation of the helmet to expose the wearer's head to impact forces during an accident. This problem exists **only** with retention tabs that have **three** adjustment grommets and are part of a universal adjustable retention assembly procured under a U.S. Navy contract. Retention tabs with **single** grommet connection points (nonadjustable) and linear stitching have been tested and proven satisfactory.

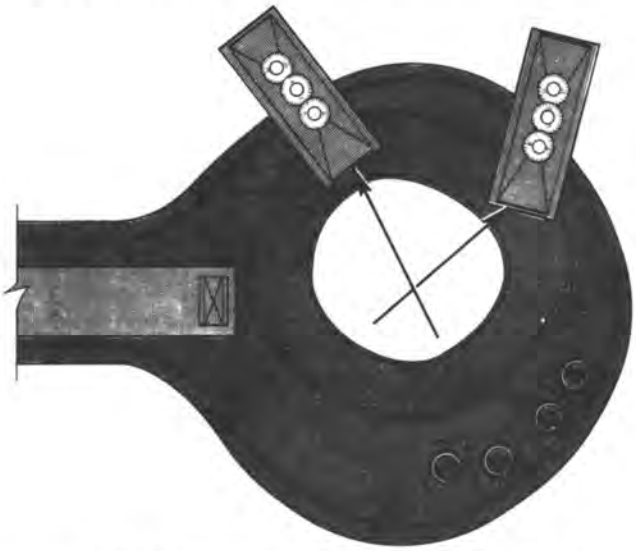

Figure 1. SPH-4 universal retention assembly with three-adjustment-grommet retention tabs.

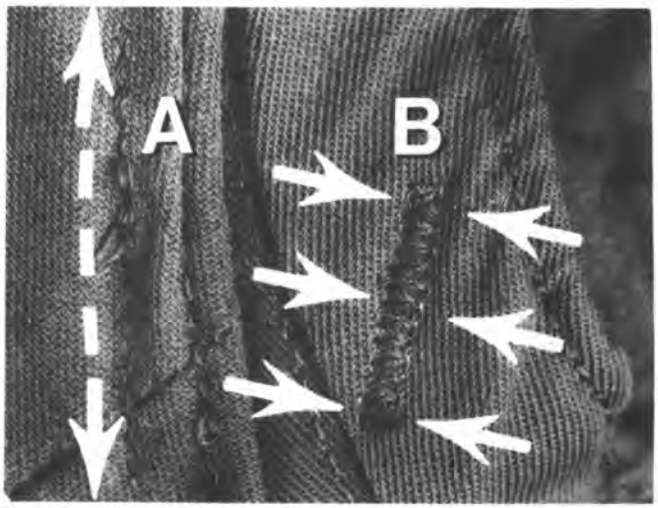

Figure 2. Linear stitching (A) used to connect retention tabs to the SPH-4 universal retention assembly can fail and expose the wearer's head to impact forces during an accident. The only universal retention assemblies that should remain in the system are those where the retention tabs have been attached with bar stitching (B).

ALSE specialists should take immediate action to replace the faulty universal retention assemblies. There is no further stockage of satisfactory **universal** retention assemblies available in the supply system. Therefore, retention assembly, **regular**, NSN 8415-01-056-0700 should be ordered. □

—Mr. Joseph Licina, U.S. Army Aeromedical Research Laboratory, AUTOVON 558-6893/6882, commercial 205-255-6893/6882.

U.S. ARMY SAFETY CENTER

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Marvin E. Mitchiner, Jr.
Colonel (P), Aviation
Commander, Army Safety Center

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 Number 20 26 July 1989

Aircrew confusion about UH-1 fuel indicating system leads to crash

An accident involving a UH-1 that ran out of fuel during a daytime service mission reveals there is still some misunderstanding regarding the fuel indicator system on these aircraft.

When the aircraft took off, with a crew of three and six passengers on board, the fuel quantity gauge indicated around 1,340 pounds of fuel. En route to the first stop, the PIC began a fuel check. After landing, he recorded his figures and completed his fuel consumption check. The fuel burn rate was 580 pounds per hour. The crew had logged 1.5 hours of flight time up to that time, but much of that time included ground time at flight idle with a burn rate well below 580 pounds per hour. After making a couple more stops and picking up another passenger, the aircraft took off on the last leg of the flight with the fuel quantity gauge indicating 900 pounds. The PIC thought he had plenty fuel, and he decided to continue on across a mountain ridge before stopping to refuel.

Weather to the north wasn't looking good and, because of the low clouds, the PIC decided to swing a little to the south. Encountering a rainstorm, he went still farther south of his planned route of flight. Then the 20-minute fuel light and the

Aircrew confusion . . .

master caution light came on. A cross-check of the fuel quantity gauge indicated there were still 400 pounds of fuel remaining. The master caution light went out when the PIC pushed the reset button, and the PIC initiated a time check.

The PIC made three attempts to fly through various mountain passes to get to the refueling site in the next valley, but he was unable to get through because of low clouds in the passes. Eighteen minutes had elapsed since the 20-minute light first flashed on. The PIC thought he had 20 minutes of flying time remaining after the 20-minute light came on and that he had at least 2 more minutes of flight time remaining. He was wrong. He was almost out of fuel, but he didn't know it.

He made one more attempt to get through a pass but failed because of low-lying clouds, and he began searching for a place to land. When the crew chief spotted a field to the right, the PIC put the aircraft into a slow right turn. Then the master caution light and both boost pump lights flashed on. The aircraft was being flown with one inoperative boost pump—now neither boost pump was working.

The aircraft was about 200 feet agl when the engine quit, and the PIC realized he would have to attempt an autorotation. The low rotor rpm light and audio came on, and the crew chief told the passengers to assume the crash position. The pilot yelled to the copilot, "Lock up, we're going in."

There was a small knoll between the aircraft and the landing area, and the PIC used remaining rotor rpm to ease the aircraft over the knoll and past a ditch on the other side. By now, there was no rpm left, and the helicopter dropped almost straight down for the remaining 10 feet, hitting hard in a small cultivated area on a plateau.

Although all of the crewmembers and some of the passengers were injured, they were able to help each other out of the helicopter, which was lying on its left side.

Factors bearing on the accident

The aircraft's right boost pump had not worked for about 4 months. At this time, having only one operative boost pump did not require that the aircraft be grounded. This has since changed. Safety-of-flight operational message (UH-1-88-03, 101800Z Jun 88) stipulates that aircraft will not be flown when one of the fuel boost pumps is inoperative.

There wasn't as much fuel in the tanks as the quantity gauge indicated. In fact, when the tanks were drained after the accident, only 12 gallons of fuel were recovered—184 pounds less than the fuel quantity gauge had indicated. When the PIC entered a right turn toward his intended landing area, the remaining fuel ran to the right side of the tank where it couldn't be reached by the left fuel pump. Air was ingested into the fuel pump, and the engine failed.

Fuel quantity gauge (1) and fuel pressure gauge (2) froze in position when aircraft crashed.

Pilots should be aware that they cannot rely on the UH-1 fuel indicating system to tell them how much usable fuel remains in the aircraft's tanks. They should also understand that the 20-minute fuel light only serves as a warning that fuel is low. It does not mean that 20 minutes of flying time remain.

To prevent this kind of accident, aircrews should–

- Visually check the amount of fuel in the aircraft's tanks before takeoff to ensure the tanks are full.
- Conduct fuel consumption checks and calculate fuel burn rates, allowing for fuel consumed at a lower rate while the aircraft is operating on the ground.
- Make adjustments for any changes in weight during the mission. For example, in this case, no adjustment was made in the fuel consumption calculation after a seventh passenger was picked up.
- Allow for environmental factors, such as headwinds, that can increase fuel consumption.
- After determining how much fuel is being consumed, fly accordingly. Regardless of what the gauges say, do not exceed the flight time computed before stopping to refuel. The PIC in this accident could have refueled before attempting to cross the mountain ridge. The problem was he put too much faith in his fuel indicators, and he got into a situation where he ran out of fuel. ■

He was sure he could do it

The pilot of an OV-1 had 1,327 hours of total flight time, but only 235 were in fixed wing aircraft, 139 of them in the OV-1. When he first arrived in the unit, he chafed at the idea that his training to reach Aviator Readiness Level (ARL) 1 might stretch out over 3 or 4 months. He felt that not being an ARL 1 aviator could affect his ability to properly function as the flight platoon leader. His eagerness to "get on with the job" and reach ARL 1 in Mohawks sometimes led him to overload on his training, and eventually led to an accident.

The mission was a night training flight with an enlisted observer. Once airborne and en route to an airfield where he intended to practice approaches and landings, the pilot noticed that the aircraft's right external fuel tank was transferring fuel much faster than the left tank, and he switched to "LH only" on the fuel management panel.

After practicing several approaches and landings, including a power approach precision landing and a low-level pitch-out maneuver, the pilot prepared for his next approach—a 360-degree overhead. ►

During hard landing, OV-1's gear partially collapsed, and aircraft veered off the runway.

He was sure he could do it

Although he had not been trained or evaluated on this task, he was confident he could do it.

After completing a prelanding check at the 180-degree point and a landing check at the 270-degree point, the pilot turned on final with 15 degrees of flaps and an estimated airspeed of 95 to 110 knots.

While maintaining an 800 to 1,000 fpm descent, the pilot selected 45 degrees of flaps at 50 feet agl, and the aircraft "ballooned" due to increased lift. As the pilot reduced power in an attempt to reestablish a normal descent, the aircraft began descending rapidly, and the pilot warned the observer they were going to hit hard.

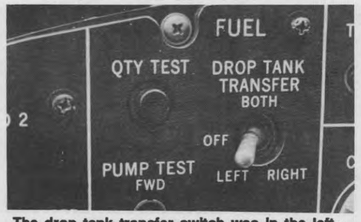
When the aircraft hit the runway, the upper cap strip fittings on the right wing failed. The failed wing flexed downward, hit the runway, and the gear partially collapsed, causing the aircraft to veer right and off the runway. When it came to rest, it was 30 feet from the edge of the runway and 1,200 feet from the initial point of touchdown.

Contributing factors

- During the last 45 minutes of flight, the fuel management switch remained in the left-hand position, allowing an extreme assymetrical fuel load condition to develop. When the pilot began the 360-degree overhead maneuver, the left tank was almost empty while the right drop tank still contained 817 pounds of fuel.

TM 55-1510-213-10, paragraph 8-52, states "It is possible to run out of lateral control at speeds below the minimum trim speed (160 KIAS) with asymmetrical loads; therefore, caution must be exercised when landing with extreme asymmetry. If extreme asymmetry exists, consideration must be given to jettisoning necessary stores to equalize the store loading condition."

Indications are that the aircraft hit right side low, but even if the wings were in a level attitude, as stated by the pilot, the extreme asymmetrical fuel load in the drop tanks could have caused the hard landing to be absorbed primarily by the right main landing gear.



The drop tank transfer switch was in the left-only position.

- The pilot had not demonstrated proficiency to a unit instructor/standardization IP in the task he was performing at the time the accident occurred. The tactical traffic pattern approach and landing (360-degree overhead), Task 2005, FC 1-217, is a special mission task included in the unit task list. The pilot had been advanced to ARL 1 without having been trained or evaluated in Task 2005.
- The pilot failed to perform the task he was attempting in accordance with the ATM. He flew the initial approach at approximately 1,000 feet agl although the ATM requires an initial altitude of 1,500. This meant he had about 500 feet less altitude to complete the turn before landing.

He also failed to properly coordinate pitch and power as required to control airspeed and rate of descent so as to arrive at the correct reference (Vref) airspeed at approximately 50 feet agl.

- The pilot was not familiar with critical aircraft limitations and flight characteristics described in the aircraft operator's manual. He had not been given an operator's manual written examination in conjunction with his last standardization evaluation.

This pilot's eagerness to progress to ARL 1 caused him to try to "short circuit" the time he needed to devote to his training. It led him to attempt tasks he had not proven he was capable of performing, resulting in more than $150,000 in damage to an aircraft. In addition, those who were responsible for ensuring he received training in all of the required tasks, and devoted whatever time necessary to become proficient in each task, failed in their responsibility by allowing him to attempt maneuvers for which he was not adequately trained. ■

FLIGHTFAX

Shortfax on Black Hawks

The following items of interest to the UH-60 user community were furnished by the Black Hawk Project Manager's Office.

Improved inlet particle separator blower

A General Electric engineering change proposal introduced an improved inlet particle separator blower (6034T62P13) into the T-700 production line beginning with engine serial number 207922. The improved inlet particle separator blower, which has no life limit, replaces parts number 6034T62P11 and 6034T62P15.

AVSCOM records show that approximately 213 of the old (-11 and -15) particle separator blowers may still be installed on aircraft. These older blowers have a 1,500-hour life limit and could cause an in-flight shutdown.

Ample stocks of the newer blower are available. Unit maintenance personnel should check their aircraft for outdated blowers. If any are found, replacements should be ordered and the old blowers returned to the supply system for retrofit.

Wire strike protection system

Project OLR personnel are in the final stages of applying the wire strike protection system modification work order to Black Hawks worldwide. Units with Black Hawks requiring this modification should contact their AVSCOM LAR or project officer. ■

—MAJ Marsha Finley, Black Hawk Assistant Project Manager for Logistics, AUTOVON 693-1726, commercial 314-263-1726.

FY89 Class A Accidents through 26 July

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	5
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4	4	4	10
4th Qtr	July	1	4	0	7
	August	2		0	
	September	4		1	
	Total	32	28	38	27

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class D

H series - Aircraft was flying over a valley when it struck wires at about 300 feet agl. Wires were not marked on map and poles were obscured by trees.

H series - While aircraft was in cruise flight at 1,500 feet agl, PIC inadvertently touched cargo release switch, jettisoning load. Crew had failed to disarm switch during level-off check.

H series - Aircraft developed vertical vibration during approach. Caused by debonding on one main rotor blade.

H series - During practice landings and takeoffs in marshy area, SIP noticed aft portion of left skid had broken loose from the mount strap, causing skid to crack.

UH-1 Class E

H series - Left cargo door was discovered missing during postflight. Door was returned by witness who saw it fall from aircraft into a field.

H series - Master caution and chip light came on as aircraft hovered to parking. Caused by internal failure of 90-degree gearbox.

H series - Aircraft was in a left bank during NOE flight. Crew heard a scraping noise and landed. Main rotor blades had contacted a tree.

UH-60 Class E

A series - When aircraft was picked up to a hover, crew felt moderate vibration in main rotor system. Caused by failure of antiflap assembly.

A series - Caution light flickered during shutdown. About 30 seconds later, master caution light came on. Maintenance replaced right accessory gearbox.

Attack helicopters

AH-1 Class D

F series - Pilot noted increased torque was required to maintain hover, but he attributed it to gusty crosswinds. During postflight inspection, main rotor blades showed signs of tree strike.

P series - Aircraft was trail in a flight of two inbound to an airfield. Crew heard a noise and No. 2 hydraulic light came on. During landing on a dry lake bed, MILES adapter failed to stow properly, and mounting bracket was damaged when it contacted the ground.

Cargo helicopters

CH-47 Class D

C series - When crew chief closed ramp, aircraft chocks were caught between ramp and fuselage. Damage was found when ramp was lowered at end of mission.

C series - While aircraft was taxiing to parking, rotorwash caused an unsecured fixed wing aircraft to tip over, damaging its wing tip.

C series - Jeep driver failed to follow crewmembers' directions during loading of jeep. Inside of aircraft was dented when it was hit by the jeep.

CH-47 Class E

C series - Oil began leaking from combining transmission during flight. Caused by failure of oil filter seal.

D series - During cruise flight, aircraft began vibrating, crew heard a noise, and cargo area began filling with smoke. Slingload was released and, with both pilots on the controls, aircraft landed. Caused by failure of transmission fan assembly.

Observation helicopters

OH-6 Class C

A series - Crew chief untied blades and removed aircraft doors in preparation for flight. Unforecast 40-knot wind gust started rotor system turning. Main rotor blades hit the tail boom, damaging blades and breaking skin on the tail boom. The main rotor hub assembly, and swashplate and idler assemblies may also have sustained damage.

OH-58 Class D

A series - During flight at 700 feet agl, 80 KIAS, aircraft's main rotor blade struck a bird.

A series - Crew was instructed to shut down aircraft at FARP until AH-1Fs were loaded. Copilot failed to secure left rear door, and rotorwash from an AH-1 blew door open, breaking door hinge.

A series - During preflight, pilot found tail skid missing from aircraft. PIC had noticed lateral play in skid during previous preflight. Suspect skid was lost during flight.

Fixed wing

C-7 Class E

A series - Right engine failed without warning during flight. Aircraft flew to nearest airfield and landed.

C-12 Class E

D series - Pinhole in polyflow tubing caused master caution and right bleed air lights to come on during flight.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followup information

on accidents previously reported

UH-1 Class A

Reported in 13 Jul 88 issue as 8832 - Flight of 7 aircraft was returning to home station from a 5-day field exercise. The flight proceeded in loose trail formation with three to five rotor disk separation. Visibility was poor, with ceilings estimated at 400 to 600 feet. The flight crossed several sets of power lines along the route of flight. Before crossing each set, the flight would climb from a cruise altitude just above the trees to an altitude that would allow them to cross the wires at the support towers. Visibility was reduced significantly when climbing to cross the towers. Once the towers were crossed, each aircraft would descend individually. Unit leaders, who were part of the flight, were not enforcing the 50-foot standard set forth in the unit SOP for crossing wire obstacles. The first three aircraft slowed to about 50 KIAS and crossed a tower at less than the required 50-foot clearance. The No. 4 aircraft descended onto the tower while returning to cruising altitude and crashed inverted, killing the three crewmembers. (This accident was reenacted in a Crashfax Video "Surviving in the Wire Environment" (CFV 46-3, PIN 708002) available at local audiovisual support centers.)

UH-1 Class A

Reported in 7 Sep 88 issue as 8836 - During a nap-of-the-earth NVG training mission, the pilot at the controls elected to continue a descent down a mountain draw after visual cues in the direction of flight were obscured by dust. The crew was using the aircraft's infrared searchlight to offset the lack of natural illumination, but dust from two preceding aircraft negated the effectiveness of the searchlight. Although he had lost sight of the ground, the pilot failed to initiate IFR recovery procedures by executing a climb. The helicopter hit the side of a mountain ridge and tumbled down the slope. The crewmembers were able to escape before the wreckage caught fire and burned.

UH-1 Class A

Reported in 2 Jul 88 issue as 8834 - The PIC failed to properly compute his aircraft performance data given the existing meteorological conditions. He computed a higher available torque for OGE hover than the aircraft's engine was capable of producing. As a result, while making a shallow approach to landing along the sunny side of a steep valley with the aircraft OGE, below effective translational lift, and in a downwind condition, the aircraft began losing rpm and crashed. The copilot and one passenger were seriously injured.

UH-60 Class A

Reported in 7 Sep 88 as 8837 - Aircraft was on the return leg of a medical service mission. While ground taxiing the helicopter from the right pilot's seat, the PIC misjudged clearance between the aircraft's main rotor and a metal pole supporting a large sign. The aircraft hit the pole, and the sign fell into the rotor system, resulting in loss of control. The aircraft yawed left, rolled right, and came to rest on its right side. Two crewmembers received serious injuries.

UH-60 Class B

Reported in 20 Jan 88 issue as 8805 - Lead aircraft in a flight of three was operating in zero illumination during an NVG training mission over low-contrast terrain. The pilot on the controls placed the aircraft in a right descending turn from a westerly heading at 300 feet agl to a northerly heading at 100 to 200 feet agl over gently upsloping terrain. While the pilot maintained his attention outside the aircraft, the PIC was monitoring the instruments. During the turn and descent, the PIC's attention was diverted by a radio call from one of the other aircraft. The PIC looked outside the aircraft and failed to monitor the instruments–specifically, the radar altimeter–and the aircraft continued to descend. As the PIC brought his attention back to the instruments, the aircraft struck a wire at about 80 feet agl. The crew maintained the aircraft in a level decelerating attitude and landed with only one minor injury. ■

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363

Update on protecting Army aircraft from storm and wind damage

Severe weather this summer has reemphasized the potential hazard that exists for aircraft left in the open. While there isn't enough hangar space to accommodate all of the Army's helicopters and airplanes, aircraft are better able to withstand storms and winds if they are properly moored and tied down.

This was the purpose of a message (092246Z Jun 89) from the Vice Chief of Staff, Army, and a safety-of-flight operational message (191300Z Jun 89). These messages provided instructions for protecting rotary wing aircraft from severe storm and wind damage, but they did not address securing fixed wing aircraft.

A followup message from Headquarters, Department of the Army, DALO-ZA, 032025Z Jul 89, provides additional information on securing, tie-down, and mooring of both fixed and rotary wing aircraft.

Rotary wing aircraft

These previous messages advised that when helicopters with multiple main rotor blades must remain outside during severe weather because of insufficient hangar space, the blades should be removed or folded, when feasible. Follow-on engineering analysis has revealed that when blades are folded and transport racks are used on some helicopters, damage to the tail boom area may result during high winds. Therefore, at this time, blades will be folded **only** when helicopters are being placed in hangars or storage. Engineers will continue to evaluate the potential for quick-release blade removal and the feasibility of blade folding as well as securing of blades to preclude storm and wind damage to rotary wing aircraft. In the meantime, to provide maximum protection to helicopters remaining outside during severe weather, units must ensure that blades are secured to the proper tie-down on the aircraft.

Fixed wing aircraft

Commanders must also ensure that fixed wing aircraft are protected from the effects of storms and wind. Priority will be given tactical fixed wing aircraft over administrative airplanes, except for the C-20, in the following order: RC-12, OV-1D, RU-21, C-12, U-21, U-8, and T-42.

At airfields where both fixed and rotary wing aircraft are located, the commander must decide the mix of aircraft to be hangared. The commander's decision will be based on hangar space, tactical requirements, and importance of the aircraft to the mission. Cost, limited quantities, and combat capability dictate that AH-64 and OH-58D aircraft receive priority for protection from severe weather.

Army Aviation Systems Command is currently validating tie-down and mooring procedures and developing detailed instructions for all types of aircraft. Following testing by a field unit, these instructions will be furnished to aviation units.

Units must ensure proper precautions are taken and procedures are in place when notification of severe weather warnings and watches are received. After receipt of a severe weather warning or watch, a person will be on duty full-time to monitor the weather activity. Upon receipt of a local severe weather warning for winds greater than 50 knots, with or without hail, units will take immediate action to hangar or secure all aircraft.

Continued emphasis is essential to protect valuable aviation assets and preserve our warfighting capability. Units will continue to be informed as progress is made toward reducing or precluding storm damage to Army aircraft. Comments and recommendations should be addressed to LTC Dennis Williamson, DALO-AV, AUTOVON 227-0487, commercial 202-697-0487. ■

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Fort Rucker, AL 36362-5163

Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 21 9 August 1989

Water and fuel don't mix

During a field training exercise, the OH-58 landed at a forward assembly area to refuel. After closed-circuit refueling, the aircraft took off. About 40 seconds into the flight, the fuel filter caution light came on. The copilot, at the controls, immediately banked the aircraft to the left in an attempt to return to the forward area refueling point (FARP). On final approach to the FARP, at an altitude of 40 feet above the trees and at an estimated airspeed of 30 to 35 knots, the aircraft's engine failed.

The aircraft hit the tops of the trees in a nose-high, tail-low attitude, and the last 4 feet of the tailboom were severed by the main rotor blade. After initial impact, the aircraft then pitched nose down, went through the trees, and crashed in an open area about 40 feet from the tree line.

Both pilots were seriously injured, and the aircraft was destroyed.

During the investigation, water was found in the aircraft's engine-driven fuel pump fuel filter, the engine's fuel nozzle had water on it, and about an ounce of water was in the fuel cell.

Water and fuel don't mix

POL personnel from the unit had begun setting up the three-point refueling site about an hour before the accident. In fact, when the OH-58 arrived, all the required qualitative tests had just been completed. According to POL personnel, the particular FARE system (hoses and filters) had been in storage. Two months earlier, the hoses had been purged with water, dried, rolled up on reels, and placed in storage in preparation for an inspection.

During the investigation, these actions were repeated, and it was discovered that water could be easily trapped in the hoses. In fact, each 50-foot section could contain 4 gallons of water and still be rolled up without the water being squeezed out.

Accident investigators concluded that the POL NCO failed to ensure adequate sampling was performed prior to issuing fuel, and that, 2 months earlier, the section had used water instead of fuel to purge their refueling hoses. As a result, water trapped in the hoses was pumped into the aircraft.

The accident investigation board also found that FM 10-68: Aircraft Refueling, dated 29 May 1987, is ambiguous in two specific areas:

- Sampling procedures listed on page 4-13 do not specifically state what actions the user should take if water is found during a visual sample.
- FM 10-68 does not address procedures for cleaning the interior of refueling hoses.

Both of these issues have since been addressed by USAQMC&S message 101100Z May 89, subject: Aircraft Refueling Safety. Following is a transcript of that message.

1. Due to a helicopter crash, this message is to reinforce the correct procedures outlined in FM 10-68: Aircraft Refueling.

2. The interior of fuel hoses will only be cleaned or rinsed with product used. Do not use water or any other solution to rinse the interior of fuel hoses.

3. Sampling procedures in FM 10-68, page 2-5 (fuel in a system or refueler) are also reinforced.

4. Flight crews should sample fuel in aircraft fuel tanks as prescribed in FM 10-68, page 2-5 (fuel in aircraft fuel tanks). Sample bottles used for aircraft tank sampling should be cleaned IAW FM 10-70, paragraph 6-40. Bottles may be clear or amber in color (NSN 6640-00-404-0660, bottle, screw, clear glass, 16 oz; or NSN 6640-00-404-0658, bottle, screw, amber glass, 16 oz).

5. Sampling procedures in FM 10-68, page 4-13 (sampling), are further clarified. As soon as the refueling system is full of fuel, draw a sample from each nozzle using a clean container. Check the sample for both free water and sediment. If either water or dirt is present, flush the affected hoses into waste containers (either 5-gallon cans or 55-gallon drums). After flushing the system, retake a visual sample. If, after taking a second visual sample, water and sediment still exist, shut down the system and change filter elements in the filter/separator. After changing the filter elements, take another visual sample. If the sample appears clear and free of visual sediment and water, perform an Aqua-Glo test. Perform the Aqua-Glo on a moving stream of fuel. That is, open one of the nozzles or recirculate the fuel to provide a pressurized moving stream of fuel. The Aqua-Glo should be taken downstream of the filter/separator at the water detector kit adapter. If the sample passes the Aqua-Glo test, operate the system. If the sample fails the Aqua-Glo test, keep the system shut down and send a sample to the laboratory to verify the test results. Continue operations using good fuel from another fuel source.

Point of contact at the Liquid Logistics Department, Fort Lee, VA, is Mr. Robert M. Anderson II, AUTOVON 687-5456/5460, commercial 804-734-5456/5460. ■

—CW4 Robert J. Rendzio, Investigation Division, AUTOVON 558-3262/3493

Aviators receive Broken Wing Award

An in-flight emergency can test the mettle of the best of Army aviators. Following are accounts of 3 aviators who proved themselves equal to the challenge. Faced with situations that could have cost the lives of the crew or destroyed an aircraft, they recovered their aircraft with little or no additional damage or injury to aircrewmembers.

In recognition of their judgment and skill in coping with an in-flight emergency, these crewmembers have received the Broken Wing Award. These accounts are presented not only to recognize outstanding airmanship but in the hope that the information they contain will help others faced with similar in-flight emergencies.

• **CW2 Bradley D. Pecor, B Troop, 4-9 Cavalry Squadron, Fort Wainwright.** The unit was conducting NVG refresher training at an en route location before further deployment to the Joint Readiness Training Center. The copilot was on the controls from the front seat of an AH-1S engaged in NVG NOE training when the crew heard cavitation noises from the hydraulic pumps. CW2 Pecor, the PIC, took control of the aircraft and began a climb out of the wooded area, while searching for a place to make a forced landing. He decided to return to an airport where, if necessary, he could make a running landing and crash rescue services would be available. The crew had removed their goggles and were about 5 minutes into the return flight when the No. 1 hydraulic segment light came on and the flight controls became stiff. When emergency procedures were initiated, the flight controls loosened and the warning light went out. CW2 Pecor felt the aircraft might still experience a full hydraulic failure, and he declared an emergency and placed the helicopter in a running landing profile. During final approach, at 15 feet agl and 65 knots, the No. 1 hydraulic light again flashed on, and all of the controls locked up. Because of CW2 Pecor's foresight in having placed the aircraft in a hydraulics-off landing profile, the helicopter touched down, skidded about 1,500 feet, and came to a stop undamaged. The hydraulic pressure line from the tail rotor servo to the lockout valve on the hydraulic manifold had failed. The No. 2 hydraulic system bled into the No. 1 hydraulic system (which probably accounts for the temporary return of pressure on the No. 1 system). As hydraulic fluid continued to dump overboard, both systems failed, causing the controls to lock up.

continued on next page ►

Broken Wing Awards

• **CW3 Clarence E. Brown, 498th Medical Company (Air Ambulance), 34th Medical Battalion, Fort Benning.** After receiving a call for medical assistance, the crew of a UH-60 took off over heavily wooded terrain along a river. During climbout at 300 feet agl, with about 84 percent power applied, the aircraft began vibrating severely and yawing left and right. The No. 1 engine NP dropped to zero and torque reading was 2 percent. Torque on No. 2 engine was 3 percent. Tgt on both engines was normal. When power was increased, torque indications remained unchanged, but the yawing and vibration increased to such an extent that crewmembers in the rear had to lock their seatbelts to keep from being thrown from their seats. NR and NP on the No. 2 engine were bouncing up to the red line and back down. The Marconi strips on the No. 1 engine had failed, and the crew had no idea what that engine was doing. The PIC made a mayday call while CW3 Brown, who was on the controls, spotted a small field among the trees and prepared to make a roll-on landing. During approach, the helicopter continued to vibrate and yaw severely. The aircraft landed undamaged, although it buried itself in the freshly plowed ground up to the wire cutters on the landing gear. The electrical control unit on the No. 1 engine had failed, causing both engines to go to max power. When the engine reached 106 percent NP, it tripped the overspeed governor, causing the aircraft to yaw. When the crew tried to use the engine control lever to reduce power on the No. 1 engine, it had no effect, and the failed ECU continued to force the engines to go to max power. There are no procedures in the operators manual for this particular emergency situation.

• **CW2 James E. Platske, 5th Battalion, 101st Aviation Regiment, Fort Campbell.** CW2 Platske was PIC of a UH-60 in a flight of four aircraft conducting a daytime tactical troop extraction. The aircraft had picked up their troops and were proceeding over heavily wooded, hilly terrain to the dropoff point. There were numerous high-tension power lines in the area. The aircraft were in cruise flight at 300 feet agl and 120 knots. The copilot was on the controls of CW2 Platske's aircraft, and the crew chief was occupying the left-hand gunner's seat. Numerous rucksacks had been secured between the two gunners' seats. When the crew chief turned in his seat and reached over to adjust the intercom switches on the right-hand ICS box for the chalk leader, who was on a headset, he unknowingly allowed his arm to rest on the Halon fire extinguisher mounted on the copilot's seat. At some point during the flight, the safety that secures the pin in the fire extinguisher had broken and fallen out. (The pin was later found between the copilot's seat and the center console.) When pressure was inadvertently applied to the discharge handle of the fire extinguisher, it discharged into the cockpit. The copilot shouted as the extinguishing agent hit him in the face, blinding him. Hearing the copilot's shout, CW2 Platske turned toward him, and the extinguishing agent hit him in the left eye and face. Still able to see with his right eye, CW2 Platske took the controls. Both pilots were having extreme difficulty seeing, and the fumes were affecting their ability to breathe until the crew chief opened the gunner's window, clearing the cockpit of fumes. Suddenly the crew of chalk 2 announced "wires" over the radio and CW2 Platske turned the aircraft to the right and pulled up, narrowly missing a set of high-tension power lines. The crew of chalk 2 continued to give directions to the stricken crew, guiding them to an airfield where CW2 Platske made a successful landing. The total time of the emergency was 10 minutes. ■

Another set of eyes

Just how important is a thorough aircraft preflight to your safety? Here's a case where a picture is indeed better than a thousand words.

The crack in this AH-1 transmission case, where the lift link is connected, was found by a relatively junior Cobra pilot, WO1 Scott Melius, while he was preflighting the aircraft for a gunnery mission. The aircraft had already undergone a postflight and daily inspection, but this failure, which had the potential to be catastrophic, was somehow missed.

Never underestimate the importance of thoroughly inspecting your aircraft. You never know when one more set of eyes might save your life. ■

–Thanks to 1LT Louis E. Carmona, D Troop, 2-1 Cav, 2AD(F), APO NY 09355

Crack in AH-1 transmission case was found during preflight inspection.

AH-64A tail rotor temperature caution light

At a recent Apache Action Team meeting it was discovered that some AH-64A units may have received a copy of a Category 1 Equipment Improvement Report (EIR) investigation concerning in-flight illumination of the tail rotor temperature caution light. The EIR included a proposed change to the emergency procedure for light illumination during extended OGE hover with high ambient air temperature.

The proposed modification to the emergency procedure in the operator's manual and dash 10CL **was not** approved or adopted. All units with AH-64A aircraft are asked to disregard the proposed emergency procedure change in the EIR and comply with the operators manual should the tail rotor temperature light illuminate during flight–**"LAND AS SOON AS PRACTICABLE."**

Aviation Systems Command will provide update information as it becomes available. ■

–POC: CW4 Sanford D. Breckons, HHD, 1-14th Aviation (Standards), U.S. Army Aviation Center, Fort Rucker, AL 36362-5000, AUTOVON 558-2690/3818, commercial 205-255-2690/3818.

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class B

H series - During flight, aircraft yawed left and low rpm audio sounded. Engine failed during descent to a field. Suspect Nos. 3 and 4 engine main bearing packs failed, causing turbine rub, and resulting in catastrophic failure of power turbine section. Aircraft was autorotated to a hard landing. 8935

UH-1 Class D

H series - Aircraft was in cruise flight at 1,600 feet msl, 100 KIAS, when crew heard three loud reports and aircraft yawed left and right. Pilot lowered collective and began a descending right turn, landing in an open field. Suspect fuel control unit malfunctioned, causing compressor stall.

H series - Aircraft was approaching release area during water bucket training. PIC told crew chief to release water load. Pilot misunderstood and jettisoned the load.

UH-1 Class E

H series - Aircraft was shut down to allow TI to check 90-degree gearbox. When engine was run up, egt began rising and exceeded 600° C for about 12 seconds. Pilot did not allow enough time for engine to cool before attempting start.

H series - PIC noticed transmission temperature gauge was fluctuating during low-level flight. Caused by loose cannon plug on transmission temperature gauge.

H series - Hydraulic pressure light came on during IFR flight, but there was no accompanying loss of hydraulics. Caused by failure of hydraulic pressure switch.

H series - Tail rotor chain cover was lost during flight. Caused by failure of cover fasteners.

UH-60 Class D

A series - Crew had completed several normal touchdowns during training mission. Aircraft was climbing through 100 feet agl at 70 KIAS when the crew heard a loud bang and felt a bump in the airframe. Crew made approach to hover, and another crew told them their tail strut had come apart. Aircraft was landed, using a jack stand to support tail boom. Investigation revealed tail wheel strut lower piston had a 360-degree fracture in uppermost area where six holes had been drilled to accommodate the orifice pin. Further examination showed what appeared to be fatigue and overstress zones in the upper face. This was the third failure of this type at this installation in the last year. QDRs were submitted and installation is conducting a 100-percent inspection of its UH-60 fleet.

A series - Aircraft made an approach to a rocky pinnacle. After asking crewmembers to clear aircraft, copilot landed. Rock punctured hole in bottom of fuselage.

A series - During postflight after multiship mission, crew found damaged antiflap assembly.

A series - Suspect main rotor struck No. 4 aft antenna during landing to a sloped and rutted landing area.

A series - Rock hit turning tail rotor and was thrown into stabilator.

UH-60 Class E

A series - During recon of confined area before landing, No. 1 engine-out light came on, accompanied by a loss of indicated torque, and decrease of tgt, NG, and NP. Crew initiated a go-around and returned to airfield. Aircraft had a history of engine failures.

A series - Crew noticed main transmission oil temperature had exceeded 105° C during hover. Caused by accumulation of grass and leaves in oil cooler.

Attack helicopters

AH-1 Class D

F series - Refueler pulled fuel cap and lanyard while attempting to close CCR port and refuel aircraft. Cap was pulled free, but PIC was able to retrieve lanyard and close CCR. After refueling aircraft, CCR was damaged when refueler attempted to disconnect the hose improperly.

F series - Fuel would not flow through CCR nozzle during hot refueling. While attempting to turn off nozzle, refueler applied excessive downward pressure, damaging retainer ring on CCR port.

AH-64 Class D

A series - Crew found ADF antenna missing at the end of second test flight. Antenna apparently broke off at forward connector.

A series - Debonding of main rotor blade to second doubler was found during postflight.

A series - Postflight inspection revealed punctures in tailboom, bent ADF sensing antenna mount, damage to IFF antenna, and missing radar warning antenna. Damage probably occurred during landing at a rocky field site.

Cargo helicopters

CH-47 Class D

D series - As aircraft ascended to take slack out of sling after hooking up an M107A1 water trailer, PIC allowed it to drift rearward. Crew chief told PIC he was drifting, and PIC stopped drift but continued to ascend. Water trailer turned onto its left side.

D series - During unloading of M1009, crew chief's ICS cord became disconnected. He did not receive signal to stop vehicle, and vehicle contacted side of aircraft.

CH-47 Class E

C series - Solder on switch terminals of copilot's thrust lever came loose, and thrust brake would not release.

D series - During flight, No. 2 hydraulic system light flickered then burned steadily. Caused by failure of hydraulic system.

D series - Aft transmission chip light came on during OGE hover. Caused by transmission failure.

D series - During takeoff, cargo net legs broke and load of rocks fell about 200 feet to the ground below. Cargo net was not properly rigged.

D series - During flight, crew heard noise from forward transmission area. After landing, metal shavings were found on forward swashplate.

Observation helicopters

OH-6 Class D

H series - During flight, engine-out and reignition lights came on, and N2 and NR decayed. IP took the controls and, after ensuring throttle was full open, lowered collective and turned aircraft 120 degrees to land in an open field. N2 and NR returned to 100 rpm. At 75 feet agl, pilot reported a tree in the flight path. IP began deceleration and turned aircraft about 45 degrees before the pilot realized what he had seen was a shadow. At this point, N2 and NR were below 90 rpm. The aircraft hit the ground, rocked forward, became airborne, and turned 40 degrees right, before coming to rest upright in a plowed field.

OH-58 Class D

C series - Main rotor blade struck a tree during NOE training, damaging tip cap.

C series - During practice autorotation, IP allowed pilot to apply initial pitch pull at about 20 feet agl, resulting in a high vertical sink rate. Aircraft touched down hard and slid approximately 15 feet before stopping.

Fixed wing

OV-1 Class E

D series - Engine failed while aircraft was making steep turns to the left. Attempt to restart engine was unsuccessful.

Maintenance

UH-60 Class E

A series - Mission was aborted after No. 2 engine failed HIT check. Intake plug was turned sideways and lodged in engine intake. There were no red "Remove before flight" flags on any of the aircraft plugs.

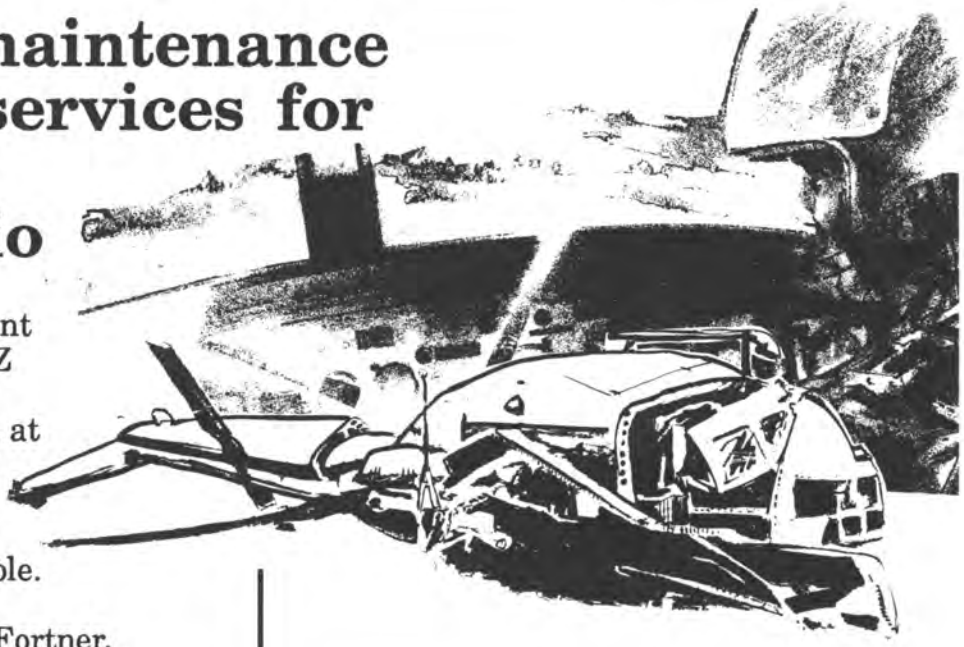
CH-47 Class E

C series - Nos. 1 and 2 normal engine beep trim switch responded opposite to pilot's inputs. Beep switch was reversed during installation.

D series - Damage to No. 1 drive shaft was found after 5-hour flight. FOD was caused by emery paper left behind after repair of hydraulic line. Drive shaft was replaced.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Preventive maintenance checks and services for AN/PRC-90-2 survival radio



Aviation life support equipment message (ALSE 89-3, 301330Z Jun 89) states that users of AN/PRC-90-2 survival radios, at both AVIM and AVUM levels, will use U.S. Air Force TO 31R2-2PR C90-1 until Army technical manuals are available. Point of contact at Aviation Systems Command is Chuck Fortner, AMCPM-ALSE, AUTOVON 693-3574, commercial 314-263-3574.

According to a recent change, there is only one account for Air Force publications at each Army installation. You should contact your local publications section for assistance in obtaining the Air Force manual. You may also write Air Force Publications, ATTN: OC-ALC/MMEDUB, Tinker AFB, OK 73145-5979, or call Larry Windle, AUTOVON 336-3604/3868, for information. ■

U.S. ARMY SAFETY CENTER

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C. A. Hennies
Brigadier General, USA
Commanding General
U.S. Army Safety Center

FY89 Class A Accidents through 9 August

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	5
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4	4	4	10
4th Qtr	July	1	4	0	7
	August	2		0	
	September	4		1	
	Total	32	28	38	27

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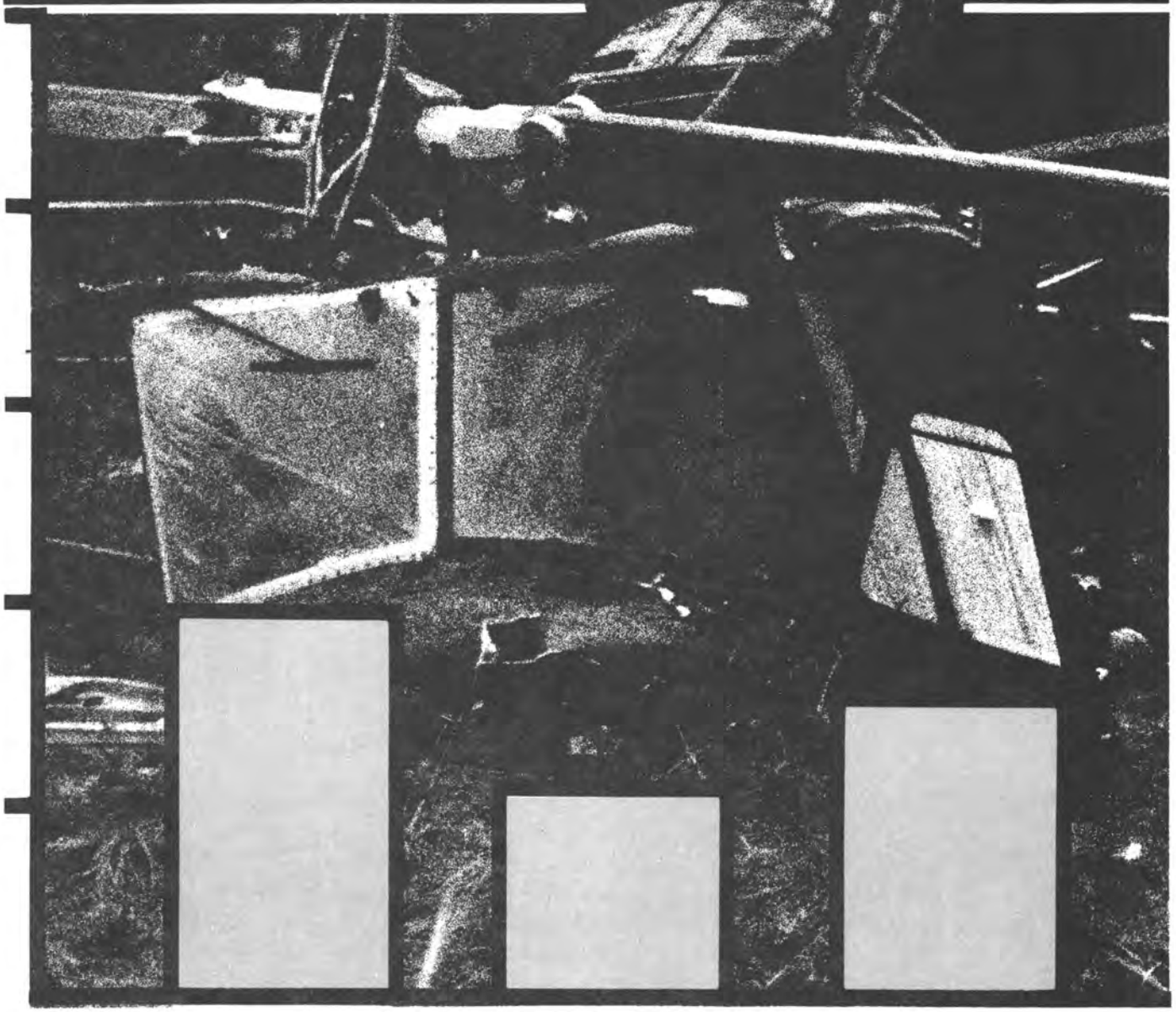
Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 22

23 August 1989



Aviation safety update

Aviation safety update

At the end of the first three quarters of FY 89, the Class A aircraft accident rate per 100,000 hours was 1.98. This is below the 3-year average of 2.10 for the same period. The year-end rate is forecast to be 2.04, compared to the 3-year average of 2.03 (figure 1).

There has been an encouraging reduction in fatalities in aviation accidents. During the first three quarters of FY 88, 37 Army aircrewmembers died in accidents. This number was reduced by nearly half this year, to 20.

A profile of FY 89 Class A accidents discloses they were predominantly single-ship, daytime VFR tactical training missions in which an aircrewmember with more than 1,000 hours allowed a helicopter to strike an obstacle such as trees or wires. The aircraft involved was most likely a UH-1 or UH-60.

This same profile holds true for Class A-C aviation accidents. The 8.16 rate for A-C accidents in the first three quarters of this fiscal year is significantly above the 3-year average of 6.84 (figure 2).

Human error continues to be the leading cause of Army aviation accidents. Table 1 is a breakdown of human-error accidents, showing the leading causes of Class A-C and Class D-E accidents. It is apparent that the same human errors that cause Class D and E accidents also cause A, B, and C accidents. This suggests that a commander who sees D and E accidents increasing in his unit should be able to target activities that are causing the increase and take corrective action before someone is killed or an aircraft is heavily damaged or destroyed. ■

Table 1.—Leading causes of human error accidents (1st through 3rd quarters, FY 89)

	Class A-C	Class D&E
Ground Strike	18	45
Tree Strike	15	56
Wire Strike	5	8
Tiedowns/Panels	4	37

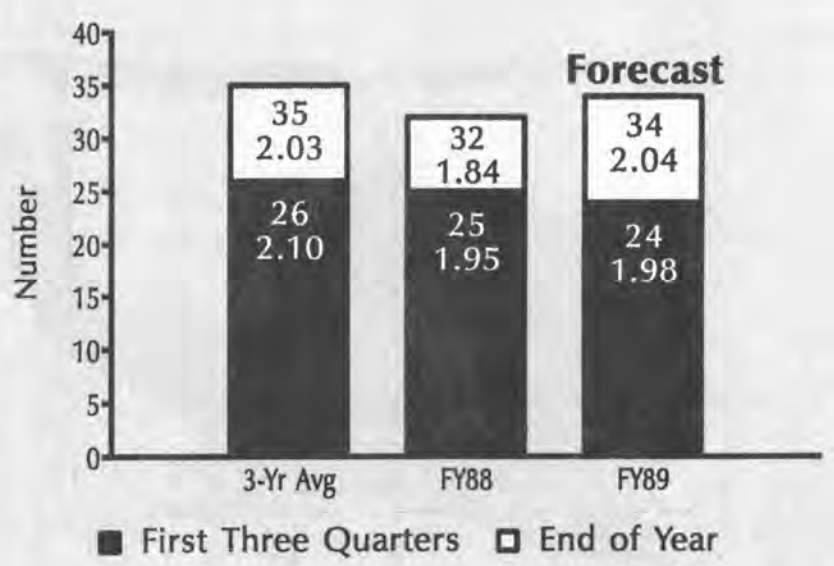


Figure 1.—Class A aircraft accidents

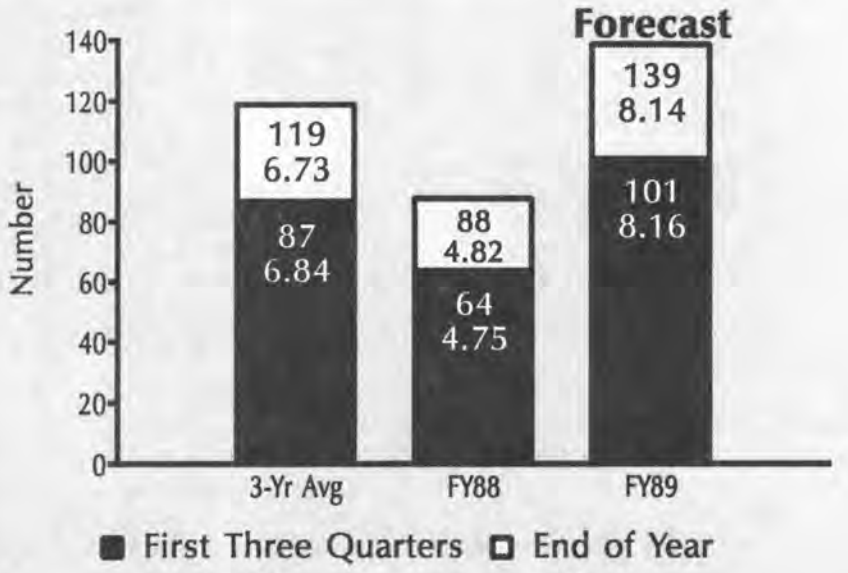


Figure 2.—Class A-C aircraft accidents

Aviators recognized with Broken Wing awards

Four Army aircrewmembers have received the Broken Wing award for recovering aircraft from in-flight emergencies. Except for their quick reactions and flying skill, all of these aircraft and possibly their crews as well would have been lost. Requirements for the Broken Wing Award are spelled out in AR 672-74.

• **CW2 Kenneth W. Haynie, 3d Battalion, 3d Aviation, 3d Infantry Division, APO New York 09182.** CW2 Haynie, an IP, was conducting night low-level training in an AH-1F with a newly assigned RL-3 aviator. Illumination was poor due to cloud cover, and visibility was limited by ground fog. CW2 Haynie was on the controls from the front seat when he realized the pedals wouldn't move. He declared an emergency and turned toward an airfield 11 kilometers away. He attempted to climb to a higher altitude because he knew there was a large set of high-tension electrical wires about 2 kilometers from the runway threshold, but he had to discontinue the climb at about 500 feet because of the cloud cover. After completing the turn, CW2 Haynie noticed he could move the pedals about one-half inch, but the pedals intermittently locked the rest of the way to the airfield. On short final, the pedals became very stiff, with no heading control. As the aircraft touched down, it began bouncing from skid to skid because of the poor runway surface. CW2 Haynie lowered collective and reduced throttle. He continued to use throttle to keep the aircraft aligned with the runway. After traveling about 300 meters, the helicopter came to a stop. The air duct had been improperly installed, and the clevis bolt on the tail rotor pedal control was catching in a hole that had been worn in the air duct, keeping the pedals from moving.

• **CW4 Robert E. LaPan, Army Aviation Support Facility, South Carolina Army National Guard, McEntire ANG Base, Eastover, SC.**

CW4 LaPan was PIC of an A-90 (Kingair) aircraft that was on a return flight to home base after picking up two passengers. During IFR descent from 14,000 feet to 3,000 feet, at an indicated airspeed of 180 knots, the stall warning light flashed on, then went out. The "Prop Rev Not Ready" light also came on and then went out. The aircraft was cleared for ILS approach. During descent on final approach, the entire lighting system dimmed, the localizer needle began going on and off due to surging in the electrical system, the flight director command bar was oscillating from top to bottom, the flight director warning system activated, and the volt load meter read zero. No generator failure or other warning lights came on. The pilot declared a missed approach at 800 feet msl and was cleared to 8,000 feet to proceed to another airfield. En route, the electrical system twice surged from dim to bright and back to dim. CW4 LaPan reported to ATC that he was having electrical problems. He was vectored for an ASR approach and cleared for descent. The aircraft was still IMC at about 500 feet msl when the entire electrical system failed. CW4 LaPan initiated a climb and broke out at about 2,500 feet msl. His only working attitude instrument was the copilot's air-driven attitude indicator, which he could see by flashlight. He also had a mag compass. All communications, navigational capabilities, and engine instruments had been lost, including

continued on back page ►

FLIGHTFAX

The $1,400 plug

When an OV-1D aircraft was run up, the pilot noticed pressure on the No. 2 hydraulic system was zero. He shut down the aircraft and turned it over to maintenance.

Inspection revealed that before installing the No. 2 hydraulic gearbox (manufactured by Western), a mechanic had failed to remove a red plastic FOD-prevention plug from the oil supply port on the gearbox mounting flange. The gearbox was installed with the plug still in the oil supply port. The plug cut off the flow of oil from the engine oil supply system, causing the gearbox bearing to fail after 7 hours of operation. This oversight cost the Army around $1,400.

The maintenance manual does not include a step directing maintenance personnel to remove FOD plugs. To prevent a similar occurrence in the future, a locally produced preprinted DA Form 2404 for installation of Western gearboxes was revised and a step added requiring a technical inspector to check the gearbox to ensure all plugs have been removed before the gearbox is installed.

The red plug installed in the oil port of Western gearboxes such as the one on this Mohawk is 1/2-inch long and 1/4-inch in diameter. These plugs are completely cylindrical and, as demonstrated in this incident, it is possible to install the gearbox with the plug still in place.

There is a Murphy-proof plug available that can be used in place of the red cylindrical plug. This plug, which is made of yellow plastic, is

3/8-inch long, 1/4-inch in diameter, and has a 5/8-inch diameter disk at the top of the plug. Instead of being a simple cylinder, the yellow plug resembles a wide-brimmed hat. Its larger size makes it easier to see, and the gearbox cannot be properly installed with this plug inserted in the oil supply port.

To prevent installation of gearboxes with FOD prevention plugs still in place, the unit in which this Class D accident occurred has recommended to Aviation Systems Command that the manufacturer install the yellow FOD prevention plug in gearbox oil supply ports instead of the harder-to-see red cylindrical plug. ■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class A

H series - Crew heard loud grinding noise and noted stiffness in controls. As they approached an open field for landing, aircraft began to spin. Crew noted a hydraulic light was on and needles were split. Aircraft hit the ground hard and came to rest upright. Fire in transmission area spread and aircraft burned. Two crewmembers were seriously injured. 8936

UH-1 Class C

V series - After 20 minutes of flight in light turbulence, the crew heard a thump, and the crew chief reported the right cargo door, which had been in the locked-back position, had been lost. The door was retrieved; however, when the aircraft reached its destination, damage to the main rotor blade was found. A 3- by 3/8-inch piece of track was missing from the front of the door slider, allowing the door to move. The retainer pin was apparently forced out by vibration, allowing the door to slide and separate from the aircraft, striking the main rotor blade.

UH-1 Class E

H series - Aircraft was picked up to a 3-foot hover and began moving forward for takeoff. A sheet metal panel blown into the air by the aircraft's rotors descended through the rotor system, denting one of the blades. The crew had seen the sheet metal but failed to take any action to secure or remove it before takeoff.

UH-60 Class A

A series - Suspect aircraft struck wire during NVG ATM training. During attempt to land on sloping terrain, aircraft rolled onto its right side and exploded. One crewmember was killed. 8937

UH-60 Class B

A series - PIC was notified to check two sets of grids for aircraft accident. No sign of accident was found. While checking another area, aircraft was on approach at 300 feet agl, 40 KIAS, when it became entangled in wires and forward motion stopped. Aircraft was backed out of wires and landed at the nearest suitable landing site. 8938

UH-60 Class D

A series - Cargo hook door was stored in right rear bulkhead of cargo compartment, which was proper during external load operations. Cargo hook door was not reinstalled before a second flight to transport passengers but no external load. During takeoff from LZ after dropping off passengers, cargo hook door flew out of cargo door.

UH-60 Class E

A series - During approach, crew heard a high-pitched squeal from No. 2 engine. Shaft had sheared on inlet particle separator blower.

A series - While performing a maximum power check during maintenance test flight, crew heard a loud bang and rattling noise and noted the No. 2 engine had failed. Aircraft made a single-engine roll-on landing.

Attack helicopters

AH-1 Class C

F series -PIC in aft crew station noticed slight uncommanded descent while aircraft was in cruise flight. Instrument check showed gradual decrease in N2 and N1, and tgt was decreasing through 300° C. Determining that he had an engine failure, PIC initiated an autorotation. During descent, PIC smelled hot oil and rpm audio and KY58 alarm sounded. Crew smelled smoke as aircraft landed in a wheat field, and smoke was seen coming from right engine cowling air vent as well as from the exhaust and right engine bleed band area. There was no sign of flames.

AH-1 Class D

F series - During hot refueling at FARP site, refueler had difficulty connecting refueling nozzle. Refueler pulled down on nozzle, breaking CCR port ring retainer.

F series - Crew discovered dents in main rotor blade during postflight following tactical training. Suspect

FOD or possible tree strike.

F series - Hydraulics light came on and the stability and control augmentation system (SCAS) disengaged pitch and roll channels. Emergency procedure for hydraulics failure was completed. En route to airfield, hydraulics light went out and SCAS was reengaged. A few seconds later, No. 2 hydraulics light came on again, emergency procedure was repeated, and crew made a run-on landing. Skid tubes were damaged during landing.

AH-64 Class A

A series - During training mission using aircraft's night vision system, helicopter's tail rotor struck a tree. IP reduced throttles, and aircraft hit the ground and rolled onto its left side. There was no postcrash fire and no injuries. 8939

A series - Crew failed to properly secure canopy locking device during preflight. During cruise flight, crew heard a loud bang as locking device struck tail rotor. Tail rotor separated, and aircraft yawed right and began rotating about its vertical axis. Crew pulled engine power control levers off and autorotated into trees in a near-level attitude. Aircraft hit the ground hard and burned. One crewmember was killed, and the other was injured. 8940

AH-64 Class C

A series - During live-fire exercise, crew felt aircraft shuffle. Because of earlier problems with the digital automatic stabilization equipment, crew completed the firing mission, returned to rearm area, and shut down. During postflight, crew discovered damage to tail rotor blades from tree strike.

AH-64 Class D

A series - Aircraft touched down for roll-on landing at 40 KIAS with parking brake engaged. Right main landing gear tire blew out.

Cargo helicopters

CH-47 Class D

D series - During final approach at about 35 feet agl, externally loaded HMMWV was inadvertently jettisoned.

CH-47 Class E

C series - During flight at 125 knots, 1,200 feet agl, PIC noticed aircraft was nose low. Crew had failed to ensure cyclic speed trim switch was in automatic before takeoff or that speed trim indicators were programmed forward after departure.

D series - During flight at 500 feet agl, FE heard a loud thump and ramp area began filling with smoke. PIC told pilot to land immediately. During turn and descent, smoke cleared briefly, but FE reported loud noises coming from the combining transmission gearbox area, and combining gearbox chip detector latch indicator tripped on FE's maintenance panel followed about 10 seconds later by a master caution and transmission chip light in the cockpit. When a second thump was heard, Nos. 1 and 2 engine debris screen latches tripped, and smoke once again filled the aircraft. Aircraft landed and maintenance replaced combining transmission. Suspect subassembly oil cooler fan bearing failed, allowing oil cooler fan impellers to strike the side of the oil cooler fan housing and the top of the oil cooler housing. Increased drag and torque on the fan drive shaft caused failure of the drive shaft and destruction of the combining gearbox fan drive gear bearing and snubber.

Observation helicopters

OH-58 Class B

D series - Aircraft was on final at 65 feet agl, 30 to 40 KIAS, into a refueling site when the engine failed. Crew performed an autorotation, but aircraft's landing gear, belly, vertical fin, seats, and skids were damaged. There were no injuries. 8941

OH-58 Class C

A series - Ground guide directed pilot to landing area on a dirt service road near brigade TOC. Pilot brought aircraft to a hover and asked crew chief if the landing area was level and clear. Crew chief replied that it was. After a normal landing and stability check, pilot reduced power to flight idle before shutdown. Depression under forward portion of left skid caused aircraft to rock and encounter spike knock. There was no rotor contact.

C series - During engine start, throttle was inadvertently left in flight-idle position. When starter was engaged, TOT reached 1,000° C for about 2 seconds before throttle could be closed.

OH-58 Class D

A series - While performing multiple landings and takeoffs during aerial and ground reconnaissance, pilot kept aircraft running to prevent sinking into marshy area. Passenger got out and retrieved equipment from back seat. After passenger closed doors, pilot asked if anything was hanging out of the doors and was told there wasn't. Upon arrival at an airfield, pilot was told by another pilot that a seatbelt was hanging from the door. Fuselage below door was dented and paint was chipped.

A series - Pilot increased collective at 10 feet agl to terminate approach to unimproved area, and egt exceeded limits. Teardown analysis revealed 1-inch crack at weld point in combustion chamber that could have been caused by overtemp.

A series - Allied crew chiefs were inside aircraft holding onto door handle, but door was not properly secured. Rotorwash from hovering AH-1F pulled the door from crew chiefs' grip, damaging door hinge.

C series - During postflight inspection, aerial observer noticed puncture in aircraft skin about 10 inches below refueling port. Caused by dangling fuel cap rubbing against aircraft.

Fixed wing

C-12 Class B

C series - Aircraft struck trees during instrument approach, damaging both wings and nose cone. Pilot initiated a climb, declared an emergency, and landed with no further damage. There were no injuries. 8942

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followup information

on accidents previously reported

UH-60 Class A

Reported in 27 Jul 88 issue as 8835 - An IP was conducting the night tasks portion of the commander's initial flight evaluation with a pilot who had not attempted night hovering flight in more than 120 days. The pilot failed to properly divide his attention between maintaining aircraft control, conducting a power check, and listening to the IP conduct pre-takeoff checks. The pilot allowed the helicopter to ascend to a high hover position and drift over another UH-60 parked on a hospital helipad. When the pilot began a descent to correct the high hover, the tail rotor of his aircraft hit the tail rotor area of the parked aircraft, and he lost control of the helicopter and crashed. The IP was injured.

AH-1 Class B

Reported in 20 Jan 88 issue as 8806 - The mission was an IP standardization flight evaluation. The IP was performing a power recovery from a simulated engine failure initiated by the SIP at about 1,000 feet msl. The throttle was increased to full open while rotor rpm was controlled with collective. After the engine and rotor were at normal operating rpm, with the aircraft in level flight prior to initiating a climb, the crew felt a vertical jolt in the airframe. As collective pitch was increased, the thrust bearings in the hub of the scissors and sleeve assembly had failed. The IP noticed rotor rpm slowly increasing above normal and attempted to correct with collective. The failed bearing allowed the collective sleeve to move independently of the scissors and sleeve assembly, thus causing complete loss of collective control. With the aircraft in autorotation, the SIP decelerated and attempted to apply initial and cushioning pitch, but to no effect. The aircraft hit the ground, bounced and slid to a stop. Both crewmembers left the aircraft under their own power. The degree of damage to the bearings made it impossible for laboratory analysis to determine the cause of the thrust bearing failure.

CH-47 Class A

Reported in 4 May 88 issue as 8816 - While the aircraft was in cruise flight at 2,000 feet agl and 120 knots ground speed, the drive train from the No. 2 engine failed. The engine oversped, causing the No. 2 power turbine wheel to exceed the centrifugal rotation limitations, and power turbine blades were thrown into the aircraft fuselage. Witnesses heard a pop, followed by the sound of a loud explosion. Parts of the aircraft began falling to the ground. Fire and smoke were seen coming from the rear of the aircraft, and the cabin area filled with smoke. Smoke also entered the cockpit. The pilot initiated an emergency descent, and the aircraft touched down in a landing attitude at about 130 knots. The aircraft was totally destroyed by impact forces and the in-flight/postcrash fire. Ten people were killed and the remaining eight on board were seriously injured.

CH-47 Class B

Reported in 4 May 88 issue as 8817 - Aircraft was one of three CH-47s conducting VFR NVG missions in support of artillery units during a field training exercise. The accident aircraft was in cruise flight on its final sortie with an external load when one of the Type IV connector links on the "doughnut" ring (3-foot sling) failed. As a result, the slingloaded howitzer fell about 200 feet and was destroyed.

CH-47 Class C

Reported in 29 Jun 88 issue as 8827 - Downgraded from Class B. Aircraft was at a 60-foot hover when externally slingloaded M102 howitzer was jettisoned. No equipment malfunction was found in the cargo hook system. When the pilots felt the aircraft lurch as the load was jettisoned, each checked the position of the other's hands and determined that neither of them could have inadvertently jettisoned the load. While calling the load, the crew chief was using the winch/hoist control grip for communicating with the pilots. The winch/hoist control grip was to his right, with the cargo hook release switch and the microphone switch facing away from him toward the right side of the aircraft. There is a possibility that the crew chief inadvertently released the load by pressing the cargo hook release switch instead of the microphone switch.

OH-6 Class A

Reported in 29 Jun 88 issue as 8829 - The aircraft was on a day VFR mission at about 200 feet agl and 40 KIAS when low rotor rpm allowed the helicopter's main rotor blade to hit the tail boom. As a result, the aft portion of the tail boom and tail rotor components separated from the aircraft. The aircraft rolled 90 degrees left, pitched approximately 70 degrees nose down, yawed about 25 degrees right, and hit the ground. The aircraft was destroyed, and the pilot and technical observer were killed. Investigation could not determine how or why the main rotor rpm became low enough to allow the main rotor to strike the tail boom. It is suspected that an engine power problem played a role in this accident, but there is no evidence as to whether the problem was materiel or human-induced. ■

U.S. ARMY SAFETY CENTER

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Broken Wing awards

intercommunications between the crew. Using his knowledge of the area, CW4 LaPan flew toward the glow of lights and found the only available hole in the overcast. He descended to 700 feet msl, recognized where he was, and attempted to follow an interstate highway south. Visibility continued to decrease and he had to turn north, following the interstate to a town he knew had an uncontrolled airport. The runway lights were on, and the aircraft circled while the gear was pumped down. Without electrical power, the crew could only assume the gear was down and locked when it could be pumped down no farther. CW4 LaPan made a no-flaps "black-out" landing on the 3,100-foot minimally lit runway, relying on the sound of the engines for the required power setting to make a successful landing. If the airport had had pilot-controlled lighting, the crew would have had no way to turn the lights on. Their only alternative would have been to attempt a landing on the interstate. A half hour after the aircraft landed, the hole through which they had descended had closed in, and visibility was less than one-quarter mile with fog. The crew had flown for 1 hour and 20 minutes and completed a successful landing with no crew communication system. The aircraft's electrical failure was caused by several components malfunctioning at the same time. The sequence in which the electrical parts failed could not be determined.

• **CPT George Lourigan and CW2 Chris B. Archer, 507th Medical Company (Air Ambulance), Fort Sam Houston.** CW2 Archer, a Maintenance Test Pilot Examiner, was conducting an annual maintenance test flight evaluation for CPT Lourigan. During the flight portion of the checkride all maneuvers were completed in sequence without incident. Then CPT Lourigan was asked to perform an engine response check. He increased collective, applying about 42 psi torque. At 45 to 50 feet agl, CW2 Archer announced N2 had recovered normally, and CPT Lourigan began reducing collective. He had made only a slight reduction in collective when N2, N1, and egt fluctuated, then abruptly dropped to zero. Simultaneously, the crew heard a loud bang as the second stage power turbine wheels disintegrated. CW2 Archer immediately lowered collective slightly, attempting to regain lost rotor rpm. With both pilots on the controls, collective was increased to cushion landing, and the aircraft landed with no further damage. ■

FY89 Class A Accidents through 23 August

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	5
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4	4	4	10
4th Qtr	July	1	4	0	7
	August	2	1	0	3
	September	4		1	
	Total	32	29	38	30

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Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 23 6 September 1989

Is it worth it?

Each year 390,000 Americans die as a result of smoking. That is more than all American military fatalities in World War I, World War II, and Vietnam put together. Add to that number 3,800 people who die of lung cancer because of involuntary or passive smoking–people who were unfortunate enough to breathe smoke even though they themselves were nonsmokers. To this total add the babies whose mothers smoked during pregnancy and who account for about 18 percent of all cases of low birth weight, shortened gestation, respiration distress syndrome, and sudden infant death syndrome. Then consider that there are about 1,500 fire-related deaths and 4,000 injuries each year as a result of cigarette smoking. The total direct and indirect costs of smoking may be as high as $200 billion per year. Is it worth it?

Is it worth it?

What does all of this have to do with people who fly Army aircraft? Unfortunately, a lot. If you smoke, no matter what your job is, you increase your and your family's chances of dying from smoke-related illnesses or accidents. But if you are an Army pilot who smokes, you also increase your chances of being injured or killed in an aircraft accident. Why? Because in addition to the other health risks, smoking degrades your night vision.

We all know that to survive on tomorrow's battlefield, helicopters are going to have to fly at night, and they're going to have to fly low. That means added risks of running into things. To try to compensate for these added risks, the Army provides night vision goggles and other types of devices designed to help aircrewmembers see better. But these devices aren't perfect; they only enhance ability to see in the dark, they don't enhance the aviator's vision.

Effects of tobacco use on aviators

Aviators need every bit of visual acuity possible, and those who smoke sacrifice some of their ability to see at night. The reason is that carbon monoxide in tobacco smoke combines tightly with hemoglobin molecules in the blood. The job of these molecules is to transport oxygen to the body's cells, a job they can't do when they are saturated with carbon monoxide. Cells in the retina, which facilitate night vision, are sensitive to even slight decreases in the amount of oxygen supplied to them.

Medical researchers disagree on the exact percent of a person's hemoglobin (oxygen transport) molecules that are saturated with carbon monoxide from smoking one pack of cigarettes a day. Estimates vary from 2 to 15 percent, but researchers all agree that carbon monoxide degrades night vision acuity. Carbon monoxide stays in the bloodstream, robbing the body of oxygen for as long as 6 hours after the person stops smoking.

Just how important this degradation is to you who fly is reflected in MIL-STD-1472C, 2 May 1981. The standard says that you should not be exposed to concentrations of carbon monoxide that result in carboxyhemoglobin (COHb) levels in the blood greater than 5 percent. (A 5-percent saturation of carboxyhemoglobin has the same effect on visual threshold as an altitude of 8,000 to 10,000 feet.)

Consider that industrial plants, automobile exhausts, even some home heating systems all contribute to the carbon monoxide present in the air we breathe every day. Even "clean" air that meets the National Ambient Air Quality Standards established by the Environmental Protection Agency generally results in blood carbon monoxide levels greater than 1.5 percent after 8 hours of exposure. With only a 3.5-percent margin before the Army's

MIL-STD is reached, it doesn't take much tobacco smoke to boost a smoker over the limit.

In addition to the effects of carbon monoxide on the blood's ability to transport oxygen to the retina, the nicotine in tobacco products decreases blood flow by constricting the blood vessels in the retina. The effects of nicotine on eyesight are produced by smokeless tobacco as well as cigarette, cigar, and pipe tobacco.

Death isn't glamorous

The Army is making a continuing effort to reshape the stereotypical aviator image of the macho male seen through a haze of smoke, downing a few at the bar the night before a mission. But in spite of these efforts, movies and television often portray young, savvy aviators with a cigarette in one hand and a can of beer in the other. In the Hollywood version, a few short hours later, this same aviator straps on a multimillion dollar aircraft and outflies everything in the sky.

This kind of glamorization sends the wrong message to youngsters still in high school or college who want to become Army aviators. They aren't being told of the adverse effects years of tobacco and alcohol use can have on a future in aviation.

Like it or not, aviators have a responsibility toward young people. They are role models in much the same way as athletes because what they do is highly visible and exciting, particularly to people below the age of 21. Ironically, it is this same impressionable age group that is most likely to start smoking. More than three-fourths of people who smoke started when they were teenagers.

It isn't too late

While the ideal thing is to convince people never to start smoking, millions of them already have. That doesn't mean it's too late, however. More than 30 million regular smokers have been able to stop smoking in the past 20 years.

The first step is to convince people that no matter how long they have smoked, there are benefits from quitting. Many health risks associated with tobacco use can be reduced by stopping. Over a period of 15 to 20 years, the ex-smoker's risk of dying from lung cancer decreases to a risk comparable to that of a nonsmoker. The cardiovascular benefits of smoking cessation have been well demonstrated among the young, and recent evidence suggests that the risk of cardiovascular disease is also reduced among persons who stop smoking after age 55.

Aside from the health benefits, people who have stopped using tobacco after years of use report the quality of their life has been vastly improved. Things often taken for granted such as the flavor of food, ability to smell, or simply walking up a flight of stairs without puffing for breath are only a sample of the things mentioned.

How can it be done?

While the significant benefits of smoking cessation are well established, why do so many people continue to smoke? Nicotine is addictive–many smokers know that. When nicotine has been given intravenously during research, it has been proved to be more addicting than cocaine. Stopping such an addiction, which in many cases has developed over a period of years, is extremely difficult. But there's help out there.

Medical personnel. Army flight surgeons are in a particularly strong position to influence aviators who smoke. The most effective message is a brief, unambiguous, and informative statement on the need to stop using tobacco for general health reasons and the deleterious effects of smoking on aircrewmembers' ability to perform flying tasks, particularly those involving night vision.

continued on next page ►

FY89 Class A Accidents through 6 September

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	5
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3	4	18	0
3rd Qtr	April	3	2	1	0
	May	7	2	4	0
	June	4	4	4	10
4th Qtr	July	1	4	0	7
	August	2	1	0	3
	September	4	2	1	0
	Total	32	31	38	30

FLIGHTFAX

Is it worth it?

Family and associates. When a smoker attempts to stop, social support from fellow aviators, friends, and family members is important. Fostering a smoker's belief in his ability to quit, and if possible getting him to agree to a specific quit date, is important. Drawing up some kind of written contract to stop smoking is helpful in some cases.

It is important that the person who is attempting to stop smoking be prepared for a possible relapse. Most people who have been able to quit smoking report they made several attempts before they were finally successful. The smoker should not view relapse as a failure, but should learn from the reason for the relapse. Encouragement to set another quit date and try again is needed at this point, and the reason for relapse should be included in the next attempt at smoking cessation.

Community resources. Most Army installations as well as local hospitals, health departments, community health centers, and many voluntary organizations offer smoking cessation programs and support groups to people who want to quit smoking.

Self-help. For people who are attempting to quit smoking on their own, there is a variety of printed self-help materials and videotapes available from local and national health agencies such as the American Lung Association.

Drug therapy. When coupled with other interventions, use of nicotine gum may relieve withdrawal symptoms for some people. Use of nicotine gum by Army aviation personnel, including air traffic controllers, must be under a treatment program prescribed and managed by a flight surgeon and requires an initial 72-hour restriction from flying.

Every year, one out of every six deaths in the United States is related in some way to smoking. If you smoke, ask yourself: Is it worth it? ■

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ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class C

H series - During cruise flight at 4,000 feet and 90 KIAS, aircraft yawed three times, about 10 degrees each time. Pilot took controls and reduced collective to full-down position. Crew felt the aircraft vibrate, but instrument indications remained normal during descent. Crew made an approach to hover and aircraft landed with power. The 90- and 42-degree gearboxes were replaced. Additional damage has not been determined.

UH-1 Class D

H series - When crew noted during takeoff that aircraft was flying a little more nose high than usual, they attributed it to 50 gallons of fuel that had been added to the auxillary fuel tank. After a 10-minute flight, aircraft landed. During walk-around, crew found tail rotor drive shaft cover on vertical fin had been damaged when it came open during flight. Pilot had forgotten to secure cover.

V series - During takeoff at about 20 knots, aircraft shuddered and tail dropped slightly. Vertical tail fin cover had come open and flexed into tail rotor. Dzus fasteners on tail fin cover had not been properly secured.

UH-1 Class E

H series - During flight, master caution and transmission oil hot lights came on. Caused by defective transmission oil thermostatic switch.

H series - Crew noticed severe vibration when aircraft was hovered. Main drive shaft was replaced.

H series - During approach, engine rpm increased to about 6900, and rotor rpm began decreasing. Caused by failure of dual tachometer.

H series - During runup, transmission oil pressure low light came on and gauge dropped to zero. IP saw oil flowing on the ground. Caused by failure of transmission oil cooler.

H series - Aircraft was in cruise flight when the engine surged, and aircraft yawed right. Caused by compressor stall.

H series - During flight at 1,700 feet msl, crew heard four reports from engine. Instrument indications were normal when aircraft landed. When engine response check was conducted during maintenance test flight, several more reports were heard. Egt rose to 780°C, making an engine change necessary. Suspect fuel control malfunctioned.

H series - After takeoff, main generator experienced an overvoltage of more than 30 volts. Copilot switched to standby generator. After 20 seconds, standby generator also went to 30-plus volts. Crew smelled wires burning during approach for landing. Standby/starter generator had disintegrated.

H series - Aircraft was conducting slingloads in support of an infantry mortar section. Eight minutes after first load was picked up, load dropped into a swamp. Aircraft returned to PZ, and cargo hook was retested with and without a load. Second load was picked up with cargo arming switch turned off. About 2 minutes after departure, this load also fell. Cause of cargo hook failure has not been determined.

UH-60 Class C

A series - After landing at an LZ to drop off passengers, aircraft's right main landing gear sank into the ground. The aircraft tilted about 12 degrees to the right. One of the passengers had left the aircraft before being released by the crew chief. When he stood upright near the edge of the rotor disk, the main rotor, which was only about 6 feet above the ground due to the tilt of the aircraft, struck his Kevlar helmet a glancing blow. The soldier received a minor cut on the back of his head and was hospitalized for 2 days of observation.

UH-60 Class D

A series - Aircraft was trail in flight of five, transporting artillery during NVG tactical training. During hookup of an artillery piece, pilot allowed aircraft to drift slightly left. Crew chief saw the hookup man, who was moving in the same direction, stumble. Fearing the hookup man would be injured, crew chief jettisoned load, damaging sight on M102 howitzer. Hookup man should have followed SOP and moved to the right of the load.

A series - While attempting to hook up an M102 howitzer during NVG slingload mission, IP felt aircraft hit load. Aircraft landed, but crew chief failed to find any damage to aircraft's underside. During postflight, broken tip was found on WSPS. IP and crew chief had misjudged clearance and allowed aircraft to drift. Hookup man was crouching instead of standing on load, adding to crew's difficulty in judging clearance.

A series - During short final to a confined area LZ, stabilator was damaged slightly when it hit the top of a tree. Approach angle was too shallow.

A series - PIC misjudged clearance during NOE flight, and main rotor tip cap was damaged when it hit trees. Aircraft was on an EOD mission involving sweeping impact area and could not make an immediate landing. When aircraft landed, PIC failed to find damage to blades. Incident was not entered in aircraft logbook. Damage was found 3 days later after a precautionary landing.

A series - Crew was attempting NVG slope operations in a confined area at near zero illumination. While at a hover, pilot failed to use proper scanning technique and allowed aircraft to drift rearward. IP was late with corrective action, and aircraft's tail rotor struck a tree about 24 feet above the ground.

UH-60 Class E

A series - During climbout, crew felt a pronounced jolt in the flight controls or airframe. A few minutes later, there was a second jolt and crew landed. Suspect SAS valve malfunctioned.

A series - While slingloading a 105mm howitzer, crew felt aircraft vibrate and confirmed a high-side on the No. 1 engine. Caused by failure of ECU.

A series - During preflight, pilot heard sound of metal on metal as rotor blade was turned by hand. Inspection revealed FOD inside oil cooler duct. FOD had not been detected during phase inspection 11 months earlier, and aircraft had flown 250 hours since that time.

A series - POL handler did not use proper procedures while hooking up aircraft for hot refueling. Two screws were sheared off the CCR port.

A series - Aircraft had hooked up load and begun ascent when engine failed.

A series - Aircraft was about 150 feet agl and 55 KIAS, when the stabilator audio sounded and the stabilator and master caution lights came on, accompanied by the accelerometer capsule light. The PIC reset the stabilator, but the accelerometer capsule light remained on. Caused by failure of lateral accelerometer.

A series - Aircraft was 1,500 feet agl at 150 KIAS, when the stabilator failed six times in succession. Time lapse between failures decreased to 1 second. Pilot took manual control of stabilator and set it at zero degrees. Stabilator moved itself 5 degrees down. Airspeed was reduced to 120 knots, and aircraft returned to airfield. Caused by failure of lateral accelerometers.

Attack helicopters

AH-1 Class D

F series - During postflight inspection, right rear crosstube was found sheared at the skid cuff. During previous flight, standardization IP initiated a simulated engine failure from a 5-foot hover. The aircraft touched down right rear skid low. Landing was not considered by SP or PIC to be a hard landing. Damage was not found when skids were visually checked immediately after the hovering autorotation.

AH-64 Class C

A series - Tail rotor blades struck a tree during landing to field assembly area at night. Investigation is in progress.

Cargo helicopters

CH-47 Class D

D series - While hovering over a half-track vehicle while crew chief hooked up load with a shepherd's hook, pilot allowed aircraft to descend slightly. Bottom of aircraft contacted load.

CH-47 Class E

C series - Aircraft was on a mission to support Allied special forces during helocasting operations. On the third sortie, the aircraft was flying over the water at about 50 feet. About 45 seconds after passing over the safety boat, the crew accelerated from 80 to 100 knots, and No. 1 engine beep had a static failure. When emergency engine beep was tested, it worked normally. The copilot disabled No. 1 engine beep trim. By this time, rpm had drooped to 195. Aircraft was in a left turn to return to shore and still maintaining altitude at 50 feet. The copilot was using emergency engine trim to regain rotor rpm. Rotor rpm had increased to 224 with a 10 percent split in torque when No. 2 torque needle indicated a high-side. Copilot pulled No. 2 engine condition lever just out of flight position, and the No. 2 engine fell off line to ground position. Rpm again drooped, this time to 186. Pilot had started an approach to the water. Copilot immediately went to No. 1 emergency engine beep trim and held it forward. As the aft gear broke the water, rotor rpm was passing through 190. When it reached 195, the copilot recommended they fly to the beach if possible. Pilot pulled in power and rotor rpm continued to build. No. 1 engine went into emergency power. Copilot maintained rotor rpm at 236 until aircraft approached the beach, then reduced it into the green arc. After landing, the APU was started and Nos. 1 and 2 ECLs were pulled to ground position. After 2 minutes, ECLs were pulled to stop. Maintenance recovered the aircraft but could not duplicate the problem.

C series - During engine start with both engines in ground position, crewmember noticed smoke around No. 2 engine. Both engines were shut down. After the rotor stopped, the crew found a hydraulic line was leaking in the vicinity of the starter. Caused by loose fitting on hydraulic line to starter.

C series - During flight, transmission oil pressure and master caution lights came on. Pressure on No. 2 engine transmission was 20 psi. Aircraft landed and transmission oil pressure adjustment was increased. A MOC was conducted, and aircraft was released.

Observation helicopters

OH-6 Class E

A series - Aircraft had been flying for about 2 hours and 5 minutes when the low fuel light began flickering intermittently. Aircraft was still 15 to 18 minutes from the field where it was to refuel. PIC decided to land at another airport 5 minutes from destination. On short final, fuel low light came on and stayed on. PIC's fuel consumption check was inaccurate.

OH-58 Class D

C series - Crew chief unhooked tow bar at tug. AO unhooked tow bar at aircraft, then, turning his back toward the aircraft, he began lifting tow bars. Bottom of bars broke both chin bubbles on aircraft.

OH-58 Class E

C series - During preflight, gusty winds blew open passenger door, breaking upper hinge and bending lower part of door near hinge. AO had failed to secure door.

Fixed wing

C-7 Class E

A series - Aircraft was at 200 feet agl and 95 KIAS when the No. 2 engine failed. IP took the controls, placed the aircraft in a single-engine climb attitude, completed emergency procedures for engine failure during takeoff, and established single-engine climb speed. At 500 feet agl, he initiated a shallow left turn to return to the airport where he made an uneventful single-engine landing. Set screw plug on the side of the carburetor had pulled out, causing a complete engine failure due to fuel starvation.

C-12 Class E

D series - During climbout, crew noticed No. 2 engine cowling appeared to be unlatched. After landing, cowling was found latched, but looser than normal. Latch was adjusted.

UV-18 Class D

A series - When brakes were applied after harder than normal landing on gravel runway, brakes became ineffective and nose wheel steering became unstable. Crosswind caused aircraft to start drifting to right side of runway, but pilot used differential power and reverse application to return aircraft to center of runway and bring it to a stop. Suspect pilot was late in correcting for high sink rate during landing. Stress on brake during hard landing caused the brake assembly to sever from wheel assembly and swing around, snapping brake line and resulting in loss of brakes and nose wheel steering. Wear on left tire indicates brake might also have locked during a previous landing on paved runway.

Maintenance

AH-64 Class D

A series - During postflight, IP found a hole in leading edge of No. 1 tail rotor blade. The tail rotor swashplate de-ice cable bracket had failed during flight, falling off and striking the tail rotor blade. During changeout of the swashplate assembly, an older-type assembly had been used–one in which the de-ice cables emerge as two separate cables–but a newer type of support bracket was used. This bracket was designed for use with the new type of swashplate assembly, which has only one de-ice cable. (The cable splits into a "Y" at the tail rotor blades.) The bracket failed after 2.4 hours of flight. Normal tail rotor vibration combined with the added weight of the two de-ice cables and clamps probably caused the support bracket to fail.

CH-47 Class E

D series - Aircraft was on final when crew chief discovered a high-frequency vibration in No. 1 engine area. Vibration increased as aircraft landed. Mechanic had failed to install O-ring seal on drive shaft coupler. Grease was thrown out, causing vibration in area of No. 1 engine nose gearbox shaft.

OH-58 Class E

C series - Master caution and fuel filter lights came on while aircraft was IGE hover. Suspect about a gallon of water was introduced into fuel system through fuel cell vent line when aircraft was washed 6 days earlier. Water in fuel filter created enough differential pressure to cause the fuel filter light to come on.

C-7 Class E

A series - During flight, No. 2 engine low oil quantity light came on and crew chief verified oil leak. Aircraft made a normal landing at an airport, where ruptured oil line was replaced. Oil line had been improperly routed, causing it to chafe and rupture.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

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PIREPs...are they needed?

Just how important are pilot weather reports (PIREPs) to National Aviation Weather Advisory Unit (NAWAU) operations? Do modern-day meteorologists with their radar and weather satellites still need weather information from pilots? The following article, reprinted from Air Traffic Bulletin No. 89-2, February 1989, says they do and urges pilots to continue furnishing the reports.

Surface observations and PIREPs together are the most important sources of direct weather data meteorologists have at their disposal for developing the area forecast. PIREPs alert us to changing conditions, confirm the existence of expected turbulence and icing, and also let us know when those conditions have ended.

Picture a shift change in the weather unit. You've just arrived on shift and you're being briefed on the current weather and the area forecast.

The area forecast shows there is moderate turbulence outlined over the northwestern part of the area. However, there have been no pilot reports from that area for several hours, and the upper air observations are 10 hours old. You have to make one of the following assumptions–

- No one is flying in the area.
- Those flying are not making PIREPs because they are not experiencing any turbulence. Or they are experiencing moderate turbulence as forecast.
- There are too many PIREPs to handle, and no one has time to send them.
- The reports agree with the forecast, so there is no need to transmit them.

In most cases, NAWAU assumes the absence of PIREPs means that no one is flying in the area or there is no turbulence to report.

How you as an aviator can help

Keep them coming! PIREPs are very important. The surface reporting network does a good job on ceiling, visibility, and wind, but there is simply no substitute for pilot reports in assessing turbulence and icing conditions along with layers and tops information. Other tools help, such as satellite imagery, radar, and radiosonde data, but there is no direct sensor for turbulence and icing conditions aloft.

Give us those negative reports. A "no turbulence" report may seem trivial, but when we have AIRMET or SIGMET conditions forecast and the conditions end or shift out of the forecast area it becomes important information.

Night and early morning reports are especially welcome. The scarcity of planes in the air limits the number of reports received, but it makes each report even more important. Freighters, mail flights, and anybody in the air between about 0600Z and 1200Z can be a good source of tops, turbulence or icing information. Those reports are a big help as we compose the mid-shift FA.

Those of you in the flight service stations, centers, and towers do an outstanding job of soliciting, coding, and disseminating PIREPs. We know and appreciate it.■

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Report of Army Aircraft Accidents

FLIGHTFAX

Volume 17 Number 24 20 September 1989

Too close for comfort

At 0630, the UH-60 crew began preparing the aircraft and equipment for first-up medical evacuation duty. By 0800, all pre-mission planning and preflight/runup checks had been completed. At 1416, a call came in requesting assistance for the National Park Service. A 15-year-old boy had fallen from a cliff. The pilot left for base operations to update weather and NOTAMs (Notices to Airmen) while the crew chief and two medics prepared the aircraft for the mission.

By 1500, the aircraft was in the air, and it arrived at an airport near the park at 1730. After landing, the PIC taxied up to the refueling pumps and stopped with the aircraft's nose facing the pumps. The crew wasn't sure the refueling hose would reach the refueling port, and they decided to reposition the aircraft nearer the pumps.

Too close for comfort

After refueling was completed, the PIC met with park rangers, who gave him additional information about the mission. One of the rangers would fly in the helicopter to assist the crew in locating the rescue site.

But then the mission was delayed because of fog and rain in the mountains where the accident had happened. It was 1845 before the aircraft took off again.

The flight was uneventful, but when the crew arrived at the mission area, they were told that the injured youngster had died.

The PIC was still at the controls when the aircraft arrived back at the airport. He landed and began ground taxiing at a brisk walking pace to the refueling point.

Remembering their earlier experience with the refueling hose, the pilots decided to park the aircraft parallel to the refueling pumps, placing the pumps on the left side of the aircraft. Although the PIC was occupying the right seat and no one was ground guiding the aircraft, it never occurred to the PIC to turn the controls over to the copilot.

Both pilots saw a sign post located with the refueling pumps, but they thought the helicopter's rotor blades would clear the post. When the aircraft was about 50 feet from the sign, the copilot warned the PIC that they were getting close to the post. The PIC replied that they would clear the sign, and he told the copilot to lock the tail wheel. As the copilot complied, the helicopter's main rotor blades hit the sign post at about the 9 o'clock position, causing the sign to fall into the rotor system.

The aircraft pitched up, turned about 170 degrees, the tail boom and tail rotor gearbox separated, and the aircraft came to rest on its right side. The PIC suffered a head injury when the external shell of his helmet separated due to failure of the internal retention system. Other crewmembers and the passenger received flailing injuries caused by the rotational motion of the aircraft. Other injuries were caused when a litter pan shifted forward because it had been improperly stowed on the medevac carousel.

The PIC, who had 817 total flight hours, 475 in the UH-60, was overconfident in his ability to maintain proper clearance while operating the aircraft from his position in the right pilot's seat. His concern about the length of the refueling hose, which caused him to try to get as close to the refueling point as clearance would allow, was unwarranted. The hose could have extended 50 feet beyond the point where the crash took place.

Other aviators should be aware of the part overconfidence played in this accident. All crewmembers should assist in visually clearing an aircraft, particularly when there are obstacles or other aircraft in the area.■

Aviators recognized with Broken Wing awards

Four Army aircrewmembers have received the Broken Wing award for recovering aircraft from in-flight emergencies. Except for their quick reactions and flying skill, all of these aircraft and possibly their crews as well would have been lost. Requirements for the Broken Wing Award are spelled out in AR 672-74.

• **CW2 Larry S. Roberts, G Company, 1st Aviation Regiment, 4th Brigade, 1st Armored Division, APO New York 09250.** A flight of two OH-58Ds were on a tactical training mission. The aircraft on which CW2 Roberts was PIC was 500 feet agl, at 60 knots, and turning right downwind when an unusual noise from the engine was heard, accompanied by vibrations in the airframe. No loss of power was noticed at this time. CW2 Roberts radioed the tower to declare an emergency and request a precautionary landing back at the airfield. He had completed a 90-degree right turn when the engine-out warning displayed, and the engine-out audio sounded. There was a rapid drop in NP and NR, and CW2 Roberts decided to initiate an autorotation. Because he was now over a housing area and unable to land at the airfield, CW2 Roberts was forced to turn 130 degrees to the left to align the aircraft with an open field. He made a mayday call to the tower, and the crew of the other OH-58 was alerted to the emergency. During the final stage of autorotation, at about 100 feet agl, the copilot noticed the field was bordered by 3- to 4-foot dikes, and CW2 Roberts realized the field was

freshly plowed and would be very soft. Because of the obstacles and surface conditions, he was forced to level the aircraft at about 25 feet and apply collective to extend the glide to clear the dikes and reach a sod field. As the aircraft touched down, the front part of the left skid began digging into the soft soil, and the aircraft started to roll to the left. CW2 Roberts applied remaining collective to lift the skid and level the aircraft, preventing the aircraft from rolling over. Inspection revealed that a loose main fuel line had allowed air to get into the fuel supply line, resulting in partial fuel starvation and power loss.

• **CW3 Elmer W. Matlock, 1st Battalion, 14th Aviation Regiment, Aviation Training Brigade, U.S. Army Aviation Center, Fort Rucker.** The AH-64 was performing masking/unmasking operations during a day VFR terrain training flight. The IP, CW3 Matlock, demonstrated a masking, unmasking operation to a rated student pilot and transferred the controls to the student pilot. The student pilot, who was in the rear seat with total blackout curtains installed, began to unmask using the pilot's night vision system. The aircraft was about 40 feet agl when the No. 1 engine began to overspeed, immediately followed by overspeed of the No. 2 engine. Because of the increased engine output, the aircraft began an immediate ascent. As the engine power turbines reached 119.5 percent, the aircraft's overspeed protection system shut down both engines. As rotor rpm decreased, the aircraft lost electrical power, leaving the student pilot with no outside vision. CW3 Matlock took control of the aircraft and performed a ►

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	March	3	4	18	0
3rd Qtr	April	3	2	1	0
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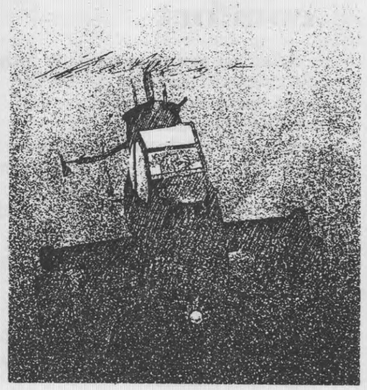
4th Qtr	July	1	4	0	7
	August	2	1	0	3
	September	4	3	1	3
	Total	32	32	38	33

Broken Wing Awards

hovering autorotation. The aircraft landed, undamaged, in a narrow grassy area with 70- to 100-foot trees about 30 feet to the front and rear of the aircraft.

• **CW3 Norman S. Sheflin, 2d Squadron, 17th Cavalry, 101st Airborne Division (Air Assault), Fort Campbell.** During a local area orientation flight at a desert training site, the crew of an AH-1S decided to practice desert landings. The aircraft was about 100 feet agl during climbout after the third landing when N2 dropped to 93 percent, and the low rpm audio sounded. CW3 Sheflin reduced collective and initiated an approach to the ground. When power was reduced, N2 temporarily returned to 100 percent. But as approach continued, N1 and N2 began to droop. At about 25 feet, the engine experienced compressor stalls and lost power. The aircraft began buffeting and yawing as it descended. At about 10 feet agl, the aircraft entered total brownout caused by blowing sand and dust and continued to yaw back and forth as it settled into the dust cloud. Losing all reference with the ground, CW3 Sheflin immediately transitioned to instruments. Using the radar



altimeter to determine the aircraft's height above the ground, he increased collective to cushion landing, and the aircraft landed with no further damage. N1 and N2 returned to normal after landing. Dirt and sand had clogged the aircraft's bleed band actuator in the open position.

• **CW2 Ronald A. Whitney, 1st Battalion, 14th Aviation Regiment, Aviation Training Brigade, U.S. Army Aviation Center, Fort Rucker.** CW2 Whitney was conducting an evaluation checkride with an enlisted observer in an OH-58 at contour flight altitude over heavily forrested terrain. En route to the student's objective, CW2 Whitney had to circle a large hill so that the student could orient himself. The aircraft was about 50 feet agl when it began several uncommanded left yaws. CW2 Whitney sensed that he might have an impending emergency situation, and he turned the aircraft away from a small town and populated area toward a field he had spotted in the distance. Just as he finished the turn, the low rpm light came on, the audio sounded, and N1 and N2 began rapidly decreasing. Realizing the engine had failed, CW2 Whitney initiated emergency procedures and made a mayday call. To his left was a densely wooded slope. To his right was another slope with trees and houses. Using collective and increasing airspeed to extend his autorotative glide, he managed to avoid more trees, houses, and sheds in his path, maneuvered around a large tree, and decelerated sharply to stop the aircraft before reaching wires crossing his flight path. As he applied collective before landing, he again had to maneuver to avoid placing one of the aircraft's skids in a small trench. The aircraft landed without damage to the aircraft or private property and no injuries to the IP and two students on board.■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class B

H series - After picking up troops at PZ, PIC cleared aircraft and told copilot to take off. During takeoff, PIC was monitoring torque and calling out engine power readings. Main rotor blades hit a tree on the left side of the aircraft, and PIC took controls. Rpm dropped and audio came on briefly, but rpm recovered when collective was decreased. Aircraft landed with no further damage or injuries. 8943

UH-1 Class C

H series - N2 deterioriated to 6300 rpm while aircraft was hovering OGE with an external load consisting of a Bambi bucket containing 1,850 pounds of water. Pilot tried unsuccessfully to beep up N2 to maximum. PIC released water load, and N2 stabilized at 6600 rpm. Then N2 began creeping up to 6800. PIC applied collective to load rotor system while attempting to beep down N2. N2 would not beep down and continued to increase to 6900 rpm. PIC again applied collective to load rotor system, but N2 rose to 7000 rpm. Crew performed engine overspeed emergency procedure and landed with no damage to the aircraft.

UH-1 Class D

H series - Damaged tail rotor blade was found during daily inspection. Suspect damage was caused during preceding flight when the M-60 machine gun was fired without the brass catcher installed.

H series - Pilot initiated hovering autorotation and applied premature and excessive cushioning pitch. IP was unable to arrest rate of descent. Rear crosstube was damaged during hard landing.

UH-1 Class E

H series - IP was on controls during IPC NVG training flight. Shortly after takeoff, with aircraft at 50 feet AHO and 40 knots, IP noted rapid rise in engine noise and aircraft yawed to the right. IP reduced throttle and noted that N2 was at about 7100 rpm. Engine noise decreased, followed by failure of N2 tachometer. While attempting 180-degree turn back to point of departure, IP noticed a small tree line in his flight path. As he reached the tree line, the engine failed. IP increased collective slightly to clear tree line, and made an uneventful landing. Moon illumination at time of engine failure was near zero percent. Gear shaft spur was replaced.

H series - Aircraft was chalk 3 in flight of 5. Takeoff from confined area LZ was interrupted when other aircraft crossed flight path. Engine overtorqued when takeoff run was resumed.

H series - Aircraft was at 3-foot hover at start of maintenance test flight. Aircraft yawed left and crew heard loud noises coming from engine area. Engine failed and aircraft was autorotated to ground. Flames coming from tail pipe and doghouse area were extinguished.

H series - High-pressure hydraulic line rubbed on push-pull tube until line failed, and hydraulic pressure was lost.

M series - During hover firing of 2.75-inch rockets, hydraulic pump cavitated, and No. 2 hydraulic system light came on. Pressure line to collective had worn through at hose clamp on line.

UH-60 Class A

A series - Aircraft was on an NVG flight en route to a forward area refueling point when it crashed into the ground, killing all six people on board. 8944

UH-60 Class C

A series - Aircraft landed on runway at municipal airport and taxied onto grass parking area. Copilot noticed an empty Cessna 150 had become unstable as helicopter stopped, and PIC reversed hover taxi. Cessna was damaged when it rolled onto its back.

UH-60 Class D

A series - Jumpmaster failed to ensure seatbelts were fastened after jumpers had jumped from aircraft. Seatbelts hanging from aircraft caused dents and small holes in outside of both cargo doors.

A series - After completing MTE, copilot was performing a simulated approach for proficiency purposes. During deceleration after final shallow approach, aircraft's tail section hit a perimeter fence.

A series - When power levers were advanced to fly position during runup, crew heard a bumping noise. Cyclic was not properly centered during start, and forward cyclic caused antiflap stops to contact stop plates.

A series - During approach, IP stated "simulated No. 2 engine chip caution light on," and retarded No. 2 PCL to 10 percent torque. No. 1 PCL was increased to 110 percent. Crew heard several bangs from the engine and landed. Maintenance replaced engine.

A series - Stabilator light and audio came on during flight at 90 KIAS, 8,500 feet msl. Pilot was unable to regain automatic mode by pressing reset switch. Cyclic slew switch was used and stabilator slewed to 10 degrees down and stopped. Caused by loose cannon plug pin.

A series - No. 2 engine flamed out during approach. Caused by failure of hydro mechanical unit fuel control.

Attack helicopters

AH-1 Class B

P series - Rated student pilot was performing an altitude over airspeed takeoff. At 200 to 250 feet, engine lost power. Aircraft was autorotated into an open field and landed hard. Aircraft came to rest upright on its belly. Weight of aircraft opened fuel drain valve, releasing 50 gallons of fuel. 8945

AH-1 Class D

E series - Refueler applied excessive downward pressure, breaking the closed circuit refueling receptacle.

F series - When aircraft hovered near OH-58, open cabin door on OH-58 was blown off its hinges.

AH-64 Class D

A series - Tower operator told IP No. 1 engine nacelle appeared to be open during takeoff. Although the IP stated he demonstrated proper way to secure engine nacelles during preflight, nacelle was not secured.

A series - Tail rotor drive shaft cover came loose during low-level flight. Postflight inspection revealed damage to cover. As currently designed, Dzus fasteners on AH-64s cannot be fully tightened, and fasteners vibrate loose. Type of Dzus fasteners used on UH-1, AH-1, and OH-58 helicopters do not have this problem.

Cargo helicopters

CH-47 Class E

C series - During flight control check, crew noted unusual hydraulic pressure indications. During flight to airfield, crew chief reported severe hydraulic leak from No. 2 flight boost manifold. Shortly afterwards, transmission chip light came on. After landing, No. 2 flight boost filter was removed and crew chief found a small spring in filter cup. Spring was not part of flight boost and its origin could not be determined.

CH-54 Class E

A series - During flight, crew felt momentary vibration in airframe followed by zero torque and 60 percent N1 on No. 2 engine. Postflight inspection revealed No. 2 engine flex coupler had failed at transmission input.

Observation helicopters

OH-6 Class D

G series - During breakaway from target, about 200 meters from target, aircraft was struck by fragment of rocket motor.

OH-58 Class A

A series - Aircraft encountered IMC during NVG training flight. Pilot lost control of aircraft and helicopter crashed. The three crewmembers were killed. 8946

Fixed wing

C-12 Class E

D series - Aircraft was 4.6 hours into mission when No. 1 engine nacelle low light came on. Fuel indicators showed 800 pounds of fuel remaining. During descent for landing, light went out. This was third occurrence of the same problem in this aircraft in past month, and maintenance replaced fuel quantity probe and two flapper valves. Nacelle low lights in the C-12 are a frequent problem for this unit, indicating possible design defect in gravity feed fuel system from wing tanks into nacelle tank on left side of aircraft.

U-21 Class E

A series - During go-around, pilot noticed No. 2 engine was slow responding to power application. As aircraft leveled off, amount of torque continued to decrease and pilot had to apply more power. Pilot secured engine and landed. Caused by internal failure of fuel control unit

Maintenance

AH-64 Class D

A series - Aircraft had flown 9.2 hours since last PMS. Aircraft was needed for night battle drill and another PMS was needed. Crew chief found No. 5 tail rotor drive shaft had been scored by a soda can that had been left in drive shaft area. This cowling is normally opened only during PMS or when maintenance is being performed in this area.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

Followups

UH-1 Class A

Reported in 5 Oct 88 issue as 8840 - During takeoff from a field site, the aircraft entered brownout conditions. When the pilot attempted to continue the takeoff and fly out of the brownout conditions, he used forward cyclic input instead of adding collective to establish a climb. The pilot became spatially disoriented, and the aircraft flew into a downwind condition and hit four trees along a dusty road. The pilot initiated a descent, and the aircraft sustained major damage when it landed hard in a right yaw and came to rest on its left side. There were no major injuries to the crew or passengers.

UH-1 Class A

Reported in 5 Oct 88 issue as 8841 - While the aircraft was climbing to 400 feet agl, engine N2 rapidly increased to 7000 rpm. As the pilot was attempting to control airspeed by increasing collective, the crew heard a bang from the engine compartment and the engine failed. The pilot began a 180-degree left turn to select a landing site. Because of the amount of collective used to control the engine overspeed, this increase in collective caused the rotor rpm to decay rapidly when the engine failed. The low altitude gave the pilot insufficient time to regain lost rotor rpm. Pitch application was initiated at 75 to 90 feet agl, and the aircraft descended vertically and struck the ground at a high rate of descent. After initial impact, the aircraft rolled right, coming to rest on its right side. The three crewmembers received minor injuries.

CH-47 Class B

Reported in 27 Jan 88 issue as 8809 - During aircraft runup, engine condition levers (ECL) on both engines were advanced to ground position, and engines were allowed to warm up normally to above 0°C. When ECLs were advanced to flight position, pilot detected a grinding noise and abnormal rotor rpm indications. Engines were immediately retarded to off position, and No. 2 engine drive shaft failed. Suspect No. 2 engine transmission clutch failed to engage initially. When it subsequently engaged, the sudden high-torque clutch engagement caused severe damage to No. 2 engine, transmission, and drive shaft. No actions by the crew contributed to the failure of the clutch to engage.

CH-47 Class B

Reported in 7 Sep 88 issue as 8838 - During takeoff on an NVG training flight, the PIC had his attention focused on another aircraft on the ground in front of him. While attempting a departure to the right of the other aircraft, the PIC failed to see a large concrete block located to his aircraft's right front. The CH-47's right front landing gear hit the concrete block, causing the aircraft to assume a nose-low attitude. The pilot applied aft cyclic as the nose dipped. The impact and application of cyclic caused an abrupt out-of-balance condition in the main rotor system. The PIC perceived the ensuing aircraft vibrations as severe and elected to put the aircraft on the ground. As the aircraft descended, the concrete block penetrated the bottom of the aircraft. Severe droop stop pounding occurred as the aircraft settled onto the block. The PIC had deviated from the ATM standards by attempting to combine an NVG takeoff with diagonal movement, which is contrary to procedures in TC 1-216.

OH-6 Class A

Reported in 29 Jun 88 issue as 8828 - Aircraft was trail in a flight of four during an NVG training mission. The aircraft was 1.7 hours into a planned 2.8-hour flight. During a gradual descent over a lake, engine power was lost. The IP took the controls and initiated an autorotation. The aircraft came to rest in 16 feet of water, rolling 90 degrees left. Both crewmembers exited from the aircraft and surfaced, using their life preserver units for flotation. They were picked up by other aircraft from the flight. The aircraft received extensive damage, but the crew escaped with only minor back sprains. Cause of the power loss could not be determined, but a temporary disruption of fuel or air to the engine is suspected. During the rescue notification, a control tower operator failed to notify medevac personnel of the accident in accordance with the installation crash plan. As a result, it was several minutes before the medevac aircraft was launched. The tower operator failed to use the crash line because he felt other personnel who would also answer the crash phone were not required and should not be notified.

OH-58 Class A

Reported in 2 Nov 88 issue as 8842 - The copilot was on the controls when the aircraft, which was in contour flight at about 40 feet agl and 60 KIAS, hit and severed a three-strand set of wires

suspended parallel to a road across a valley. The road was built on a 30- to 35-foot fill, making the wires only 10 to 15 feet above the road at the point of impact. The wires had not been properly marked on the crew's wire hazard map. The sun was in the copilot's face, and the supporting poles were concealed by shadows cast by surrounding trees. The lack of contrast between the wires and background terrain made the wires difficult to see. Both crewmembers were seriously injured when the aircraft hit the ground.

OH-58 Class A

Reported in 2 Nov 88 issue as 8843 - While in a left turn during contour flight, the PIC failed to maintain a safe obstacle-clearance altitude. As a result, the aircraft's main rotors hit trees, causing extensive rotor and airframe damage, and the aircraft crashed through 100-foot-tall trees. The passenger was killed, and the PIC was seriously injured. The aircraft was destroyed.■

ELTs approved for Black Hawks

Emergency locator transmitters (ELTs), designed to automatically transmit life-saving distress signals in the event of a crash, may be installed in UH-60 Black Hawks by owning units. Major Army commands can authorize and fund the purchase of ELTs.

Airworthiness releases and approved installation instructions must be obtained by written request to the U.S. Army Aviation Systems Command, ATTN: AMSAV-ECU, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798.

Approved instructions are available for model EBC 302 HM, manufactured by Emergency Beacon Corporation, 15 River Street, New Rochelle, NY 10801. Installation instructions are also available for model DM SE 86, manufactured by Dorne Margolin, 2950 Veterans Memorial Highway, Bohemia, NY 11716.

If another ELT manufacturer is selected, specifications and installation instructions must be approved by AMSAV-ECU in order to obtain an airworthiness release.

ELTs cost approximately $850 each. The price is less when 12 or more are ordered. Units procuring ELTs should also plan for maintenance requirements and battery replacement through local purchase procedures.

If additional information is needed, contact Mr. Brian Cioffi at AVSCOM, AUTOVON 693-1687.■

Check your emergency locator transmitter

The 5 April 1989 issue of **Flightfax** dealt with the use of emergency locator transmitters in Army aircraft.

The Chief, Aviation Electronics Management Office, Aviation Systems Command, has requested that we warn aviators about the need for removing a shunt that is used in some ELTs to prevent accidental activation during shipping or ground handling. If this shunt is not removed before flight, the ELT will not transmit in the event the aircraft crash lands.

Aircrews should make sure they remove the shunt from ELTs before taking off and reinstall it upon landing. This information should also be included in local standing operating procedures for ELTs.

–Point of contact: Mr. Charles A. Daher, U.S. Army Aviation Systems Command, AMSAV-2E, AUTOVON 693-1391.■

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is for acci Specifically prol s or matters of l Direct com-mu .

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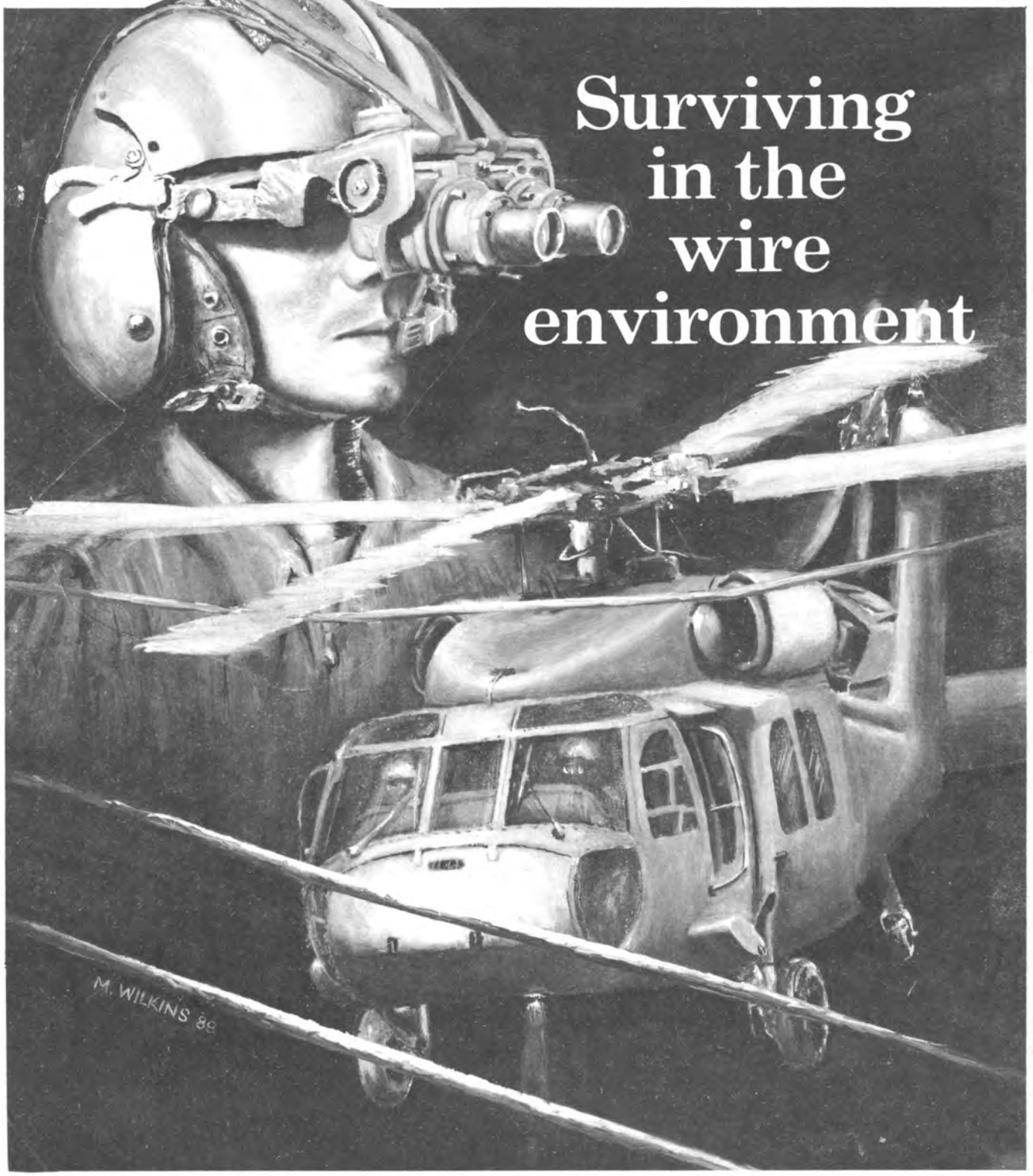
Report of Army Aircraft Mishaps

FLIGHTFAX

2 November 1988 Volume 17 □ Number 3



Surviving in the wire environment

Surviving in the wire environment

Proficiency in terrain flying has become a basic combat skill. It increases the effectiveness as well as the survivability of our actions in a hostile environment. In other words, to protect ourselves in a combat environment we accept the more manageable risks of the wire environment. How well have we adjusted to the demands of this most challenging form of flying?

The wire strike accidents we have each year show we pay a needlessly high price for the learning process. Seventy-six wire strike accidents involving damage were reported over the past 5 years. Ten people were killed and 22 injured in these accidents. Twelve aircraft were destroyed. Total cost of these accidents was almost $21 million.

No subject has received more headlines in aviation safety publications. Prevention programs and procedures have been developed, but they do not seem to affect those who are caught next.

If there is a common denominator in these accidents, it seems to be a lack of awareness of how little room for error there is in the terrain flying mode. **Any** corner-cutting or compromise in the preparation and conduct of these flights can produce disastrous results. The validity of this observation can be judged in a review of two recent wire strike accidents.

A Black Hawk was on a night vision goggles tactical training flight. It was a dark, clear night without a moon. Both pilots were wearing AN/VIS-6 goggles and the crew chef was wearing AN/PVS-5 goggles. Three passengers were on board.

The pilot-in-command (PIC) was navigating from the left seat. The copilot was flying from the right seat. The route was being flown at 80 knots about 150 feet above the ground.

The PIC was using the infrared searchlight whenever he anticipated wires plotted on his hazard map. Half a mile from where the Black Hawk flew over one set of wires marked on the map, a 150-foot-tall tower of a powerline loomed up unexpectedly. The PIC pushed the collective down and told the copilot to go under the wires.

As the helicopter was descending, the copilot started a right turn and raised the nose. While the helicopter was in the turn, the main rotor severed four bottom wires that were more than three-fourths of an inch thick. The UH-60 hit the ground on its right side and came to rest upright. After the crew and passengers exited, a postcrash fire destroyed the helicopter.

The error-inviting compromise that set the stage for this accident is easily identified. The PIC had not transcribed to his own map all the powerlines displayed on the wire hazards map in the operations office, although he had the time and the opportunity.

When the UH-60 flew over the first set of wires, the PIC thought these were the wires marked on his map. There were no other wires marked on his map in the immediate area. Actually, he had not reached the wires marked on his map. They were one-half mile away. When the UH-60 reached the set of wires marked on the map, the crew was not on guard for them.

The PIC was a standardization instructor pilot with almost 5,000 hours of flying time and 3 years of experience in that theater of operations. He had flown over the same area in the daytime but did not recall seeing the wires the helicopter hit.

Rank, age, and experience do not make anyone immune to errors. Experience is no substitute for compliance with SOPs in the preparation and performance of missions.

Another wire strike accident killed all three crewmembers. It involved the No. 4 aircraft in a 7-ship formation of Hueys returning to home station after a 5-day training exercise.

The flight proceeded in loose trail formation with three to five rotor disks separation. Visibility conditions were poor, with ceilings estimated at 400 to 600 feet. Airspeed varied between 50 and 70 knots as the flight paralleled a main highway on the left.

The flight crossed several sets of powerlines. Before crossing each set, the flight would climb from a cruising altitude of just above the trees to an altitude that would allow the wires to be crossed at the towers. Once the towers were crossed, each aircraft would descend individually to cruising altitude. Visibility was reduced significantly when climbing to cross the towers. The aircraft crossed over the towers at varying heights, with several aircraft in the flight crossing at less than the 50-foot clearance required by the unit's SOP.

Approaching the wires at the accident site, the flight lead and the No. 2 and 3 aircraft slowed to about 50 knots and crossed the tower with less than the 50-foot clearance required. The No. 4 aircraft descended onto the tower while returning to cruising altitude and crashed inverted. The height of the tower was 163 feet.

The copilot was flying the aircraft. Since leaving flight school he had accumulated only 15.8 hours. His formation flying ability had been criticized by the other pilots in the unit, especially his lack of smoothness in crossing wires.

His attention may have been so focused on the aircraft in front of him that he failed to ensure he had cleared the tower. It is also possible that fear of going IFR in the reduced visibility above the tower prompted a premature descent.

The 50-foot crossing height was not enforced by several leaders in the flight: the air mission commander, who was the flight lead; the flight platoon leader, in the No. 2 aircraft; the unit IP, in the No. 3 aircraft; and several other pilots-in-command. In fact, it had become an accepted practice in this unit to cross wires at less than the required 50-foot clearance.

These two accidents underline the critical importance of five key wire strike prevention actions:

- Make sure that thorough hazard and obstacle briefings are conducted before every low-level mission.
- Mark all wires in the areas where you normally operate.
- Mark all wires on current hazard maps.

(continued on back page)

FLIGHTFAX

The missing nail

Remember the old story that because of a missing nail the horse lost a shoe, then because of the loss of a horse, the rider and eventually the battle itself was lost? The Army doesn't need many horses these days, but the principle remains the same—without attention to details, we can lose an aircraft, an aircrew, even a battle.

Paperwork is a necessary evil in most of our lives, but it helps if we can see some kind of payoff from doing it. Part of the paperwork required of an aviation unit is the preliminary report of aircraft mishap, better known as the PRAM.

Because most PRAMs involve precautionary landings with little or no damage or injuries, it isn't always clear to everyone involved just how important they are. For example, let's look at item 19, which asks you to describe the materiel/maintenance/design factors involved in a mishap or precautionary landing.

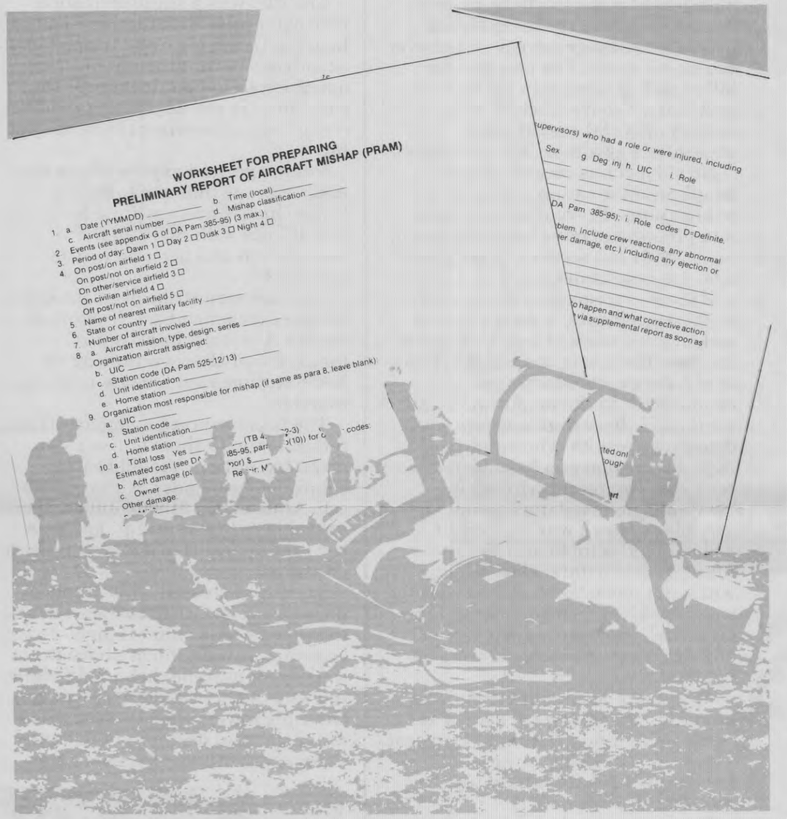
When a PRAM is received at the Army Safety Center without a part number or national stock number (NSN) for a failed aircraft part, we could have another "missing nail" case, particularly if it is a flight critical part. If one of these parts breaks, malfunctions, or is missing, it can cause a component to fail and may result in the loss of an aircraft.

When failure of an aircraft part is reported on a PRAM, it is added to the historical record on that part; but for this record to be accurate, the NSN and part number must be included. This information may raise a "red flag" indicating that a trend appears to be developing on this part. For example, if there have been 11 failures of the antiflap cam on UH-60s in the past 6 months, this may indicate a trend that needs to be followed up. If the part involved is even more critical, such as gearbox failures on the UH-1, timely and complete PRAMs are even more important.

When part numbers and NSNs are left off the PRAM, incidents won't be added to the part's historical record. If this happens often enough, we could have a missing nail that we won't even know about until the horse's shoe falls off (or a critical part breaks and an aircraft falls out of the sky).

Another important number in item 19 is the manufacturer's code. Some components may have the same part number and NSN but be made by different manufacturers. Properly completed PRAMs will enable us not only to identify the problem part, they will also tell us if the parts that are failing are made by the same manufacturer.

Occasionally, a part that doesn't meet Army specifications shows up on a PRAM. This is extremely important because items classified as "critical" (or designated as flight safety parts) must not be locally purchased for this very reason. Flight safety parts that do not meet critical characteristics can fail or malfunction and cause the loss of an aircraft and its crew. That is why the Army's Flight Safety Parts Program was established. The program is designed to keep nonspecification parts out of the system and to track critical parts from the time they are manufactured until they are retired from use. (See "Flight Safety Parts Excluded From Local Purchase," in the 29 June 1988 issue of *Flightfax*.)



There are several things aviation units can do to ensure that PRAMs give us the information we need to do our job better:

- When reporting part numbers and NSNs, accuracy is extremely important. The most accurate number is the one on the failed part itself. The reason is, an NSN covers multiple part numbers. Some of these parts may be used on different aircraft components; e.g., transmission or engine. They may even be interchangeable between aircraft. If the aircraft parts manual is used to identify the part, only two or three of the parts under a certain NSN may be listed, and the part that failed may not be one of those listed. By reporting the number from the failed part, you are helping the Army Safety Center identify exactly which part failed and to establish an historical record of how many times that particular part has failed.
- If a parts manual is used, thoroughly research the manual to be sure the correct part number and NSN are reported. These numbers change, so it is essential that only current parts manuals are used.
- State the nomenclature exactly as it is written in the parts manual. If aircraft in your unit experience two tail rotor gearbox failures and one PRAM reads "gearbox" and the other reads "tail rotor gearbox," the computer may not accurately report how many tail rotor gearbox failures there have been. Multiply this Armywide, and you can see that a trend could be developing that isn't showing up on the reports.
- Give us your best shot at describing exactly how the mishap occurred. Begin with the first indication of a problem. Include crew reactions, any abnormal control reactions, and describe termination of the problem (landing, further damage, etc.) including any ejection or bailout. For example:

  Aircraft was in cruise flight when a loud bang was heard aft, with right yaw and left roll. During powered descent, the aircraft began to spin to the right. The pilot initiated an autorotation, and the aircraft sustained major damage as it descended vertically through the trees and came to rest on its left side. Postcrash fire was put out by CE.

  Contrast this description with a PRAM that states only that caution lights came on and the crew made an immediate landing. That doesn't tell us what caused the light to come on, what the crew did, what corrective action was taken, and so on. So the PRAM really doesn't tell anybody anything.
- Remember item 21 is being used to report whether or not a flight data recorder was installed on the aircraft.

We have talked about only a small portion of the information required on a PRAM, but all of the information is important. Getting all the details together and doing the paperwork to send in a PRAM can be a hassle, but this is one bit of paperwork that has a big payoff. If we can find the missing nails that are causing the Class D and E incidents, we might be able to keep the big ones from happening—the ones that can cost lives and destroy aircraft. □

STACOM

The subject of electromagnetic interference (EMI) encounters and their effects on Army aircraft continues to be raised during dialogue between evaluation and standardization personnel and units in the field.

The following messages have been issued on this subject:

a. AMSAV-E 212120Z Jun 88, subject: (Classified).

b. AMSAV-E 191500Z Jul 88, subject: EMI reporting procedures.

c. AMSAV-E 191400Z Aug 88, subject: (Classified).

All aviation commanders should have received reference b **and** either reference a or reference c, whichever is appropriate. Further guidance for aviation commanders and airfield commanders is contained in Part IV of reference a and in the final section of reference c. Units that have not received these messages should contact their higher headquarters immediately.

Electromagnetic interference has the potential to affect operation of all Army aircraft. Pilots are to report EMI anomalies in a timely manner, using the format for preliminary reports of aircraft mishaps (PRAM) in accordance with AR 385-40. All PRAMs reporting suspected EMI encounters will be classified as confidential.

Points of contact at AVSOM for questions concerning EMI are Mr. Kelso or Mr. Albright, AUTOVON 693-1634, commercial (314) 263-1634.

STACOM 132 2 November 1988

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208. AUTOVON 558-3589 during duty hours, 558-6487 after duty hours. 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.

Michael H. Abbott
Colonel, Aviation
Director, DES

MISHAP BRIEFS

Information based on preliminary reports of aircraft mishaps

Utility helicopters

UH-1 Class C

H series- Copilot applied aft cyclic during takeoff from confined area and aircraft began settling. PIC took the controls, applied forward cyclic, and increased power. Copilot noted torque reached 65 psi for about 3 seconds. PIC completed two sorties before returning to home station. Maintenance replaced transmission, main drive shaft, main rotor blades, hub, and mast.

UH-1 Class D

H series - Large bird struck and broke left windshield panel during contour flight.

H series - During postflight inspection, pilot noticed a dzus fastener had come loose from vertical fin drive shaft cover. Fastener had hit tail rotor blade, making a hole in the blade.

UH-1 Class E

H series - When pilot started engine after refueling, cyclic began pulling forward. With both pilots on controls, hydraulic control switch was recycled and cyclic broke loose. Suspect malfunction of hydraulic system.

UH-60 Class E

A series - During postflight, oil was seen leaking from left accessory module oil return tube. Maintenance replaced packing.

A series - About 2 hours into flight, right inboard fuel tank stopped transferring fuel and the no-flow advisory light came on in the manual transfer mode. Caused by loose fuel line.

Attack helicopters

AH-1 Class D

F series - Aircraft was in a 20- to 30-degree bank while conducting tactical terrain flight at 45 KIAS, 50 feet agl. Both crewmembers focused their attention on a dead tree to the left of their flight path, and the aircraft's main rotors struck the top of another tree on the right side of the aircraft. The copilot, who was flying from the gunner's station, was not current in the AH-1, and the maneuver performed was not appropriate for his level of training.

Cargo helicopters

CH-47 Class D

C series - Aircrew allowed aircraft to descend too low while hovering for hookup of external load. IP was late responding to crew chief's warning and bottom of aircraft contacted load.

D series - After hooking up fuel blivet to rear cargo hook, crew focused attention on hooking up the forward load. The rear cargo hook contacted the fuel blivet and fuel began leaking when the aircraft came to a hover. Blivet could not be repaired.

CH-47 Class E

D series - During cooldown, engine fuel control failed, and power turbine inlet temperature exceeded limits.

CH-54 Class E

A series - During takeoff, IP demonstrated first-stage servo failure to pilot. When IP attempted to recover system, it would not come back on line. Maintenance replaced manifold assembly.

Observation helicopters

OH-6 Class C

A series - Pilot gave aerial observer, who was at the controls, an unauthorized simulated engine failure at altitude. Aerial observer reacted with abrupt aft cycle input, causing main rotor to contact engine air inlet aft fairing. Crew was unaware aircraft had been damaged and continued mission.

OH-58 Class A

A series - Aircraft was in a flight of two on a recon mission when it encountered 50- to 75-foot-high power lines. Wire cutters cut one wire, but a second wire caught in the main rotor blades and the aircraft crashed. 8842

A series - Aircraft crashed in heavily wooded area while conducting terrain flight. Aircraft was destroyed and passenger was killed. 8843

OH-58 Class E

A series - During pilot flight evaluation, IP retarded throttle and announced simulated engine failure. Pilot reduced throttle to idle and continued autorotation with collective full down. IP noticed rpm continuing to decay, needles did not split, and low rpm audio and light came on. IP took controls, increased throttle, and made uneventful landing. Maintenance replaced free-wheeling assembly.

Fixed wing

OV-1 Class E

D series - During vector for VOR approach, pilot attempted to extend speed brakes to slow aircraft. Brakes would not extend. Pilot used emergency gear extension system to lower landing gear and made uneventful landing. Pressure line to right speed brake had ruptured, causing total loss of hydraulic fluid.

T-41 Class E

A series - While engaged in upper-air work at 7,500 feet msl, rated student pilot was demonstrating landing configuration stall. Aircraft broke left and student attempted to correct with aileron only, abruptly adding full power. Right engine responded, but left engine did not. Aircraft began entering a spin. IP recovered aircraft, but negative Gs with flaps were experienced during recovery.

U-21 Class E

A series - During preflight, large dent was found on left inboard flap. Suspect jumper struck flap during parachute operations.

Maintenance

AH-1 Class E

F series - During rapid refueling, pilot noticed oil leaking from aircraft. Investigation revealed oil coming from transmission internal oil filter housing. O-ring on transmission internal oil filter was improperly aligned, causing it to tear.

OH-6 Class E

A series - Engine quit as N1 reached 67 percent before runup. Main fuel line was not properly tightened after replacement of fuel gauge, and air entered main fuel line.

Safety messages

- Maintenance information message concerning hub moment spring and hub restraint retrofit kit for UH-1H/V and EH-1H/X aircraft (UH-1-88-MIM-06, 172000Z Oct 88).

For more information on selected mishap briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft mishaps published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is for accident prevention purposes

Surviving in the wire environment

• Ensure maximum crew coordination in searching out and calling out wires.

• Go slow when you go low.

Because of the wire strike protection system, we are not losing as many aircraft to wire strikes as we once did. However, wire strikes are still costing us lives and dollars. A team effort is required to prevent wire strikes.

• Commanders must enforce SOPs. Procedures for all types of missions to be flown must be clearly spelled out in the SOP, and these procedures should be reinforced regularly at aviation safety meetings. Breaches of flight discipline should be dealt with immediately.

• Operations officers must schedule aircrews who are compatible and who have attained the desired state of training as weighed against the complexity of the mission. Operations officers must provide hazard maps and brief aviators on wire hazards.

• Aviation safety officers must promote wire strike prevention awareness in safety meetings and closely monitor flight crew scheduling, briefings/debriefings, and posting, use of, and availability of wire hazard maps.

• IPs must practice, teach, and reinforce wire strike prevention criteria and commonsense rules for detecting and avoiding wires.

• Copilots and crew chiefs must be assigned specific cockpit tasks and duties. Open lines of communication must exist between the pilot at the controls and those navigating and/or clearing the aircraft in all quadrants.

• Pilots must, as the "final authority," consistently and successfully combat the temptation to take shortcuts that may lead to wire strikes. Every Army helicopter pilot must remain conscious of basic wire strike prevention measures and **think** wires constantly while flying in the terrain flight mode.

Everyone on the team shares the responsibility for wire strike accidents, but the final responsibility still belongs to the people in the cockpit. □

New twist on man bites dog story

An Army helicopter obviously annoyed one of man's best friends when it landed at a National Guard armory recently. The crew had just shut the OH-58 down when a dog appeared and tried to take a bite out of the still-turning tail rotor. The aircraft was damaged, but the dog didn't escape unscathed either; he suffered a broken jaw and lost several teeth. We aren't sure if the nearly $4,000 tab for this Class D mishap includes the dog's dental bill, but you have to admit that's one gutsy canine. □

FY89 Class A Mishaps
through 2 November

	Month	Class A Mishaps		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	0	0	0
	December	1		0	
2nd Qtr	January	2		0	
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	5	38	3

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 4 16 November 1988

These guys did it right

Flightfax devotes a lot of space to crashes and the errors that caused them. This is done in the hope that Army aviators will learn the hard-bought lessons and not repeat the mistakes.

But there are also lessons to be learned from in-flight emergencies that have a happy ending because the guys involved did it right.

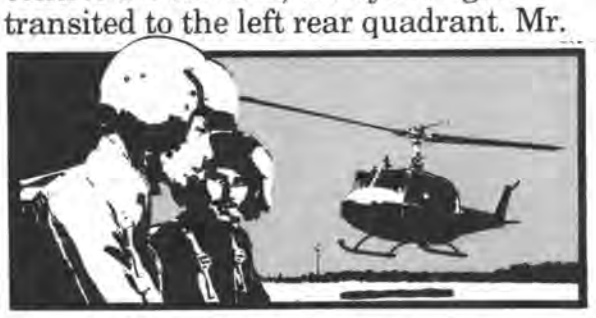
Following are accounts of eight such cases—cases that could have but did not end in disaster because of the way the crews responded. These crewmembers received the Broken Wing Award in recognition of their skill in recovering from their emergencies. We congratulate them and hope others will benefit from knowing the details of their experiences.

• **Mr. Rodney S. Marchant, Pan Am Support Services, Inc., U.S. Army Aviation Center, Fort Rucker.** Mr. Marchant was conducting transition training for two student pilots in a UH-1. One of the students was at the controls when the aircraft experienced a cyclic hardover to the left rear quadrant, causing the aircraft to begin a climbing left turn. The IP thought the student pilot was overcontrolling pitch attitude with cyclic inputs. But when the overcontrolling continued after he had verbally corrected the student, the IP got on the controls and immediately recognized the cyclic hardover condition. Both pilots felt stiffness in the controls as the cyclic continued to surge to the left rear quadrant. While the IP fought to control the aircraft, he told the student to

switch the hydraulic control to the off position. When the student delayed, Mr. Marchant turned the switch off himself. This action resulted in continued numerous cyclic hardovers in and out of the left quadrant. Using both hands on the

These guys did it right

cyclic, Mr. Marchant managed to level the aircraft. He declared an emergency and established a traffic pattern, using shallow turns and a shallow approach angle. The hardovers continued until the UH-1 was on short final for a run-on landing. Then, contrary to all technical experience, the hardovers traversed to the right forward quadrant. This caused the aircraft to begin a nose-low right turn, presenting Mr. Marchant with a life-threatening situation. As he continued fighting to control the aircraft, the cyclic again transited to the left rear quadrant. Mr.



Marchant's skill and experience enabled him to counter the erratic control movements and land the aircraft safely. While coping with the emergency, Mr. Marchant kept up a running account of what was happening to the aircraft and what he was doing, providing a rare training opportunity for the student pilots. Mr. Marchant made a successful landing and brought the aircraft to a stop, undamaged. The emergency resulted from malfunction of the irreversible valves. (In addition to being a contractor instructor pilot, Mr. Marchant is a test pilot with B Company, 144th AHB, Georgia Army National Guard, Winder, GA.)

• **CW3 Zan D. Aslett and SP4 Artur A. Piotrowski, A Company, 7th Battalion, 101st Aviation Regiment, 101st Airborne Division, Fort Campbell.** CW3 Aslett was PIC and SP4 Piotrowski the crew chief of a CH-47D aircraft returning to its home base from an emergency deployment exercise. The aircraft, which was trail in a flight of two, was configured with two 600-gallon internal ferry fuel tanks and was carrying components of a forward area refueling system and maintenance equipment. The aircraft had refueled and was flying at 2,000 feet agl over mountainous terrain. Its gross weight was approximately 46,000 pounds. The flight engineer had begun transferring fuel from the internal ferry fuel system when SP4 Piotrowski, who was in the rear of the aircraft, announced there was a fire in the aft transmission/ combining transmission area. As the cabin and cockpit began filling with smoke and fumes, the copilot turned over the controls to CW3 Aslett. He began an emergency descent, and started procedures to clear the cockpit of smoke and eliminate fumes. SP4 Piotrowski had immediately begun trying to contain the fire using a hand-held extinguisher, and the flight engineer in the forward area turned off the internal fuel pumps. The fire was extinguished, but smoke could still be seen coming from the combining transmission area. His visibility still obscured by smoke, CW3 Aslett placed the aircraft in a 20-degree bank and made a 180-degree turn, searching for a place to land. Locating the only available clear area in the mountainous terrain, he began a final descent. The aircraft was 500 feet agl when the transmission chip detector light came on. The unit had experienced several failures of the combining transmission oil cooler fan, and the PIC correctly assumed that the oil cooler fan had failed and the combining transmission was in imminent danger of failure. He immediately prepared to land in a 125-foot by 80-foot clearing bounded by high-tension power lines on the left and front and by trees on the other two sides. The aircraft touched down undamaged. The copilot completed emergency shutdown, and the PIC told the crew to get out while he remained at the controls until rotor rpm had decayed so that he could leave the aircraft. Inspection revealed the two combining transmission debris screen latches on the maintenance panel had tripped, indicating ferrous particles in the combining transmission. The oil cooler fan shaft had sheared and pieces of the fan were found under the No. 7 drive shaft. The crew chief's quick action in reporting and extinguishing the fire probably prevented explosion of the ferry fuel tanks. The total time elapsed from the time the fire was spotted until the aircraft landed was 2 minutes. If there had been any delay by the PIC in locating a landing area and getting the aircraft on the ground, there could have been a catastrophic failure of the combining transmission or drive shaft. This could have resulted in loss of the aircraft and its crew.

• **CW4 Richard E. Dappen and CW4 Franklyn Andringa, Jr., 25th Aviation Company, 223d Aviation Battalion, APO New York 09061.** The U-21 was on final approach after completing a service mission. It was well after official sunset and approaching total darkness. CW4 Dappen, the IP, was on the controls. In addition to the two pilots, there was a crew chief and another NCO on board. The air traffic controller had just cleared the aircraft for approach when the No. 2 engine boost pump fail light, the fuel crossfeed light, and the master caution light came on. When the aircraft reached cruise level after takeoff, fuel on board was 2,340 pounds. Time at cruise was computed at 5+05 hours. When the warning lights came on, the aircraft was 3.9 hours into the flight. The pilots saw that all other fuel indicators were reading normally and concluded that the boost pump had failed. CW4 Dappen continued the approach, and the aircraft was just inside the outer marker when the No. 1 engine boost pump fail light came on, followed immediately by loss of power to No. 2 engine, and an accompanying yaw. The IP completed emergency procedures for a single-engine landing, and the pilots completed the before-landing check. Airspeed was 120 knots, and the aircraft was on course and slightly above the glide path. At this point, the No. 1 engine lost power and started to run intermittently. Although it is not called for in the emergency checklist, CW4 Andringa, the copilot, turned on the auto ignition, an action that may have ultimately saved the aircraft from a forced landing short of the runway. The crew then prepared for a dual-engine failure. Without engine power, it would be impossible to reach the runway and ground impact was imminent. At about 500 feet agl, CW4 Dappen put the aircraft into a glide with both power levers at flight idle, props feathered, and flaps lowered to the approach setting. The aircraft was still about 3 miles out, and the passengers were told to prepare for a gear-up landing. CW4 Dappen selected a field just short of the runway and maneuvered the aircraft to avoid the approach lights in its path. As he reached for the handle to retract the gear and made a final check of the engine instruments, he saw the engines were developing what looked like normal power at flight idle. With only a few feet remaining between the aircraft and the ground, and only seconds to react, CW4 Dappen decided to make one last attempt to reach the runway. He unfeathered the props, moved the power levers to normal full-power position, and left the gear extended. The engines continued to surge intermittently, attempting to develop power. The aircraft was yawing violently from side to side as the auto ignition tried to reignite the engines and first one and then the other caught, surged, and died. CW4 Dappen managed to maintain airspeed at about

100 knots as he maneuvered the aircraft around obstructing approach lights and made a safe landing on the runway. As the aircraft rolled to the exit taxiway, both engines quit. Exceptional teamwork by both crewmembers saved the aircraft from the damage that would have resulted from a gear-up landing short of the runway. Maintenance inspection revealed neither fuel system transfer pump was operative.

• **CW3 Benjamin A. VanEtten, B Company, 8th Battalion, 158th Aviation Regiment, APO New York 09165.** CW3 VanEtten had just completed a maintenance flight in an OH-58C and was returning to the airfield. The aircraft was at 1,000 feet agl, 90 KIAS, over rolling farmland and forest when it suddenly yawed to the left, and N2 rpm dropped to below 80 percent as the rpm warning light came on. CW3 VanEtten lowered ►

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These guys did it right

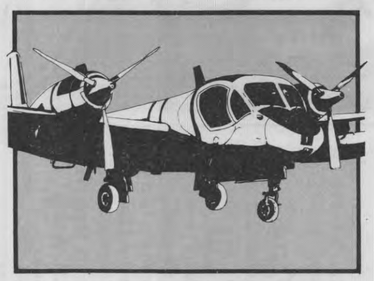
collective, the needles split, and he began an autorotational descent. He attempted to increase N2 rpm with the increase/decrease switch, but there was only momentary response from the aircraft. He closed the throttle and turned to the right, heading for an open field. The field was surrounded by trees on three sides and a small populated area on its southern edge. Two sets of power lines, the tallest at 100 feet, cut diagonally across the field. After crossing over the power lines at 400 feet, CW3 VanEtten had to execute an S-turn to avoid the populated area and make his intended touchdown point. During final rollout, he noticed the chosen touchdown area had an 8-degree slope with a 4-foot grass-covered trench at the bottom, parallel to his approach. At about 35 feet agl, he initiated a deceleration flare and slipped the aircraft to the left, crossing over the ditch to a flat portion of a dirt road, bordered on the left by small trees and shrubs. He completed touchdown with zero forward or lateral airspeed and no damage to the aircraft or injury to the three occupants. The emergency was caused by failure of the double check valve and accumulators.

• **CW3 James W. Oates, 11th Armored Cavalry Regiment, APO New York 09146-0803.** CW3 Oates was flying single-pilot in an OH-58C on a training support mission. The ceiling was 500 feet, with two kilometers visibility and isolated snow showers. After taking off for a field site, CW3 Oates had to alter his course to avoid a snow shower. As the aircraft approached a heavily wooded ridgeline, he noted rapid torque fluctuations accompanied by repeated yaws in the aircraft. After reducing power, decelerating slightly to maintain altitude, and ensuring the throttle was full open, CW3 Oates crosschecked his instruments and prepared to make a precautionary landing. With power reduced, the torque and yaw fluctuations ceased momentarily, and CW3 Oates proceeded toward the nearest suitable landing area about 1,500 meters away. A few seconds later, with the aircraft at 200 feet agl and 60 knots, the surges began again, followed by complete engine failure. CW3 Oates entered autorotation toward the nearest open field and declared an emergency. His autorotational glidepath did not extend to the landing area, and he was forced to use collective and airspeed to clear a line of 50-foot trees and a creek. After clearing the obstacles in his path, he used remaining airspeed, in deceleration with collective down, to recover enough rotor rpm for landing.

The aircraft touched down in loose snow and slid to a stop. A breakdown in the auxiliary fuel tank had clogged the main fuel filter and caused the engine to fail because of fuel starvation.

• **CW2 Robert C. Witter, 160th Special Operations Aviation Group (Airborne), Fort Campbell.** CW2 Witter was piloting an AH-6 during unit aerial gunnery training. While making an NVG terrain flight takeoff from the range arming pads, he heard a sudden loud, shuddering noise from the aircraft. The AH-6 began a severe vibration and yawed left and right 20 to 30 degrees. Moments before takeoff, the aircraft had been rearmed with seven 2.75-inch rockets and 1,500 rounds of ammunition. It also had a full 62-gallon crashworthy auxiliary fuel tank on board. The aircraft's flight path took it over a small, dry creek bed before it banked out over the southern end of the range impact area. CW2 Witter placed the aircraft into autorotation and maneuvered toward a small clearing surrounded by low shrub brush. When CW2 Witter applied collective pitch to cushion the aircraft, the AH-6 yawed farther right. He applied full left pedal in an attempt to maintain heading control, but there was no response from the aircraft. The AH-6 touched down, bounced up about 1 foot, and continued to yaw right. When it touched down the second time, the aircraft had yawed 30 to 40 degrees right of its original flight path. The left skid settled into a small hole in the rough ground of the impact area, and the aircraft tipped over onto its left side. The aircraft's tail rotor had separated, with partial loss of its components. As a result, CW2 Witter was unable to control the aircraft's yawing during autorotation. From his position in the left seat, he was unable to roll the aircraft's throttle past the mechanical flight idle stop on the right collective to the off position, which contributed to the increased yaw when cushioning pitch was applied. CW2 Witter's skill and judgment allowed him to complete an NVG autorotation with an aircraft at near maximum gross weight without injury to the crew. The nonstandard airframe was also salvageable.

• **CW4 Michael C. Buie, A Company, 15th MI Battalion (AE), Fort Hood.** CW4 Buie was pilot of an OV-1D engaged in an IFR training flight. The aircraft was in cruise flight at 17,000 feet when CW4 Buie noticed rpm on the No. 2 propeller had climbed above 2,000. He reduced power on the No. 2 engine in an attempt to regain control of propeller rpm. This action failed to correct the overspeed, and he secured the engine and tried to feather the propeller. When he could not manually feather the propeller, CW4 Buie declared an emergency and requested immediate vectors to the nearest airport. The difficulty of controlling an OV-1 with an inoperative engine was intensified by the unfeathered propeller, which was creating an enormous amount of drag. This situation meant that CW4 Buie was likely to have substantial problems in controlling the aircraft if his speed dropped below 120 knots. To add to his problems, it was dark and a large portion of the time he was flying under instrument meteorological conditions (IMC). After receiving vectors to a municipal airport, CW4 Buie determined that at high power settings, the effects of yaw and torque resulted in a near roll condition, requiring maximum lateral control inputs. He was able to maintain some degree of aircraft control by reducing power on the operating engine and placing the aircraft in a descent. As the aircraft descended through the overcast and he initiated an approach, CW4 Buie realized he could not see the runway because the windshield had fogged over. When the aircraft was about 1,300 feet agl, he began a single-engine go-around, an extremely difficult procedure in an OV-1. The still windmilling propeller and the resulting effects of torque and drag added to his problems. When he applied maximum allowable power, control again became marginal. If he had not made his decision early to go around, the aircraft likely would have been lost at this point. Even with power on the No. 1 engine at the maximum controllable rate and airspeed at best single engine rate of climb, he was unable to regain altitude, and the aircraft continued to descend for another 6 miles. Several times, he had to apply full lateral control to the operating engine just to maintain a 5-degree angle of bank. At some point, the aircraft again entered overcast and CW4 Buie once again was operating under IMC. ATC radar contact was lost due to the aircraft's low altitude. During the go-around, CW4 Buie recognized the potential hazard to personnel on the ground, and he repeatedly asked for vectors away from populated areas and known obstacles. Realizing that ejection was imminent, CW4 Buie jettisoned both external fuel tanks in a last-ditch effort to reduce aircraft weight enough to allow him to climb back to a safe altitude. By this time, he was over a sparsely populated marshy area where the jettisoned tanks posed no danger to anyone or anything on the ground. The reduced weight allowed him to establish a marginal rate of climb of about 300 fpm. At 1,300 feet agl, CW4



Buie was able to turn back toward the airfield, reestablish contact with ATC, and complete an uneventful approach and landing. The emergency was caused when internal failure caused overspeed of the propeller on the No. 2 engine.

• **1LT(P) Steven A. Boylan, D Company, 1-4th Aviation Regiment, 4th Infantry Division (Mechanized), Fort Carson.** 1LT Boylan was PIC of a UH-1H providing aerial gunnery training support. The aircraft had departed the range and was about a third of the way to the airfield. During a normal climb at 70 KIAS, LT Boylan felt the tail rotor pedals begin to motor fore and aft about one-half to 1 inch. He asked the copilot to verify what he was experiencing on his pedals. The copilot verified that his pedals were doing the same thing. About 5 seconds later, the cyclic made a drastic right forward movement. LT Boylan verified that the copilot had not caused the input and called for hydraulics to be turned off. He was unable to return the cyclic to its proper position until the copilot had turned off the hydraulics. The UH-1 went into a 75- to 80-degree right-nose-low bank at about 150 feet agl. When the copilot turned off the hydraulics, LT Boylan was able to pull the cyclic back and to the left and level the UH-1. When the copilot turned the hydraulic switch back to the on position, the UH-1 again began a right forward bank. This time the hydraulics were turned off for the duration of the flight. LT Boylan called the airfield and declared an emergency. He then proceeded in a wide, slow turn to enter downwind and line the aircraft up on the active runway. The copilot had to back the PIC up on the controls because of stiffness in the pedals, collective, and cyclic. The crew experienced lateral bounce in the cyclic all the way to the airfield after the hydraulics were turned off. Airspeed was held at 70 knots in order to maintain control of the aircraft. During final, the pilots instructed the two passengers to assume the crash position and made a run-on landing at about 30 knots. With the copilot's assistance on the pedals and collective, LT Boylan was able to keep the aircraft straight and reduce power. The UH-1 landed and slid about 120 meters before stopping with no damage to the aircraft or injuries to the people on board. The emergency was caused by failure of the hydraulic safety valve. □

U.S. ARMY SAFETY CENTER

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Marvin E. Mitchiner, Jr.
Colonel (P), Aviation
Commander, Army Safety Center

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class D

H series - During approach, crew chief noticed vertical fin cowling was unsecured. Crew had failed to verify cowling was secure, and rivets were pulled loose as cowling flapped in the wind.

UH-1 Class E

V series - Aircraft was about 300 feet agl, at approximately 20 knots, during descent into a canyon at night for a hoist rescue. When aircraft began settling with power, crew turned searchlight on and saw trees. PIC applied 60 psi torque, and aircraft began climbing. PIC became disoriented and passed controls to the copilot who terminated rescue operation and returned to airfield.

UH-60 Class A

A series - Aircraft was chalk 2 in flight of four. Pilot lost visual reference with the ground during approach to sandy LZ. During attempt to hover aircraft to the right, aircraft contacted ground and rolled onto its right side. 8901

UH-60 Class C

A series - While aircraft was at a 10-foot hover, crew chief opened left cargo door to clear aircraft's tail during pedal turn. The crew heard a loud noise. Crew chief's flight jacket had blown out and was pulled into No. 1 engine inlet. Aircraft landed, but when no apparent damage was found, engine was restarted. There was a loud whine, and turbine gas temperature on No. 1 engine showed higher than on No. 2 engine. Next day, maintenance officer discovered FOD to engine.

UH-60 Class D

A series - Aircraft was at a stabilized hover during a slingload mission to an unimproved LZ. Crew was using AN/AVS-6 NVGs. After placing an A-11 bag on the ground, the copilot, who was flying from the right seat, moved the aircraft to the left to allow an M102 to be set down. After the M102 was on the ground, the copilot continued to descend and move to the left to allow jettison of the clevis. The PIC attempted to jettison the sling, but it failed to jettison. The crew chief reported the aircraft was drifting too far to the left, and the copilot lost visual reference in dust generated by the aircraft's rotors. The PIC took the controls, successfully jettisoned the load, and made an instrument takeoff. Damage occurred when the aircraft drifted and the M102 was dragged and overturned.

UH-60 Class E

A series - Aircraft was about halfway to destination when crew was notified field was closed for VIP restriction. While attempting to reach another destination to refuel, aircraft encountered unforecast headwinds of 35 knots. When low fuel light came on, aircraft made precautionary landing.

Attack helicopters

AH-1 Class A

E series - Flight of three aircraft were in contour flight during return to airfield following JAAT mission. Chalk 3 made an approximate 30-degree turn to the left at an angle of bank exceeding 30 degrees. After leveling the aircraft, the pilot was unable to avoid a large tree in his flight path. The aircraft settled into a wooded area, coming to rest upright. 8902

AH-1 Class C

F series - Crew was conducting lookdown field-of-view testing. Gunner's left and right canopy had 20-degree lookdown limit plates installed. While on final segment of NOE route along railroad track, both pilots were scanning around aircraft. Experimental test pilot, who was at the gunner's station, was looking to the right to clear large trees. When he looked back to the left, he saw the main rotor blade strike the top of a tree. There were no vibrations, abnormal noise, or torque fluctuations, and aircraft completed flight to landing area. During shutdown, damage to underside of both blades was discovered.

AH-64 Class D

A series - Damage to two tail rotor blades was found during preflight. On previous day, crew had completed preflight in the afternoon in preparation for a night tactical training mission. After cleaning canopy, crew chief replaced covers on canopy, pilot night vision sensor (PNVS), and IR jammer to reduce glint signature for tactical considerations. Before night takeoff, crew made a flashlight walkaround and removed covers from canopy and PNVS, but the IR jammer cover was not removed. About 5 minutes after takeoff, the IR jammer cover came off and went through the tail rotor, causing damage to two tail rotor blades. Crew noticed a small bump during flight, but attributed it to wing store pylon articulation. Crew was in a hurry to complete postflight and get to the post-mission debrief, and they failed to discover the damage. Failure to remove TR jammer cover was caused by crew not following checklist procedures.

Cargo helicopters

CH-47 Class D

D series - During internal loading of M880 vehicle, vehicle operator failed to follow crewmember's directions. Vehicle's right front bumper struck side of aircraft and also tore one of the seats from its hinges.

Observation helicopters

OH-58 Class A

D series - During NVG landing on deck of ship, aircraft's main rotor blades meshed with another aircraft that was chained to deck of ship with engine running and blades turning while crew completed shutdown. Both aircraft were extensively damaged, and enlisted crewmember was injured by flying debris. 8903

OH-58 Class D

C series - During postflight inspection, crew found damage to rotor blade tip. Crew had allowed blade to contact a tree during NOE operations.

OH-58 Class E

A series - During aircraft start, PIC and pilot failed to notice main rotor was tied down. PIC attempted to start engine, and at 15 percent N1 he realized rotor was still tied down. Caused by failure to follow checklist.

Fixed wing

U-21 Class D

A series - After completing a precision approach power landing, PIC attempted to shorten ground run to turn on first taxiway. When he applied excessive brakes and reverse thrust, right main landing gear locked up and tire blew out.

Maintenance

AH-1 Class E

S series - During hover at 50 feet, transmission oil temperature began rising and caution light came on. Transmission oil temperature reached 115° C during landing, and transmission oil pressure dropped to 37 psi. Braided transmission oil line was improperly installed, allowing it to contact rotating tail rotor drive shaft clamp, and causing line to rupture.

FY 89 Class A Accidents through 16 November

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	1	0	0
	December	1		0	
2nd Qtr	January	2		0	
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	6	38	3

Crashfax Videos recreate real accidents

Attention commanders and ASOs! Need something new for your unit safety meetings? Something to stimulate discussion? Have we got a tool for you!

Videos. "Crashfax Videos." Two available now at your local audiovisual library and more in the works.

Crashfax Videos are not typical "safety films." They're short. To the point. They don't just tell what happened, they show what happened. And seeing is believing.

Crashfax Videos re-create real accidents. Recent accidents. Accidents that killed and destroyed. Accidents that resulted from human errors, errors that could kill again if not avoided.

The visual accounts of Army aviation accidents in Crashfax Videos complement the written accounts in *Flightfax*. They show the circumstances that led up to the errors that caused the accident. They open the door to self-examination, not only by individual aviators but by the unit as a whole. They prompt folks—commanders, ASOs, and aviators alike—to ask, "Could that happen in my unit? Do those conditions exist here? Could that be me?"

Following are synopses of the two Crashfax Videos that are available now. Availability of future videos will be announced in *Flightfax*.

• **"UH-60 Midair"** (CFV 46-1, PIN 707996). This video re-creates the midair collision of two Black Hawks during a night vision goggle training mission. All seven crewmembers and ten soldiers on board the 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). This video re-creates the events leading up to the crash of an OH-58 into a lake. The warning signs were there that the pilot was a high-risk aviator, but he was allowed to continue to fly until the inevitable happened. He was killed in the crash.

NVG videos available

Two videotapes on night vision goggle operations are now at local audiovisual libraries.

• **"Flying Goggles: A Special Report"** (TVT 46-15, PIN 707999). Targeted at operational pilots, this video 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). Targeted at aviation unit commanders, this video focuses on the development of a night operations SOP for a typical UH-60 unit.

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 5 30 November 1988

FY 88 sets record for Army aviation safety

The U.S. Army has just completed the safest year in Army aviation history. The fiscal year 1988 record-setting rate of 1.84 Class A accidents per 100,000 flying hours is the lowest rate recorded since Armywide aircraft accident data collection began in 1958. That year the Army's major—now called Class A—accident rate was 54.3 accidents per 100,000 flying hours.

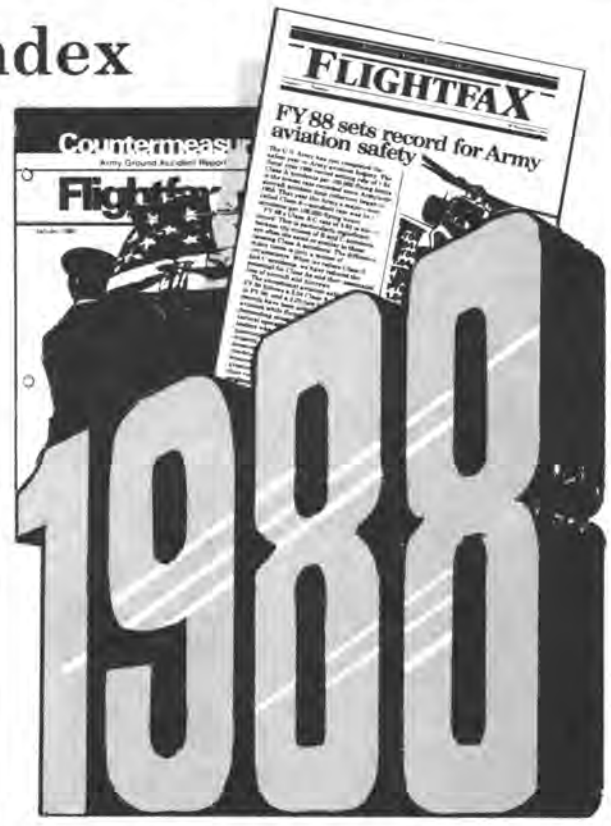
FY 88's Class A-C rate of 4.82 is also a record. This is particularly significant because the causes of B and C accidents are often the same or similar to those causing Class A accidents. The difference many times is only a matter of circumstance. When we reduce Class B and C accidents, we have reduced the potential for Class As and their associated loss of aircraft and aircrews.

The exceptional aviation safety record of FY 88 follows a 2.04 Class A accident rate in FY 86, and a 2.22 rate in FY 87. These records have been achieved by Army aviators while flying increasingly more demanding missions and high-risk night tactical operations. Credit must go to leaders who managed the increased risks associated with these more demanding missions, to aviation crews who flew the missions under extremely tough conditions, to support personnel who ensured the aircraft were safe to fly, and to aviation safety officers who supported their commanders with strong safety programs.

Today's Army safety strategy is built on the premise that training to standard is the key to preventing accidents. Here again, responsibility and credit go to commanders who establish clear, achievable standards, to trainers who ensure the standards are known and ways to achieve them are taught to disciplined soldiers, to leaders who make sure the standards are enforced, and to the individuals in the cockpits, in the flight platoons, and in the maintenance hangars who follow the standards themselves and care enough for their fellow soldiers to ensure that they do the same.

People prevent accidents. □

CY 88 Flightfax index



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Followups (of mishaps previously published)—20 Jan, 24 Feb, 4 May, 13 Jul, 27 Jul, 7 Sep, 21 Sep, 5 Oct
Formation lead change procedure—20 Apr
Fort Rucker unit sets new safety record—13 Jul
FY 88 Class A accident update (months ahead call for increased safety effort)—1 Jun
FY 88 sets record for Army aviation safety—30 Nov
Having trouble getting Flightfax?—10 Feb
Implementing safety programs in J series TOE units (STACOM)—24 Feb
Lessons learned from NVG accidents—20 Apr
Little things do make a difference—29 Jun
Logging time flown by DACs in Army aircraft (STACOM)—10 Aug
Low-pressure, high-altitude qualification training (STACOM)—10 Aug
Maintenance and use of night vision devices—5 Oct
McClellan Award (CW4 Gary D. Braman)—15 Jun
Medical Service Corps advisor (STACOM)—29 Jun
Monitoring of flight controls on UH-60 aircraft (STACOM)—30 Nov
Multiple factors cause Black Hawk midair—20 Apr
New twist on man bites dog story—2 Nov
Night mission planning and briefings—20 Apr
Night vision goggles (STACOM)—27 Jan
NVD auxiliary lights—7 Sep
NVD maintenance and use—5 Oct
NVD sources of information—5 Oct
NVG (AN/PVS-5)—19 Oct
NVG lighting control panels causing problems in CH-47D—19 Oct
NVG messages (STACOM)—27 Jan
NVG modifications—20 Apr
NVG points of contact—20 Apr
NVG videos available—16 Nov
OH-58 hits slope during landing attempt (accident review)—4 May
Performance planning—1 Jun
Recording "imminent danger" flight time (STACOM)—10 Aug
Removal or deactivation of oxygen systems in U-21 aircraft (STACOM)—30 Nov
SafeLine disconnected—27 Jan
Safety awareness: a commander's perspective (COL Matthew M. McGuire)—10 Feb
Safety officer receives McClellan Award (CW2 Gary Braman)—15 Jun

Safety-of-flight messages

- C-12/RC-12/U-21/RU-21 inspection of flight control cable tensions—24 Feb
- CH-47 inspection of pivoting and swiveling servo cylinders—29 Jun
- CH-47D expanded coverage of one-time inspection of pivoting and swiveling servo cylinders—10 Aug
- OV-1/RV-1 life extension of MK-J5D ejection seat rocket motor—10 Aug
- OV-1/RV-1 inspection of recently overhauled deice generators—10 Aug
- T-42 inspection of aluminum elevator fittings—29 Jun
- UH-1H restrictions lifted on high performance hoists—27 Jan
- UH-1 series inspection for nonconforming parts—27 Jan
- UH-1/EH-1H/AH-1 series inspection and removal of governor with possible missing cotter pin—24 Feb
- UH-60 inspection of certain serial-numbered tail rotor blade assemblies—24 Feb
- U-8F/BE-65 series inspections of tracks and components—24 Aug
- U-21/RU-21/A-90/VC-6 series inspection and selective replacement of wingbolt hardware—24 Feb

Safety tips for NVG lithium battery users—13 Jul
Seven steps for wire strike prevention—13 Jul
Somebody knew (After most accidents, somebody can say, "I knew something like this was going to happen.")—special issue, Jan 88
Special combined issue (of *Flightfax* and *Countermeasure* as part of Leaders Crusade Against Human-Error Accidents)—Jan 88
Special thanks to a caring leader (LTG John W. Foss)—special issue, Jan 88
Spectacle lens study under way—4 May
SPH-4 helmet alert—19 Oct
STACOM—27 Jan, 24 Feb, 29 Jun, 10 Aug, 24 Aug, 21 Sep, 2 Nov, 30 Nov
STACOM index for CY 88—30 Nov
Standardized battery packs for NVGs—20 Apr
Standing operating procedures critical for night vision goggles training—20 Apr
Summer training and NVG flying—1 Jun
Surviving in the wire environment—2 Nov
The case for performing to standard—24 Feb
The high cost of leader failure—24 Feb
The importance of performance planning—1 Jun
The missing nail (attention to detail can prevent accidents)—2 Nov
The other guy (accidents caused by assuming "the other guy" did it)—30 Nov
Thermoplastic helmet liner: a reality at last—19 Oct
These guys did it right (Broken Wing award recipients)—16 Nov
These pilots do it by the book—15 Jun
Tips for ASOs from an ASO—15 Jun
"Tough caring" can make a difference (leaders and individual soldiers must care enough to police themselves and each other)—special issue, Jan 88
Training is Army theme for 1988—special issue, Jan 88
Training to standards is key to reducing human error—10 Feb
UH-1/AH-1 ground-handling wheels—24 Feb
UH-1 crashes during medevac mission (accident review)—24 Feb
UH-60 cockpit field of view and visibility restrictions—20 Apr
UH-60 performance planning (STACOM)—24 Aug
UH-60 update—24 Aug
USASC flight surgeon named aerospace medicine specialist of year (MAJ Jerry W. Hope)—4 May
Well done—10 Feb, 13 Jul
Who was that guy in the red cape?—15 Jun □

FLIGHTFAX

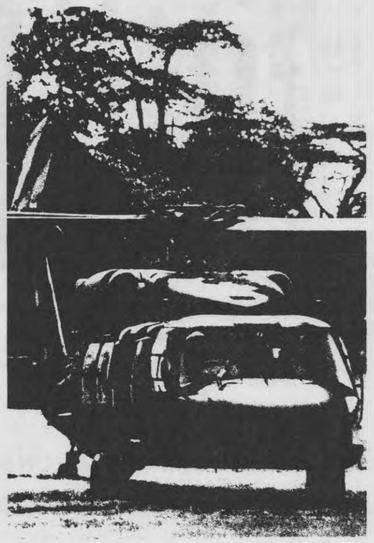
STACOM

Removal or deactivation of oxygen systems in U-21 aircraft

DES has recently observed that some aviation units have deactivated or totally removed oxygen systems in their U-21 aircraft. Authorization for removal or deactivation of the oxygen systems in U-21 aircraft must be obtained from the Director of Engineering at AVSCOM. There must be written approval for each aircraft, and this documentation must be maintained in accordance with AVSCOM directives. Without such approval, oxygen systems must be installed and operable in all U-21 aircraft. AVSCOM point of contact is Greg Karprelian, AUTOVON 693-2069.

Monitoring of flight controls on UH-60 aircraft

DES has been made aware that some UH-60 crews are not properly "monitoring" the flight controls. Reports received indicate that on two separate occasions neither the pilot nor the copilot had their hands on the controls for an extended period of time. In one case, the crew's attention was diverted for a long enough period of time to allow the aircraft to lose 500 feet of altitude. The potential for an accident or incident is greatly increased by this kind of attitude on the part of aircrews. The pilot in command is responsible for ensuring that one pilot is dedicated to and solely responsible for monitoring the flight controls, flight instruments, and aircraft attitude at all times.



Elimination of the IP/IE/SP/ME certification requirement in TC 1-210

Effective 29 September 1988, the certification requirement in TC 1-210, paragraphs 3-7e, f, g, and h was eliminated. Designation procedures outlined in AR 95-1, paragraphs 4-11, 4-12, 4-13, and 4-15 negate the need for a certification requirement. The last sentence in TC 1-210, paragraphs 3-7e, f, g, and h should be changed to read: "Before performing IP, IE, SP, or ME must be qualified and current in the aircraft and designated per AR 95-1."

CY 88 STACOM index

STACOM 126, 27 Jan - Night vision goggles. Changes to FC 1-219. Aircrew training manual information update. Consolidated list of NVG messages. Questions and answers: Army Aviation Annual Written Examination (AAAWE), NVG currency requirements, static cockpit/SFTS training. Day vision goggle operations.
STACOM 127, 24 Feb - Implementing safety programs in J series TOE units. Questions and answers: Effect of AR 95-1 on PC programs.
STACOM 128, 29 Jun - Flight data recorders. Medical Service Corps advisor in DES.
STACOM 129, 10 Aug - Recording "imminent danger" flight time. Low-pressure, high-altitude qualification training. Questions and answers: Logging time flown by DACs in Army aircraft.
STACOM 130, 24 Aug - UH-60 performance planning (includes performance planning card worksheet for UH-60).
STACOM 131, 21 Sep -Flight crew qualification and selection program.
STACOM 132, 2 Nov - Effects of electromagnetic interference (EMI) encounters on Army aircraft.
STACOM 133, 30 Nov - Removal or deactivation of oxygen systems in U-21 aircraft. Monitoring of flight controls on UH-60 aircraft. Elimination of the IP/IE/SP/ME certification requirement in TC 1-210. CY 88 STACOM index. □

STACOM 133 30 November 1988

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208. AUTOVON 558-3589 during duty hours, 558-6487 after duty hours. 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.

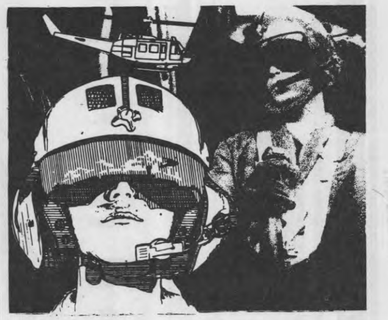
Michael H. Abbott
Colonel, Aviation
Director, DES

The other guy

Some accidents happen because someone thought "the other guy did it." In the following case, the pilot failed to ensure that the engine inlet cover on a UH-1 was removed before the engine was started because he thought it was the crew chief's job to remove all covers and tiedowns.

The pilot had been told the day before that he was to run up the aircraft the next day for a "stand to." While preflighting the aircraft the next morning, the pilot unsnapped the engine inlet cover on the left side, but he didn't remove the cover because he thought the crew chief would do it. The crew chief, who was busy removing the tiedowns from the tail rotor, didn't know the pilot expected him to remove the engine inlet cover—and he didn't do it.

When the pilot started the aircraft, he and the crew chief, who was standing fire guard, heard a low rumbling from the engine that sounded like the engine was starved for air. The pilot immediately shut the engine down. The crew chief saw that the inlet cover was still on, and he removed it. He asked the pilot if there were any unusual instrument indications and the pilot replied, "No." N1 was at about 40 percent



and exhaust gas temperature remained below 400° C. That led the crew chief to think there had been no damage, and he didn't check the engine inlet. Everything appeared to be normal when the aircraft was restarted.

The pilot and the crew chief told the acting platoon sergeant what had happened during the first start attempt. The crew chief and the acting platoon sergeant checked the aircraft and engine manuals to see what they were supposed to do when an engine had been started with the inlet blocked. They couldn't find anything about what kind of inspection was required, and they decided that the crew chief's limited inspection of the barrier filters and engine exhaust area was adequate.➤

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class D

H series - During postflight, aircrew noted that tail rotor drive shaft vertical fin cover was open. Crew chief failed to secure access cover during performance of PMD, and pilots failed to notice unsecured cover during preflight and walk-around check.

H series - About 10 minutes after departure, while climbing through 2,500 feet msl, PIC noticed engine oil temperature was above 150° C and told pilot to land. During descent, engine oil temperature fluctuated from 90° to 150° C. Thermostat flow control was not properly seating in the body of the bypass manifold, allowing some of the engine oil to bypass the engine oil cooler.

H series - Aircraft was 500 feet agl at 100 KIAS, when bird struck and damaged pilot's chin bubble.

H series - During takeoff from LZ in mountainous area, crew allowed main rotor blade to strike a tree.

H series - After terminating at a hover to a mountain landing site, crew chief directed pilot to a landing area. Left skid tube was bent when aircraft landed on sharp rock.

UH-1 Class E

H series - After takeoff, crew heard a high-pitched sound they thought might be due to rotor blade failure. While on approach to landing, PIC noticed pilot's door was open at top latch area. Door had not been properly secured or was out of adjustment.

UH-60 Class D

A series - Aircraft was landing in tall grass during simulated medevac mission when crew heard a loud bang. Aircraft's underside was damaged by tree stump concealed by grass.

A series - Aircraft was about 5 feet agl, near zero airspeed, during NVG approach to airstrip, when 75-foot strip of engineer tape blew up into rotor system. Both pilots reduced collective to land as airframe began moderate vibrations. During ground contact, main landing gear strut compressed, allowing turret-mounted FLIR to strike ground.

A series - While on a supply mission, aircraft landed in confined area. During touchdown, rotor tip caps hit nearby tree limbs.

A series - When aircraft attempted to pick up slingloaded M102 howitzer, one leg of the sling wrapped around gun sight mount. Crew chief informed pilot, and pilot placed aircraft in descent until sling could be freed. Load was not properly rigged.

UH-60 Class E

A series - PIC was unable to evade a bird in his flight path, and blade tip cap struck the bird.

A series - During unloading of cargo, large plastic bag blew out of aircraft and was drawn through rotor system.

A series - About 30 minutes after refueling, crew was notified fuel showed excessive water content.

Attack helicopters

AH-1 Class D

F series - Pilot aborted start when aircraft began vibrating and rocking. Postflight revealed some ice buildup near main rotor blade tips. After ice was removed, another start was attempted, but when rpm reached 75 percent, the aircraft again began vibrating and rocking. PIC attempted to shut down aircraft, but was momentarily unable to reach the idle release due to the violent rocking. Postflight revealed transmission dampers had been pulled loose and the main rotor PC link and main drive shaft were damaged. Left and right pylon fairings were also cracked. Caused by failure to anticipate and remove ice buildup on blades.

P series - Crew misjudged clearance and allowed tail rotor to hit a tree.

AH-1 Class E

E series - During NOE flight, gun would not stow. Crew chief held gun up while aircraft landed.

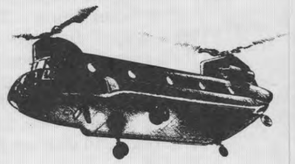
AH-64 Class D

A series - During inspection after pilot night vision sensor flight, crew chief noticed scratches on No. 4 main drive shaft. Drive shaft was scored when pin holding catwalk cowlings together came out.

A series - During shutdown, pilot depressed wing stores jettison button while attempting to reset automatic stabilator.

A series - Aircraft was at rapid refueling site. When pilot began procedures to start No. 2 engine, aircraft rolled forward, causing fuel handler to stumble and strike his helmet on aircraft missile rack. Aircrew failed to ensure aircraft's brakes were securely set.

A series - During postflight inspection, crew found No. 2 UHF antenna fin was broken. Suspect damage occurred during slope landing.



Cargo helicopters

CH-47 Class D

C series - Aircraft was en route to a field site with slingload. Crew felt severe vibration and began immediate descent. Approach was terminated at high hover due to rough terrain, slingload, and blowing snow. When blowing snow obscured pilot's vision, load was released at 5- to 10-feet agl.

C series - Aircraft was landing beside another CH-47 in a river bed. In blowing snow and darkness, crew chief, who was clearing aircraft, failed to detect a snow-covered tree stump. Underside of aircraft was damaged.

D series - After aircraft landed and ground taxied to parking area for refueling and parking overnight, a taxi director was sent out with lighted batons to position aircraft. As the aircraft taxied toward the taxi director, aircrew noticed a line of fixed wing aircraft parked on ramp. The CH-47 stopped, and the crew chief got out to check parked aircraft and explain that the helicopter should not be taxied any closer to the fixed wing aircraft. The taxi director wanted the CH-47 to taxi forward another 10 yards to clear taxiway. After examining the parked aircraft which were about 100 yards away and finding they appeared to be tied down, the crew chief reported the situation to the PIC. The PIC decided to relocate to an area farther away from the other aircraft. After obtaining tower clearance, the CH-47 made a 90-degree left turn, utilizing four-wheel taxi with minimum power. An ultralight aircraft parked among the fixed wings rocked forward onto its propeller. None of the other aircraft were affected.

CH-47 Class E

C series - During landing at LZ, all crewmembers lost visual ground reference due to brownout. When load contacted ground, PIC told the crew chief to release the load and began attempt to climb out of dust. When the crew chief hesitated, the slings jerked, causing the aircraft to rock back and strike the load.

C series - While hovering from parking, PIC heard a sound as if something had struck the rotor system and saw shredded white particles coming through the rotor disk. A piece of styrofoam had been picked up by the rotor system.

C series - Aircraft was at ground idle when the flight engineer reported a massive hydraulic leak in the aft transmission area, and numerous caution lights came on. Rupture in utility system hydraulic line resulted in total loss of hydraulic pressure.

D series - Pilot had just set the parking brake after completing mission when crew chief notified him the No. 1 engine transmission latch detector had activated. As pilot shut down No. 1 engine, another aircraft reported smoke coming from back of the CH-47. Pilot shut down No. 2 engine. Caused by failure of combining transmission oil cooler fan.

Observation helicopters

OH-6 Class E

A series - When aircraft was brought to hover, engine failed and aircraft yawed left. Engine-out audio and light came on as well as reignition light and audio. Pilot made a successful autorotation. Crew had no prior indication of impending failure. Aircraft had old torquemeter gear installed. Oil sample revealed high iron content.

OH-58 Class D

A series - When aircraft was picked up from parking pad and started to taxi, servicemember noticed ground cable to aircraft had not been disconnected. Cable was torn from aircraft as it taxied out.

OH-58 Class E

C series - Crew was conducting enlisted aeroscout observer training at 350 feet agl, 80 KIAS. The AO student was on the controls when the engine began to surge. As the IP took the controls, the engine failed. IP completed an uneventful autorotation.

C series - During power recovery from simulated engine failure at altitude, N2 drooped to 96 percent. Caused by failure of power turbine goveror.

C series - During engine runup, fuel chamber light came on, and a few seconds later the engine failed. Caused by fuel contamination.

Fixed wing

C-12 Class D

C series - While aircraft was being repositioned on ramp, pilot allowed right wing tip to contact a parked van.

C series - As brakes were released for takeoff with 100 percent power applied, rudder pedals oscillated severely. Takeoff was aborted. Cause was low fluid in shimmy damper.

U-21 Class E

H series - Engine failed during flight at 18,000 feel msl. Crew made uneventful landing. Engine-driven fuel pump drive shaft had sheared after approximately 200 hours of operation, causing fuel starvation.

Maintenance

CH-47 Class E

D series - On previous day, routine maintenance involved inspection of maintenance panel. Some wiring was changed around and was not properly soldered back together. During the next flight, wires shorted out, causing transmission oil pressure and transmission auxiliary oil pressure lights to come on.

OH-58 Class E

A series - Aircraft was operating NOE when PIC noticed engine oil temperature slowly begin to rise. Oil temperature went to 95° C and aircraft landed. Crew chief asked pilot to keep engine at operating rpm for MOC, and when pilot checked gauges again, engine oil temperature had reached 120° C. Aircraft was immediately shut down. Maintenance inspection revealed shredded shop towel was blocking oil cooler filter.

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Direct communication is authorized by AR 10-29.

Marvin E. Mitchiner, Jr.
Colonel (P), Aviation
Commander, Army Safety Center

The other guy

The crew chief reported the incident to the maintenance officer, but upon hearing that there were no unusual instrument indications, feedback in the controls, or limitations exceeded, the maintenance officer thought the aircraft was okay.

The pilot also informed the aviator who was scheduled to fly the UH-1 about what had happened during engine startup earlier that day.

The next day, the crew chief found nothing wrong when he went through his normal daily check of the aircraft. He still did not remove the barrier screens because they didn't appear dirty or damaged. Two days later, however, he removed the screens to clean out grass that had collected on them. While he was cleaning the inlet compartment, he found a dzus fastener and its receptacle and another broken fastener. One of the baffles was torn and the compressor section was damaged. Records showed that the aircraft had been flown a little more than 13 hours from the time the mishap occurred until the damage was found. But no one had noticed any problem with the aircraft during these flights.

There was some pressure on maintenance personnel in the unit because of the urgency of missions in the field. Crew chiefs had been told to use common sense when performing PMDs rather than sticking verbatim to the checklist procedures. This probably contributed to the fact that when the crew chief found the barrier screens were not blocked or damaged, he went no further, and the engine inlet compartment was not checked for FOD.

This mishap resulted from the pilot's failure to ensure that the engine inlet cover was removed prior to starting the aircraft. Normally, the crew chief removes all covers and tiedowns, but the responsibility for seeing that it has been done is the pilot's.

This is a classic case of each person thinking "the other guy did it." The misunderstanding about who was responsible led to a breakdown in communication that could easily have been corrected by closely following the checklist procedures. □

FY89 Class A Accidents through 30 November

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1		0	
2nd Qtr	January	2		0	
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	8	38	3

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Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 6 11 January 1989

A license to learn

"Flight school gets you technically proficient and shows you how to handle the aircraft; it's a license to learn." That's the way one young aviator with Task Force Falcon at the National Training Center (NTC) at Fort Irwin, CA, puts it. He understands that when an aviator reports to his first tactical unit, his learning is just beginning.

Even in tactical units, a lot of time is taken up by Aircrew Training Program requirements, completing minimums, checkrides, readiness level progression, preparing for APART (Annual Proficiency and Readiness Tests) and other types of required flying. That is one reason aviators welcome field training exercises and rotations to the NTC. According to one aviator, "This is where you get a chance to really be tactical. You're flying for real in this environment. Somebody can shoot you down (using MILES--multiple integrated laser system). You don't die, but it teaches you there's an enemy out there. That makes you be more tactically sound."

Another concern that is uppermost in young aviators' minds is safety, particularly in an environment like the NTC where the winds, the dust, and lack of contrast in the terrain make flying particularly hazardous, especially at night. The high level of safety consciousness among new aviators is attested to by their commanders.

A license to learn

The new guys

"It's not the new guys that have the accidents," says COL Dennis Kerr, commander of the aviation brigade in the 82d Airborne Division at Fort Bragg, NC. "The new guys are the ones who still sit on the edge of their seats and take notes. They take every mission very seriously because they are attentive to their own capabilities and the machine's capabilities. It's the guys that have been out of flight school for 7 years, 10 years, 15 years that have the accidents. That's because a certain amount of complacency creeps in when you've done something over and over."

Another commander who gives high marks to the aviators coming out of flight school is COL Robert E. Oakley, Jr. whose aviators at Hunter Army Airfield, GA, support the 24th Infantry Division (Mech). "The people coming out of flight school today are tremendously good. They are very competent and thorough and I think they have had a positive impact on safety."

Good crew integration key to safe operations

There is a great deal of emphasis in COL Oakley's brigade as well as in other tactical units on crew integration—pairing the inexperienced aviator with a more experienced aviator. And "experience" isn't measured by the number of flying hours an aviator has.

In an environment like the NTC, an aviator with hundreds of flying hours can still be inexperienced in flying in that particular environment. So you don't put him in the cockpit with someone who has been on only one rotation to the area. At the NTC, he should be paired with someone who has been there several times and can teach him about the hazards of this harsh desert environment. Commanders attribute much of their unit's safety success to the establishment of standards and the professionalism of aviators and support personnel who maintain these standards in everything they do. In an article, "The Wrong Guys Are Breaking Helicopters," *Aviation Digest*, August 1985, MG Ellis D. Parker, Commanding General, U.S. Army Aviation Center and Fort Rucker and Chief, Army Aviation Branch, said, "I know from experience that commanders cannot be present in every cockpit, and once the aircraft is off the ground, the pilot is on his own. But I also know that while each commander cannot be physically present in every cockpit on every flight, his presence can be felt in that cockpit. His presence would be the attitude and professional atmosphere that he has established through his own example and the requirements he has placed on his aircrews...."

When a "new guy" goes into a tactical unit where flying by the standards is the way everybody does it, that's how he's going to fly. In this kind of environment, his "license to learn" becomes a license to learn to fly safely. ■

UH-60 crew has close call

A UH-60 was the lead aircraft in a four-ship formation on a troop extraction mission. The aircraft was at 300 feet agl and flying at 120 knots when the crew chief reached over to change the intercom switches and accidentally discharged the fire extinguisher located near the copilot's seat.

The copilot, who was on the controls, yelled as the extinguishing agent hit his face and went into his eyes. The PIC turned his head to the left to see what was happening, and the extinguishing agent went into his left eye.

The copilot was temporarily blinded, and the PIC took the controls. Both pilots were having trouble breathing until the gunner's window was opened.

As the aircraft made a turn to the right, the PIC heard another member of the flight shout "wires." The PIC pulled the aircraft up just in time to miss the wires.

The crew of the chase aircraft directed the disabled crew to a landing and performed the shutdown while the stricken crew received medical attention. After a 24-hour grounding, the pilots were released by the flight surgeon. ■

Aerospace FOD conference scheduled

The Ninth Aerospace FOD Conference has been scheduled for 15-17 March 1989 in Cocoa Beach, FL. Sponsored by NASA, the conference is open to all military services as well as the aerospace industry and commercial airlines.

The 200 attendees at the fall conference in Fairborn, OH, included an increasing number of military personnel ranging from junior NCOs to general officers. BG Michael Butchko, C-17 Program Director, Aeronautical Systems Division, Wright-Patterson AFB, OH, summed up the reason for emphasis on FOD control. "What we want and demand are FO-free aircraft," he said. "Our aircrews deserve the best."

Vendors displayed a variety of FOD-prevention products at the conference ranging from tools that glow with bright colors to those with tethering devices and a state-of-the-art tool detection system that can quickly detect tools lodged in critical areas of aircraft where visual inspection is not possible.

Those interested in attending the spring FOD conference should contact either Bill Eldred, NASA, M/C-RQ-SAO, Kennedy Space Center, FL 32899 (commercial 407-867-3163) or Gayle McCormick, Textron Aerostructures, Department 421, P. O. Box 210, Nashville, TN, 37202 (commercial 615-361-2008). ■

FY89 Class A Accidents through 11 January

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	10	38	9

FLIGHTFAX

STACOM

Unauthorized foam pad being used in SPH-4 flight helmet

The circular foam head pad for the personnel armor system for ground troops (PASGT) infantry helmet is reportedly being used by some personnel in the SPH-4 flight helmet. The PASGT pads **are not** approved or authorized for use with the SPH-4 helmet. These pads, which range in diameter from 8 to 12 inches and in thickness from 1/4- to 1/2-inch, were not designed for crashworthiness, and there are no existing military specifications or parameters for their manufacture.

Many of these pads are procured privately from specialty shops and have varied thicknesses and densities. Further, there exists the possibility of reduced impact performance of the SPH-4 as well as the possibility of misadjustment of the sling suspension and degradation of helmet retention when these pads are used.

The thermoplastic liner (TPL), NSN 8415-01-281-5497 for size small-regular, -5498 size regular, and -5499 size extra-large, has been validated for crashworthiness and is currently type classified for issue and use with the SPH-4 helmet. The TPL eliminated "hot spot" difficulties during testing in the problem fit program of the U.S. Army Aeromedical Research Laboratory and by the U.S. Army Aviation Board.

Remember–head injury continues to be the number-one cause of death in Army aircraft accidents.

Low-pressure, high-altitude training

During recent visits to the field, Directorate of Evaluation and Standardization (DES) has found that confusion exists on the requirements for low-pressure, high-altitude training described in TC 1-210.

NATO Standardization Agreement (STANAG) 3114 directs that all fixed wing aviators receive altitude chamber exposure every 3 years regardless of the type of fixed wing aircraft they fly and the altitude at which they operate. FM 1-301 implements STANAG 3114 and TC 1-210 requires that aeromedical training be conducted per FC 1-301 (FM 1-301 has replaced FC 1-301). The word "routinely" does not appear in TC 1-210, but the word is in FM 1-301. According to the U.S. Army School of Aviation Medicine (USASAM), proponent for FM 1-301, the term "routinely" used in FM 1-301 was included in the manual prior to the rewrite of TC 1-210. The intent of the wording is to give local commanders of **helicopter** units some flexibility in determining when their crewmembers fly above 10,000 feet msl often enough to require refresher training. STANAG 3114 does not require an altitude chamber as part of refresher training for rotary wing crewmembers. The following low-pressure, high-altitude training requirements apply to all aviators operating Army aircraft.

- All Army fixed and rotary wing aviators must have completed initial low-pressure, high-altitude training, which includes exposure to reduced pressure in a hypobaric chamber. This is a requirement in STANAG 3114. This initial exposure may have occurred at any time during the aviator's military career.
- All aviators operating fixed wing aircraft require low-pressure, high-altitude refresher training every three years, even if the unit's mission does not require the aircraft to be routinely flown above 10,000 feet. Local commanders of **helicopter** units will determine when their crewmembers operate above 10,000 feet msl often enough to require refresher training.

The above requirement for low-pressure, high-altitude training does place a burden on some of our aviation units. If aeromedical training, including low-pressure, high-altitude chamber qualification, cannot be accomplished at Fort Rucker, Air Force or Navy physiological training units can be used. USASAM at Fort Rucker is responsible for planning, supervising, and conducting all formal aeromedical training for Army personnel to support Army aviation programs. The school can advise and assist commanders and flight surgeons with aeromedical training programs. Special refresher classes can be scheduled for units by contacting Operations Division, USASAM, AUTOVON 558-7460, commercial 205-255-7460, or by writing to the Dean, U.S. Army School of Aviation Medicine, ATTN: HSAA-AVN, Fort Rucker, AL 36362-5377.

Flight crew qualification and selection

Whoops! STACOM 131 in the 21 September 1988 **Flightfax**, pertaining to the flight crew qualification and selection program, contained an error.

The stated reference of AR 95-1, paragraph 4-5, was incorrect. AR 95-3, paragraph 4-18, is the regulation that requires a flight crew qualification and selection program. AR 95-1, paragraphs 4-5 and 4-6a(7), should have been cited as supporting references since those paragraphs establish how crew selections will be made and that they will be briefed by commander-designated briefing officers.

We hope this clears up any misunderstanding, and we apologize for the error. ■

STACOM 134 11 January 1989

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208. AUTOVON 558-3589 during duty hours, 558-6487 after duty hours. 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.

Michael H. Abbott
Colonel, Aviation
Director, DES

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class A

H series - Aircraft crashed and burned after striking high-tension power cables. The three crewmembers and five civilian passengers were killed. 8904

H series - Aircraft encountered whiteout during takeoff. While attempting to fly out of the snow cloud, the pilot lost visual reference and aircraft crashed. 8905

H series - Pilot terminated pinnacle touchdown with the forward 3 feet of the aircraft's skids on the top of an earthen dam. As the IP started to tell the pilot to move the aircraft forward, the pilot reduced power. The aircraft descended and slid backwards down the 32-degree slope to the base of the dam. 8906

UH-1 Class C

V series - Crew was transitioning from low level to NOE flight in a shallow valley with rising ground on the right side. Aircraft was about 20 feet agl and 50 KIAS when the main rotor blades struck a tree to the right front of the aircraft.

UH-1 Class D

H series - Aircraft was chalk 3 in flight of 5. During final approach, chalk 1 made a steep approach and slowed airspeed to near zero knots. Chalk 3 zeroed out airspeed and "fell through." Chalk 3 flew to the right and pulled 58 pounds of torque to arrest rate of descent and avoid hitting the ground.

H series - During low level flight at 100 feet agl, 70 KIAS, crew heard rumbling coming from engine. Crew felt aircraft vibrate and feedback in cyclic and turned toward open field for landing. Aircraft touched down on top of a low terrace and again became airborne. Student on controls bottomed collective, and aircraft impacted down slope in soft ground.

UH-60 Class C

A series - During landing in an LZ, aircraft's main rotor blades struck trees.

UH-60 Class D

A series - Pilot misjudged clearance during NOE flight and allowed rotor blade to strike a tree.

A series - During an NVG mission, aircraft was transporting a 6-member gun crew and an external load consisting of an M102 and an A22 bag on an extended sling. While transitioning from flight over water to flight over land, the crew descended from 500 feet msl to 275 feet agl. The crew chief, who was watching the load through the cargo hook access area, saw a bright flash, which shut down his NVGs for 2 to 3 seconds. When his goggles reactivated, he saw that the A22 bag was missing and informed the pilots. Investigation revealed the sling to the A22 bag had struck two 90-foot electrical power lines located on a 120-foot hill in the aircraft's flight path. The momentary slack in the sling allowed the chain to the A22 bag to slide under the keeper and the bag fell. The crew failed to detect the hill because of lack of contrast in the terrain and poor performance of their NVGs under zero-percent illumination conditions.

Attack helicopters

AH-1 Class E

E series - During postflight inspection, crew discovered signs of ground contact on tips of 20mm cannon. Suspect turret failed to stow.

S series - Aircraft was running when master arm switch was turned on. Hydraulic fluid could be seen leaking onto the ground, and five seconds later the master caution and No. 2 hydraulic segment lights came on. Caused by loose hydraulic fitting at forward bulkhead behind the turret assembly.

AH-64 Class A

A series - Aircraft's No. 1 engine was running and on line. When crew started the No. 2 engine, ground observers reported smoke coming from the engine control unit vent. The pilot saw he had a fire-warning light and pulled both fire handles, but the fire was not extinguished. After the crew evacuated the aircraft, it was totally consumed by the fire. 8907

AH-64 Class D

A series - During ground taxi, crew heard a muffled explosion and the APU failure and fire lights came on. Crew pulled APU fire handle and fire was extinguished.

A series - MTP started the No. 2 engine during MOC of the aircraft for leaking No. 2 nose gearbox. Blades engaged normally and power lever was left at ground idle until the oil bypass light went out. As pilot increased power lever about halfway to the fly position, the mechanic saw sparks in the accessory gearbox area and signaled the pilot to shut down the aircraft. Flames began rising around the main rotor swashplate and the mechanic told the pilot to get out. As the pilot completed the shutdown, firefighters extinguished the fire. The MTP stated that during shutdown he moved the rotor brake switch to brake and observed no caution light nor physical indication that the brake was effective. There was still no indication of braking when the switch was placed in the lock position. He placed the switch in the off position and waited until the rotor decelerated enough so that he could get out of the aircraft safely.

Cargo helicopters

CH-47 Class A

D series - The aircraft had taken off on the second leg of a service mission and was in cruise flight at 500 feet agl. Shortly after takeoff, witnesses saw smoke coming from rear of aircraft, then heard a loud bang and saw a fireball come from the same area. The aircraft descended in a nose-low, left-side-low attitude, hit the ground, and burned. All five people on board were killed. 8908

CH-47 Class D

C series - Aircraft was parked next to a taxi lane while a rig check was performed. When check was completed, tunnel covers were closed but not locked. Rotorwash from a hovering aircraft blew off the No. 5 drive shaft tunnel cover, breaking out left rear bubble window.

D series - Slingloaded M101 howitzer rigged with 40-foot slings was parked on sloping terrain. As the aircraft was maneuvered for takeoff, blowing snow obscured the load. The pilot allowed the aircraft to drift, causing the howitzer to tip over.

D series - About 5 minutes after takeoff, flight engineer reported emergency escape hatch had blown off the aircraft. Hatch had been removed to install machineguns for an FTX. Suspect hatch was not properly sealed when reinstalled.

CH-54 Class D

A series - Aircraft was about 100 feet agl. When pilot noticed the lighted inverted "Y" he was approaching was made up of people holding lights, he terminated the approach 50 feet short of the Y to ensure no one was injured. Aircraft pod was punctured by a white metal stake protruding from the snow-covered ground.

Observation helicopters

OH-58 Class C

A series - Rotor rpm was low during termination of standard autorotation, and aircraft was shuddering as it touched down in a level attitude. Damage to tailboom was found after shutdown.

OH-58 Class D

D series - During NOE stationary hover, crew felt slight bump in airframe. After landing, evidence was found that tail rotor had struck a tree branch.

OH-58 Class E

A series - During engine start, pilot inadvertently released starter switch as throttle was being opened, causing turbine outlet temperature to reach 980° C for 2 seconds.

C series - As aircraft taxied out of hot refueling, crew felt slight vibration. Aircraft landed and as throttle was rolled to idle, vibration grew worse. Caused by failure of tail rotor gear shaft bearing.

Fixed wing

OV-1 Class A

D series - Aircraft was on a maintenance test flight for an autopilot that would not engage while in flight. The MTP had completed several circles in the aircraft when witnesses saw the aircraft flying in an inverted position. The aircraft began a nose-low descent and the left wing dropped as the aircraft descended out of sight, struck the ground, and burned. The MTP was killed in the crash. 8909

OV-1 Class E

D series - During landing, pilot inadvertently pulled right power lever back into reverse. Aircraft yawed and wing dropped and contacted runway.

D series - During taxi on snow-covered runway, pilot used reverse to slow aircraft. The No. 1 engine did not reverse, and aircraft made uncontrolled right turn into a snow bank.

Maintenance

UH-1 Class D

H series - Aircraft had been preflighted and flown on a training flight. No deficiencies were noted during postflight, but while crew chief was performing PMD he found a hole in the tail rotor drive shaft cover. A screwdriver had been left in drive shaft channel.

CH-47 Class E

C series - Crew heard a loud bang and returned to field site. During postflight, a wrench was found under the tunnel cover. No. 6 drive shaft showed signs of scoring, and support for drive shaft mounts was cracked.

OV-1 Class E

D series - During takeoff roll at about 80 knots, pilot noted airspeed indicator read 400 KIAS. Suspect that lines to airspeed indicator were disconnected to gain access to the area during replacement of windshield wiper motor. When lines were reconnected, they were reversed, causing airspeed indicator to give erroneous readings.

Safety messages

. Safety-of-use message concerning one-time inspection of all Army-procured interim Ram air parachute systems (IRAPS), MT1-XX, NSN 1670-01-212-3335 (SOU-MES-23-88, 121525Z Dec 88).

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

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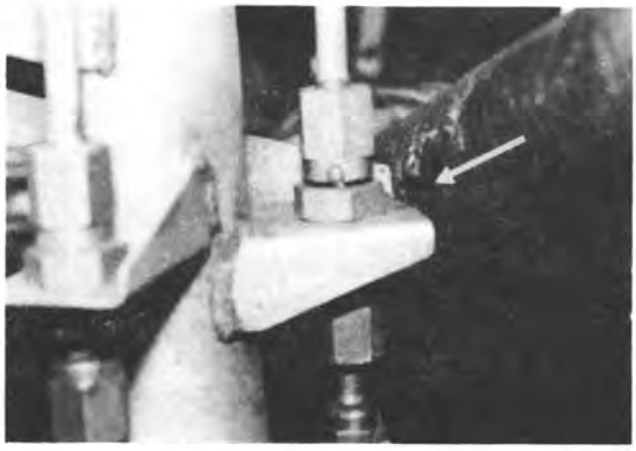
Marvi
Colon
Comm

Attention AH-64 personnel

Recently an AH-64 was destroyed by fire while still on the ground. The crew had started the No. 1 engine and was just starting the No. 2 engine when ground observers reported smoke coming from the turtle-back area. The fire warning light illuminated and the pilot pulled both fire handles, but the fire continued to burn, consuming the aircraft. The crew was able to get out safely.

A field inspection of other AH-64s revealed numerous instances of chafing fuel lines, cables, and wire bundles, particularly in the catwalk area of the aircraft. Some aircraft were received from the factory with this problem, while some were the result of maintenance practices. For example, these cables, hoses, and wires may be pushed aside while a component is being worked on. Extreme care must be taken during maintenance to ensure that fuel lines, electrical cables, and other hoses and wires are not repositioned to cause chafing.

AH-64 aircrews, maintenance personnel, and technical inspectors need to be aware of this problem. A safety-of-flight message will be issued with further details. ■



Crossover fuel line has chafed against a hydraulic line bracket.

Chafed electrical wires are located near No. 2 engine fuel line.

Transmission filler drain line showing results of chafing by hydraulic line.

Electrical wires chafing against airframe.

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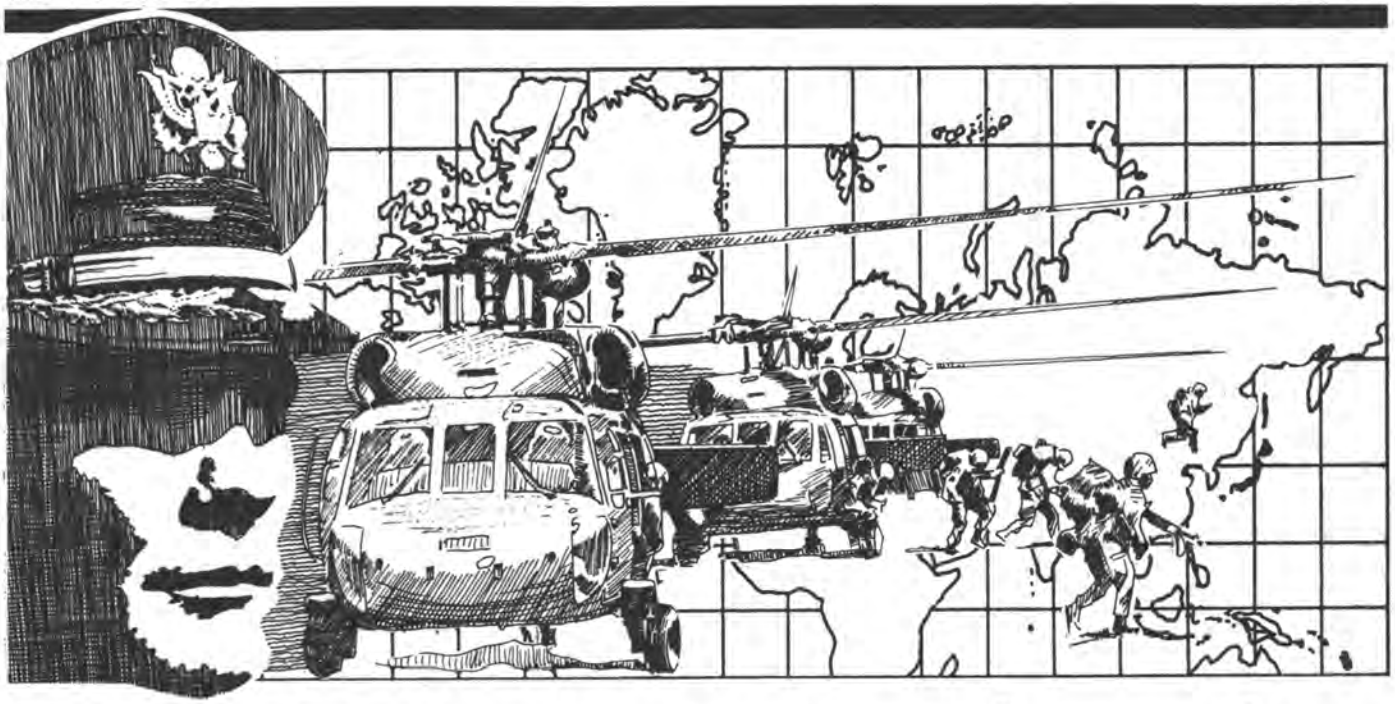
Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 7 25 January 1989



Safe deployment: a function of command and control

Comparatively few accidents are caused by environmental factors or materiel failures. Most accidents result from some kind of human shortcoming. COL Billy G. Murphy, whose aviators support the 1st Infantry Division (Mech) at Fort Riley, KS, believes there is a definite correlation between command and control and safe operations, particularly during overseas deployments.

According to COL Murphy, when you geographically stretch out a unit during deployment, command and control decreases, and there is a corresponding increase in the potential for accidents. For example, the brigade commander may be in another country with the advance party as the main body deploys. As people, aircraft, tools, and equipment begin moving by various means of transportation, they become spread over thousands of miles, and company commanders are spread thin. This situation may last for several days, and that is when command and control bottoms out. This is when accidents are most likely to happen.

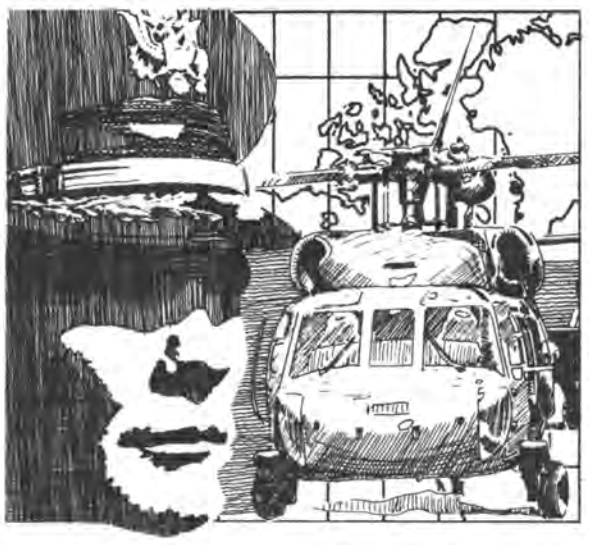
During the critical period when command and control is lowest, decisions have to be made about where key people need to be and when they need to be there. Areas of highest risk have to be predicted and that is where the strongest leaders should be. ►

Safe deployment: a function of command and control

The aviation unit commander may decide he needs to be where the aircraft are arriving, and that means he has to rely on his executive officer or first sergeant to be in a different location to draw all of his ground equipment out of POMCUS. That isn't a good command and control situation. In fact, the commander has little control of his unit. It isn't until the aircraft are reassembled, and the ground convoys reach the tactical assembly area that everything begins coming back together, and the level of command and control that existed before deployment is restored. But the unit isn't out of the woods yet.

There is a strong sense of urgency at this point to get into the thick of things. But aircraft have been on boats for approximately 3 weeks, and aircrews haven't flown for a long period of time. Caution has to be exercised so that the exhilaration of getting into battle does not overcome common sense. Care must be taken to ensure that maintenance crews don't start cutting corners and people do not exceed endurance limits. Risks have to be examined and reexamined and weighed against the training benefits to be gained.

"If we're in absolute control of our units, then the probability of mishaps is greatly decreased. But if it isn't clear who's in command, who's in control right now, mishaps will probably occur." COL Murphy inculcates this simple philosophy not only in the officers of his brigade but in the first sergeants as well. He encourages these leaders to evaluate situations and assess risks to determine where they need to be to provide command and control and prevent accidents.



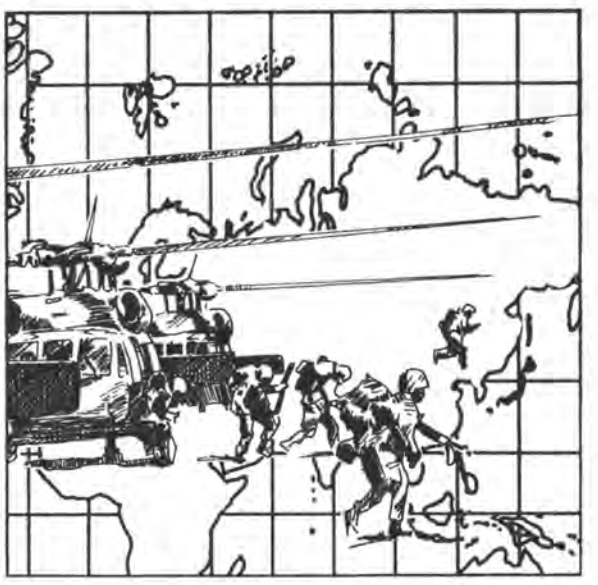
Tools to get the job done

One way to ensure that someone is in command–in control–is to use a mandatory mission briefing sheet for every mission flown. This process ensures that the chain of command is aware that a mission is going to be flown, that they're aware of the parameters–the conditions under which the mission will flown, and that it meets with everyone's approval. It ensures that someone is in charge and in control of each individual aircraft before it leaves the ground.

It takes time to complete this procedure for every mission, but it also precludes the possibility of an aircraft being on a mission that the company commander doesn't know about and has not authorized.

Units retain cohesion

Another facet of command and control is that when units deploy they begin to lose cohesion because of being split in different directions. By establishing a kind of ad hoc task force and making sure that someone is designated as the commander of a particular phase of the operation, everybody knows who is in control. They know who is charged with the responsibility, and they know who has the authority. You may have a task force that includes air cavalry, attack forces, and general support, but once everyone understands the concept of command and control, there is a much smaller probability of anyone saying "Well, that isn't the way it's done in my unit," because you have defined what the parameters are.



Plan the mission and fly the plan

"My philosophy about safety is simple," COL Murphy stated. "We decide what we're going to do. Once we know that, we plan every facet of the mission or tactical operation, and we execute in accordance with that plan. You plan it the way you're going to do it. You don't have a bright idea about what you're going to do after you take off. Then we critique or debrief after the mission's completed. This logic applies equally well to a single aircraft, a flight of several aircraft, or employment of a full helicopter battalion."

COL Murphy believes that the time spent on debriefing or critiquing the mission is well spent. It is particularly valuable when there are aviators with different experience levels in a unit. What might be a routine critique for a Master Army Aviator is a great learning experience for someone right out of flight school.

"This is when you determine if the plan was a good one, whether you executed in accordance with the plan, and how you can do it better the next time. I believe if units and individuals don't continue to get better, then predictably they will get worse. It's just not possible to reach a plateau and then sustain it," COL Murphy concluded. "Safety is a function of command; safe operations are a function of command and control." ■

Update on thermoplastic helmet liner

Ordering TPL kits

Some units have had problems ordering or installing thermoplastic liner (TPL) kits in SPH-4 flight helmets. Some TPL kits in the supply system are not compatible with the SPH-4 helmet. For example, TPL kit medium, NSN 8475-01-210-8507, and large, NSN 8475-01-210-8509, are designed for Air Force HGU-55P flight helmets. *Do not order or use these kits for Army SPH-4 flight helmets.*

Use the following NSNs to order kits that are compatible with the Army SPH-4 flight helmet.

- Small regular–NSN 8415-01-281-5497
- Regular–NSN 8415-01-281-5498
- Extra large–NSN 8415-01-281-5499

Request for assistance

The United States Army Aeromedical Research Laboratory (USAARL) needs followup information to complete the original research protocol on initial fielding of the TPL. Aviators and other crewmembers who are using SPH-4 flight helmets with a TPL installed *but have not filled out a TPL questionnaire since January 1987* are requested to send their name and current mailing address to:

Commander
U.S. Army Aeromedical Research Laboratory
ATTN: SGRD-UAD-IE (SSG Pritts)
P. O. Box 577
Fort Rucker, AL 36362-5292

The questionnaire that will be sent to you should be completed and returned to this same address. Information from the questionnaire will enable USAARL to determine any maintenance or other problems associated with the use of the TPL helmet liner.

–SSG Doug Pritts, AUTOVON 558-6882, commercial 205-255-6882. ■

Lip and finger lights approved for use during NVG operations

The need for supplementary light aids during night operations has led to a proliferation of devices in the field through local purchase or fabrication. Use of the following devices has been approved by the U.S. Army Aviation Systems Command. Although they may be used during all night flights, aided or unaided, these supplementary light aids are primarily intended for use during NVG flights.

These "off-the-shelf" items have been procured as an interim measure and have not undergone developmental testing. In the absence of such testing, no assurances can be made about the reliability of these devices. Use of supplementary light aids other than those described below must be in accordance with AMCPM-ALSE message, 061200Z Oct 87, subject: Night Vision Goggle Operations.

Item	Manufacturer	Item Type
Lip light	Night Devices, Inc. 208 Miller Drive Newton, AL 36352	Single switch
Finger light	Night Devices, Inc. (same as above)	Single switch
Night light II (finger light)	Elaine Burns Co. 601 Paddy Run Road Clarksville, TN 37042	NVG II
Lip light	Seitz Scientific Ind. 201 Hickory Bend Enterprise, AL 36330	ML II

NOTE: Lip lights will not mount on the Tempest mike boom, but they can be mounted on standard booms.

Procurement

Units do not need to requisition these lights. Distribution will be made automatically following the distribution plan in use for the Aviator's Night Vision Imaging System (ANVIS). Supply quantities will be limited to initial procurement.

Unit Aviation Life Support Equipment (ALSE) personnel will control distribution and maintain hand receipts.

Operations

Supplementary light aids will be operated in accordance with the manufacturer's instructions and a memorandum from AMSAV-ES, 6 January 1989. This memorandum will be distributed to aviation units by the Project Manager for Clothing and Individual Equipment (PM-CIE) either before or along with initial distribution of the supplementary lights. Use of these lights in the cockpit should be minimized due to the emission of near-infrared radiation (IR) in a frequency to which NVGs are sensitive. Supplementary light aids should be turned off when not in use. Use of these devices by aircrews is not mandatory, and unit commanders may restrict their use.

The use of supplementary light aids does not eliminate the requirement for having a flashlight in the cockpit during night flights per AR 95-1, table 5-2. The flashlight is intended as a backup light source for cockpit instruments and radios during unaided flight. If the use of white light becomes necessary during NVG flight, NVG flight should be discontinued. Natick Research and Development Center is currently testing NVG-compatible flashlight filters to be distributed to the field in the near future.

WARNING

Do not point supplementary light aids directly at or in the direction of the pilot controlling the aircraft during NVG flight. Degradation of NVG effectiveness may result.

Maintenance

The supplementary light aids will be maintained in accordance with the memorandum from AVSCOM. With the exception of battery replacement, no repair of supplementary light aids is authorized. If failure occurs which cannot be remedied by replacement of the battery, the light will be turned in to the unit's ALSE shop. Only battery types recommended by the manufacturer are authorized for use. Batteries may be locally purchased.

CAUTION

The watch-type batteries used in the Night Light II finger light have on occasion shorted out while in the package. Exercise care when storing and handling.

Training

Unit commanders and instructor pilots will identify their supplementary light-aid training requirements and include as a minimum–

Classroom instruction in:

- Operation and use of supplementary light aids.
- Cautions/warnings concerning supplementary light aids.
- Cockpit coordination involving use of supplementary light aids.

Cockpit instruction (on ground with NVG) to:

- Demonstrate degrading effects of supplementary light aids on NVGs.
- Reinforce classroom instruction.
- Verify knowledge on operation and use.

This instruction is required prior to initial NVG flight. Commanders are responsible for addressing use of supplemental light aids in unit SOPs on NVGs. A copy of the AVSCOM memorandum on supplemental light aids will be maintained in the unit reading file or in the aviator's information file for review by pilots prior to NVG flight.

Quality Deficiency Reports (QDRs) and Equipment Improvement Recommendations (EIRs), DA Pam 738-751, should be submitted to PM-CIE to assist in future procurement of light aids.

Points of contact

- Aviation Electronics Management Office: LTC R. Ratzlaff, AUTOVON 693-1391.
- Directorate for Engineering technical point of contact: CPT J. McVeigh, AUTOVON 693-1130.
- Aviation Life Support Equipment Product Manager: Mr. James Dittmer, AUTOVON 693-3573.
- Project Manager, Clothing and Individual Equipment: LTC Gidley, AUTOVON 356-2406. ■

The things that go right

In the safety business, we tend to focus on things that go wrong–things that cause accidents. But sometimes we need to look at the things that go right–the things that save lives–helmets, fire-retardant clothing, air frames designed to absorb crash forces, crashworthy fuel cells, or in the following case, a main rotor blade that was damaged during a tree strike but maintained flyable integrity.

The crew of an AH-1S was supporting an armor ARTEP. The aircraft was being maneuvered into a simulated firing position when the crew spotted "enemy" troops about 25 meters to their left. While hovering at treetop level, the pilot, who was flying the aircraft, engaged the ground troops with the turret weapons system. The crew then heard a "chattering" sound from the rear of the aircraft and felt the helicopter vibrate. The pilot increased collective and applied left pedal in an attempt to clear the trees. When the aircraft began slowly turning to the right, both crewmembers tried to compensate with left pedal. Realizing the pedal control input was having no effect, the PIC rolled the throttle to the flight idle position and tried to cushion contact with the ground. The aircraft touched down hard, slightly nose high. The tail boom fractured, and the 90-degree tail rotor gearbox separated.

Photo courtesy Cobra Project Manager's Office, Army Aviation Systems Command

Although damaged by repeated tree strikes, this Kaman K-47 main rotor blade did not separate from the AH-1S during the crash sequence.

Antitorque control had been lost when the tail rotor struck a tree. Collective was not reduced when the throttle was retarded to flight idle to compensate for the loss of antitorque control, and the aircraft lost rotor rpm. Rotor rpm was further degraded when the main rotor blades repeatedly hit a tree to the right front of the aircraft during descent, and the aircraft fell the last 15 feet.

Although the main rotor blades were damaged when they hit a 9-inch-diameter tree several times, there was no apparent damage to the rotor hub, shaft, and main transmission. The main rotor remained essentially intact and attached to the aircraft.

This accident demonstrates the resilience and impact-absorbing characteristics of the composite improved main rotor blade assembly on the AH-1S. Similar strikes to metal main rotor blades would have caused damage prohibiting further controllable flight. ■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class D

H series - While performing a simulated engine failure at a hover, pilot applied forward cyclic and placed the aircraft in a nose-low attitude. IP took the controls, returned aircraft to level attitude, and landed. Breakaway tip broke off lower wire cutter when it contacted the ground.

H series - Aircraft was on hoist training mission. Jump door blew shut as hoist ascended, and bottom of door was damaged by dummy. Use of thin retention strap on jump door allowed it to close.

H series - Windshield was shattered by bird strike during cruise flight.

UH-1 Class E

H series - During through-flight inspection, IP noticed fuel leaking from fuel filter output elbow quick disconnect. Caused by deterioration of coupling O-ring.

V series - During approach to confined area, PIC noticed slight binding and moderate ratcheting in tail rotor controls. Binding increased during approach for run-on landing at airfield. Inspection showed tail rotor cables were overtorqued. Exposure to cold probably caused cable to shrink out of limits.

UH-60 Class E

A series - Compressor stall occurred during power check on No. 1 engine.

A series - During takeoff to a hover, crew felt abnormal vibration. Vibration grew stronger as collective was increased. Main rotor blade antiflap was stuck in down position.

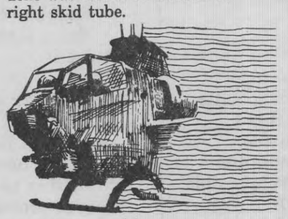
A series - Crew heard whistling sound coming from main rotor system. Abrasion strip on one of the rotor blades had separated.

A series - Aircraft encountered snow at 4,500 feet msl. About 10 minutes after windshield anti-ice was turned on, crew noticed odor of electrical wires burning. Bottom right connection on pilot's windshield shorted and caused windshield to crack.

Attack helicopters

AH-1 Class D

F series - Pilot repositioned aircraft to a more stable spot after landing. During postflight, dent was found on bottom of right skid tube.



AH-1 Class E

F series - Aircraft landed after experiencing excessive vibration in tail rotor during takeoff. Outer face of both trunnion bearings had failed, allowing yoke to slide out against trunnion half.

Cargo helicopters

CH-47 Class E

C series - Master caution, No. 1 hydraulic boost, and stability augmentation system lights came on during flight. Caused by pinhole in hydraulic line.

C series - APU failed during hot refueling, and generator and No. 2 flight boost lights came on. Caused by seizure of APU power turbine section.

C series - During hover in light rain, No. 2 generator-off light came on, and generator would not reset. A minute later, while taxiing to parking in heavy rain, No. 1 generator-off light came on and would not reset. Water ingested through generator cooling intakes caused both generators to short out.

D series - During engine start, crewmember noticed fuel leaking from No. 2 engine. Fuel line was replaced.

Observation helicopters

OH-58 Class B

D series - Aircraft was being run up on ship deck in preparation for night flight. Crew of a UH-60 also began start procedures. When the UH-60's main rotor system was engaged, the aircraft's main rotor blades meshed with the OH-58's blades, damaging both aircraft. 8910

OH-58 Class E

C series - Aircraft had been running about 10 minutes during zero-degree temperatures with heater on, when cockpit and cabin area filled with oily smoke and fumes. Caused by failure of No. 1 engine bearing.

Fixed wing

OV-1 Class C

D series - No. 1 engine was brought up to full power during MOC. Nose gear strut sheared and aircraft shifted to the left, causing the slar boom to come to rest on the nose-wheel assembly.

OV-1 Class E

D series - No. 2 engine experienced compressor stalls at 93 percent N1. Stalls stopped when power was reduced to 88 percent. Crew continued flight with engine at reduced power and made an uneventful landing. Inspection revealed foreign object damage in compressor section. Cause of FOD could not be determined.

D series - Aircraft was at flight level 160 when the crew heard a pop and felt the aircraft shudder. Overhead canopy cracked. Temperature was minus 20° C.

U-8 Class E

F series - No. 2 engine cylinder head temperature began abnormal increase during cruise flight. Caused by chafed wiring on cylinder head temperature probe.

U-21 Class E

G series - During flight, crew saw oil flowing over No. 1 engine assembly. Caused by failure of prop seal.

Safety messages

- Safety-of-flight technical message concerning one-time inspection of main rotor hub assemblies on all UH-1H/V and EH-1H/X series aircraft. (UH-1-89-01, 032130Z Jan 89). Contact: Roger Heidenreich, AUTOVON 693-9089, commercial 314-263-9089.
- Maintenance information message concerning auxiliary power unit igniter plugs on UH-60A aircraft (UH-60-89-MIM-01, 052100Z Jan 89).

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363

A family affair

Families are important to the Army; not just the big family that is the Army itself, and the smaller family that is the unit a soldier belongs to, but the most important family of all to a soldier–his own family. The Army has recognized that to retain today's quality soldiers, we have to give them some assurances about the quality of life their families can expect.

MG Gordon R. Sullivan, commanding general of Fort Riley, understands the importance of taking care of soldiers' families, especially in the 1st Infantry Division. These soldiers are often away from home for long periods of time, as they were last year during REFORGER.

"If a soldier thinks his wife is unsafe, his family's not secure, and the programs aren't there to take care of them, he's just not going to perform. His mind is going to be somewhere else, and he's certainly not going to be safe. We did some very, very hard training on this REFORGER, as hard as I've ever seen, and we brought every single one of our soldiers home safe. I think it worked because people's heads were in the exercise. They felt that there were people back at Fort Riley taking care of their families–and there were. At Fort Riley we take care of our people."

Army aviation is still another kind of family, and people in this family have to take care of each other too. MAJ(P) Craig Hackett, Aviation Brigade S3 with the 82d Airborne Division at Fort Bragg puts it this way: "If a soldier hasn't had a good breakfast or he didn't have a comfortable place to sleep last night, and he's cold out on the flight line because there are no hangars, then what kind of product are you going to have when you climb in that aircraft and go risk your life or the lives of others?

"Aviation has to be a family. You have to rely on the specialist or the sergeant or the NCO to do his job so that you're capable of doing yours. If you don't work together as a team, there's going to be a missing link, and when you have a missing link, that's when you're going to start having accidents and getting people hurt."

Aircrews become close knit because not only are they working in a small group and in a small space, their lives depend on each other. Speaking of this mutual dependency, people in E Company, 24th Aviation Regiment, at Hunter Army Airfield said, "It's kind of like the Ranger battalions. They work in small teams and become close to each other. They know each other. That's how it is when our people deploy. We are closely knit and we know each other's needs. We look out for each other." ■

FY89 Class A Accidents through 25 January

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1		10	
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	10	38	9

Report of Army Aircraft Mishaps

FLIGHTFAX

8 February 1989 Volume 17 Number 8

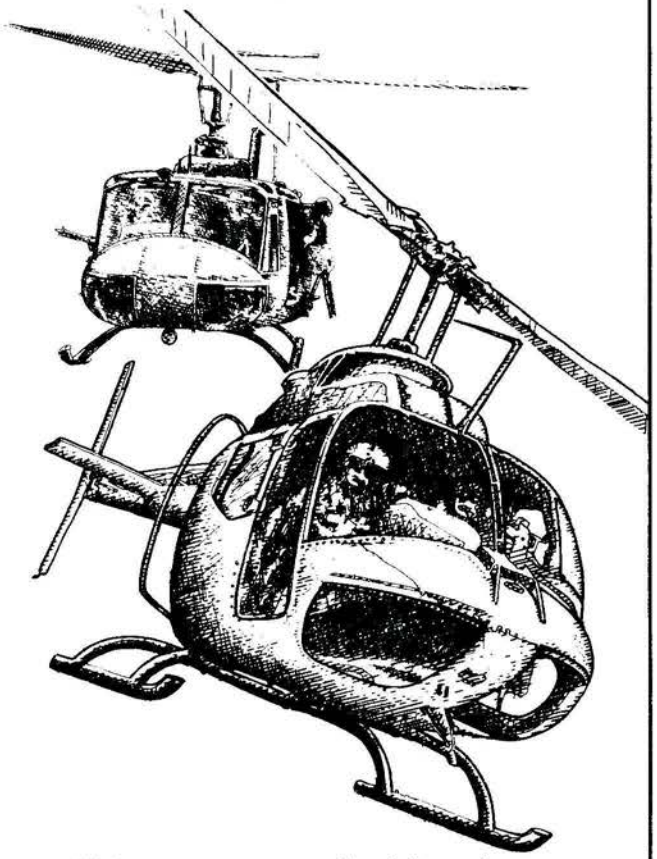
Rule 1 – Control the aircraft

Rule 1—Control the aircraft

Army aircraft are flying more and more at low level while engaging in a wide variety of tactical operations. That means pilots are doing a lot more than just manipulating the flight controls. With little vertical clearance and so many tasks requiring attention, an accident can happen in only a fraction of a second. To prevent that from happening, the cardinal rule remains—**control the aircraft.**

The crew of an AH-1 was on a day training mission. The PIC was on the controls making confined area approaches and departures and practicing masking and unmasking. After about 50 minutes of flight, the aircraft landed in a marshy area at the end of a pond. When the PIC brought the AH-1S to a hover, he noticed the aircraft felt a little sluggish as it came up out of the marsh, but it came to a hover 1 to 3 feet above the water with no further problems. The PIC looked down to verify his before-takeoff check and noticed that the transmission oil pressure looked low. He turned his head to the left and looked down to get a straight-on view of the gauge and saw that the transmission oil pressure was within limits at 43 psi.

inside the cockpit to monitor the instruments during takeoff and to conduct a built-in test of the telescopic sight unit. He looked back outside just as the helicopter's right skid hit the water.



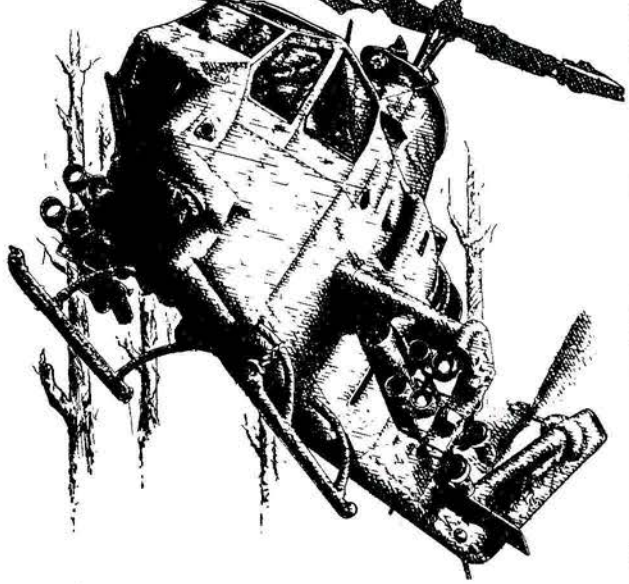
This crew escaped with only minor injury to the PIC. The crew of an OH-58 was equally lucky.

Two teams, each made up of an OH-58 and a UH-1, were operating as opposing forces on an NOE search and attack mission. Another UH-1 He thought the aircraft was going to roll over, and he immediately applied left cyclic and reduced collective. The main rotor blade hit the ground to the left front of the aircraft, tearing off the main rotor system and transmission. The aircraft remained upright as it settled to the ground, and the crew was uninjured.

About a week before the accident, the IP who was flying the target aircraft had instructed the PIC of the other OH-58 in aeroscout tactics. Realizing he had successfully maneuvered his team into a position where they could defeat his former instructor's team, the PIC of the aggressor team concentrated his attention on the target handoff to the detriment of flying the aircraft.

Neither of these accidents was caused by a pilot deliberately violating procedures or consciously failing to meet a standard. These were conscientious pilots who, while concentrating on one aspect of their flying, failed to coordinate with the other pilot and forgot the number one rule—**control the aircraft.** ■

Having trouble with fire extinguishers



While the PIC's attention was on the instruments, the aircraft had begun drifting and rolling to the right. When he looked back outside, the PIC saw the aircraft was in a right roll, and he told the copilot they were going to crash. The right skid hit the water while the aircraft was still drifting, causing the helicopter to continue to roll right. The PIC applied left lateral cyclic, but he was unable to prevent the main rotor blades from hitting the water and mud. The retreating main rotor blade severed the aircraft's tail boom. If the PIC had reduced collective as stated in TM 55-1520-234-10 instead of applying lateral cyclic, he would have had a better chance of controlling the aircraft's roll. Reducing collective reduces the main rotor thrust.

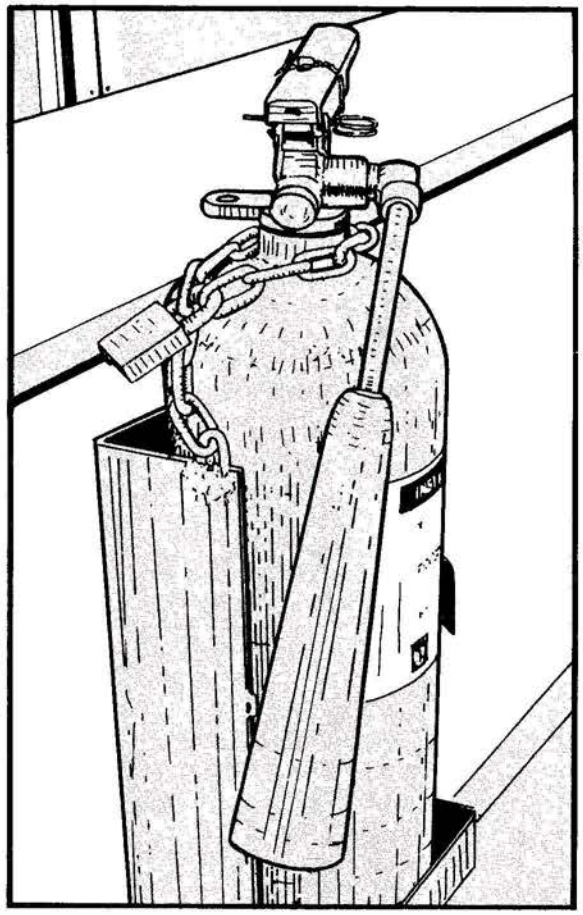
While the aircraft was at a hover, the copilot had directed his attention was acting as the high safety aircraft. After completing a high reconnaissance, the teams flew a mission and then reversed roles, with the accident aircraft becoming the aggressor. The PIC of the aggressor OH-58, with the UH-1 flying as his gunship to the rear, began searching for the other team. When he had located the other team, he brought the OH-58 to a stationary hover while attempting to hand off the target to his gunship. The gunship crew was not receiving all the radio transmissions from the OH-58, and the PIC, who was flying the OH-58 from the left seat, was having to repeat his radio transmissions while trying to keep the other team under surveillance without giving away his own position. He was using a tree, located between his aircraft and the target, for concealment while trying to communicate with his gunship and bring it in on the "kill."

While the PIC was concentrating on the target and his radio transmissions, he allowed the aircraft to drift to the right toward upsloping ground covered by 12- to 18-inch-tall grass. The pilot, who was navigating, had looked down at his map. He realized the helicopter was drifting, and as he looked up, he felt a bump.

The helicopter's right skid had hit the 14-inch-high stump of a 2 1/2-inch-diameter tree. The PIC felt the skid make contact, and the aircraft began a rolling motion to the right.

disappearing?

An overseas transportation unit was having problems with fire extinguishers being stolen from their 32-passenger buses. They found a solution to their security problem, but the fire extinguishers aren't going to be much good in an emergency. Don't solve your problem by creating an unsafe condition like this. ■



Don't use this method to prevent fire extinguisher theft.

STACOM

Instructor pilot/instrument examiner certification

Initial IP/IE designation orders are no longer required and will not be published. Successful completion of an Instructor Pilot Course (IPC), Methods of Instruction (MOI) Course, or Instrument Flight Examiner (IFE) Course, will be certified by the diploma issued by Academic Records, Directorate of Aviation Proponency (DAP), U.S. Army Aviation Center, Fort Rucker.

Aviators completing the IPC, MOI, and IFE courses after 15 January 1989 will be provided diplomas by Academic Records, DAP. Aviators who qualify as IPs/IEs by passing an equivalency evaluation or by completing an IP-producing course at the Eastern or Western Army Aviation Training Sites will also receive a diploma instead of a designation order. Directorate of Evaluation and Standardization (DES) will initially process these qualifications and provide them to DAP for publication of diplomas. Aviators who meet the qualification requirements of paragraphs 4-11 and 4-12, AR 95-1, after 15 January 1989 are required to have a copy of their diploma in their Individual Flight Records Folder (IFRF). Aviators who qualified as IPs/IEs before 15 January 1989 may maintain either a copy of their initial designation order or their diploma in the IFRF.

Diplomas should be maintained in a safe place where they will not be destroyed or lost since they serve as the interim qualification document until the individual's Officer Record Brief (ORB)/official personnel record is updated. The ORB/official personnel record will serve as the final authority concerning aviator initial IP/IE qualification.

Aviators whose ORBs/official personnel records are not current should update them as soon as possible. Aviators qualified as IPs/IEs before 15 January 1989 can obtain initial qualification documents from the sources listed below. **Only** those aviators who are missing this documentation should contact these sources:

- Aviators who have successfully completed an IPC, contact Directorate of Personnel and Community Activities, Personnel Center, Student Records, Fort Rucker, AL 36362-5000, AUTOVON 558-4081.
- Aviators qualified by any other means (i.e., MOI equivalency evaluation, IFE, NG or Reserve courses), contact Directorate of Evaluation and Standardization, ATTN: Technical Support Branch, Fort Rucker, AL 36362-5000, AUTOVON 558-4691/6571.

Aviators qualified as IPs/IEs after 15 January 1989 should obtain initial qualification documentation (diploma) from Directorate of Aviation Proponency, Academic Records, Fort Rucker, AL 36362-

ACCIDENT BRIEFS

Information based on preliminary reports o

Utility helicopters

UH-1 Class D

H series - Unsecured vertical fin cowling came open during flight.

H series - Gusty winds blew

extinguisher. Maintenance inspection revealed no damage to aircraft fuselage or engine. Smoke and flames were caused by exhaust stack fire.

A series - Aircraft was at 20 feet agl during approach to pick up a slingload. A small metal

links were bent and main rotor blades struck the aft portion of the transmission housing, cracking the fiberglass.

AH-64 Class D

A series - After test flight for stiff lateral cyclic control followed

to gain altitude, tail rotor blades hit tree branches, damaging both blades.

D series - Aircraft was preparing for takeoff from unimproved confined area while conducting aerial observer (AO) training. AO cleared aircraft to

damaging door hinge.

UH-1 Class E

H series - During approach, copilot had trouble maintaining heading. When he relaxed pressure on antitorque pedals, right pedal went full travel forward. Excessive pressure was required to move left pedal. When pressure on left pedal was relaxed, the pedal continued forward an additional 2 inches. Tail rotor cables were out of adjustment.

UH-60 Class D

A series - Aircraft was on an urgent medevac mission to a field site. During short final, ground panel marker blew through rotor system, damaging one main rotor blade.

A series - IP placed slingloaded fuel blivets on the ground and asked copilot to release the load. The CP pressed the emergency release switch on his collective, unintentionally activating release squib.

UH-60 Class E

A series - Pilot was returning No. 2 power control lever (PCL) to fly position during HIT check. PCL continued past fly detent into ECU lockout. Engine noise increased and aircraft shuddered. As pilot returned PCL to idle detent, control tower personnel reported smoke and possible flames in engine area. The crew chief got out and confirmed there was smoke. The PIC initiated emergency engine shutdown of No. 2 engine and pulled emergency handle. The pilot activated the main fire

sign was picked up by the rotorwash, damaging one main rotor blade. The sign apparently came from an impact boundary fence 100 yards away.

A series - Stabilator light and audio came on at 120 knots. Switch was reset, but stabilator failed again about 5 seconds later. Caused by failure of linear servo accelerometer.

Attack helicopters

AH-1 Class D

F series - While repositioning for landing at a tactical field site, crew allowed aircraft's main rotor blades to hit tree branches.

P series - Aircraft was at about 15 feet agl during standard autorotation. IP thought student IP had failed to pull enough initial pitch. While he was telling the student and getting on the controls, the aircraft's aft skids touched down. Both pilots pulled cushioning pitch, and the aircraft became airborne at about 5 feet. IP leveled aircraft and pulled remaining pitch. Due to low rotor rpm at impact, both pitch change

by a roll-on landing, control tower reported the aircraft had a loose cowling. Caused by failure of fairing fastener assembly.

A series - During start sequence, pilot's checklist fell from kneeboard attached to his left leg and struck the wing stores jettison button on the collective. Left and right inboard missile launcher and right outboard rocket pod were jettisoned.

Cargo helicopters

CH-47 Class D

C series - When Allied soldier drove a TOW-equipped jeep off aircraft, top rubbed against pressure and return lines of utility and APU motor pump, crimping lines. Soldier did not understand crew chief's instructions to stop vehicle.

Observation helicopters

OH-58 Class A

A series - The OH-58, followed by an AH-1, was en route to a training area to conduct a multiship tactical training mission under NVGs. The AH-1 overtook and collided with the OH-58. The pilot of the OH-58 was killed and the IP was injured when the aircraft fell almost vertically from 200 to 250 feet agl. The AH-1 crash-landed without injury to the two crewmembers. 8911

OH-58 Class D

A series - While hovering OGE on a mountain ridge, pilot allowed aircraft to drift rearward. When pilot attempted

the left, but as pilot made a hovering left turn, tail rotor struck a tree.

Fixed wing

C-12 Class D

C series - Crew was conducting annual instrument evaluation for the pilot. While inbound on VOR approach, aircraft's left engine chip detector light came on. Engine was secured, and aircraft made a single-engine landing. As the pilot started a left turn onto high-speed taxiway, fire truck crew reported smoke coming from left main gear. Excessive braking while making the turn caused the tire to blow out.

U-21 Class C

A series - While aircraft was on takeoff roll at about 60 KIAS, herd of deer ran onto runway and into aircraft's path. Aircraft struck three of the deer. There was no visible damage to the aircraft, but engines and propellers were removed and sent to depot for further inspection.

A series - When propeller was reversed during termination of single-engine landing, student pilot was slow in correcting left yaw. IP tried to correct yaw with right brake and rudder, but brake failed. Aircraft went off the runway to the left, and right propeller struck a taxi light.

Maintenance

UH-1 Class D

H series - Rotorwash from hovering aircraft caused an

5000, AUTOVON 558-2596.

Questions about initial IP/IE qualifications should be directed to DES, Flight Standardization Division, Fort Rucker, AL 36362-5000, AUTOVON 558-2442.

U-8F flight procedures

A recent review by DES of U-8F Excalibur aircraft flight procedures has revealed a lack of standardization in continuous climb power settings.

There is a lack of published material on this modified version of the U-8F. The Missouri AVCRAD has produced a supplemental data sheet on the Excalibur version of the U-8F that recommends climb power settings of 25 inches Hg manifold pressure and a propeller setting of 2500 rpm for normal operations.

To ensure better standardization among all U-8F Excalibur operators, DES recommends that all commanders with these aircraft review their unit operating procedures and incorporate these power and propeller settings for normal continuous climb in the procedures.

Correction

In the 30 November 1988 issue of **Flightfax,** STACOM 133 contained an error in the portion pertaining to elimination of IP/SP/IE/ME certification requirements. The last sentence should read: "Before performing IP, SP, IE, or ME duties, the aviator must be designated in writing by the commander IAW AR 95-1." ■

STACOM 135 — 8 February 1989

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5208. AUTOVON 558-3589 during duty hours, 558-6487 after duty hours. 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.

Michael H. Abbott
Colonel, Aviation
Director, DES

FY89 Class A Accidents through 8 February

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	1	10	1
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	11	38	10

aircraft accidents

unattended rollaway tool box to roll into and break the UH-1's right chin window panel.

H series - Brush used to clean vertical fin was left in drive shaft tunnel. Damage to No. 4 tail rotor drive shaft was found after test flight was terminated

AH-1 Class A

Reported in 11 Nov 87 issue as 8802 - Aircraft was trail in a flight of three on a battle drill and reconnaisance mission. While in straight and level flight at 100 knots, approximately 1,000 feet agl, the crew heard a loud

toward it. As the aircraft approached the selected forced landing area, the pilot used thrust to clear a line of 50-foot trees. As he decelerated, the aft rotor struck the trees. The aircraft landed 90 degrees nose up with the aft rotor system

because of reduced visibility and the position of the aircraft as it turned, tower personnel were unable to confirm the gear was down. The crew was given clearance to land. The first sign of trouble was a steeper-than-normal approach. As the aircraft

because of maintenance problems.

Followup information on accidents previously reported

UH-1 Class A

Reported in 2 Dec 87 issue as 8803 - An unexplained vibration occurred during a VOR approach at night in VMC conditions. The IP took the controls and prepared to make a precautionary landing at an airfield, but the aircraft descended into trees about 800 feet short of the runway, crashed, and burned. The IP was killed in the crash.

UH-60 Class A

Reported in 24 Feb 87 issue as 8812 - While making a night approach to a field site with the aid of AN/AVS-6 night vision goggles, the PIC of the lead aircraft in a flight of four terminated approach to a hover. The aircraft immediately encountered a brownout condition in rotorwash-induced blowing sand and dust, and the PIC lost sight of the ground. The aircraft drifted about 25 feet forward and to the right before the right main gear contacted slightly rising ground. The aircraft began rolling to the right and came to rest inverted. The PIC had intended to follow the procedures described in the ATM for an NVG approach by executing a landing with forward airspeed. However, when he saw ruts in the sand he hesitated in lowering the collective but continued the approach, and the aircraft was enveloped in blowing sand and dust.

bang and saw parts of the aircraft fly by the right side of the cockpit. Part of the tail rotor blade had separated from the yoke assembly. The resulting imbalance caused the remainder of the tail rotor and the 90-degree gearbox to separate from the aircraft and parts of the tail rotor system hit the right wing and rocket pod. The pilot lowered collective and flew to an open area, where he entered autorotation. The aircraft landed hard in a right yaw and rolled onto its left side. Failure of the yoke assembly, which allowed the tail rotor blade to separate, was caused by metal fatigue.

CH-47 Class A

Reported in 20 Jan 88 issue as 8807 - During cruise flight, aircraft's No. 2 engine lost power and went off line. The rotor rpm dropped and the copilot, who was on the controls, attempted to beep up the No. 1 engine to regain operating rpm. Then the No. 1 engine also began to lose power. The PIC took the controls, entered autorotation, selected a forced landing area, and turned striking the ground first, separating the aft pylon and both engines. The nose continued pitching up and over, and the aircraft came to rest inverted on its top right side. The aircraft immediately burst into flames from severed electrical wiring and fuel lines. The PIC, copilot, and all three enlisted crewmembers escaped the burning aircraft, but two of the enlisted crewmembers were seriously burned. The aircraft was destroyed. Cause of engine failure was fuel contaminated by water from a ferry fuel tank. (See article in 29 Jun 88 **Flightfax** for details.)

C-12 Class B

Reported in 20 Jan 88 issue as 8808 - Downgraded to Class C. Aircraft had a history of flap problems. During three previous landings on the day of the accident, the flaps failed to work properly, requiring manual operation of the switch and visual confirmation of the flap setting. During the accident flight, the pilot on the controls decided to make a precision approach power landing. He had initiated the before-landing checklist and got as far as setting the flaps when he had to direct his attention outside the aircraft to visually ensure the flap setting. Visibility was poor because of sun glare reflecting off haze and fog. The IP decided to demonstrate the first approach, which was into the sun, and let the pilot do the next one. A normal transfer of controls was completed. Tower personnel were asked to confirm that the gear was down, but touched down, its right propeller hit the runway, and the IP added power in an attempt to regain enough altitude to extend the gear. But as he reached for the gear handle, two warning lights came on. As the IP moved the gear handle switch to the down position, the aircraft's left propeller struck the runway. Realizing further flight was impractical, the IP reduced power and feathered the propellers. The nose gear extended, and the main gear came down far enough to prevent additional nacelle damage. The aircraft came to rest about 4,000 feet from the approach end of the runway. The before-landing checklist was interrupted when the pilot had to visually ensure the flap setting, and subsequently transferred controls to the IP. The before-landing checklist was never restarted and the landing check was never initiated, resulting in the aircraft being landed with the gear up.

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. AUTOVON 558-2062. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Direct communication is authorized by AR 10-29.

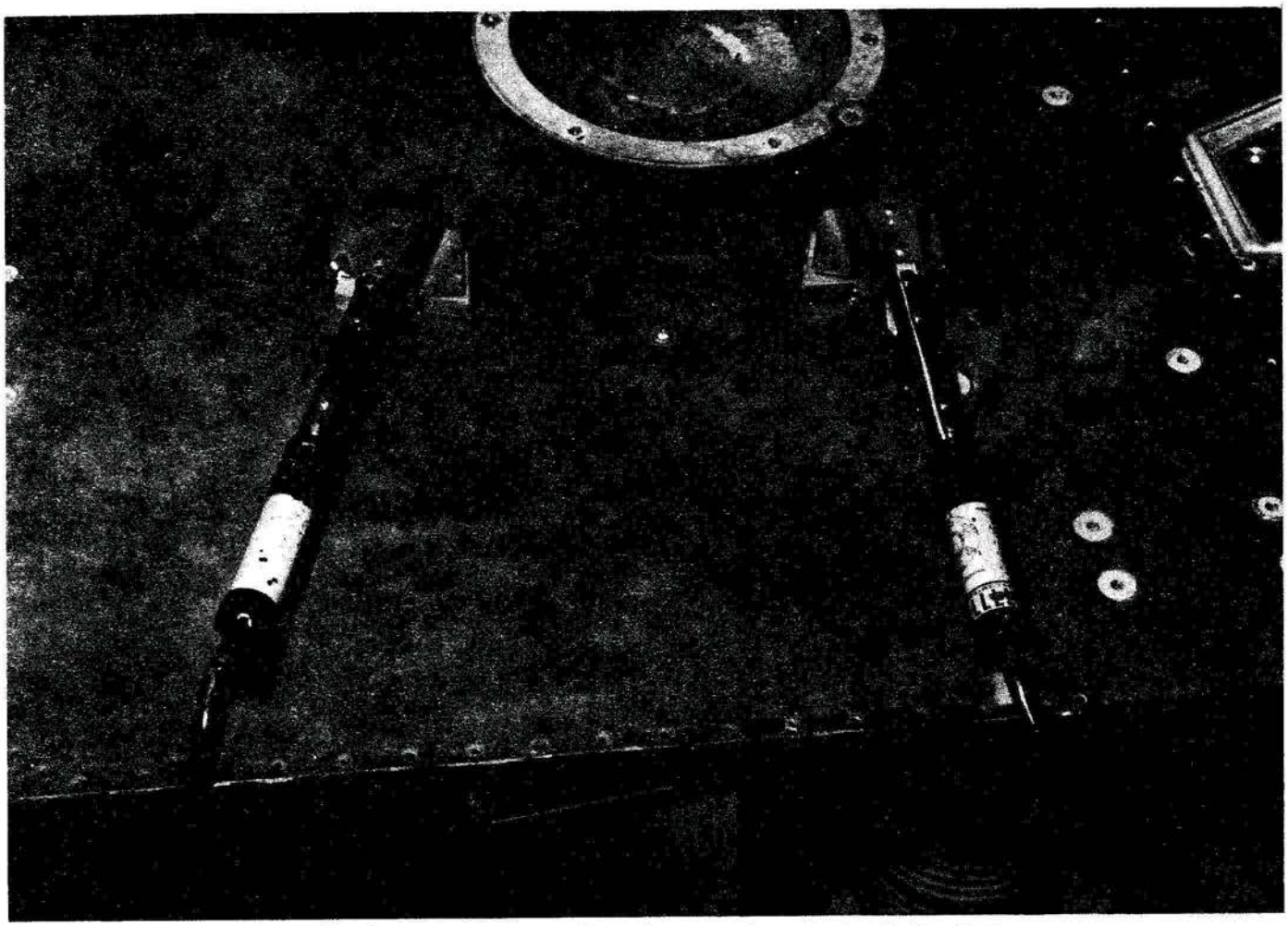
C. A. Hennies
Brigadier General, USA
Commanding General
U.S. Army Safety Center

Watch those hot irons!

When people at the U.S. Army Reserve Aviation Support Facility in Glenview, IL, discovered blisters and burned spots on the aft portion of an aircraft's engine deck, at first they didn't know what had happened. Now they do.

Irons that are used on temperature sensing probes in the aircraft exhaust had been laid on the engine deck. These irons are calibrated to temperatures as high as 400° C, so it is easy to see the kind of damage that can result. ■

What caused these burned spots?



Here's the culprit. Hot irons like these can cause serious damage when carelessly handled.

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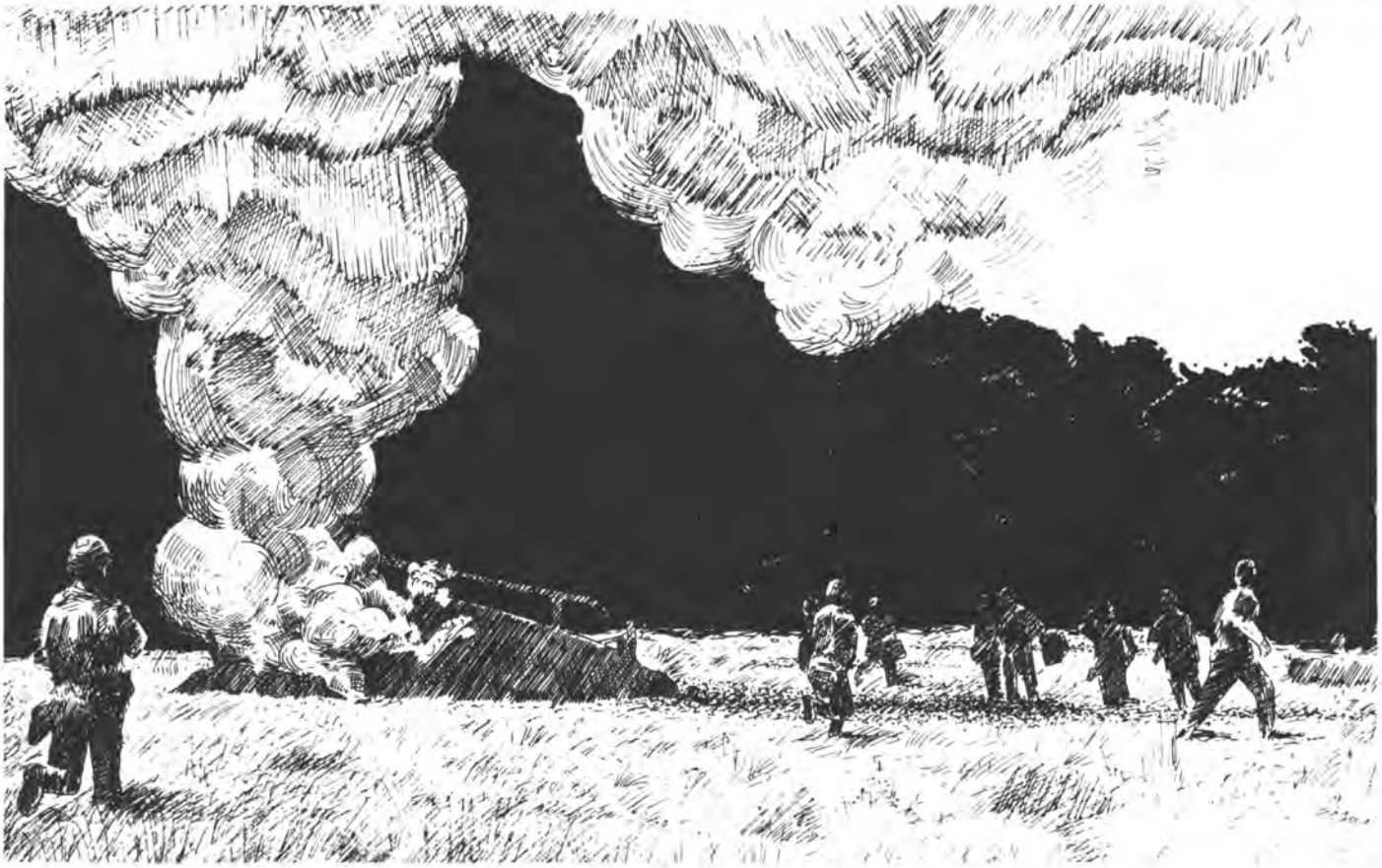
Report of Army Aircraft Mishaps

FLIGHTFAX

Volume 17 □ Number 9 22 February 1989



The senseless accident

Some accidents simply make no sense. This was one of them. Four crewmembers and six passengers died in the crash of a UH-1. The pilots were reportedly well-trained and professionally competent, but apparently they thought an orientation ride should be exciting. Instead, it was tragic and senseless.

The idea of giving unit NCOs and soldiers helicopter rides during field training wasn't new. It had been done in this unit for some time. A ride in a helicopter gave people a chance to become familiar with boarding and exiting procedures and to learn safety precautions they need to take around operating aircraft. It also gave them a chance to become oriented with the training area from the air and to see the effectiveness of their camouflage.

This particular aircrew had already flown two 10- to 15-minute sorties with passengers that morning. After loading six more passengers, the UH-1 took off on its third flight. A few minutes later, it had crashed to the ground and burned, killing everyone on board.

The senseless accident

Witnesses reported having seen the aircraft during an earlier flight at treetop level and flying fast. The helicopter was also seen in a climbing steep bank. During the accident flight, the aircraft was seen in a nose-high climb, with a 180-degree turn at the top, followed by a nose-low descent. The maneuver was described as similar to a return-to-target, which is characterized by a cyclic climb to zero airspeed, a rapid 180-degree heading change, and a nose-low descent to regain airspeed. Immediately following this maneuver, witnesses saw pieces falling off the aircraft before it crashed.

This is all that was left of the aircraft when the fire had been extinguished.

An investigation revealed that following this aerobatic maneuver (witnessed by ground personnel), the aircraft's tail rotor struck a tree and a tail rotor blade separated from the aircraft. The resulting imbalance caused the 90-degree gearbox to fracture and separate. The loss of tail rotor components may have caused the pilot to react by pulling aft cyclic. If so, this reaction and the sudden forward shift in aircraft center of gravity would have caused the main rotor blades to dip down and hit the fuselage. Evidence indicated the tailboom was severed and the synchronized elevators, which separated from the fuselage, were struck by the main rotor blade.

An overzealous crew, who wanted to give their passengers an exciting ride, failed to fly by the standards–standards they knew–and 10 people died. ■

Aviators recognized with Broken Wing awards

Ten Army aircrewmembers have received the Broken Wing award for recovering aircraft from in-flight emergencies. Except for their quick reactions and flying skill, all of these aircraft and possibly their crews as well would have been lost.

Accounts of these incidents are furnished not only to recognize these exceptional aviators, but in the hope that their experiences may benefit others.

•CW3 Randall B. Potter and SSG John P. McConnell, 2d Battalion, 159th Aviation Regiment, Fort Bragg. CW3 Potter was the IP and SSG McConnell the flight engineer of a CH-47D assigned to a joint task force. The aircraft had picked up 25 passengers and equipment and was en route back to an airfield. About 10 minutes from destination, the aircraft's aft cabin began filling with smoke. SSG McConnell alerted the pilots, who put out a mayday call and told the enlisted crewmembers to prepare the passengers for an emergency landing. Feeling substantial back pressure in the controls, CW3 Potter asked the copilot to get on the controls to help him. The only possible landing area was a small clearing about 2 miles away. The clearing was a small saddle about 150 meters long and 30 meters wide, with steeply sloping hills to the north and south. To the west, the ground sloped steeply downward. The downslope to the east, while not as steep, was covered by tall trees. As the aircraft neared the landing area, CW3 Potter could see that there was barely enough level ground for the CH-47 to land. While the pilots maneuvered the aircraft for landing, SSG McConnell confirmed from the maintenance panel at his station in the rear of the aircraft that the emergency was a transmission problem, not an electrical fire. SSG McConnell was also ready with the aircraft's portable fire extinguisher in case it was needed. The aircraft landed in soft soil and tall grass with almost no forward roll, and the passengers were evacuated while the pilots completed an emergency shutdown. As power to the engines was removed, the smoke began clearing. Inspection revealed that the combining transmission oil cooling fan shaft had sheared. There was no other damage to the aircraft.

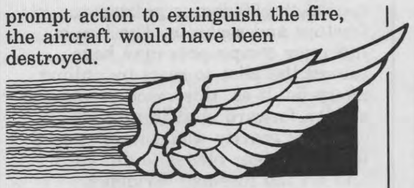
•CW2 Edwin S. Coleman, G Company, 1st Aviation Regiment, 4th Brigade, 1st Armored Division, APO New York 09250. CW2 Coleman was PIC of the trail aircraft in a flight of two OH-58Ds during a team tactical training mission. The aircraft were conducting a zone reconnaissance at NOE altitudes. CW2 Coleman's aircraft was at an OGE hover in an aerial observation position with only the mast-mounted sight exposed. He was providing overwatch for the other OH-58. Receiving a digital transmission to move to the next aerial observation position, CW2 Coleman initiated an NOE takeoff. During climbout, he found he had a severe lateral binding of the cyclic, followed by binding in the fore and aft quadrants. The binding was so severe the aerial observer had to assist CW2 Coleman in keeping the aircraft level. There were no caution lights or warnings to indicate there had been a hydraulics failure but, sensing he had a malfunction of hydraulics or the stability control augmentation system (SCAS), CW2 Coleman gained forward airspeed to maintain control of the aircraft. Following CW2 Coleman's directions, the observer executed the emergency procedure for hydraulic power failure and placed the hydraulic switch in the off position. This disengaged the hydraulics and SCAS. CW2 Coleman maneuvered the aircraft to a safe altitude and, after radioing the pilot of the other aircraft, headed for the nearest hard-surfaced runway about 14 nautical miles away. Arriving at the heliport, he made a perfect hydraulics-off landing with no damage to the aircraft or injury to the crew. The malfunction could not be duplicated during extensive troubleshooting and test flight, and the aircraft was released for flight. After about 17 additional hours of flight, cyclic binding again occurred. Fortunately, this time the aircraft was on the ground. Troubleshooting revealed the SCAS transducer cap screw had backed off about two turns, and this was causing the binding in the cyclic control.

•CW4 Dennis X. McCormack, C Troop, 1st Squadron, 1st Cavalry, 4th Brigade, 1st Armored Division, APO New York 09250. An OH-58A was 125 to 150 feet above rolling hills with fields, trees, and numerous power lines. The crew heard a violent grinding noise coming from the engine compartment and saw that N1 had gone to zero. Then the engine-out light and audio came on. CW4 McCormack, the IP, was on the controls and he initiated an autorotation. As the aircraft landed, the crew could see heavy smoke, and they immediately shut down the aircraft. CW4 McCormack refused to abandon the aircraft and began emptying every available fire extinguisher into the exhaust stacks and engine compartment. The fire was so intense the exhaust stacks had begun melting. Four fire extinguishers had been emptied by the time the fire was out. The fire was caused by a bearing failure that allowed oil to enter the combustion chamber. Without CW4 McCormack's

FLIGHTFAX

Broken Wing awards

prompt action to extinguish the fire, the aircraft would have been destroyed.



•CW3 Michael P. Popovitch, 4th Battalion, 159th Aviation Regiment, 11th Aviation Brigade, APO New York 09359. A UH-1 with CW3 Popovitch as PIC was transporting civilian dignitaries to field sites during REFORGER 88. The aircraft, with the copilot on the controls, had made a maximum performance takeoff from the last field site when the antitorque system failed. The left pedal applied setting was 2 to 3 inches forward of neutral. CW3 Popovitch took over the aircraft and regained control by reducing power and airspeed. By forcibly applying pressure to the right pedal, he was able to partially offset the adverse antitorque effect. Suspecting a possible magnetic brake problem, although the severity of the actual emergency did not approximate this type of malfunction, he instructed the copilot to recycle the force trim switch to eliminate this possibility. Recycling the switch did not alleviate the aircraft's yaw, and he decided to fly to the nearest hard-surfaced landing area and make a run-on landing. Although the airfield was only 20 miles away, and the aircraft was flying at about 70 knots, the excessive pressure required on the right pedal to maintain aircraft control began to cause fatigue and CW3 Popovitch's leg began visibly shaking. Asking the copilot to back him up on the pedals during landing, CW3 Popovitch began a shallow approach. As the aircraft neared the runway, he reduced airspeed to 35 knots for touchdown. The slower airspeed and reduced power setting, together with the left pedal condition, caused the aircraft's nose to drift to the left. CW3 Popovitch increased collective slightly to align the aircraft with the runway and, as the aircraft skidded to a stop, applied small amounts of throttle correction to maintain his heading, guiding the aircraft to a successful roll-on landing.

•CW2 Phillip D. Farris, E Company, 1-14th Aviation Regiment, Aviation Training Brigade, U.S. Army Aviation Center, Fort Rucker. CW2 Farris was conducting student training with an enlisted aeroscout observer in an OH-58C aircraft. The student observer was on the controls during training in emergency aircraft handling. During this training, the observer receives instruction in flying the aircraft. The aircraft was at 350 feet agl, at 80 knots, flying south over a river surrounded by dense trees when it began to oscillate fore and aft. As CW2 Farris took the controls, the aircraft yawed to the left and began an uncommanded descent. The N1, N2, and rotor rpm were decreasing, and the engine-out light flashed on, followed by the low rotor rpm warning light and audio. Realizing he had an engine failure, CW2 Farris entered autorotation and made a mayday call. The only suitable landing area was a field on the north side of the river to the aircraft's rear. This meant he would have to make a 140-degree turn in order to land. During descent, he saw there were poles, trees, and a house in the field, and he would have to extend his glide path to avoid hitting them. As he continued autorotation and touched down, the extended glide path made the aircraft skid about 15 feet before coming to a full stop. The aircraft was undamaged.

•CPT Daniel A. Godfrey, A Company, 1st Military Intelligence Battalion (Aerial Exploitation), APO New York 09457. CPT Godfrey was on a routine aircrew training mission with a nonrated enlisted technical observer occupying the right seat of his OV-1D Mohawk reconnaissance aircraft. There was a 700-foot ceiling with 3.75 miles' visibility when CPT Godfrey began an IFR takeoff over a large metropolitan area. As the aircraft lifted off, and the landing gear retracted, the aircraft rolled violently to the left and entered the clouds. The enlisted observer told the pilot the aircraft's right 150-gallon drop tank had fallen off. CPT Godfrey was faced with an aircraft in a near-maximum asymmetrical flight condition during the critical takeoff climb. To make matters worse, the aircraft was in instrument meteorological conditions. The textbook solution would have been to jettison the remaining drop tank to alleviate the asymmetrical condition, but that would have meant dropping a fuel cell with 150 gallons of highly flammable jet fuel, the equivalent of a 2,000-pound bomb, into the heart of the city below. CPT Godfrey attempted to return to the airfield and land, using a ground controlled radar approach. He was receiving very poor control responses from the aircraft, and at 500 feet agl, he was told to make a missed approach because of the cleanup crews who were removing debris from the dropped tank on the runway. CPT Godfrey requested and received permission to remain in the holding pattern and try to burn off the remaining fuel in the left drop tank. This would give him better control of the aircraft for another try at an instrument approach and landing. Maintaining a higher than usual airspeed improved control response from the aircraft and allowed him to burn off fuel faster. After about 45 minutes, the left drop tank was empty, and CPT Godfrey initiated another GCA approach. Although he encountered heavy rainshowers, he landed with no damage to the aircraft. Before this incident, the aircraft had been flown without drop tanks. When the drop tanks were reinstalled, the bellcrank did not return to the required position when the cable was pulled from the cockpit. This allowed excessive slack in the cable and allowed it to droop down into the inboard wing root and catch on the stringer. The cable was taut but appeared normal. During takeoff at gross weight, the wings flexed enough to put further tension on the cable, causing the right drop tank to jettison.

•Mr. Robert P. Behary and Mr. Randy L. Patchett, Dyncorp, Fort Rucker Division. An AH-64 was on a post phase maintenance test flight at night with two civilian maintenance test pilots on board. The aircraft had been in cruise flight for about 15 minutes and was at 1,200 feet agl, at 120 knots, when the crew heard a loud explosion followed by severe vibration in the aircraft and feedback in the flight controls. The vibration was so severe neither pilot could focus on the aircraft's instruments or communicate with each other. With both pilots on the controls, full-down collective was applied and airspeed reduced in an attempt to reduce vibration and gain control of the aircraft so that a forced landing could be made. There was no choice of landing area, and the aircraft was landed on a 4- to 8-degree downsloping terrace with only minor damage. Postflight inspection revealed that the fiberglass surface of one main rotor blade had separated at the top and bottom, allowing about 7 feet of honeycomb to separate from the blade just aft of the spar. Strips of fiberglass were found wrapped around the mast. Army Aviation Systems Command found that during repair on the blade, the entire blade was heated instead of only the area to be repaired. Reheating the already cured bonding could have caused the blade separation.

•CW4 Sanford D. Breckons, 1-14th Aviation Regiment, Aviation Training Brigade, U.S. Army Aviation Center, Fort Rucker. CW4 Breckons was IP of an AH-64 on a terrain flight training mission over a winding river and dense forest. While demonstrating an NOE deceleration, CW4 Breckons experienced a nearly complete loss of power on the aircraft's No. 1 engine. The aircraft, which was operating below minimum single-engine airspeed, began settling below tree-top level into the river bed. Rotor rpm had dropped to less than 90 percent. By reducing collective, CW4 Breckons was able to regain rotor rpm. He then maneuvered the aircraft along the river and, by delicately adjusting power, was able to accelerate to a forward airspeed above minimum airspeed for single engine flight. This stopped the descent, and CW4 Breckons was able to recover the aircraft at only 20 feet agl. He was then able to climb above the trees and fly to an open field where he made a minimum power approach and landed. The aircraft's hydromechanical unit was removed and sent to the factory for teardown analysis. ■

FY89 Class A Accidents through 22 February

	Month	Class A Accidents		Army Military Fatalities	
		FY88	FY89	FY88	FY89
1st Qtr	October	3	5	0	3
	November	1	3	0	0
	December	1	2	0	6
2nd Qtr	January	2	0	0	0
	February	1	2	10	2
	March	3		18	
3rd Qtr	April	3		1	
	May	7		4	
	June	4		4	
4th Qtr	July	1		0	
	August	2		0	
	September	4		1	
	Total	32	12	38	11

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

Utility helicopters

UH-1 Class D

H series - As aircraft hovered into parking, rotorwash blew door off another aircraft.

H series - A 6-inch separation on one rotor blade and creases in the other blade were found during postflight inspection. Crew had noticed nothing during terrain flight that would have caused the damage.

UH-1 Class E

V series - Master caution light flickered during flight. A few seconds later, chip light flickered. Caused by broken wire on 42-degree gearbox chip detector.

V series - During night unaided flight at 1,000 feet msl, crew heard a bang and aircraft yawed 30 degrees left. High rpm warning light came on, and exhaust gas temperature and N1 increased slightly. IP took the controls and maneuvered aircraft to a landing in an open field. Variable inlet guide vanes were out of rig.

UH-60 Class D

A series - Drive shaft cover was damaged when it opened during flight.

UH-60 Class E

A series - Aircraft was in flight at 70 KIAS with a 2,200-pound slingload of 105mm ammunition. No. 2 reservoir-low caution light came on, and PIC turned off stability augmentation system, boost, and flightpath stabilization and attempted an approach to a confined LZ. Aircraft control became questionable, and the PIC decided to land at an airfield equipped for crash rescue. About 10 kilometers from the airfield, the No. 2 hydraulic pump caution and backup pump advisory lights came on. The crew continued approach, and aircraft was at a 5-foot hover when the backup reservoir-low caution light came on. After normal release of the slingload, the aircraft landed. Inspection showed No. 2 pump was empty. The No. 2 hydraulic pump assembly had failed. The backup pump was full, and maintenance could not duplicate the backup reservoir-low situation.

A series - During flight, No. 2 engine oil pressure and master caution lights came on and turbine gas temperature, oil temperature, and torque became erratic. Aircraft began filling with smoke. Signal data converter failed due to miscompare between engine-drive alternator and electrical control unit.

A series - During cruise flight, No. 1 engine would not return to fly position from ECU lockout. Caused by out-of-adjustment load spindle.

A series - During NVG mission to make a pickup for STABO operations, pilot misjudged clearance and aircraft's main rotor blades hit a tree.

Attack helicopters

AH-1 Class D

F series - During hot refueling at FARP, POL handler pushed CCR nozzle into port too hard, breaking retaining ring from CCR receptacle.

F series - Refueler damaged outer flange of CCR when he pulled fuel nozzle from CCR port after completing hot refueling.

S series - Following terrain flight mission, dents were discovered on the steel abrasion guard of each of the main rotor blades.

AH-64 Class D

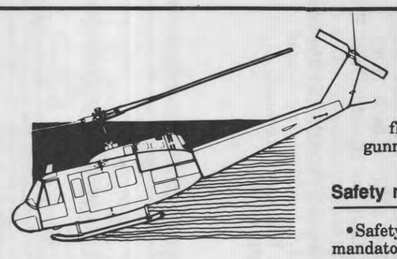
A series - While coming out of a FARP, crew was told by another aircrew their drive shaft cover was coming open. Unsecured cowling was missed during preflight.

A series - Both engines were running during runup. APU had been off for 2 minutes when the front and back seat fire lights came on. Rated student pilot pulled APU fire handle and activated primary fire extinguisher. After a hard shutdown, the pilots got out of the aircraft. Caused by a faulty APU flame detector.

Observation helicopters

OH-6 Class C

E series - While attempting to negotiate a route through a 7,400 msl saddle in the mountains, engine failed to produce sufficient power to continue flight. When an attempt to reduce airspeed and continue the climb was unsuccessful, the pilot made a turn to the right. Power continued to deteriorate, and the pilot initiated an autorotation. The aircraft descended into 10-foot trees on a 25-degree downslope. The main rotor blades, tail rotor system, tail boom, and skid gear were damaged. There were no injuries to the crew.



Maintenance

UH-1 Class E

H series - Heater wouldn't work when aircraft was started. Improper stacking of washers on muff heater mixing valve held valve in closed position.

AH-1 Class D

F series - Aircraft was inbound about 11 kilometers from the airfield. IP, who was on the controls, found the pedals would move only about 2 inches. He made a run-on landing at 50 KIAS. During ground slide, the aircraft began bouncing and yawing right, and IP used throttle to control heading. Skids were damaged. Improperly installed air duct caused chaffing and binding on tail rotor flight control bell crank in gunner's station.

Safety messages

•Safety-of-flight maintenance mandatory message concerning one-time inspection of T700-GE-700 engine gas generator stator shrouds on all H-60 aircraft (UH-60-89-01, 092010Z Feb 89). Contact: Brad Meyer, AMSAV-XS0F, AUTOVON 693-9089, commercial 314-263-9089.

•Safety-of-flight technical message concerning one-time inspection of main rotor hub assemblies on all UH-1H/V and EH-1H/X series aircraft (UH-1-89-01, 032130Z Jan 89). Contact: Roger Heidenreich, AUTOVON 693-9089, commercial 314-263-9089.

• Maintenance information message concerning P/N AN320-5 (NSN 5310-00-176-8109) and P/N AN320-6 (NSN 5310-00-176-8110) nut replacement program (GEN-89-MIM-02, 082112Z Feb 89).

•Maintenance information message concerning UH-60 auxiliary power unit ignitor plugs (UH-60-89-MIM-01, 052100Z Jan 89)

For more information on selected accident briefs, call AUTOVON 558-4198/3901, commercial 205-255-4198/3901.

U.S. ARMY SAFETY CENTER

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STACOM

Documenting NVD training/currency for nonrated crewmembers

Because of recent inquiries from the field, this STACOM will clarify the documentation requirements of night vision devices (NVD) training/currency for nonrated crewmembers.

The requirement to document and maintain nonrated crewmember NVD training should be accomplished in the same manner as that for rated crewmembers.

The USAAVNC NVD exportable training packet (ETP) will be used for aviator and nonrated crewmember academic training. Units are encouraged to add additional training and to modify the examination for use with nonrated crewmembers as follows:

•Delete questions that are aviator task specific (questions 26, 27, 30 through 34, and 37 through 47).

•Add training material and questions that pertain to nonrated crewmember tasks, mission, and local operating procedures.

•Each unit will develop and conduct flight training that is pertinent to the nonrated crewmember tasks. The subjects outlined in USAAVNC message 261830Z Jul 88, will be trained.

Additionally, the following changes should be made to TCs 1-211 and 1-212 as indicated:

•Paragraph 1-1. NOTE: Delete entire note in both TCs. ADD: "The commander designates, in writing, in the aviator's Individual Flight Records Folder, the aviator's 3-month NVG evaluation period. An aviator's NVG semiannual training period begins the first day of the month following the end of the designated 3-month NVG evaluation period. It continues for 6 months."

•Paragraph 5-3a(1). ADD: "or compatible visual SFTS."

•Delete any reference to day vision goggles (DVG) in both TCs.

POC at the Directorate of Evaluation and Standardization (DES) is CW3 Gary Helmer, AUTOVON 558-2442/6309. POC at the Aviation Training Brigade (ATB) is CW3 Richard Osterlund, AUTOVON 558-4630/4632. ■

STACOM 136 22 February 1989

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Michael H. Abbott
Colonel, Aviation
Director, DES