Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

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Food for thought. This *Flightfax* spotlights the leading causes of AH-64A accidents Armywide. Do they reflect your unit's experience? I encourage you to, during pilot briefs and classes, discuss these causes and the circumstances under which they occurred, practice them in the simulator, and exercise good crew coordination by discussing—before every flight—what each crewmember will do should you find yourself in a similar situation. And, as always, FLY SMART, FLY SAFE.

—BG Burt S. Tackaberry, Commanding General, U.S. Army Safety Center

Spotlight: AH-64A safety performance review

Note: *This review of AH-64A safety performance covers fiscal years 1995 through 1997. It does not cover fiscal 1998 experience, which includes the three Class A accidents that took two lives and destroyed three Apaches during the first quarter.*

In the 3-year period FY95 through FY97, 48 Class A through C AH-64A accidents cost $67.7 million in damage and injuries; there were no fatalities. Analysis identified the following as the three most frequent types of accident:

- Tree strike
- Aircraft ground accident
- Wire strike

Tree strikes

Tree strikes accounted for 11 (23%) of the 48 accidents and $13.7 million of the cost. The primary causes were—

- Improper scanning techniques.
- Inadequate crew coordination.

Five of the 11 tree-strike accidents occurred while the aircraft was at an out-of-ground-effect (OGE) hover. In four of these, the crews were participating in aerial gunnery.

Of the 11 tree-strike accidents, 4 occurred during confined-area operations. In two of these, the crews were performing target-handoff operations.

The other 2 of the 11 tree-strike accidents occurred during nap-of-the-earth flight.

In some of these accidents, a little readiness-level (RL) training was going on at the same time, adding even more tasks to already extremely task-intensive cockpit situations.

Interestingly, experience seems to provide little protection from tree strikes. These accidents involved aircrews with all levels of experience.

Scenario 1

The Apache drifted rearward while at a 70-foot OGE hover during a target-handoff maneuver as part of RL-2 progression training. The inadvertent rearward drift toward rising terrain continued until the tail rotor struck a tree at about 20 feet agl. The crew lost directional control, and the aircraft crashed in a descending right turn. Both crewmembers were injured, and the aircraft sustained heavy damage. Injury and damage cost totaled $9.6 million.

Crew experience: The PC had a total of 5050 hours; the PI had 2521.

Scenario 2

During an ATM training flight, the AH-64A crew attempted to maneuver between two trees while conducting nap-of-the-earth flight at about 16 feet agl and 76 knots. The number 4 main-rotor blade contacted a 2½-inch-diameter tree limb, destroying 8½ inches of blade. The crew made a controlled landing approximately 500 meters from the tree strike. Neither crewmember was injured, but the aircraft was damaged to the tune of $1.2 million.

Crew experience: The PC had a total of 1319 hours; the PI had 280.

Scenario 3

While making a low approach in a training area, the AH-64A crew heard a banging noise followed by a one-to-one lateral vibration. The PC immediately made a minimum power landing. Postflight inspection revealed damage ($44,342 worth) to all four main-rotor blades.

Crew experience: The PC had a total of 887 hours; the PI had 700.

Aircraft ground accidents

Aircraft ground accidents accounted for 7 (15%) of the 48 accidents and $16.7 million of the cost. Of the seven accidents, five occurred in FY95, one in FY96, and one in FY97.

Scenario 1

Five accidents occurred during maintenance runup and troubleshooting operations. In one case, during runup for a maintenance test flight, the number 1 main-rotor blade was damaged by a survival knife that armament personnel had left on the main-rotor hub after replacing the omnidirectional airspeed sensor. Two other accidents involved drive-shaft separation as a result of tools or other FOD left in the drive-shaft tunnels.

Scenario 2

A grass fire began beneath the parked AH-64A as the flight crew conducted APU start procedures and progressed through avionics checks. When the crew saw the fire, they egressed and attempted unsuccessfully to extinguish it. The fire engulfed and totally destroyed the aircraft.

Scenario 3

When the PC's right knee-board slipped off his leg, he reached down to pick it up. As he did so, he inadvertently pushed the cyclic forward, causing the main-rotor blades to contact the pilot night vision system (PNVS).

Wire strikes

Wire strikes accounted for 4 (8%) of the 48 accidents and $10.7 million of the cost. Of the four, one occurred in FY95 and the other three in FY97.

Improper scanning was a factor in all four of the wire-strike accidents. Three of the four also involved inadequate crew coordination. And, as is the case with tree strikes, experience—or the lack of it—seems not to be a factor in wire strikes. They, too, involved aircrews with all levels of experience.

Scenario 1

A flight of five AH-64A aircraft were conducting night terrain flight. They were at approximately 200 feet agl when the lead aircraft's tail rotor struck a set of power lines, severing the tail-rotor drive shaft. The aircraft crashed into a building, causing two injuries, extensive aircraft damage, and major damage to the building and some semi-trailers. Total cost of injuries and damage from this accident was $8.5 million.

Crew experience: The PC had a total of 2413 hours; the PI had 815.

Scenario 2

During a night, unaided, formation flight in deteriorating weather conditions, Chalk 7 twice struck a set of high-tension wires at about 60 feet agl. The first strike, which damaged only the windscreen, occurred going west as the PI initiated a descent to a selected immediate landing area. The PC took over the controls, intending to land. About ¾-mile south of the initial wire-strike area, going generally east, the aircraft again struck the same set of wires. This time, the tail rotor separated from the airframe, and the aircraft crashed out of control. The two crewmembers sustained minor injuries; with damage, the total cost of the accident was just over $2 million.

Crew experience: The PC had a total of 1125 hours; the PI had 806.

Summary

This review of AH-64A accidents indicates that human-performance errors were primary factors. But, alone, that tells only part of the story. ***Why*** the human-performance errors were made is the important issue.

Could the crews have been task saturated?

Could the system have let the crews down?

Human-factor accidents usually result from a multitude of events. To prevent future accidents, these events must be identified and addressed. A well-thought-out risk assessment of each proposed mission will go a long way toward achieving this goal.

To ensure successful mission completion, all human-performance-related issues must be addressed. In other words—

- The individual aviator must demonstrate discipline and professionalism.
- Aviators must be properly trained, current, and proficient.
- Standards must exist for the task or mission being accomplished. If no standards exist, we should not be doing the task.
- Leaders must enforce the standards.
- Support, which includes aircraft design, must be adequate. If it's not, users must report deficiencies through proper channels.

Some of these human-performance-related issues deserve further discussion.

Training
From the schoolhouse to the unit, the training environment never stops. Whether as trainer or trainee, integrating today's technology with current tactics, techniques, and procedures (TTPs) can at times be overwhelming. Having so many tasks and so little time makes it easy to unconsciously put tasks that we "know well" on automatic.

This is what can get us in trouble. Putting things on "automatic" causes breakdowns in crew coordination. And, at very busy times, crew coordination becomes most important. Basically, someone must be ***consciously***, not ***automatically***, flying the aircraft.

Recognizing that task saturation is real and that materiel improvements are slow in coming, we must develop control measures from a training perspective.

Leadership and supervision
The mission-planning stage is probably the best time to address task-saturation issues. Control measures must be built in—relief valves that allow aviators to back off when they feel that saturation point coming on. To achieve this, leaders must visibly and consistently support aviators who express that a particular task may be beyond their individual capability. ("Visible and consistent" support would not include soliciting "any volunteer" as a replacement.)

Once task saturation is identified and recognized as a potential hazard, control measures can be addressed in local TTPs, SOPs, and policies.

Individual
There is no doubt that most aircrews are out there doing the very best they can. However, it appears that task saturation is becoming a reality in the Apache community. And as evidenced by the scenarios cited above, experience is no protection from it. One of the most important controls individual aviators can apply may be to recognize circumstances where task overload will likely occur and plan around it or, simply, back off.

Materiel
As equipment continues to get more and more complex, the probability of task saturation becomes more and more of a reality. Hover-hold, a three-axis autopilot that allows hands-off operation, may be part of the answer to task saturation.

POC: CW5 Mike McGee, Aviation Systems & Investigation Division, USASC, DSN 558-3754 (334-255-3754), mcgeem@safety-emh1.army.mil

AH-64 crew performance: DES observations

DES evaluation of AH-64 crew performance in the combat mission simulator (CMS) has highlighted a couple of shortcomings in crew coordination.

Inadvertent IMC
The CMS scenario that DES evaluates includes encountering inadvertent instrument meteorological conditions (IMC). Evaluations have found that during the initial transition from VFR to IFR flight, the pilot not on the controls many times does not properly support the pilot who is. He or she is concerned with finding IFR publications and tuning radios rather than assisting the crewmember who's flying the aircraft.

Proper crew coordination involves the non-flying crewmember assisting the flying crewmember through the first four steps of the transition. Only after the aircraft is under control and climbing to minimum safe altitude is there a need to get publications and tune radios.

Task saturation
DES evaluations have found that task saturation can become a significant problem when the copilot/gunner is not proficient in front-seat tasks. In such cases, the back-seater oftentimes becomes focused on talking the front-seater through systems operation rather than on flying the aircraft.

Crews must understand each other's strengths and weaknesses prior to flight to prevent task saturation.

Solutions
Proper crew briefs and good two-way communication can eliminate some of the problems discussed here, but this is not the total solution. During CMS evaluations, DES has seen crews communicate the entire time and still fail to successfully fly the aircraft. It's the crews that operate as a single entity instead of two communicating—but separate—entities that succeed when things go bad.

Proper planning, rehearsal, and—perhaps most important—individual and collective proficiency are the keys to crew success. Remember, proficiency cannot be banked until the next major training event; it is a perishable skill that must be maintained continuously.

—MAJ Don Dudley; Directorate of Evaluation and Standardization, U.S. Army Aviation Center, Fort Rucker, AL; DSN 558-1098 (334-255-1098), don_dudley@ rucker-emh4.army.mil

AH-64D Longbow Apache maintenance data recorder

The digital source collector aboard the AH-64D Longbow Apache, the Maintenance Data Recorder (MDR), is not the first crash-survivable, solid-state flight data recorder placed on an Army aircraft. The MDR is, however, the first one to be fully integrated into an Army helicopter system; it was aboard the first AH-64D off the assembly line.

Description

The MDR weighs 9.75 pounds, measures 8 x 6.5 x 5.2 inches, and receives its power from the aircraft's +28 VDC power bus. A key element of the Longbow Integrated Maintenance and Support System, the MDR is designed to store maintenance, safety, and cockpit audio data in crash-protected, nonvolatile memory.

Capabilities

In addition to cockpit audio data, the MDR records and stores 109 analog flight parameters and another 479 discrete flight parameters as maintenance and flight safety data.

Maintenance data recording includes all faults; all warnings, cautions, and advisories (WCA); any aircraft system "exceedances" indicated during aircraft operation; and all logbook-forms data: TAMMS-A 2408-4 (rounds fired), -12 (logbook), -13 (faults), and -19 (TEAC).

Safety data recording includes such things as engine torque, engine tgt, engine Ng, engine Np, main-rotor speed, altitude, attitude, airspeed, acceleration, flight control actuator positions, fuel system settings including valve positions, aircraft stabilization equipment mode selections, and all WCAs and faults reported by the aircraft.

Recording for both maintenance and safety data begins whenever a.c. power is applied to the aircraft, be it from a ground power cart, the aircraft's APU, or the aircraft's engines. Further, the MDR has a built-in test (BIT) integrated into the AH-64D diagnostics system and multifunctional displays that provides fault reporting and fault isolation for MDR failures.

Downloading

With aircraft power off, the MDR is downloaded using the Soldier's Portable On-system Repair Tool (SPORT) Computer and MDR ground station software.

Maintenance

The MDR requires no flight-crew operational checks and only limited unit-level maintenance. The only maintenance that flight-line personnel can expect is the replacement of a line-replaceable unit, which requires the removal of two screws and one connector.

Storage

Storage of the MDR is simple. It can be stored indefinitely in a dry, well-ventilated place that is free of dust and other contaminants. All that's required is a plastic cap on the J1 connector to prevent damage to the cannon plug.

The future

The AH-64D Apache Longbow MDR is not only a crash-survivable solid-state flight data recorder for today, but also a combat multiplier for the digitized battlefield of tomorrow. Already, the MDR is designed to accept an expansion module for analog-data-signal processing and acquisition. This expansion module will permit—

- Onboard rotor track and balance adjustment measurement.
- Transmission, airframe, and engine usage and vibration monitoring.

In addition, designs in the AH-64D MDR ground-station software will permit the eventual transfer of logbook, aircraft and equipment usage, and fault data directly to satellites of the Army's global combat support system. This capability will enable real-time transmission of aircraft-maintenance information from anywhere in the world to anywhere else in the world, a giant leap beyond the 5 to 10 days it now takes to mail forms and records from Bosnia to the United States.

—Mr. Joseph Creekmore, Research Analysis and Maintenance, Inc., prime contractor on DSC Demonstration Program for U.S. Army Safety Center, DSN 558-2259 (334-255-2259), creekmoj@safety-emh1.army.mil

Incident report: AH-64 uncommanded flight-control movement

AH-64A pilots have reported incidents of uncommanded flight-control movement. Descriptions have ranged from slight changes in aircraft attitude to, in rare instances, movement that affected aircraft control. The AH-64 System Safety Working Group developed this survey form to provide a means of capturing information needed to identify the cause and determine an appropriate fix. If you experience uncommanded flight-control movement, please complete and mail this survey to: Mr. Pete Alukonis, Boeing Helicopter Systems, 5000 East McDowell Road, Mail Stop M530/B145, Mesa, AZ 85205-9797.

POC name: ____________________ Phone: DSN: ______________ Commercial: ______________ Date: ________

Date of incident: __________________ Aircraft S/N: ________________________________

Location (lat/long coordinates): ____

During incident, disengage affected axis(es) on DASE: Note whether problem persists, clears up, or is intermittent:

____

As soon as practical after an incident, record the following:

Affected axis(es): Longitudinal ________ Lateral ________ Directional ________ Collective ________

Aircraft attitude prior: ____

____

Aircraft response during: ____

____

Airspeed: ____

Engine torque: ____

"Feel" of controls: ____

Spontaneous movement of controls: ____

____

Illuminated caution/info lights: ____

Hydraulic pressure: Primary ______________________ Utility ______________________

Hydraulic fluctuations: Primary ______________________ Utility ______________________

Force trim: on ________ off ________ **HAS**: on ________ off ________ **SAS**: on ________ off ________

Problem: Persistent ____________ Intermittent ____________ Cleared up ____________

Shut down engines, keep systems on line, perform/record:

FD/LS read codes: HARS ____

DASEC ____

BUCS self (perform) ____

DASE self (perform) ____

After complete shutdown, perform/record:

Check rigging of mechanical controls: ____

Hydraulic actuator serial & part numbers: Longitudinal ________________ Lateral ________________

Directional ________________ Collective ________________

HARS S/N: ____

DASEC S/N: ____

Unusual maneuvers:____

Last time aircraft was washed: ____

Examine hydraulic filters: ____

Examine hydraulic fluid samples: ____

Could connectors be wet? ____

Hydraulic pump or overheat history: ____

Maintenance history (Provide copy of log since last phase.)

Comments: ____

____

____

____

ALSE list server

In response to the needs of the U.S. Army - Europe community, the USAREUR safety office has established a list server for aviation life support equipment (ALSE) issues. The purpose of the "eur-alse" list server is to advance the Army's aviation life support system by facilitating open discussion of current issues and sharing ideas.

The eur-alse list is operated by headquarters, USAREUR, but it is open to all ALSE officers/NCOs, aviation safety officers/NCOs, commanders, and others interested in ALSE. Already signed up are 75 to 80 Active Army, National Guard, and Reserve participants from Korea to North Carolina.

The structure of the list is the same as the Army Safety Center's ASO list server; everyone on the list can post messages, and we encourage members to get involved. That said, however, I offer the following:

- When answering technical questions, cite facts supported by official references.
- When giving your opinion, state it as such.
- Use caution when attaching files; large ones choke the system. It's almost always better to describe the files (and their size) and let folks who want them contact you separately.
- Dumb-down files to PowerPoint version 4 or Word version 6.0/95.
- Use the list; it's yours.

To be added to the eur-alse list server, simply contact me at rauchs@hq.hqusareur.army.mil.

—CW5 Steve Rauch, USAREUR Safety Office, rauchs@hq.hqusareur.army.mil

Update on ASOLIST

ASOLIST, the Army Safety Center's list server for ASOs, has been on line for nearly 2 years. During this time, more than 300 ASOs all over the Army have taken advantage of this virtually instantaneous way to talk to each other across continents and oceans on topics important to Army aviation safety.

If you haven't yet signed on, you're missing a good deal. Signing on is easy. Just e-mail your request to—

LSTSERV3@PENTAGON-HQDADSS.ARMY.MIL

Be sure to use the e-mail system on which you want to receive ASOLIST traffic, because the server will automatically detect your user-ID and e-mail address from your request.

The first line of your request must read: SUB ASOLIST YOUR NAME YOUR POSITION YOUR LOCATION DSN [or commercial phone number] (example: SUB ASOLIST JOHN SMITH ASO FT ANYWHERE STATE DSN 555-5555). No other information is required.

As soon as you sign up, you will receive an e-mail message giving you the rules of engagement (ROE) for the list server. Please review these rules before sending a message to ASOLIST.

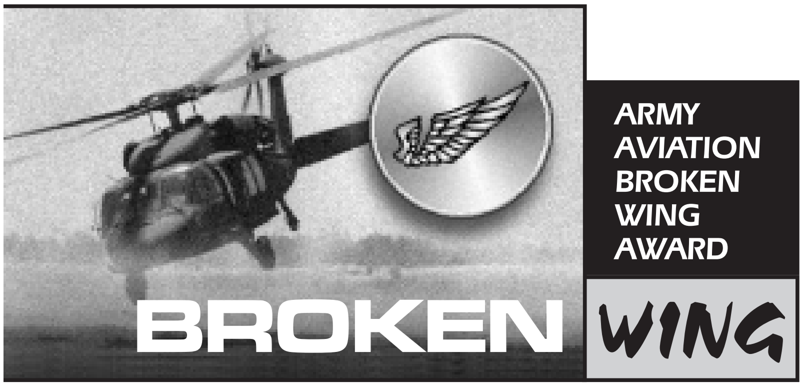
One reminder. In the simplest terms, ASOLIST automatically distributes messages to everyone on the list. So, although ASOLIST is a ***closed*** rather than a ***public*** list (not just anyone can subscribe), you should be sensitive to the information you transmit.

POC: CW4 Butch Wootten, USASC Training Branch, DSN 558-9197 (334-255-9197), woottend@safety-emh1.army.mil

New POV video on the way

Not the "usual" Army training film, this new video deals with the major causes of highway accidents in real-world terms. Soldiers will relate to the upbeat, entertaining manner in which the message is delivered. We expect that it will be widely available at local audiovisual libraries before Labor Day. Check it out by asking for "The Road Show," PIN 711133.

POC: Ms. Rebecca Nolin, Media & Marketing Division, USASC, DSN 558-2073 (334-255-2073), nolinr@safety-emh1.army.mil



The Army Aviation Broken Wing Award recognizes aircrewmembers who demonstrate a high degree of professional skill while recovering an aircraft from an inflight failure or malfunction requiring an emergency landing. Requirements for the award are in AR 672-74: Army Accident Prevention Awards.

■ CW4 Lois R. Christensen
■ CW3 Dan A. Goddard

812th Medical Company (Air Ambulance), LA ARNG
New Orleans, LA

The medevac mission involved a hospital transfer. The patient was loaded and the UH-1V took off at 0120. While climbing through 700 feet, the aircraft twice yawed severely to the right. The rpm warning light came on, and the N2 gauge indicated zero engine rpm and overspeed on the rotor rpm. The master caution and engine chip segment lights then illuminated, followed by a high-pitch engine noise and moderate vibrations. CW4 Christensen, the PC, announced N2 failure and immediately took control of the throttle as previously briefed. CW3 Goddard, the PI, announced that he had a landing area and made a right turn toward it. The landing area was a large, well-lit concrete parking area with what appeared to both pilots to be a single wire marked with orange obstruction balls running down the middle, parallel to the approach path. What the balls were actually marking was not visible from altitude—numerous wires spaced 100 feet apart and crossing left to right across the approach path.

On short final, when the crew chief and medic began shouting “Wires! Wires!”, CW3 Goddard saw the wires and slowed the aircraft. He made a pedal turn to the right and let down between the wires. CW4 Christensen continued to maintain rotor rpm with manual throttle application. A rapid collective-pitch pull was necessary to control descent to the ground, and rotor rpm began to decay.

At about 20 feet agl, the aircraft began to spin to the right. CW4 Christensen was unable to recover rpm and announced throttle going to closed position as CW3 Goddard completed his autorotative landing. During collective-pitch pull, a main-rotor blade flexed upward and contacted one of the wires, but there was no damage. An emergency shutdown was completed.

■ CW4 Phillip E. Hill

Army Aviation Support Facility, TN ARNG
Jackson, TN

During cruise flight at 1500 feet agl and 100 knots, the crew of the UH-1H heard a loud bang. Seconds later, the master caution and engine chip segment lights came on. CW4 Hill, the PC, made an immediate right turn toward an open field and began a powered descent. Seconds after that, another bang was heard, the engine oil pressure segment light came on, and N1 decreased to zero. CW4 Hill entered autorotation and called for emergency procedures for engine failure.

As he continued the autorotational descent, CW4 Hill realized that the aircraft would land short of the intended landing area. He then increased airspeed to maximum glide in order to make the open field. He successfully made his approach to the open field, which at a lower altitude revealed itself to contain no level touchdown area. He then maneuvered the aircraft to the best available area, which was the front side of a rolling hill. Considering the weight of the aircraft with nine personnel on board and the up-sloping terrain, CW4 Hill made a minimum deceleration termination and touched down in a nearly level attitude. But with the up-sloping terrain, the aircraft rocked forward on the toes of the skids, and the WSPS dug into the ground. CW4 Hill maintained control, keeping the aircraft from rocking forward, and maintained a straight ground track, which kept the aircraft from rolling onto its side.

As the aircraft slid toward the top of the hill, he assessed that the down-slope was excessive and to the right and quickly determined that the aircraft would very probably roll onto its right side. Realizing the importance of stopping the aircraft—even if it meant damaging it—in order to minimize injury to his passengers and crew, he applied aft cyclic, which stopped the aircraft upright at the top of the knoll.

Although the aircraft sustained Class C damage, no passengers or crewmembers were injured.

■ CW3 Michael W. Meyers

Army Aviation Support Facility, TX ARNG
Austin, TX

The AH-1F was returning at dusk from a firing range. The PI was on the controls, and CW3 Meyers, the PC, was in the front seat. With the aircraft in cruise flight at 1300 feet agl and 105 knots, he told the PI to turn and descend to avoid a fixed-wing aircraft at the same altitude.

As airspeed slowed to 90 knots during the descent, the pilots heard a loud crack from the rotor system. The aircraft immediately went into a right nose tuck, followed by a vibration so violent that both crewmembers' shoulder harnesses locked. Unsecured items were thrown around the cockpit, hitting the pilots, and the aircraft shook so violently that they were unable to read or interpret any of the engine or flight instruments. The noise level was such that ICS voice transmissions could not be understood. CW3 Meyers resorted to using hand and arm signals to direct the PI to start a descent.

CW3 Meyers then took the controls and tried to level the aircraft, but it again started to shake violently and rolled into a right turn. Both crewmembers attempted to stop the right turn with full left cyclic and left pedal. CW3 Meyers lowered the collective to the full-down position, which reduced the severity of the vibration, but the aircraft continued to turn to the right. As it slowed through 60 knots, he was able to stop the turn. At about 200 feet agl, he regained marginal control and spotted an emergency landing site southwest of their position.

The landing site consisted of an irregular-shaped field littered with small boulders, cactus, numerous stumps, and a 5- to 6-degree slope to the south. CW3 Meyers placed the aircraft in a left descending turn in an attempt to lose altitude and align the aircraft into the wind. As he decelerated at 10 to 15 feet, the aircraft again started vibrating violently, blurring the crewmembers' vision. Fearing loss of control, CW3 Meyers lowered the collective until impact with the ground. The aircraft touched down in a 5-degree nose down attitude between a lava rock outcropping and several tree stumps.

The aircraft sustained no damage during the emergency landing, but the PI received bruises to his inner thighs and lower legs from the violent displacement of the cyclic stick at the pilot station.

Postflight inspection revealed that the lower cheek plate fitting had broken free, allowing a main-rotor blade to twist and flap beyond normal limits.

■ CW2 Thomas J. O'Neal

C Company, 4th Battalion, 1st Cavalry Division
Fort Hood, TX

The mission was to complete CW2 O'Neal's APART and NVG currency. At 0545, the UH-60A departed the airfield to remain in right closed traffic. CW2 O'Neal, seated in the left pilot's seat, performed the NVG takeoff. As the aircraft turned onto the downwind leg and climbed through 400 feet agl, the crew lost visual contact with the ground. The IP radioed the control tower that they were entering inadvertent IMC, then took the controls from CW2 O'Neal. While the IP initiated a level climb, CW2 O'Neal removed his NVGs, turned the transponder to the emergency mode, and radioed flight operations of the emergency. ATC transitioned the aircraft to conduct the ILS approach.

As the aircraft descended through 400 feet agl on final approach, the crew regained visual reference. However, when the IP decelerated to 40 knots at 20 feet agl, the aircraft began an uncommanded right turn. As he worked the tail-rotor pedals to diagnose the situation, the IP received no response to his inputs, and the right spin accelerated. He then announced to CW2 O'Neal, "I've lost the tail rotor," and told him to shut down the engines. CW2 O'Neal had anticipated this instruction and was already working to overcome the considerable G forces involved by bracing himself against the left door with his left arm. Doing so enabled him to move both engine power control levers from "fly" to "engine off" with his right hand.

The rate of spin then decreased, and the aircraft descended to the runway, touching down upright and turning. It then flipped, coming to rest on its right side.

The aircraft sustained less than $1 million damage in what very well could have been a total-loss accident ($4.5 million). Both pilots walked away.

■ Mr. Bertrand Rhine, III

The Boeing Company
Mesa, AZ

A senior experimental test pilot, Mr. Rhine was conducting a test flight of an MH-6J for the Mission Enhancement Little Bird (MELB) program. While collecting airspeed calibration data by performing a climbout at takeoff power (70 knots), the crew heard a loud bang and felt the aircraft shudder with some vibration. They were immediately informed by the chase aircraft that the tail-rotor gearbox, with tail rotor attached, and the "bicycle rack" instrumentation had separated from the aircraft.

Mr. Rhine initiated an autorotative descent and began a shallow turn toward a suitable landing area into the wind. He maintained a level attitude during the descent and initiated a deceleration in preparation for landing. During application of collective to slow the aircraft, it began a slow turn to the right, touching down with the nose approximately 45 degrees to the left of the initial landing direction. The aircraft slid and continued to rotate counterclockwise until it came to rest approximately 75 feet from its initial touchdown point, facing in the opposite direction. The aircraft sustained no damage other than that caused by the tail-rotor gearbox separating from the aircraft, and the crew escaped unhurt.

Accident briefs

Information based on *preliminary* reports of aircraft accidents

AH1

Class E

F series

■ On downwind after takeoff, ALT/RECT light came on. PC tried twice to reset alternator and was unsuccessful both times. During shutdown after precautionary landing, PC smelled odor coming from electrical compartment. Static inverter was replaced.

■ During flight idle, engine oil pressure began fluctuating between 40 and 150 psi, occasionally sticking at 150 psi. When crewmember opened left engine cowling and tapped on tranducer, oil pressure stabilized at 90 psi and crew continued mission. After closing out fuel check, crew noted excessive fuel burn rate and landed and shut down. Caused by failed forward fuel probe and bad engine oil pressure transducer.

AH64

Class C

A series

■ While ground taxiing aircraft for post-phase maintenance test flight, crew heard 30mm gun strike ground. All armament switches were off and safe. Maintenance personnel suspect that incorrectly adjusted elevation resolver allowed gun to strike ground.

Class E

A series

■ Rapid onset of severe vertical vibration occurred during climb from low-level flight. Crew elected to return to home base, where aircraft landed and was shut down without further incident. Caused by debonding of main rotor blade near tip cap. Rotor blade was replaced.

■ Brake handle was in and assumed released, but brakes were still set. This resulted in both main landing gear tires deflating on touchdown. Maintenance replaced tires and aircraft returned to flight.

CH47

Class B

D series

■ During taxi to park, aft rotor blades contacted windsock as aircraft turned left onto parking pad. All three blades required replacement.

Class C

D series

■ Crew heard high-pitched whine for several seconds while on ground in confined area but noted no abnormal cockpit indications. As they applied power to both engines to check for vibrations, No. 1 engine transmission oil temperature exceeded 130°C. As power was reduced, temperature continued to rise, exceeding 140°. Upon completion of emergency shutdown, No. 1 engine transmission oil temperature peaked at 145°, and No. 2 engine and combining transmission oil temperatures exceeded 120°C. Inspection revealed that combining transmission cooling fan shaft had sheared.

■ During taxi for takeoff, master caution light illuminated with associated transmission hot capsule. IP isolated problem to No. 1 engine transmission and immediately performed emergency engine shutdown of both engines. Postflight inspection revealed severed transmission cooling fan drive shaft and metal flaking on combining transmission filter.

Class E

D series

■ Fifteen-inch crack was found in aft rotor blade 42 inches from where trailing edge begins. Cause is under investigation.

■ During slingload operations in dry, dusty environment, hook-man failed to wait until static discharge probe had been connected to aircraft before making contact with forward hook. Static electricity discharged, shocking soldier off load. Soldier was admitted to local hospital for observation.

OH6

Class C

J series

■ During approach to confined area while conducting high-gross-weight training, PC suspected overtorque and landed. Instrument monitoring system confirmed 86.4 psi; maximum allowable torque is 84.5.

■ During test flight, engine flamed out during straight and level flight. PC entered autorotation; at about 20 feet agl, engine re-ignition system restarted the engine. Corresponding torque and difficulty handling the aircraft resulted in hard landing, which separated tail boom and damaged rotor blades.

OH58

Class A

A+ series

■ Radio communication was lost after aircraft encountered bad weather. Aircraft was found 3 days later, having impacted a severe slope in a densely wooded area. Pilot and passenger were both killed, and aircraft was destroyed. Accident is under investigation.

Class C

D(R) series

■ Tail rotor struck tree, damaging both tail-rotor blades.

Class E

C series

■ When student pilot was repositioning aircraft, gust of wind turned aircraft to left. Student applied left pedal, which increased rate of turn. As IP took flight controls, aircraft descended and contacted landing pad. Aft skids touched down first, and aircraft rocked forward. Front cross tube sustained minor damage.

D(I) series

■ Pilot was unable to engage stability and control augmentation system (SCAS)

Note: Information published in this section is based on *preliminary* mishap reports submitted by units and is subject to change.

during runup. Inspection revealed that copilot cyclic SCAS release switch had been wired backwards.

Class F

D(I) series

■ On final approach, aircraft yawed and PC heard loud bang from engine. Suspecting compressor stall, PC decided to make minimum-power run-on landing to taxiway. Compressor stall increased in severity at 15 feet, but aircraft was landed without incident. Inspection revealed compressor blades were damaged beyond repair from sand ingestion.

■ During formation flight, Nr dropped slightly and aircraft yawed left. PC also felt bump in flight controls. Thinking he had a bird strike, he landed on end of airfield. Inspection for visible damage revealed none. Maintenance inspection, however, found compressor blades damaged beyond repair.

UH1

Class D

H series

■ Forward cross tube failed during termination phase of run-on landing. Forward tunnel and fuselage (belly) were damaged.

Class E

H series

■ Aircraft was started with main-rotor blade tied down. N1 reached 40 percent before start could be aborted.

V series

■ During IGE hover, transmission oil pressure gauge indicated zero without corresponding transmission oil pressure low light. Crew landed immediately. During hover to ramp 200 feet away, noise from transmission area increased and transmission oil pressure low light illuminated momentarily. Crew again landed immediately. Upon ground contact, aircraft began uncommanded left yaw. ME retarded throttle, and transmission seized. Main rotor made approximately two rotations before it completely stopped. Aircraft remained upright, sustaining damage due to sudden stoppage and resultant torque effect on airframe. Small oil fire noted in upper transmission area was extinguished without incident.

■ Master caution and chip detector caution lights came on during in-ground-effect hover. Caused by failure of debris monitor (with ODDS).

■ After crew had started engine, crew chief checked engine compartment and saw fuel leaking from left side of engine. B-nut on manifold assembly had backed off, allowing fuel to leak.

UH60

Class A

L series

■ Aircraft crashed into mountain approximately 100 feet down-slope from peak. All three crewmembers were killed. Accident is under investigation.

■ Aircraft struck trees and crashed, killing two passengers. Accident is under investigation.

Class B

A series

■ Postflight maintenance revealed that all four main-rotor blades had contacted ALQ-144 antenna, damaging all components.

Class C

A series

■ Damage to main-rotor tip caps was discovered during postflight inspection following NVG confined-area operations. Suspect tree strike.

■ Tgt exceeded start-abort limit (850°C) during engine start. During start abort, tgt rose to 940°C for 10 seconds. Estimated engine damage: $340,000.

■ Structural damage was discovered during postflight after phase maintenance test flight. Investigation is under way.

L series

■ Crew smelled burning electrical odor during hot refueling, but all gauges were normal and crew could not find any indication of fire or smoke. As aircraft was positioned out of refuel, crew noted burning smell was becoming stronger. During shutdown, crew observed small amounts of smoke coming from No. 1 engine compartment. Inspection revealed heat damage to No. 1 engine compartment. Cause not reported.

Class E

A series

■ Ground crew heard whistling sound coming from rotor system of aircraft taxiing to parking. After shutdown, main-rotor blade erosion strip had 18-inch separation.

L series

■ Aircraft was on short final to LZ when parachute flare blew into rotor system. Blade was repaired and aircraft released for flight.

■ Complete loss of a.c. power occurred during landing. Emergency APU start was completed, and aircraft was shut down without further incident. A bare electrical wire was creating a short, which resulted in loss of a.c. power.

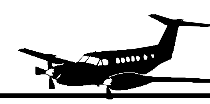
■ Four-inch tear was discovered on bottom of main-rotor blade. Inspection revealed metal clip from vehicle imbedded in blade. Suspect damage was caused when aircraft landed to unimproved LZ and mud containing clip was slung from landing gear into rotor system. Blade was replaced.

Class F

L series

■ Whining noise was heard from cabin roof area during cruise flight. About 10 minutes later, cruise climb was initiated; 20 to 30 seconds later, loud shudder and bang was heard. Aircraft was landed without incident. Caused by turbine engine FOD.

C12

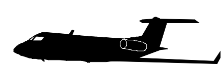


Class E

G series

■ Right bleed air warning light came on during cruise at 21,000 feet. Crew performed emergency procedures and returned to takeoff point without incident. Poly-flow tubing had come in contact with bleed air line and melted hole in blue plastic tubing.

C20



Class E

F series

■ Left thrust reverser unlock light came on during climbout. Checklist procedures were followed, and light remained intermittent. Caused by improper adjustment of left thrust reverser doors.

For more information on selected accident briefs, call DSN 558-2785 (334-255-2785).

Aviation messages

Recap of selected aviation safety messages

Aviation safety-action message

GEN-98-ASAM-02, 251610Z Jun 98, maintenance mandatory
This message supersedes GEN-98-ASAM-01. The purpose of this message is to provide consolidated and updated information on aviation NVG messages. It is not intended to replace any publication.

AMCOM contact: Mr. Robert Brock, DSN 788-8632 (256-842-8632), brock-rd@redstone.army.mil

Safety-of-flight message

AH-1-98-SOF-01, 242118Z Jun 98, technical
In November 1997, the Army placed flight restrictions on UH-1 helicopters in response to a trend of N2 spur gear failures caused by vibration in the aircraft's T-53 engines.

AH-1 aircraft equipped with the T53-L-703 engine has exhibited the same vibration found in the T53-L-13B engines. However, the T53-L-703 engine fleet has experienced a lower spur gear failure rate.

After careful consideration and as a prudent safety measure, the Army has determined that all AH-1 aircraft T53-L-703 engines will be inspected for vibration levels. An inspection procedure has been established to screen for and detect the presence of the vibration associated with failure of the spur gear (P/N 1-070-062-04, NSN 3020-00-453-9441). This procedure utilizes the aviation vibration analyzer (AVA) with a specialized application program specifically designed to detect the vibration.

Aircraft found to exhibit the damaging vibration will be grounded until the engine is replaced or a long-term corrective action is implemented. This long-term action is expected to be implemented by the second quarter of FY99. Aircraft that are screened and do not exhibit the damaging vibration will be released to fly. All aircraft released to fly will be required to repeat the vibration inspection every 25 flight hours.

Specialized reporting procedures are required to document the results of the vibration screening. Accurate, timely reporting is crucial to procuring the correct number of replacement assemblies and restoring the entire fleet to flight status as soon as practical.

The purpose of this message is to—

- Direct a one-time screening inspection and 25-hour recurring inspections of all AH-1 aircraft with T53-L-703 engines for damaging engine-vibration levels.
- Identify the procedure to obtain pre-programmed AVA memory cards to perform the vibration test.
- Direct special reporting of vibration screening results.

AMCOM contact: Mr. Robert Brock, DSN 788-8632 (256-842-8632), brock-rd@redstone.army.mil

POV-fatality update through June

Speed • Fatigue • No seatbelt

No new causes, just new victims

FY98	FY97
88	63

IN THIS ISSUE

WS • War Stories, CC • Crew Commo, SF • Shortfax

Class A Accidents through June

Qtr	Month	Class A Flight Accidents 97	Class A Flight Accidents 98	Army Military Fatalities 97	Army Military Fatalities 98
1ST QTR	October	0	2	0	0
	November	0	1	0	0
	December	1	2	0	2
2D QTR	January	2	2	2	0
	February	0	0	0	0
	March	2	1	1	0
3D QTR	April	2	0	2	0
	May	1	1	1	0
	June	3	2	0	4
4TH QTR	July	1		8	
	August	0		0	
	September	0		0	
	TOTAL	12	11	14	6

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