Volume 13 □ Number 10 28 November 1984

Flightfax
Report of Army Aircraft Mishaps

Aircraft accident review

Incorrect snow landing technique

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Fort Rucker, Al 36362

Synopsis

When the crew of a UH-1M noticed that the right cargo door was ajar, they decided to land at an unlighted airport. As the aircraft was landing, it became engulfed in rotor-induced blowing snow. The right skid hit the ground, and the UH-1 rolled right and came to rest inverted.

History of flight

A pilot and copilot were scheduled for an instrument proficiency flight in a UH-1M. It was dark by the time the crew completed their cockpit checks and received an IFR clearance. With the copilot on the controls, the aircraft took off and climbed toward the assigned altitude of 6,000 feet.

As the Huey passed 3,500 feet, the crew noticed they were picking up visible moisture. Because of previously forecast moderate rime icing, the pilot requested that the assigned altitude be amended to 3,000 feet. This request was approved.

When the aircraft was at 3,000 feet, the copilot commented that the cabin temperature was unusually cold. The pilot increased the cabin heat, but the cold persisted. After several more comments regarding the temperature, the pilot took the controls while the copilot checked the rear of the aircraft. He discovered that the right cargo door was open about 20 inches. The pilot decided to cancel the IFR clearance and make a precautionary landing at an airport so the door could be secured.

About 25 minutes after taking off, the aircraft entered the traffic pattern at the uncontrolled, unlighted airport. The pilot told the copilot to turn on the landing light at 100 feet above the ground. The pilot decided to make the approach to what he considered to be a stabilized high hover and then descend vertically to the ground.

As the aircraft began to stabilize at a hover, it was enveloped in a cloud of snow blown up by rotor blades. The pilot responded by adding collective pitch in an attempt to fly out of the condition. About the same time, the right skid hit the ground. The UH-1 began a slow 180-degree roll to the right and came to rest inverted. Neither crewmember was injured in the crash.

Crew experience

The 35-year-old pilot had almost 1,700 rotary wing flight hours, with more than 200 in the UH-1M. The 38-year-old copilot had more than 100 rotary wing hours, with more than 70 in the UH-1M.

Commentary

The operator's manual requires that an aircraft be landed as soon as practical to secure an open door. Therefore, the pilot made the right decision to land at the airport. Both crewmembers were familiar with the airport, having landed there at night on several other occasions. A safe landing could have been made had the correct snow landing technique been used.

Instead of continuing the approach to the ground, the pilot stopped the aircraft at what he believed to be a high hover, about 15 feet. Actually, the hover was established at approximately 10 feet. Because there were no lights or other visual cues on or surrounding the airport, the pilot allowed the aircraft to continue to descend. Blowing snow generated by rotorwash caused the crew to lose outside reference, and the

Accident review

descent continued until ground contact.

According to the operator's manual, landings to snow may be considered normal except for five precautions, two of which are considered relevant in this case:

1. Anticipate loose powdery snow and crust on all landings on snow.

2. When making an approach and landing on snow, it should be one continuous operation without extended hover in order to reduce the whiteout condition.

Although aware of these precautions, the pilot based his decision to terminate to a hover on the fact that he had never landed to the ground in loose snow. Unit policies and safety meetings repeatedly addressed procedures for snow landings. Both crewmembers had been exposed to the proper procedures but probably lacked the confidence, normally gained from experience, to execute the procedures.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	1-28 Nov	**4**	**3**
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**7**	**3**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Farewell message

My assignment as Commander of the Army Safety Center has been a satisfying way to top off my 30-year career. It wasn't as thrilling as flying Mohawks in Vietnam, but it offered the same kind of challenge. After every flight, I felt I could have done something better; after every review of an Army accident, I felt the same way. In both cases the feelings were true. I've never flown the perfect flight, and I was never able to put together the perfect aviation safety program.

But I'm pleased with the way things have turned out. A look at the Class A aircraft accident record over the past 3 years shows improvement. In fiscal year 82 the Class A mishap rate was 3.67 compared to 2.47 in fiscal 84. That's progress—not ideal—but certainly this decline in the number of Class A aircraft accidents is a positive indication that aviation people are doing their jobs better. I'd like to think that the Safety Center has helped you by giving you some of the technical services and products needed to reduce accident losses.

Colonel Joseph R. Koehler
Commander, U.S. Army Safety Center

Because a great many of you have been on the receiving end of my lectures on aviation safety over the past 3 years, and have been subjected to my ranting and raving about "stupid accidents," I felt it would be appropriate as a final message to assure you that there are great aviators and units out there who do things the safe way—as it should be. Unfortunately, we will always have a few aviators who will intentionally do something wrong, hoping to get away with it. But they are being identified and dealt with appropriately.

Now that retirement time is here, I realize more and more what a fine group of aviation professionals I've worked with over the last 3 years. I'm going to miss the Army; I'm going to miss flying and I'll miss the Safety Center; but most of all, I'm going to miss working for you. So keep up the good work. I salute you and wish each of you the best for the future. ■

Selected mishap briefs

Information based on preliminary reports of aircraft mishaps received 9-15 November

Utility helicopters

UH-1 Class A mishap

H series - Engine failed on short final, and aircraft hit hard about 50 feet from end of runway. Aircraft was damaged extensively. 8508

UH-1 Class D mishap

H series - UH-60 landed as UH-1 crew chief was securing his aircraft. As crew chief exited through left door, door was blown from his hand. Door post and window were cracked.

UH-1 Class E mishaps

H series - Master caution and transmission oil hot lights came on. Caused by defective transmission oil temperature probe.

H series - Fire warning light came on. Caused by corroded wiring in fire detector system.

H series - Three or four loud noises were heard from engine area, accompanied by left yaw. Sandy environment caused excessive erosion to compressor blades.

H series - Fuel gauge dropped from 400 pounds to 275 pounds in 6 minutes. Squealing sound was heard from left boost pump. Caused by failure of fuel boost pump cartridge.

H series - Transmission oil pressure dropped to zero. Crew chief said there was heavy smoke in passenger compartment. Caused by failure of quick disconnect to transmission oil output line.

H series - Engine oil pressure dropped during flight. Caused by malfunction of pressure relief valve on engine oil pump.

UH-60 Class E mishap

A series - Pilot heard loud whistling noise during takeoff. Caused by separation of skin on yellow blade trim tab.

Attack helicopters

AH-1 Class E mishaps

S series - Transmission oil pressure dropped during flight. Caused by failure of oil pressure transducer.

G series - Pilot had difficulty maintaining operating rpm when power was reduced for final approach. Rpm fluctuated from 6700 to 6200 with power adjustments. Pilot was able to control rpm by use of manual control of throttle. Slow running landing was made. The head of a bolt which held upper engine mount to engine tri-pod located on left side of engine broke. After head sheared, bolt slid out of place, causing tri-pod mount to move.

S series - Rpm warning light and audio activated, and N_2 dropped to zero. Caused by failure of N_2 tachometer generator gauge.

S series - Engine oil pressure dropped to 35 psi during flight. Caused by broken wires inside cannon plug at aft edge of contact.

Cargo helicopters

CH-47 Class D mishap

C series - As aircraft was moved to release slingload, aircraft hit the load, damaging skin of aircraft and load. Ground support crew had rigged external load with very short sling, preventing adequate safety margin between load and aircraft.

CH-47 Class E mishaps

C series - As aircraft was hovering after landing, No. 1 engine had low-side beep failure. There was an excessive amount of hydraulic oil coming from engine area. Inspection of engine showed failure of a seal and packing on hydraulic starter motor, causing oil leak. Further inspection of No. 2 engine revealed a starter bolt on the engine deck, another bolt missing, and the third one in place.

C series - IP noticed split in torque during flight. Caused by oil on cannon plug.

Observation helicopters

OH-58 Class D mishap

A series - Main rotor blade hit tree limb during NOE flight. Blade was dented.

OH-58 Class E mishaps

A series - N_2 speed dropped to 96 percent during climbout. Running landing was made without further power loss. Aircraft was checked and no malfunctions found. After several hovering takeoffs, turns, and landings were made without any malfunction, maintenance officer cleared aircraft for one-time flight to base airfield 23 miles away. When aircraft was landed at airfield, throttle was retarded to idle speed for cool-down and engine quit. Caused by malfunction of fuel control.

C series - Engine quit on runup as throttle was advanced past engine idle. Nut on accumulator check valve had loosened, allowing air leak.

A series - Master caution and hydraulic lights failed to illuminate during hydraulics control check. Caused by failure of hydraulic pressure switch.

Fixed wing

OV-1 Class E mishaps

D series - Pilot smelled electrical burning odor during photo mission. Caused by malfunction of camera control.

Mishap briefs

D series - No. 2 engine had a series of compressor stalls during climb. Caused by cracked diffuser housing to P-3 fitting.

C-12 Class E mishaps

C series - Crew and passengers smelled strong toxic odors during flight. Caused by electrical short in forward vent blower.

C series - Five birds hit right wing of aircraft during landing.

U-21 Class E mishap

A series - Copilot's brakes felt spongy during initial line-up check. During flight, pilot noticed that when brakes were applied, pedals went full forward. During landing, pilot had no brakes, but copilot's brakes worked. Pilot's left brake cylinder assembly was leaking at the seals.

Maintenance

AH-1 Class E mishaps

S series - Fuel was seen leaking from aircraft during runup. Caused by loose fuel line to fuel control.

S series - Noise was heard from hydraulic pump, followed by illumination of master caution and No. 2 hydraulic lights. Caused by loose fitting.

CH-47 Class D mishap

A series - Maintenance personnel saw aircraft taking off with No. 1 synchronized drive shaft access cover not secured. Crew was told by tower that aircraft had a loose cowling. As aircraft was landing, crew chief heard loud popping sounds. Five synchronized drive shaft access doors were destroyed and two synchronized drive shafts were scored. Suspect crew chief did not properly secure No. 1 access cover, allowing slipstream to loosen the other covers.

OH-58 Class E mishaps

A series - Engine rpm dropped below 97 percent during hover. Governor stops were adjusted incorrectly.

A series - Engine oil temperature gauge reading dropped to zero during hover. Wire to terminal block in oil tank compartment was not secured correctly.

Messages received

• Safety-of-flight technical message concerning replacement of pitch change clevis of all UH-1 aircraft except C/M models (UH-1-84-11, 131300Z Nov 84). Summary: This message directs the changeout of the old pitch change clevis with the new solid shank clevis and cancels SOF UH-1-84-09. Contact: Rich Smith, AUTOVON 693-1685, commercial 314-263-1685.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

U.S. ARMY SAFETY CENTER

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Flightfax®
Report of Army Aircraft Mishaps

Aircraft accident review

Approach to mountainous confined area

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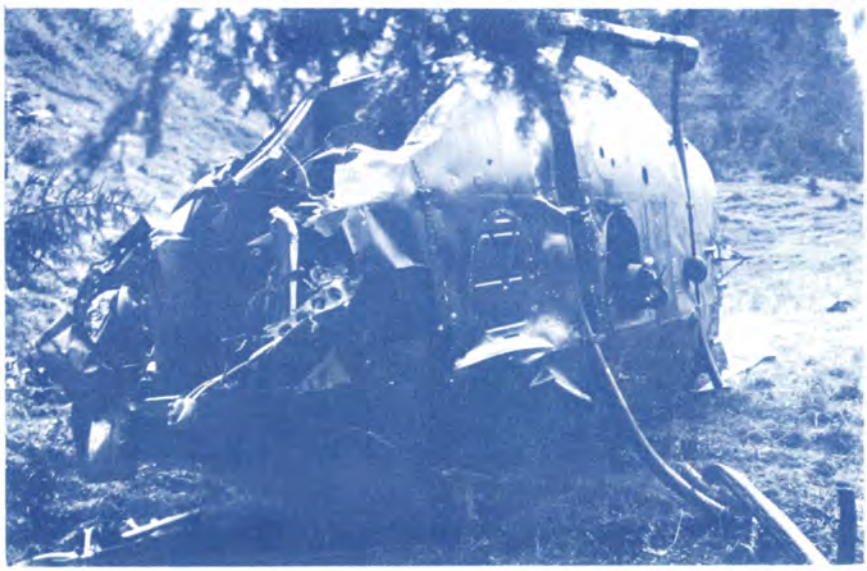
Fort Rucker, Al 36362

Synopsis

The UH-1H copilot terminated an approach to a mountainous confined area at an out-of-ground-effect hover. A right pedal turn could not be stopped. During attempted recovery, the tail rotor system hit a tree. Control was lost, and the Huey crashed.



History of flight

The unit operations officer received a mission to insert seven soldiers into a mountainous tactical landing zone. The crew of three and seven passengers took off from the airfield for the 10-minute flight to the landing site. The copilot was flying the UH-1, which weighed approximately 9,000 pounds.

The pilot, navigating from the left seat, let the copilot fly past the landing site. Realizing the error, the pilot had the copilot turn back. The copilot began a normal approach to the pinnacle landing zone, terminating the approach at a 30-foot hover. After stabilizing the hover, the copilot began a right pedal turn to align the helicopter with the desired landing axis. As the helicopter turned through 90 degrees, the copilot applied full left pedal. This did not stop the turn. Collective pitch was then increased, causing engine rpm to begin to bleed off and activating the main rotor rpm light and audio warning system.

The pilot took control of the aircraft. Realizing they had drifted close to a building, the pilot tried to fly out of the situation instead of landing and possibly colliding with the building. He applied forward cyclic, reduced left pedal input, and momentarily reduced the collective pitch/power lever in an attempt to regain engine and main rotor operating rpm. The UH-1 accelerated to about 20 knots and the fuselage streamlined.

The pilot realized the aircraft was going to brush the top of a tree in its flight path. Because the engine/rotor rpm was still low, the pilot decided not to attempt to miss the tree. The underside of the helicopter hit the tree, with no serious damage. However, the tail rotor system hit another tree, causing one tail rotor blade to separate at the blade grip assembly. The out-of-balance condition caused the 90-degree gearbox to break away from its hard mount, and antitorque control was lost.

The helicopter yawed slightly to the right and rolled to the left before crashing on a steep slope. It rolled over and came to rest on its left side. Three of the passengers unfastened their seatbelts on initial impact and jumped or were thrown from the helicopter as it tumbled down the slope. The seven passengers received varying degrees of back injuries. The pilot sustained a back injury and lacerations; the crew chief sustained a minor head injury; and the copilot was not injured.

Crew experience

The 38-year-old pilot had more than 4,400 rotary wing flight hours, with more than 200 in the UH-1H. The 37-year-old copilot had more than 700 rotary wing flight hours, with almost 600 in the UH-1H.

Commentary

It was concluded that the copilot made an incorrect decision when he decided to terminate the approach at an out-of-ground-effect hover while at a gross weight of 9,000 pounds. As a result, when the right pedal turn was begun, the antitorque capabilities of the tail rotor were exceeded and the right turn could not be stopped. The full left antitorque pedal application and addition of power to clear the obstacles

Accident review

exceeded the maximum power available, causing engine rpm to deteriorate. A factor in the copilot's decision was the lack of a unit training program in mountain flying.

The pilot realized the approach was being terminated at a higher than normal altitude, but he did not correct the copilot. He did not anticipate the potential danger because he had recently been transferred to the unit and had previously flown CH-47s in the same environment. The type of approach and termination being made were normal for a CH-47 so, because of habit interference, the pilot was not alarmed by the high termination of the approach or the right pedal turn. Because of the lack of a unit mountain flying training program, the pilot was relying on past experience in the CH-47 rather than experience gained through unit training in the aircraft type, series, and model being flown. ■

Midair collision avoided

Last May, there was a near miss between an Army UH-1 and an Air Force C-141 in Europe. Investigation of the incident revealed the following:

An instrument flight plan was filed for the UH-1 from one field to its home field, at an altitude of 5,000 feet. The crew consisted of an IP, pilot, and copilot. As the crew was preparing for departure, ground control cleared the helicopter to its destination. The IP questioned the validity of the clearance since it did not include an assigned altitude. He told the pilot to obtain an assigned altitude.

The pilot called ground control and asked them what his assigned altitude was. The controller said, "Your flight planned altitude was 5,000." The pilot replied, "Roger. Contact the tower when ready for departure." After a short delay, the aircraft departed from the airfield and was to contact _____ radar.

After departure, the copilot tried to contact _____ radar several times on the frequency assigned but was unable to do so. The copilot called the tower to get a UHF frequency, and he was told to stand by. The tower controller called for and received a UHF frequency. He also received an altitude restriction. The controller read back the new frequency but never acknowledged the altitude. When the controller relayed the UHF frequency to the UH-1, he overlooked the altitude restriction.

The UH-1 pilot then contacted _____ radar on the new frequency and reported that he was climbing through 3,700 for 5,000. The controller responded, "Roger. Maintain 3,000." The pilot replied, "Out of 3,700 for 3,000." The controller said, "Roger."

As this conversation was taking place, the UH-1 crew saw the C-141 about a mile away and took action to avoid it.

The UH-1 crew did not comply with the altitude restrictions in the SID of the airfield from which they departed. A random survey was later conducted of aviators assigned to the command. A departure clearance similar to the clearance received by the UH-1 crew was given. In almost every instance, the aviator did not comply with the altitude restrictions depicted in the SID.

Tower personnel must be attentive of all information given during ATC coordination of a hand-off. Often one piece of information is requested and several given in return.

The operating errors reported in this incident resulted in a near-miss. The next time we may not be so fortunate.

Can simulators kill you?

A seminar was held recently at the Navy Postgraduate School in Monterey on "simulator-induced syndrome," a phenomenon that even the docs admit they know little about. It seems that several aircrews have reported severe nausea, dizziness, vertigo and other symptoms during and after simulator flights. These symptoms have been known to subside and then recur hours later for no apparent reason. Indications are that this is more than simple motion sickness and that it could have adverse effects on aircrews flying after simulator training.

Several Navy sites are now grounding aircrews who exhibit symptoms after simulator flights. Here are a few suggestions that may help, from the Navy Safety Center's Aeromedical Division:

1. Maintain simulators properly so that the motion and visual systems approximate actual aircraft motion as much as possible.

2. Take breaks if simulator training exceeds 1 hour.

3. Avoid "freezing" simulator motion in unusual attitudes.

4. Avoid simulators when ill, fatigued, or on medication.

5. Do not fly for 12 hours after simulator training if you have or have had symptoms of this syndrome.

6. Report symptoms to your flight surgeon! This is the most important suggestion. Until we get more information on this syndrome, we won't be able to pinpoint the causes. Simulator-induced syndrome is **normal,** and you won't be "labeled" for having experienced it.

If you have any questions or comments about this, write Lcdr. Larry Frank, MSC, at the Naval Training Equipment Center (Code N71), Orlando, Florida 32813, or call AUTOVON 791-5130. ■

—from Approach

Selected mishap briefs

Information based on preliminary reports of aircraft mishaps received 16-22 November

Utility helicopters

UH-1 Class E mishaps

V series - Fuel vapor was detected during flight. Caused by failure of auxiliary fuel line fitting.

H series - Master caution and transmission oil pressure lights came on. Caused by failure of oil filter gasket.

H series - Loud popping sound was heard after takeoff, followed by illumination of hydraulic pressure light. Feedback was felt in controls. Caused by failure of irreversible valve.

H series - Crew noticed smoke coming from pedal area. Caused by overheated battery.

H series - Squealing sound was heard during flight. Caused by malfunction of main inverter.

UH-60 Class D mishaps

A series - Aircraft landed on artillery aiming stakes which had been left in LZ. Stabilator was damaged.

A series - Main rotor blade hit bush during landing in confined area. Blade tip cap was broken.

UH-60 Class E mishaps

A series - Pilot felt feedback in controls during landing. Caused by worn uniball.

A series - As No. 2 engine power control lever was retarded from fly to idle, high-pitched whine was heard from right input module area. Caused by unbalanced high speed shaft.

Attack helicopters

AH-1 Class E mishaps

S series - High frequency vibration was felt through tail rotor pedal controls. Caused by failure of tail rotor control quill.

S series - No. 1 hydraulic pressure light came on. Caused by failure of hydraulic pressure switch.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	1-5 Dec	**0**	**0**
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**7**	**3**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Cargo helicopters

CH-47 Class E mishap

C series - Object was seen coming through forward rotor, and visibility was restricted through windshield. Postflight inspection revealed bird strike.

Observation helicopters

OH-58 Class D mishap

A series - Aircraft hit wire during hover at field site. Main rotor blade was damaged.

OH-58 Class E mishaps

A series - N2 dropped during hover and then would not go above 94 percent. Nuts and wire end connectors to linear actuator were corroded.

C series - Copilot allowed torque to increase to 120 percent during NOE dash.

A series - Pilot felt feedback in controls. Caused by failure of bearing on bellcrank.

Fixed wing

OV-1 Class E mishap

D series - No. 1 engine fire detector light came on. Caused by failure of deicing generator.

C-12 Class D mishap

A series - As aircraft was turning right during taxi, right prop hit glass top of

Mishap briefs

taxiway light. Two propeller blades were damaged.

C-12 Class E mishap

C series - When pilot lowered nose gear, gear-down light did not illuminate. Caused by failure of gear-down lock switch assembly.

Maintenance

UH-1 Class E mishap

H series - Pilot felt binding in collective pitch lever during hover. Collective shoe pad assembly was adjusted incorrectly.

UH-60 Class E mishap

A series - No. 2 engine oil pressure dropped to zero. Oil cap was not secured correctly.

AH-1 Class E mishap

S series - Engine oil pressure dropped during flight. Caused by loose wire at cannon plug.

CH-47 Class E mishap

C series - Cannon plug fell across resistor wires, causing small cockpit fire. Cannon plug was not properly secured.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

PRAM requirements

Many units are submitting PRAMs without the nomenclature, part number, and NSN of the failed part and the QDR number. Other information which should be included in block 14 of the PRAM is total time, time since overhaul, overhaul facility, and date of overhaul of the engine or other major component which failed. This information is important to the accident prevention effort. ■

FM 55-411 being revised

The U.S. Army Aviation Logistics School at Fort Eustis has received numerous DA Forms 2028 reporting essentially the same deficiencies in FM 55-411, Army Aircraft Quality Control and Technical Inspections. The Aviation Logistics School asked us to report that they are aware of the problem and are taking the following actions:

- Pages 3-3 and 3-4 are being revised to delete the time frame examples and simply refer users to the 23 series maintenance manuals and TM 55-1500-328-25.
- Page 4-3 is in the process of revision to specify a one-half-inch round inspection stamp to identify inspectors and their units.

Further submission of DA Forms 2028 applicable to the above references are not necessary. ■

U.S. ARMY SAFETY CENTER

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Flightfax®
Report of Army Aircraft Mishaps

Aircraft accident review

Unsuitable landing site

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Fort Rucker, Al 36362

Synopsis

As the pilot of a UH-1H began his takeoff from a road covered with packed snow and ice, a ski on the rear of the skid tube dug into a snow bank. The main rotor blade hit the ground, the transmission was torn from the aircraft, and the tail boom separated.

History of flight

The mission called for five helicopters to extract 30 soldiers from a tactical area and move them to another area. Four of the aircraft took off from the airfield and were joined in flight by the fifth aircraft. They flew to the tactical area in a contour/low-level flight mode. Before landing, the pilot of the lead aircraft told the flight to assume a 15- to 30-second separation between aircraft.

As the lead aircraft approached the landing zone (LZ), a snow-covered road on top of a hill along a ridgeline, the crew saw that the soldiers were gathered in small groups in the center of the LZ. The flight continued to their preassigned touchdown points.

The pilot of the lead aircraft landed on a road with a 7-degree downslope, 6-degree right slope, and snowbanks 18 to 30 inches high on the shoulders of the road. Light to moderate turbulence was encountered on short final with a left crosswind estimated at 10 to 15 knots. All the aircraft landed in blowing snow without incident and throttles were rolled to flight idle. The flight remained on the ground for 5 minutes while the soldiers boarded.

Four passengers were seated on the right side of the lead aircraft and two passengers and the crew chief were seated on the left side. Because of this loading arrangement, the aircraft had a right lateral center of gravity displacement but was within allowable c.g. limitations. The pilot slowly increased the collective pitch and torque to 35 psi while the copilot monitored the torque gauge. As the pilot tried to bring the nose of the aircraft up to a level attitude before lifting the downslope skid, the aircraft either drifted or slid downslope, slightly to the right. The right rear portion of the ski which was attached to the right skid entered the packed snowbank, providing a stabilized pivot point and increased rollover potential. The UH-1 rolled onto its right side and the main rotor blade hit the ground. The tail boom was severed and the transmission was torn loose. The copilot and two passengers sustained minor injuries.

Crew experience

The 28-year-old pilot had more than 500 rotary wing flight hours, with more than 150 in the UH-1H. The 25-year-old copilot had more than 300 rotary wing flight hours, with more than 250 in the UH-1H.

Commentary

Several factors conducive to dynamic rollover existed at the time of the attempted takeoff. The road sloped down to the front 7 degrees and to the right 6 degrees. The aircraft was in a nose-low, right-side-low attitude that was within the 5- to 8-degree angle of bank that becomes critical to rollover when one skid is on the ground providing a pivot point. The skids of the aircraft were at an angle to the slope instead of perpendicular, as recommended for slope operations. Also, the

Accident review

right skid was downslope, which was not desirable because the requirement for increased tail rotor thrust during takeoff provides an additional right rolling motion to the aircraft fuselage. The wind was from the left at approximately 15 knots. The aircraft was heavily loaded, with the weight unevenly distributed on the right side. Fuel had gravitated to the right fuel tank while the aircraft was on the ground. Dynamic rollover is more critical to the right because the thrust of the tail rotor provides a rolling motion to the right.

In addition to the conditions listed above, as the aircraft lifted off it slid or drifted slightly to the right, and the ski dug into the snowbank. Once the rollover started, the roll rate did not allow time for corrective action.

The pilot was aware of the conditions conducive to dynamic rollover, but did not think he would have any problem with the takeoff. He was previously a medevac pilot, and it was not unusual for him to make difficult takeoffs and landings. Also, the pilot's decision to take off under these conditions may have been influenced by the fact that the landing site was selected by the air mission commander and briefed as the landing site for the lead aircraft.

The air mission commander incorrectly believed that the landing site selected had been used before. The hilltop where the rest of the flight landed had been used routinely, but the site selected for the lead aircraft had not been used and was inadequate. The site had not been reconned, and the air mission commander was not aware of the slope of the road or that it was plowed and had snowbanks on both sides.

In situations where it is not possible for air mission commanders to determine the suitability of landing areas before the mission, crewmembers of the aircraft involved should be briefed that the suitability of the site is uncertain and that they should evaluate the site and change it if necessary to ensure safe aircraft operation. ■

Last Flightfax this year

This is the last issue of **Flightfax** you will receive this year. The next issue will be dated 9 January 1985 and will include mishap briefs for the period 30 November-27 December 1984. The personnel of the Army Safety Center wish you a Merry Christmas and a Safe and Happy New Year. ■

FY 85 Class A Mishap Countdown

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	September	4	3			
	Total for Year	38	35*	Total to Date	**10**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected mishap briefs

Information based on preliminary reports of aircraft mishaps received 23-29 November

Utility helicopters

UH-1 Class E mishaps

V series - Crew noticed high frequency vibration in pedals and floor. Caused by failure of tail rotor grip bearing.

V series - After normal shutdown procedures, egt remained at 500° C. and engine continued to run for about 2 minutes. Caused by failure of fuel control.

V series - Complete hydraulic malfunction occurred, accompanied by cyclic feedback. Caused by leaking cyclic servo irreversible valve.

H series - Grinding noise was heard from rear of aircraft during hover. Caused by defective mast bearing.

H series - Master caution and low fuel lights came on, and egt gauge fluctuated and dropped to 150 degrees. Caused by broken cannon plug wire.

UH-60 Class D mishaps

A series - Crew saw a bird in flight path and banked left. Bird hit right side of aircraft, damaging FM homing antenna.

A series - Lateral vibration was felt after takeoff from confined area. Postflight inspection revealed damage to main rotor blade tip caps.

Attack helicopters

AH-1 Class E mishaps

S series - Engine oil pressure dropped to zero during flight. Caused by failure of oil pressure transducer.

S series - Master caution and alternator rectifier lights came on during hover. Caused by failure of alternator.

Cargo helicopters

CH-47 Class E mishap

C series - Utility pressure dropped to 230 psi and oil cooler fan began smoking. Caused by failure of utility hydraulic system cooler fan thermal switch.

CH-54 Class D mishap

A series - When flight engineer was told to place electro explosive circuit tester to test during runup, he inadvertently actuated cable shear switch. Hoist cable sheared and cargo hook dropped on the ramp.

Observation helicopters

OH-58 Class E mishaps

A series - Loud squeal was heard from hydraulic pump during shutdown. All hydraulic fluid had drained out of reservoir. Caused by cracked hydraulic line from hydraulic pump to inboard filter.

A series - Crew smelled fumes, and generator caution light came on. Caused by failure of generator.

A series - Torque gauge fluctuated during takeoff and then stuck at 60 pounds during landing. Caused by defective O-ring on accessory gearbox.

A series - After aircraft was run up, auxiliary power circuit breaker was pulled and battery turned off before vibrex cable was inserted. Cable was plugged in and circuit breaker pushed in. When battery power was applied, smoke appeared in auxiliary power area. Caused by internal short of wires in vibrex power cable at end that plugs into vibrex.

Fixed wing

OV-1 Class D mishap

D series - Engine analyzer test set cable bundle was attached to right engine nacelle and to a right-side panel of fuselage, below the hatch, with safety wire. The three-wire cable was routed into the cockpit though the right hatch and attached to analyzer set positioned in right seat. During reverse thrust test phase, safety wire broke away from engine nacelle and then from fuselage panel. Cable bundle was drawn into propeller and then hit hatch window, damaging propeller tips and window.

OV-1 Class E mishap

C series - Power steering and brakes failed during taxi after landing. Caused by ruptured hydraulic hose.

U-8 Class E mishap

F series - As pilot was beginning his takeoff, six deer ran across runway in front of aircraft. Takeoff was aborted, but one deer ran into gear door. Deer had been grazing about 150 yards to left of runway during five previous takeoffs and landings.

Maintenance

UH-1 Class D mishap

H series - Following maintenance on 42-degree gearbox seal, bolt used to remove seal was left in tail rotor drive shaft tunnel. Bolt was picked up by clamp just aft of No. 4 hanger bearing during flight and thrown against drive shaft cover. Holes were punctured in drive shaft cover. Damage was discovered after flight. Bolt was not accounted for by mechanics following work and was missed by technical inspector and maintenance officer.

UH-60 Class C mishap

A series - Engine flush had progressed to the engine drying stage. With gust lock engaged, No. 2 engine was operated at idle for about 34 minutes. No. 2 engine was shut down and same procedure was initiated for No. 1 engine. After about 1 minute at idle, an apparent gust lock failure resulted in uncontrolled rotor system rotation of three to four revolutions. Main rotor tiedown ropes, which had been released from fuselage but were still attached to blades, hit and damaged main rotor blades, anti-collision light, and antenna.

Mishap briefs

AH-1 Class E mishaps

S series - Roll channel SCAS had hardover during hover. Cannon plug connector was not plugged in properly, causing plug to disconnect.

S series - Forced landing was initiated during training flight. When throttle was reduced, N_2 and rotor needles would not split. Caused by flight idle rpm being set too high and rotor rpm being set too low.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

In helmets we (should) trust

Professional aviators pay extremely close attention to safety. They are ever vigilant for new ways to improve this necessary facet of their jobs and on the alert for safety deficiencies while going about their business. For instance, one safety device that not everyone takes **full** advantage of is the flight helmet.

The **major** function of a flight helmet is to provide head protection during a crash (should the unfortunate occasion arise). However, helmets can serve in other than just emergency situations. The need for head protection **begins** as we walk out to our aircraft, not after we strap into it. While preflight inspection of aircraft is not normally considered hazardous, it oftentimes can be. A majority of pilots and aircrew **do** preflight their aircraft with helmets on; a significant number still do not.

Professionals know that flight helmets offer excellent protection against heads bumping into landing gear doors, wing pylons or stores and the like. Almost every aviator has bumped his head on some part of his aircraft during preflight inspection, and chances are he or she will do it again.

By lowering your visor during preflight you can protect your eyes when that drop of leaking fuel or hydraulic fluid drips from the access door or wingtip, or when that gust of wind blows sand or dust across the flight line.

Have you gone out to preflight your aircraft and observed an aircraft turning up on your line or the next? Most likely there **will** be another aircraft turning, and your helmet is the best source of hearing protection available. Earplugs provide only a fraction of the hearing protection required when in the vicinity of turning aircraft engines.

The lesson is clear. Our flight helmets not only provide head protection, but protection for eyesight and hearing as well. A lot of money and research man-hours have been spent upgrading aviator flight equipment (including flight helmets). Let's make full use of the protective gear provided us.

The time to put your helmet on is before you walk out to the aircraft. And the time to remove it is after you have cleared the line area. We insist that our flight line personnel **always** wear the proper protective gear; now let's demand the same of ourselves.■

—adapted from the Navy's Weekly Summary

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 only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Direct communication is authorized by AR 10-29.

Craig B Schilder

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Flightfax
Report of Army Aircraft Mishaps

Aircraft accident review

Huey hits road sign

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Synopsis

While taking off from an observation post, the pilot of a UH-1H saw a fire on the ground. He decided to land and put out the fire. As the helicopter was touching down, the tail rotor blade hit a road sign. The UH-1 landed hard, spreading the skid gear and causing the main rotor blades to hit the tail boom.

History of flight

Two UH-1H helicopters left the airfield for a field site where they were to pick up some range guards at four observation posts. The crews were using night vision goggles. After approximately 30 minutes in flight, the helicopters landed at their respective LZs and picked up the guards.

As the No. 1 aircraft left the LZ and was in a turn, the pilot saw a small fire through his night vision goggles near the observation post. After confirming that the guard had started a fire to warm himself, the pilot decided to land to extinguish the fire. The pilot took control of the aircraft from the copilot and started a left turn. While making a high reconnaissance of the area, the pilot decided to land at a road intersection instead of the original LZ.

During the approach, a low recon revealed some road signs in the middle of the intersection, necessitating a change in the intended touchdown point. The pilot selected a section of the road as his new landing site and adjusted his approach accordingly.

On short final, at approximately 6 feet, the pilot felt a bump which he interpreted as touchdown on uneven ground and decided to try to increase power. As he did so, the nose began an uncontrolled rotation to the right. The pilot diagnosed the problem as loss of tail rotor effectiveness and lowered the collective to place the aircraft back on the ground. The Huey hit the ground hard, spreading the skids, and came to

UH-1 tail rotor blade hit a road sign as pilot was landing at night to extinguish a fire. Note arrow pointing to sign in bottom photo.

Accident review

rest on the underside of the fuselage. The 90-degree tail rotor gearbox separated from the aircraft. The pilot and three passengers received minor injuries. The copilot, crew chief, and one passenger were not injured.

Crew experience

The 25-year-old pilot had almost 900 rotary wing flight hours, with more than 800 in the UH-1H. The 28-year-old copilot had about 200 rotary wing flight hours, with almost 150 in the UH-1H.

Commentary

Although returning to extinguish the small fire was certainly prudent, the pilot selected a landing zone which had not been reconned for hazards. This landing zone was only 200 meters from the original landing zone, which had been reconnoitered during daylight. The pilot was confident that he would be able to see any obstacles with his night vision goggles.

When the pilot terminated his approach, the bump he felt was the tail rotor hitting a road sign, which resulted in a loss of antitorque control. The pilot's first reaction was to increase power because he felt the helicopter had touched down. This action only increased the torque and the rate of spin which had developed as a result of the loss of antitorque control.

At this point, the pilot diagnosed the problem correctly but applied the wrong emergency procedure. According to the operator's manual, the throttle should have been closed and a hovering autorotation performed. However, the pilot rapidly reduced collective pitch which resulted in a faster-than-normal rate of descent and the hard landing. The pilot thought he was much lower than he was, which led him to reduce power rather than perform the hovering autorotation. ■

As an aircraft pilot-in-command, you...

- Are now in charge of a sacred trust—the safe transporting of human lives.
- Must not let undue pressure (expressed or implied) influence your seasoned judgment during the performance of this sacred trust.
- Have at your command an aircrew—a team—in which each member must participate and contribute to the safety of the flight.
- Must delete "false pride" and "calculated risk" from your professional vocabulary.
- Will not be criticized nor stigmatized for any decision you make which will insure added safety to a flight. ■

—from The MAC Flyer

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**3**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	1-9 Jan	**1**	**0**
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**12**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 30 November - 27 December

Utility helicopters

UH-1 Class A mishaps

H series - Aircraft was on night vision goggles training mission. Pilot did not turn on radar altimeter prior to takeoff. During flight, pilot noticed that radar altimeter was not operating and turned it on. During this time, pilot lost visual ground reference and flew the aircraft into the ground. Three occupants were injured. 8509

H series - Aircraft picked up seven infantry troops, took off, and began a turn. As turn was completed at 80 to 90 knots, aircraft was leveled 13 to 15 feet over trees. Aircraft continued to settle into trees and crashed. Two of the 10 personnel on board sustained major injuries, and the other eight sustained minor injuries. 8510

UH-1 Class D mishaps

H series - Pilot landed too close to the edge of a raised helipad. Right skid was supported by a sidewalk, but left skid extended off the pad. Skid tube was bent.

H series - As aircraft was in flight, bird hit and broke right greenhouse.

UH-1 Class E mishaps

H series - Pedals became stuck during landing. Caused by failure of hydraulic servo.

H series - Abnormal vibration occurred during flight. Postflight inspection revealed tail rotor crosshead cover was still installed. Cover was not removed during preflight.

H series - Fire warning light came on during landing. Caused by short in fire detection system.

V series - Engine tachometer needle dropped to zero during takeoff. Caused by sheared tachometer generator drive shaft.

H series - Pilot felt stiffness in antitorque pedals during hover. Caused by binding spring in force gradient assembly.

H series - Needles would not split on N2 tachometer during autorotation. Caused by failure of sprag clutch to disengage.

H series - Master caution and generator lights came on. Caused by failure of voltage regulator.

H series - Engine oil pressure dropped to zero. Caused by separation of quick disconnect coupling.

UH-60 Class C mishaps

A series - Two UH-60 aircraft were flying with slingloads at night. Aircraft encountered unforecast heavy ground fog. During transition to IFR, loads of both aircraft became unstable and were jettisoned.

UH-60 Class D mishaps

A series - Stabilator hit 3-foot post during landing at field site. Right side of stabilator was damaged.

A series - Aircraft landed hard, causing main rotor blades to strike gearbox cover.

A series - Aircraft hit tree during takeoff at night. Bottom and front of aircraft were damaged.

A series - Aircraft was landed on rock in freshly plowed landing zone. Undercarriage was punctured.

UH-60 Class E mishaps

A series - No. 2 reservoir low light came on and hydraulic fluid was seen coming from control access cover during shutdown. Caused by defective pitch trim assembly.

A series - Failure of main rotor damper cap seal caused hydraulic fluid to seep from damper and resulted in in-flight lateral vibration.

A series - Pilot inadvertently turned leak isolation test switch to the on position rather than the anticollision light switch, causing aircraft to ascend about 20 feet.

A series - Moderate vertical vibration was felt during takeoff. Antiflap cam was stuck in the down position.

A series - Several caution lights came on during takeoff. Caused by failure of quick disconnect at No. 2 hydraulic pump line.

Attack helicopters

AH-1 Class A mishap

G series - Helicopter had been involved in civilian static display. Crew departed for home station at night with marginal VFR weather. About 35 minutes later, aircraft hit a powerline about 110 feet above the ground. Aircraft crashed nose low. Both pilots were killed. 8511

AH-1 Class C mishap

S series - Copilot noticed gap between gunner's door and canopy frame and told the pilot. Copilot tried to reseat the upper aft door retention pin but was unsuccessful. As aircraft was decelerated, gunner's door separated from aircraft.

AH-1 Class D mishaps

S series - Aircraft was flying at 50 feet and 60 knots up a steep grade. Aircraft hit two wires, causing minor damage to turret fairing and pilot canopy. Wires were not marked on hazard map.

S series - As pilot was hovering from parking pad to runway, rotorwash caused rear main rotor blade of another AH-1 to flex down and hit tail rotor drive shaft cover.

AH-1 Class E mishaps

S series - Master caution and engine oil bypass lights came on. Caused by failure of engine oil petcock in oil cooling fan compartment.

S series - Engine oil bypass light came on and oil pressure dropped to zero. Fitting on ball valve attached to engine oil cooler was cracked, allowing oil to leak out.

S series - Low rpm audio and light activated, and rotor tachometer indicated zero. Caused by failure of tachometer generator.

S series - Aircraft oscillated fore and aft during flight. Caused by failure of SCAS control transducer.

S series - Transmission oil temperature light came on. Caused by ruptured oil filter O-ring seal.

AH-64 Class D mishap

A series - IP was demonstrating simulated single-engine failure flyout from stabilized 100-foot hover over runway. One engine was brought to idle, collective was slightly reduced to within single-engine limits, and forward cyclic was applied to gain effective translational lift with minimum altitude loss. Aircraft descended to runway, collapsing left main and tail wheel shock struts.

AH-64 Class E mishap

A series - Oil pressure accessory pump light came on during hover. Just before touchdown, shaft-driven compressor light came on. Caused by bearing seizure in shaft-driven compressor.

Cargo helicopters

CH-47 Class C mishap

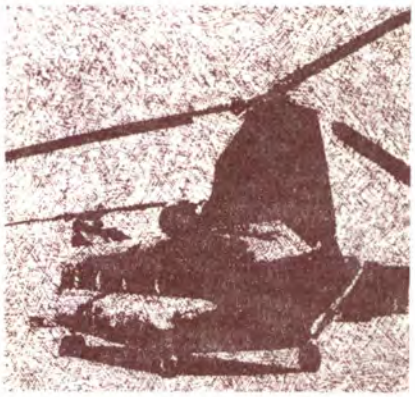
D series - Pilot's jettisonable door came off during takeoff.

CH-47 Class E mishaps

A series - Crew smelled fuel, and crew chief saw fuel on floor. Fuel was leaking from heater fuel line.

C series - Master caution and No. 2 hydraulic boost lights came on. Caused by cracked fitting on aft pivoting actuator.

C series - During No. 1 engine HIT check, N_2 actuator stayed in flight when condition lever was placed in ground. Crew chief saw smoke coming from actuator. Caused by failure of N_1 actuator.



C series - Master caution and engine chip detector lights came on. Caused by failure of accessory gearbox.

C series - Aircraft started oscillating during pickup to hover. Caused by failure of SAS amplifier control box.

Observation helicopters

OH-58 Class A mishap

A series - Aircraft crashed into a mountain about 10 minutes after takeoff, killing the pilot. Pilot was a new PIC, he was in a no-fly area, and he was conducting a single-pilot mission with night vision goggles. 8512

OH-58 Class D mishap

C series - Main rotor blades hit trees during NOE flight. Both blades were damaged.

OH-58 Class E mishaps

C series - Master caution and hydraulic lights came on. Caused by failure of servo actuator.

A series - Loud high-pitched noise was heard during hover. Caused by failure of compressor.

A series - Master caution and hydraulic lights came on, and pilot felt feedback in cyclic. Caused by cracked hydraulic line.

C series - Rotor tachometer needle rose and stuck at 20 percent. Caused by failure of dual tachometer.

A series - Pilot noticed feedback in controls during takeoff. Caused by failure of cyclic servo.

A series - Loud noise was heard from No. 1 tail rotor hanger bearings. Oil cooler fan shaft and bearings were replaced.

C series - Transmission chip detector light came on. Caused by broken wire on chip detector.

Fixed wing

C-7 Class E mishap

A series - No. 2 engine ran rough and vibrated during takeoff. Caused by cracked No. 2 cylinder.

U-21 Class A mishap

A series - As aircraft arrived at airfield, weather conditions were below minimum required. Crew tried to land using a PAR approach. When they could not see the airfield, crew executed a missed approach. Aircraft hit trees and crashed 500 yards southeast of the airfield. All four occupants were killed. 8513

U-21 Class E mishaps

A series - As power was reduced during approach, No. 2 power lever stuck in a position which produced 550 foot-pounds of torque. Single-engine landing was made. Landing gear warning horn actuator switch had broken off and lodged against No. 2 power lever, preventing its movement.

A series - Fuel was seen siphoning from right nacelle fuel tank during flight. Fuel cap was not physically checked for security.

H series - As power levers were advanced during takeoff, left engine was slow developing power. Caused by fuel control malfunction.

A series - No. 1 prop would not come out of feather after power was reapplied following simulated engine failure. Caused by failure of autofeather dump valve.

G series - Unsafe gear indication in flight was caused by intermittent short circuit in main landing gear switch.

RV-1 Class A mishap

D series - Pilot noticed series of compressor stalls and reduced power, which worsened the stalls. Almost immediately, loud bang was heard from right engine and aircraft began severe

Mishap briefs

roll to right. Pilot and technical observer ejected and aircraft crashed inverted. 8514

OV-1 Class E mishap

C series - Power steering and brakes failed during taxi. Caused by ruptured hydraulic hose to speed brake.

U-8 Class E mishap

F series - Left engine lost power, cylinder head temperature dropped, and vibration was felt during level-off from climb. Fuel injector solenoid was stuck open.

T-42 Class E mishaps

A series - Right engine lost power. Caused by faulty magneto.

A series - No. 1 engine ran rough. Caused by faulty fuel control assembly.

C-12 Class E mishap

C series - No. 1 engine had multiple compressor stalls with a power setting of 45 percent torque to idle. Caused by failure of high pressure bleed valve metering orifice.

Maintenance

UH-1 Class E mishaps

H series - Transmission chip detector light came on. Caused by loose wire to chip detector.

H series - Hydraulic light came on and flight controls became stiff. Hose failed at old chafed spot.

H series - Airspeed indicator did not work in flight. Static airlines were crossed.

UH-60 Class E mishap

A series - Several caution lights came on and slight yaw was felt. Failure of tail rotor servo pressure line was caused by chafing.

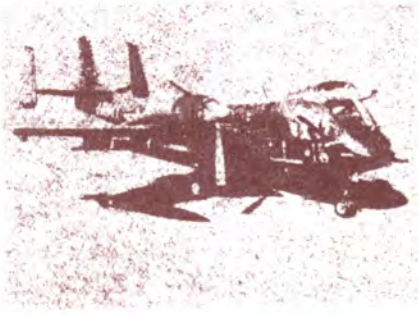
AH-1 Class E mishaps

S series - Crew heard hydraulic pump cavitating, followed by illumination of master caution and No. 1 hydraulic lights. Caused by incorrect installation of T-fitting on hydraulic line.

S series - Low fuel light came on with about 400 pounds of fuel on board. Light was out of adjustment.

OH-6 Class E mishap

A series - Pilot heard loud bang during pickup to hover. Engine-out light and audio activated. Rag was found in engine inlet.



OV-1 Class E mishaps

D series - Landing gear would not retract after takeoff. Maintenance personnel had inadvertently activated emergency gear extension during cockpit maintenance work and failed to write up the activation. Activation of the system caused priority valve to close and landing gear to remain down and locked.

C series - Left main gear indicated in transit after takeoff. Mechanic had over-serviced gear strut assembly.

C-12 Class E mishap

C series - During descent, pilot placed flap switch to approach position and flaps went to full down at 180 knots. Pilot brought flaps back up and went to approach position again, and they worked normally. After landing, flaps failed in full up position. Flap switch was not adjusted correctly.

Messages received

• Safety-of-flight maintenance notice concerning a service life extension on the AH-1S canopy removal system's arm/firing mechanisms manufactured by Space Ordnance Systems (AH-1-84-04, 071900Z Dec 84). Summary: This message advises of the 1-year extension of the arm/firing mechanism's service (installed) life and manufacture (shelf) life. The 1-year extension applies only to P/N 115141-5 and 116416. Contact: Edwin Soteropoulos, AUTOVON 693-3300, commercial 314-263-3300.

• Safety-of-flight maintenance mandatory message concerning removal and replacement of gas generator (GG) rotors at certain life limits (UH-60A-84-16, 111700Z Dec 84). Summary: Certain units within the Army have allowed the life limits of GG rotors to be exceeded in violation of TB 55-2840-248-20-16. It is imperative that GG rotors be removed and replaced in accordance with TB limits.

• Safety-of-flight technical message concerning one-time inspection of CH-54A helicopters for defective main rotor blades (CH-54-84-03, 191600Z Dec 84). Summary: Commercial operators of CH-54A type helicopters have discovered cracks in the spar of the main rotor blade. Military CH-54 helicopters should be inspected for defective blades.

• Safety-of-flight technical message concerning one-time inspection of OH-58A helicopters with MWO 55-1520-228-30-24 installed tail rotor drive shaft covers (OH-58-84-02, 271600Z Dec 84). Summary: A report was received documenting the discovery of three damaged OH-58A tail rotor control push-pull tubes. Damage was in the form of drill bit marks and possibly occurred during installation of the MWO. The push-pull tube assembly may have been damaged when drilling rivet holes in the tail boom for installing the tail rotor drive shaft cover mounting clips. Contact: Charles Cioffi, AUTOVON 693-1689, commercial 314-263-1689.

• Safety-of-flight technical message concerning one-time and recurring inspection of main gearbox dowel pins (UH-60A-84-17, 271615Z Dec 84). Summary: It has been reported that a main module dowel pin backed out of the main module housing of an HH-60D aircraft. No movement of the dowel pins is allowed. Contact: Tim Hughes, AUTOVON 693-1683, commercial 314-263-1683.

Mishap briefs

• Safety-of-flight technical message concerning one-time inspection of UH-1H/V and EH-1H/X aircraft (UH-1-84-12, 281900Z Dec 84). Summary: Several UH-1 main rotor pitch change link turnbuckle barrels have been reported as being cracked. This message directs changeout of barrels which are cracked and changeout of rod end bearings which do not meet requirements of TM 55-1520-210-23. Contact: Richard Smith, AUTOVON 693-1685, commercial 314-263-1685.

• Safety-of-flight maintenance notice concerning changes to inspection of CH-47C/D and YCH-47C rotor head assemblies (CH-47-84-13, 281830Z Dec 84). Summary: Based on additional information, several CH-47 aircraft should be eliminated from the required inspection. Contact: Bill Reese, AUTOVON 693-1418, commercial 314-263-1418.

• Aviation life support equipment message advising of the relocation of the SDU-5/E distress marker light with flashguard and the water storage bag (262000Z Dec 84).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Pubs patter

It's called "Line Item Number (LIN) to Publication Number Cross-Reference List" and you'll find it in Section XI of DA Pam 310-1, Consolidated Index of Army Pubs and Forms. You need to know the LIN of your equipment to find the pubs. The fiche lists TMs, TBs, LOs, SCs, and MWOs.

Find the LIN of your equipment on your property book. Then look it up on the fiche. Beside it is the nomenclature and NSN for the equipment. But underneath is a jackpot of basic pubs and changes for your end-item.

You'll also find a list of publications that specifically cover components of your end-item. This "pubs on components listing" identifies the publication, gives its date and the latest change, and relates the pub to the item it covers.

Is there a quick and easy way to find out what publications you need to have on hand for a particular piece of equipment? Yes, there is one place you can look to find all of the pubs you need to maintain your equipment.

So, look up your LIN, check the fiche, and retire those graying pubs! ■

—from PS magazine

Correction

Page 3 of the 12 December 1984 **Flightfax** contained a UH-60 Class C mishap brief. We stated that the No. 2 engine was operated at idle for about 34 minutes. This should have been **3** minutes. The brief also stated that the main rotor blades were damaged by the tiedown ropes. Actually, it was the tail rotor blades which were damaged by the ropes. ■

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Report on OTC drugs

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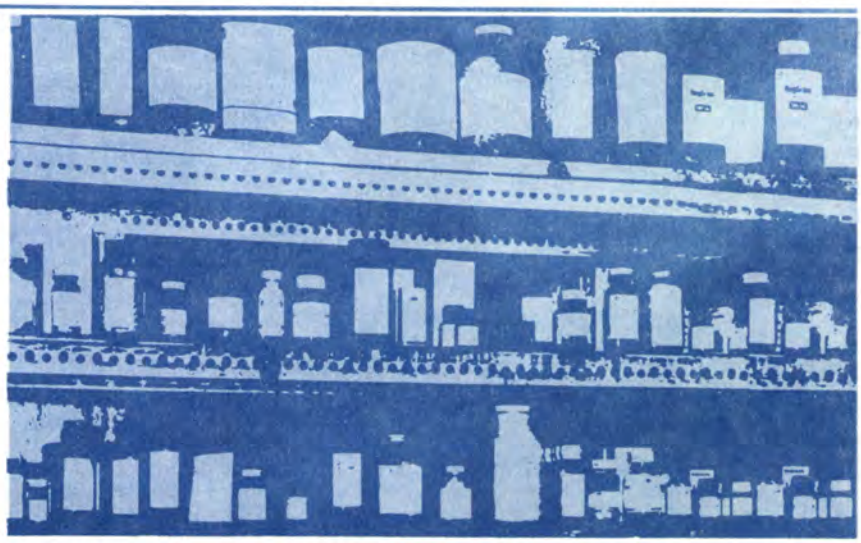

One of the biggest problems in the aviation community is OTC (over-the-counter) drugs. These are the ones you can buy without a prescription. Some aviators tend to think that, since these drugs can be bought without a prescription, they can do no harm. OTC drugs can be every bit as dangerous as prescription drugs. Let's look at a few of the very common ones:

Aspirin (ASA or acetylsalicylic acid): Bayer, Bufferin, St. Joseph's, Ecotrin, Measurin, Alka-Seltzer, Anacin, APC, Ascriptin, CAMA, Cope, Excedrin, Empirin, etc., etc. We all use ASA for our headache, our fever, our aching bones, the flu, the "chills," our sore leg or arm or back, etc., and it does a good job. In fact, aspirin is probably the best nonnarcotic all-purpose pain reliever there is. But it also has a few nasty side effects, at normal dosages, that can make it dangerous. It can cause stomach bleeding, even if you've never had an ulcer. It can decrease your night vision; make your blood clot less easily; and cause drowsiness, allergic reactions, runny noses, heartburn, nausea, and vomiting. So you'll try Tylenol instead? Okay, here goes.

Acetaminophen: Tylenol, Datril, Nebs, Anacin-3, Phenaphen, Tempra, Arthralgan, Parafon Forte, Percocet, etc., etc. This drug can make you drowsy; just what you need during an already long flight or before an early launch. It can also cause allergic reactions, impaired thinking, and impaired concentration. And most of the side effects are insidious: i.e., they sneak up on you without your being aware that they are there.

What about some OTC cough syrup for that nagging cough? A lot of the OTC cough syrups have dextromethorphan in them: Benylin, Romilar, St. Joseph's, Cheracol-D, Dristan, Endotussin, Formula 44-D, Hold, Pertussin, Robitussin, Vicks, etc., etc., and this includes many of the cough drops that a lot of people eat like candy. Probably the most insidious side effect of the drug is drowsiness, but you can also be the recipient of such side effects as allergic reactions, dizziness, nausea, and indigestion. If you take too much of the "good thing" you may become euphoric (super happy), overactive, or feel as if you're intoxicated.

Another drug that's found in most cough medicines is guaifenesin or glycerol guaiacolate. Like its buddy, dextromethorphan, it can cause drowsiness, allergic reactions, nausea, and indigestion. This makes most cough preparations a double "no-no" for flying.

Drugs such as Allerest, Contac, 4-Way nasal spray, Sinubid, Sinutab, Triaminic, etc., are dangerous to fliers, their primary constituent being phenylpropanolamine. Their expected side effects include nervousness and insomnia, but they may also cause headache, dizziness, nausea, vomiting, and a rapid heart rate. These drugs have been known to cause something as serious as an acute temporary mental derangement (psychotic episode). Some decongestants may also make you sleepy.

Caffeine is also a drug. Have you noticed all the soft drink manufacturers advertising no-caffeine everything? We get most of our caffeine in the form of coffee, tea, chocolate, cola, and other soft drinks. Caffeine is a stimulant and it is addictive. People with heart disease or stomach ulcers should never use it. What effects does it have on you? Well, it causes nervousness, insomnia, and increased urine output. It can also cause headache, irritability, lightheadedness, a feeling of drunkenness, impaired thinking, nausea, heartburn, indigestion, and stomach irritation.

All drugs are "unnatural" chemicals in the body. They usually hang around for about 4 to 6 hours, sometimes more

Report on OTC drugs

and sometimes less. Many have "rebound" effects after the effects of the drug wear off. A couple of good examples of this are a super "low" feeling after your last dose of caffeine wears off, or an extra stuffy nose after the effects of the decongestant wear off. These rebound effects may actually be more dangerous than the effects of the drug itself.

Furthermore, OTC drugs are usually taken to relieve symptoms of an illness or condition (i.e., cold, flu, headache, sinus, etc.) for which the aviator probably should have been temporarily grounded in the first place. The drugs mask the symptoms of the illness as well as produce side effects. The responsible, mature aviator reports these problems to his flight surgeon, who decides whether temporary grounding and/or medication is appropriate or not.

—adapted from an article in Approach by Commander V.M. Voge, MC, USN, USAF School of Aerospace Medicine

Editor's note: Several years ago, a Navy instructor pilot flew his aircraft into the ground and was killed. Nothing could be found wrong with the engine or airframe, weather was not a problem, and there was no attempt to eject. During the investigation of the accident, it was determined that the pilot had been taking Contac, an OTC medication, for several days before the accident. The pathology report of the autopsy revealed the presence of chlortrimeton (chlorpheniramine) in the pilot's lungs, kidneys, liver, and blood in amounts approximately 10 times greater than would be expected from normal therapeutic use. This drug is found in Contac.

The accident board concluded that the high level of chlortrimeton present in the pilot's body could easily have caused drowsiness or inattention. This was supported by the fact that there was no ejection attempt. Impact with the ground was in a level attitude with the aircraft being on the preplanned course. ■

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**3**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	1-16 Jan	**2**	**0**
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**13**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

New film released

An Army safety training film, "How to Survive in Water - Prepare to Ditch," SAVPIN 30362DA (TF) (VT) 46-6074), was released in October 1984. This 18-minute film deals with survival after an aircraft has been ditched at sea. It covers emergency procedures and simulates survival techniques. Filmed at the Naval Aviation Training Station, Pensacola, Florida, this videotape provides basic and refresher courses in escaping from a ditched aircraft which has plunged into deep, cold water.

The film includes exercises in how to execute proper parachute descent and disentanglement. Swimming strokes most effective for survival are demonstrated, along with how to tread water, pace oneself for long distance swimming, and maneuver through surface debris and under a burning surface. An underwater tank is used to simulate exit from a downed aircraft and a helicopter is engaged to demonstrate rescue by air.

You can get this film from your local Training Aids Service Center. ■

U.S. ARMY SAFETY CENTER

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Craig B Schilder

CRAIG B. SCHILDER
Deputy Director of Army Safety

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 28 December- 3 January

Utility helicopters

UH-1 Class D mishaps

H series - As hover was terminated at 5 feet, panel marker broke loose from the ground and blew up. Crew heard a banging sound as marker passed through rotor system. One main rotor blade was damaged.

UH-1 Class E mishaps

H series - Master caution and engine fuel pump lights came on during landing. Caused by defective fuel pressure switch.

H series - Pilot noticed excessive variation in engine rpm with application of collective. Rpm would not decrease with N_2 governor control switch. Precautionary landing was initiated. As collective was decreased, rpm reached 6700 at 15 psi torque. Pilot elected to go to normal throttle rather than risk overspeed. Landing was made without further incident. Caused by failure of linear actuator.

H series - Engine oil temperature gauge fluctuated between 90 and 150 degrees during takeoff. Caused by failure of engine thermal temperature transmitter.

H series - Rotor rpm fluctuated during hover. Caused by sheared tachometer generator shaft.

UH-60 Class E mishap

A series - Transmission oil pressure fluctuated. Caused by failure of oil pressure sensor.

Attack helicopters

AH-1 Class D mishap

S series - Main rotor blades hit tree during landing to confined area. Both blades were damaged.

AH-1 Class E mishaps

S series - Engine oil pressure went to 110 psi during flight. Caused by malfunction of oil pressure transducer.

S series - Fuel was seen leaking from fuel servo filter during start. Caused by failure of O-ring.

Cargo helicopters

CH-47 Class D mishap

A series - Preflight inspection revealed grooves in No. 3 drive shaft. Cracks in No. 2 access door allowed door contact with drive shaft, causing grooves to be cut in drive shaft.

CH-47 Class E mishap

C series - No. 2 engine oil low light came on. Caused by failure of engine oil indicator.

Observation helicopters

OH-58 Class E mishap

C series - Transmission oil hot light came on. Caused by moisture in wiring.

Fixed wing

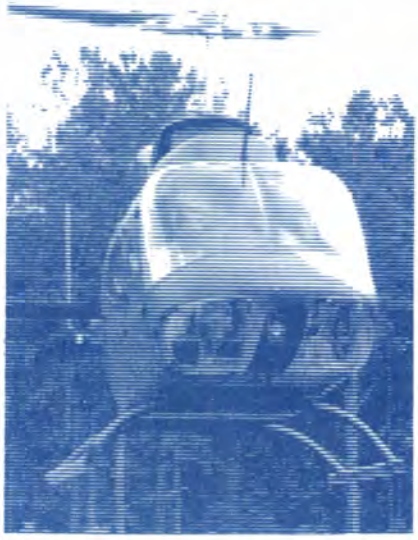
OV-1 Class E mishap

D series - Simulated engine failure was initiated during training flight. When restart was attempted, N_1 would not accelerate past 36. Single-engine landing was made. Caused by failure of internal fuel control valve.

Maintenance

UH-1 Class C mishap

H series - Postflight inspection revealed damage to forward tail rotor drive shaft cover. When cover was opened, it was discovered that two screwdrivers had damaged No. 3 tail rotor drive shaft and drive shaft clamps. No work had been done in this area recently, but a few days earlier the engine exhaust cowling had been installed. It is believed that the screwdrivers were laid in the drive shaft area and not removed. The mechanic installing the exhaust cowling was called for another maintenance duty and another individual secured the drive shaft cover.



OH-58 Class E mishap

C series - Pedals jammed in neutral position as aircraft was taxiing to parking area. Avionics repairman had removed ADF control head and was attempting to repair antenna lead. Pilot told repairman to put control lead back in without hooking up antenna lead. Repairman misunderstood and thought pilot did not want antenna lead or cannon plug reinstalled. As a result, ADF cannon plug hung up on tail rotor control tube, causing binding in tail rotor control.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

CY 84 Flightfax index

Accident review (aircraft limitations exceeded - 8 Aug
Accident review (approach to mountainous confined area) - 5 Dec
Accident review (failure to document removal of nuts and cotter pins) - 7 Nov
Accident review (failure to follow procedures) - 6 Jun
Accident review (flight into IMC) - 7 Mar
Accident review (incorrect snow landing technique) - 28 Nov
Accident review (incorrect weather forecast) - 15 Aug
Accident review (late with corrective action) - 2 May
Accident review (loss of tail rotor effectiveness) - 23 May
Accident review (maintenance error and design deficiency) - 17 Oct
Accident review (misjudged hover height) - 11 Apr
Accident review (night vision goggles training flight) - 3 Oct
Accident review (nonrated officer at the controls) - 29 Aug
Accident review (OH-58 tree strike) - 28 Mar

Accident review (power droop diagnosed as engine failure) - 26 Sep
Accident review (single-pilot medevac mission) - 21 Nov
Accident review (T-42 training flight) - 15 Feb
Accident review (UH-1 wire strike) - 1 Feb
Accident review (UH-60 test flight) - 12 Sep
Accident review (unsuitable landing site) - 12 Dec
A debt which must be paid (sleep loss and fatigue) - 1 Aug
A hatched-up program (safety program in name only) - 11 Apr
Aircraft limitations exceeded (accident review) - 8 Aug
Aircraft mishap classification chart - 2 May
Aircrew family survival (suggestions for dealing with stress) - 29 Aug
A lesson from the past (OH-23 bird strike) - 31 Oct
A matter of professional discipline (requirement to use checklists) - 19 Sep
Attitude control (factors affecting attitude) - 8 Feb
Audiovisual productions catalog - 24 Oct
Aviation mishap prevention forum - 11 Jan, 18 Jan, 25 Jan, 1 Feb, 8 Feb, 15 Feb, 22 Feb, 29 Feb, 7 Mar, 14 Mar, 21 Mar, 28 Mar, 4 Apr, 11 Apr, 18 Apr, 25 Apr, 2 May, 9 May, 16 May, 23 May, 30 May, 6 Jun, 13 Jun, 20 Jun, 27 Jun, 4 Jul, 11 Jul, 18 Jul, 25 Jul, 1 Aug, 8 Aug, 15 Aug, 22 Aug, 29 Aug, 5 Sep, 12 Sep, 19 Sep
Aviation safety courses (FY 85) - 1 Aug
Bird strikes (tips on avoiding) - 5 Sep
Broken Wing Award, eleven receive (recipients for July through September 84) - 14 Nov
Broken Wing Award, four receive (recipients for January through March 84) - 16 May
Broken Wing Award, twenty receive (recipients for October through December 83) - 22 Feb
Can simulators kill you? - 5 Dec
Cross-talk (what we say and what we really mean) - 18 Jul
CY 83 **Flightfax** index - 18 Jan
Deadly delay (OV-1 ejections) - 16 May
Disorientation in IMC (accident review) - 18 Jul
Drug quiz - (questions and answers on drug abuse) - 25 Jul
Dust hazards - 11 Jul
Eye hazard on the OH-58 (upper door jettison pin) - 22 Aug
Failure to follow procedures (accident review) - 6 Jun
Farewell message (COL Koehler retires) - 28 Nov
Fatigue (a debt which must be paid) - ~~1 Aug~~
Finger trouble (response errors) - 4 Apr
Flying 9 to 5 may be safest (wake-sleep cycles) - 23 May
FM 55-411 being revised - 5 Dec
Followups (of mishaps previously published) - 15 Feb, 9 May, 30 May, 27 Jun, 19 Sep, 10 Oct, 7 Nov
Foreign objects found in engines (pieces of tools found) - 11 Apr
FY 85 USASC aviation safety courses - 1 Aug
Helmets authorized for passengers (in observation helicopters) - 18 Jan
High visibility belt available (part number, NSN, and cost) - 27 Jun
Human factors (errors in judgment) - 22 Aug
Icing . . . major winter hazard (ice formation on aircraft) - 11 Jan
IMC (accident review) - 7 Mar
Incorrect snow landing technique (accident review) - 28 Nov
Incorrect weather forecast (accident review) - 15 Aug
In helmets we (should) trust (wear helmets on the flight line) - 12 Dec
Is PRAM required for weather delay? - 22 Feb
"I thought I would be able to see the wires" (wire strike mishaps) - 30 May
It's their airspace, too (bird strikes) - 5 Sep
Know them before you need them (emergency procedures) - 18 Jan
Last **Flightfax** this year - 12 Dec
Let your seats stroke (don't place items under UH-60 crew seats) - 18 Jul
Lightning . . . out of the blue (research on aircraft lightning strikes) -18 Apr
Loss of tail rotor effectiveness (accident review) - 23 May
Medevac mission (accident review) - 21 Nov
Medicines and the pilot (effects of drugs) - 22 Feb
Microburst—a deadly killer (how to detect and avoid) - 4 Jul
Midair collision avoided (UH-1 and C-141 in Europe) - 5 Dec
Mishap data given to commanders (PRAM file searches authorized) - 3 Oct

Mission briefings—necessary for mission success (mishaps involving lack of or incomplete briefings) - 14 Mar
More on the UH-60 (causes of pilot-error mishaps) - 20 Jun
New aircraft mishap report forms (DA Form 2397-R series) - 8 Feb
New audiovisual productions catalog - ~~24 Oct~~

New format (**Flightfax** format changed) - 14 Nov
Not only in the desert (hazards of dust) - 11 Jul
OH-58 first half FY 84 review (mishaps and causes) - 13 Jun
On the new format (**Flightfax** format changed) - 14 Nov
PRAM requirements (block 14) - 5 Dec
PRAMS—just a reminder (mission briefer required) - 11 Apr
Recap of AVSCOM messages (from 1 January through 31 March 84) - 16 May
Recap of AVSCOM messages (from 1 July through 30 September 84) - 24 Oct
Recap of AVSCOM messages (from 1 October through 31 December 83) - 29 Feb
Reminder on mission briefer requirement - 21 Nov
Renumbering of publications (aviation doctrinal literature publications) - 10 Oct
Reporting forms (DA Form 2397-R series) - 8 Feb
Reporting requirements for mishap classifications (chart listing requirements) - 2 May
Report of fourth quarter FY 84 Class A mishaps - 24 Oct
Review of first quarter mishaps shows upward trend continuing (first quarter FY 83 mishaps) - 25 Jan
Safety-of-flight messages
- AH-1 and UH-1 operator's and crewmember's checklist manuals - 30 May
- AH-1S main rotor blade - 30 May
- ALQ-144 IR jammer - 23 May, 3 Oct
- CH-54 brass turnbuckles - 24 Oct
- CH-54 main rotor head trunnion assembly - 11 Jan
- CH-47 aft transmission upper housing - 24 Oct
- CH-47 flight control tubes in aft cabin area - 29 Aug
- CH-47 floor beams - 11 Jul
- CH-47 engine transmission warning system - 11 Apr, 13 Jun
- C-12 brass turnbuckles - 31 Oct
- H-6 series main rotor blade and damper attaching pins - 18 Apr
- H-6 series main rotor swashplate bearing assembly - 11 Jan
- H-6 series engine power-out warning control units - 26 Sep
- H-6 series tail rotor assembly - 18 Apr
- OH-58C main rotor hub assemblies -11 Jan
- OH-6 tail rotor assemblies - 4 Apr
- OH-6 tail rotor blades - 11 Jan
- OV-1 bracket - 12 Sep
- OV-1 brass turnbuckles - 31 Oct
- OV-1 main landing gear torque arms - 4 Jul
- UH-1 aircraft grounded - 25 Jul
- UH-1 main rotor blades - 7 Nov
- UH-1 pitch change clevis - 28 Nov
- UH-1 pitch change link clevis - 1 Aug, 3 Oct
- UH-1 TAMMS 2410 reporting system - 9 May
- UH-1 thin wall masts - 1 Aug
- UH-1 turnbuckle bodies - 18 Apr, 2 May
- UH-60 brass turnbuckles - 14 Nov
- UH-60 main rotor shaft - 8 Feb
- UH-60 tail cone canted hinge bulkhead radius blocks - 5 Sep
- UH-60 main rotor spindle assembly pitch control arm attaching bolts - 15 Aug
- UH-60 engine output shaft - 23 May, 6 Jun
- UH-60 pitch control rod attaching bolts - 9 May
- UH-60 stabilator amplifier - 25 Apr
- UH-60 tail rotor control cables - 14 Nov
- UH-60 tail rotor gearbox and intermediate gearbox oil levels - 9 May
- UH-60 tail rotor pylon cover hinge bracket - 18 Apr
- UH-60 wire harness routing - 28 Mar
- U-9 brass turnbuckles - 31 Oct
- U-21 aft-facing seats - 21 Mar
- U-21 brass turnbuckles - 31 Oct
- UV-18 brass turnbuckles - 31 Oct

Second quarter Class A aircraft mishap review - 9 May
STACOM - 25 Jan, 1 Feb, 7 Mar, 28 Mar, 25 Apr, 23 May, 6 Jun, 4 Jul, 15 Aug, 5 Sep, 19 Sep, 21 Nov
T-42 training flight (accident review) - 15 Feb
There we were (electrical failure in T-42 at night) - 11 Apr
Third quarter Class A aircraft mishap review - 25 Jul
Thurman emphasizes safety to Aviation Officers Advanced Course graduates (speech by GEN Thurman) - 14 Nov
Time out for safety (take the time to do it right) - 22 Aug
Tree strike (accident review) - 28 Mar
UH-60 restraint systems differ from others (releases differently from other helicopters) - 20 Jun
UH-60, what's happening? (review of mishaps and causes) - 21 Mar
Unplanned doesn't have to be unprepared (flights into instrument conditions) - 25 Apr
Updated field manuals available soon (FM 25-1 through FM 25-4) - 21 Nov
What about this new SPH-4 TPL suspension system? (liner for helmets) - 19 Sep
What's happening with the UH-60? (review of mishaps and causes) - 21 Mar
When the still of the night (effects of hangover) - 29 Feb
When the temperature soars (how to cope with the heat) - 27 Jun
Wire strike (accident review) - 1 Feb
Wire strike mishaps - 30 May ■

UH-1 Performance Planning

As some difference exists between the new UH-1 UPDATE Operations Manual (-10) and Field Circular (FC) 1-211, the following guide may be used in completing the Performance Planning Card until such time as a change is published for FM 1-211.

TASK: Prepare performance planning card (PPC).

CONDITIONS: Given a UH-1 Operator's Manual; the mission; environmental conditions at takeoff, enroute, and landing; and a blank Performance Planning Card (PPC).

STANDARD: Correctly complete PPC using Operator's Manual applicable publications.

DESCRIPTION:

1. The aviator will determine and have available aircraft performance information necessary to complete the mission. The PPC is used to organize this information. The pilot-in-command will ensure that the aircraft limitations and capabilities are not exceeded.

2. Use this PPC instead of other (obsolete) Performance Planning Cards or Sheets.

3. The reverse of the PPC is provided for mission and enroute planning. Local reproduction of the PPC is authorized.

4. When determining aircraft performance, Predicted Hover Power Check will be computed using the Estimated Time of Departure pressure altitude and temperature. Maximum Torque Available 30 Minute Limit and Go-No-Go Torques should be computed using the highest pressure altitude and temperature forecast during the planned mission profile. The following provides instruction for completing the PPC.

a. **Item 1.** Pressure Altitude (PA).

b. **Item 2.** Free Air Temperature (FAT).

c. **Item 3.** Takeoff Gross Weight (T/O GWT).

d. **Item 4.** Weight of External Load or Maximum Aircraft Internal Load at takeoff for both (IGE) and (OGE) missions.

e. **Item 5.** Calibration Factor (Data Plate Torque).

f. **Item 6.** Takeoff Fuel Weight.

g. **Item 7.** Maximum Torque Available. Using Maximum Torque Available (30 Minute Operation) chart, enter the graph at FAT, move horizontally to PA (not to exceed Transmission Limit), then vertically down to the Calibrated Torque line. Read Maximum Calibrated Torque Available.

h. **Item 8A/B.** Go-No-Go Torques. Depending on environmental conditions, there may be two Go-No-Go Values. One measures Out-of-Ground Effect (OGE) capability and the other measures In-Ground-Effect (IGE) capability. Compute these values by using the following methods.

(1) **Max Allowable GWT (IGE/OGE).** Using the Hover Ceiling Chart, enter at PA, move horizontally to FAT, move vertically to Gross Weight (OGE), and record Maximum Gross Weight (OGE) in block 8A. Continue vertically to the 5 Foot Skid Height line, move horizontally to Gross Weight, and record Maximum Gross Weight (IGE) in block 8A. (If 5 Foot Skid Height line is not intersected, use 9500 pounds as Max GWT.)

(2) **Go-No-Go Torque (IGE/OGE).** Using the Hover Power Required Chart, enter at the PA, move horizontally to FAT, move vertically to the Maximum Gross Weight (IGE), move horizontally to the 5 Foot Skid Height, move vertically to Calibrated Torque-PSI and record the Go-No-Go (IGE) value, in block 8B. Using the same chart, enter at the PA, move horizontally to FAT, move vertically to the Maximum Gross Weight (OGE), move horizontally to the 5 Foot Skid Height line, move vertically to Calibrated Torque-PSI and record the Go-No-Go (OGE) value, in block 8B.

i. **Item 9A.** Predicted Hover Torque (IGE). Enter Hover Power Required Chart at PA, move horizontally to FAT, move vertically to Takeoff Gross Weight, move horizontally to 5 Foot Skid Height line, move vertically to Calibrated Torque-PSI and record Predicted Hover Torque (IGE), in block 9A.

j. **Item 9B.** Hover (OGE). Enter Hover Power Required Chart at PA, move horizontally to FAT, move vertically to Takeoff Gross Weight, move horizontally to 50 Foot (OGE) Skid Height line, move vertically to Calibrated Torque-PSI and record Predicted Hover Torque (OGE), in block 9B.

k. **Item 10.** Max R/C-Endurance IAS as derived from the appropriate cruise charts for anticipated conditions.

l. **Item 11.** Max Range IAS as derived from the appropriate cruise charts for anticipated conditions.

m. **Item 12.** Control Margin (IGE). The shaded area on sheet 1, figure 7-4, UH-1H/V Operator's Manual, indicates conditions where the Directional Control Margin may be less than 10 percent in a Zero Wind Hover condition. The shaded area on sheet 2, figure 7-5, UH-1H/V Operator's Manual, labeled DIRECTIONAL, indicates conditions when the Directional Control Margin may be less than 10 percent for Crosswind Components in excess of those determined for sheet 1. Refer to UH-1H/V Operator's Manual, paragraph 7-18, for additional information.

Enter the chart at PA, move right until intersecting FAT line; move vertically to intersect Gross Weight line, move left to find Maximum 90 Degree Right Crosswind that can be encountered and still have 10 Percent Directional Control

Margin remaining. If the Forecast Winds (steady winds or highest gust) fall below this value, enter Maximum Crosswind Component-Knots in "Yes" block of PPC. If the winds are predicted above this value, enter Maximum Crosswind Component-Knots in "No" block of PPC. Refer to figure 7-5, UH-1H/V Operator's Manual, sheet 2, to find the wind azimuths where the Control Margin may be less than 10 percent. To determine Critical Wind Azimuth and Maximum Velocities, enter Control Margin Chart at the intersection of the 90 Degree Azimuth line and Maximum 90 Degree Crosswind Velocity derived from figure 7-4, sheet 1. Through this point, draw a line parallel to either the 10/20-Knot Dark Bold line vertically through the shaded area. The intersection of the vertical line with the Arc corresponding to the Predicted Maximum Winds outlines the area in which Directional Control may be less than 10 percent. If Safe Pedal Margin cannot be maintained, the Aircraft Gross Weight should be adjusted, or takeoff and landing must be made into the wind.

NOTE: Safe Pedal Margin (OGE) can be found by using the same methods as (IGE) except Gross Weight corresponding to Power Required must be used.

Rule of Thumb Method: Take the difference between Predicted Hover Torque 5 Foot, and Hover (OGE) Torque (items 9A and 9B on PPC). Multiply difference by 200 pounds (i.e., 5 psi difference X 200 = 1000), add difference to Aircraft Gross Weight and use that Gross Weight to determine Maximum Crosswind (OGE).

n. **Item 13.** Estimated Pressure Altitude (PA).

o. **Item 14.** Estimated Free Air Temperature (FAT).

p. **Item 15.** Estimated Landing Gross Weight as computed on DD Form 365F.

q. **Item 16a.** Max Allowable Gross Weight (OGE) computed as in item 8A, using arrival environmental conditions.

r. **Item 16b.** Max Allowable Gross Weight (IGE) computed as in item 8A, using arrival environmental conditions.

s. **Item 17.** Max Torque Available based on items 13 and 14.

t. **Item 18.** See Note 2.

u. **Item 19.** Torque Required to Hover (IGE) based on items 13, 14, and 15.

v. **Item 20.** See Note 2.

w. **Item 21.** Torque Required to Hover (OGE) based on items 13, 14, and 15.

x. **Item 22.** See Note 2.

y. **Item 23.** Safe Pedal Margin using items 13, 14, and 15.

z. **Item 24.** Space for In-Flight Fuel Consumption Check, to include fuel burnout (exhaustion) and appropriate VFR and IFR reserve.

aa. **Item 25.** The Weight Computation Blocks are for the convenience of the pilot and are used as desired.

bb. **Item 26.** Planned Cruise Pressure Altitude (PA).

cc. **Item 27.** Planned Cruise Forecasted Free Air Temperature (FAT).

dd. **Item 28.** Cruise VNE, figure 7-6, Operator's Manual.

ee. **Item 29.** Cruise Indicated Airspeed and True Airspeed derived from appropriate cruise charts.

ff. **Item 30a.** Predicted Cruise Torque derived from appropriate cruise charts.

RW PERFORMANCE PLANNING CARD (PPC)

FOR USE OF THIS FORM SEE TCs 1-135, 1-139-1, 1-138, 1-137 or 1-138. PROPONENT FOR THIS FORM IS TRADOC.

(DEPARTURE)

PA (1)		FAT (2)	
T/O GWT (3)		LOAD (4)	
CAL FACTOR (5)		FUEL (6)	
	DUAL ENG	SINGLE ENG CAL	SINGLE ENG IND
MAX (TQ/%) AVAIL		(7)	
(TQ/% AVAIL (CONT)			
GO-NO-GO (TQ/%)	IGE OGE	(8B) (8B)	
PREDICTED HOVER (TQ/%)		(9A)	
HOVER OGE (TQ/%)		(9B)	
MAX ALLOWABLE GWT	IGE OGE	(8A) (8A)	
MAX R/C - ENDURANCE IAS		(10)	
MAX RANGE IAS		(11)	

VALIDATION FACTOR _____

SAFE PEDAL MARGIN (12) YES _____ NO _____

(ARRIVAL)

PA (13)		FAT (14)	
LANDING GWT (15)		MAX ALLOWABLE GWT	(16A) (16B)
	DUAL ENG IND	SINGLE ENG CAL	SINGLE ENG IND
MAX (TQ/%) AVAIL		(17)	(18)
(TQ/%) REQ TO HOVER IGE		(19)	(20)
(TQ/%) REQ TO HOVER OGE		(21)	(22)

SAFE PEDAL MARGIN (23) YES _____ NO _____

DA FORM 4887-R (1 Jul 80)

gg. **Item 30b.** Convert Calibrated Torque to Indicated Torque. (See Note 2.)

hh. **Item 31.** Predicted Fuel Flow derived from appropriate cruise charts.

FUEL CHECK:	FUEL/TIME	CONSUMPTION RATE	LBS/HR
(24)			
START:		BURN OUT	Z
STOP:		RESERVE	Z

LCT RET	KIAS/PROG	KIAS

OPTIONAL DATA	
WT COMPUTATION (25)	
BASIC WT (OIL INCL)	
CREW & FLT EQUIP	
EMER OR OTHER EQUIP	
OPERATING WT	
FUEL WT	
PAX-BAGGAGE-CARGO	
TAKEOFF WT (MINUS R/U FUEL)	

CRUISE DATA		
PA (26)	FAT (27)	VNE (28) KIAS

	SINGLE ENG	DUAL ENG
CRUISE SPEED (29)	___ KIAS ___ KIAS	___ KIAS ___ KIAS
CRUISE (TQ/%)	(30A) (30B)	
CRUISE FUEL FLOW	(31)	

REMARKS:

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NOTES:

1. The same PPC will suffice for consecutive takeoffs and landings if load and/or environmental conditions do not change significantly (+5 degrees Celsius or +500 feet PA).

2. Calibrated Torque conversion to Indicated Torque: Using the Maximum Torque Available (30 Minute Operation) Chart, enter the graph at the Calibrated Torque line. Move vertically to the appropriate Calibration Factor line. Move horizontally to read Indicated Torque.

3. Go-no-go Torque for external load operations is computed by using the appropriate Skid Height line that will ensure a load altitude of 5 feet agl without exceeding Maximum Allowable (OGE) Weight. ■

STACOM 108 16 Jan 1985
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Director, DES

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Fort Rucker, Alabama 36362-5363

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Report of Army Aircraft Mishaps

Report of first quarter FY 85 Class A mishaps

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Eleven Class A aircraft mishaps occurred during the first quarter of this fiscal year, compared to 10 for the first quarter of FY 84. Four of the 11 mishaps resulted in 8 fatalities. Nine of the 11 mishaps involved human error. Following are synopses of the human error mishaps.

• An AH-1 had been involved in a civilian static display. The crew departed for home station at night with marginal VFR weather. About 35 minutes after takeoff, the aircraft hit the top two cables of a powerline about 110 feet above the ground. The accident occurred near an interstate highway, indicating the crew was using the highway for navigational purposes. The aircraft was not equipped with wire cutters.

Cause: Pilot was trying to maintain VFR in IFR conditions.

Result: Two fatalities and a destroyed aircraft, at a cost of more than $1 million.

• An OH-58 on a nap-of-the-earth night vision goggles training mission was returning to the airfield. The pilot, a unit trainer, was in the left seat, and the copilot was in the right seat. As the aircraft was flying about 100 feet above the ground, it hit the top two cables of a high-tension line. The first cable entered the cockpit just below the center guide of the windshield. The second cable was cut by the bottom wire cutter. The aircraft crashed and rolled onto its left side. The cables were marked on the unit hazard map and the map was in the aircraft.

Cause: Crew was distracted by radio traffic and instructions from the platoon leader, causing inattention to obstacle avoidance.

Result: One fatality, one serious injury, and a destroyed aircraft, at a cost of more than $500,000.

This UH-1 hit a wire and crashed on a rainy and foggy night. The pilot was trying to maintain VFR in IFR conditions.

• A UH-1 medevac crew was on a night mission. When the crew returned to their home field, fog required an instrument approach. The aircraft did not break out on this approach, so the pilot elected to attempt another approach. The UH-1 descended below landing minimums and crashed beyond the end of the runway.

Cause: Pilot continued approach below landing minimums.

Result: One major injury, two minor injuries, and a destroyed aircraft, at a cost of more than $600,000.

• A UH-1 was transporting staff personnel to a field training location. The crew was trying to traverse a mountain pass along an interstate highway. It was dark, raining, and foggy. The aircraft hit a wire 176 feet above the highway and crashed.

Cause: Pilot tried to maintain VFR in IFR conditions. The company commander, who was a passenger in the aircraft, failed to order the pilot to turn around as conditions worsened.

Report of first quarter FY 85 Class A mishaps

Result: One major injury and a destroyed aircraft, at a cost of more than $900,000.

• A CH-47 was inserting troops on a mountain ridgeline. With the instructor pilot at the controls, the aircraft was making a rear-wheel-only landing. The aft rotor hit the slope above the landing site. Severe vibrations caused the aircraft to travel forward down a ravine until the forward rotor and transmission separated. The CH-47 then rolled onto its left side.

Cause: Inadequate terrain clearance.

Result: One critical injury, four minor injuries, and a destroyed aircraft, at a cost of more than $1.5 million.

• A UH-1 picked up seven infantry troops and took off. A few minutes later, the aircraft descended to contour flight at 80 to 90 knots, completed a turn, and leveled off 13 to 15 feet over trees. The UH-1 continued to settle into the trees and crashed.

Tentative cause: Inadequate terrain clearance due to inattention.

Result: Two major injuries, eight minor injuries, and a destroyed aircraft, at a cost of more than $900,000.

• A UH-1 pilot on a night vision goggles training mission did not turn on the radar altimeter prior to takeoff. During flight, the pilot noticed that the altimeter was not operating and proceeded to turn it on. During this time, the pilot lost ground reference and flew the aircraft into the ground.

Cause: Pilot failed to maintain visual reference to the ground. The new UH-1H dash 10 checklist does not include "turn on altimeter" as a response.

Result: Two major injuries, one minor injury, and a destroyed aircraft, at a cost of more than $900,000.

• When a U-21 on a service mission arrived at the airfield, weather conditions were below minimums. The crew tried to land but could not see the airfield. They executed a missed approach. The U-21 hit trees and crashed 500 yards from the airfield.

Tentative cause: Pilot inadvertently allowed the aircraft to descend below decision height.

Result: Four fatalities and a destroyed aircraft, at a cost of more than $1 million.

• About 10 minutes after taking off from a field site, an OH-58 crashed into a mountain. The pilot did not file a flight plan and did not get a weather report before taking off. The pilot, who was a new pilot-in-command, was in a no-fly area and was conducting a single-pilot mission with night vision goggles.

Cause: Inadequate mission control, single-pilot night vision goggles flight, and inadequate division of attention.

Result: One fatality and a destroyed aircraft, at a cost of more than $450,000.

Failure to follow established procedures continues to be the main cause of human-error mishaps. Commanders must insure that their crews are operating their aircraft according to regulations and time-proven procedures. ■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**3**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	1 - 23 Jan	**2**	**0**
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**13**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 4-10 January

Utility helicopters

UH-1 Class D mishap

H series - Pilot saw buzzard in his flight path and maneuvered to turn away from the bird. Bird dove into rotor system. Control tube was bent and main transmission cowling was cracked.

UH-1 Class E mishaps

H series - Engine oil temperature gauge fluctuated during approach for landing. Caused by short in wire.

H series - Crew chief heard noise from transmission area during landing. Caused by failure of collective servo.

H series - Master caution and tail rotor chip detector lights came on. Caused by failure of 90-degree tail rotor gearbox.

UH-60 Class A mishap

A series - Two UH-60 helicopters were ground taxiing out of adjacent parking pads. Crews of both aircraft were wearing night vision goggles. Aircraft collided and came to rest on their right sides. 8515

UH-60 Class E mishap

A series - Pilot had difficulty with all control inputs during flight. No. 2 reservoir low, boost servo off, and SAS off lights came on. Caused by failure of pitch trim assembly.

Attack helicopters

AH-1 Class C mishap

S series - After the third mission of the day, crew chief tied down blade and found 1-inch hole in right side of tail rotor drive shaft cover. Further inspection revealed damage to No. 3 hanger bearing mount and drive shaft ,etaining clamps. Pilot stated that after the first and second missions, he had postflighted the aircraft and did not see any damage. Because of mission requirements, daily inspection had been done on the aircraft the night before and preflight was done before daylight. Darkness may have prevented crew chief and pilots from seeing any foreign objects or deterioration in hanger bearing mount.

AH-1 Class E mishaps

S series - Engine oil pressure dropped during takeoff. Caused by failure of pressure transducer.

S series - Master caution, alternator, and rectifier lights came on. Caused by failure of alternator.

S series - As pilot was hovering in blowing snow, he lost outside visual reference. Copilot took controls and lost visual reference. Copilot increased torque to fly out of the snow cloud. As aircraft broke out of the snow cloud at about 60 feet, pilot saw torque had increased to 107 percent for 2 seconds. Aircraft was landed without further incident.

Observation helicopters

OH-58 Class E mishaps

C series - Master caution and fuel filter lights came on during hover. Caused by clogged fuel filter.

C series - Master caution and generator lights came on during runup. Caused by failure of voltage regulator.

C series - Master caution and fuel filter lights came on during takeoff. Caused by malfunction of pressure switch.

Cargo helicopters

CH-47 Class C mishaps

C series - Flight engineer saw fuel venting overboard during shutdown after 30-minute ground run. Structural damage to airframe was caused by left main fuel cell overpressure.

A series - When engine condition levers were moved to flight, No. 2 engine accelerated faster than No. 1. No. 2 reached 92 and 1050 pounds torque; rotor exceeded 270 rpm. Suspect No. 2 engine fuel control stuck.

C series - Lower rescue crew hatch door fell off during flight. Suspect right side forward attaching point bolt sheared off.

D series - Pilot's jettisonable door came off during takeoff.

Fixed wing

C-7 Class E mishap

A series - No. 2 engine ran rough during runup. Caused by broken No. 4 connecting rod.

U-21 Class C mishap

A series - During runup for test flight, crew was concentrating on No. 1 engine indicators. While increasing power to check No. 1 prop limitations, pilot inadvertently allowed No. 2 torque to exceed limits.

U-8 Class D mishap

F series - As pilot was turning into takeoff position, right wing hit small tree, damaging deice boot, wing skin, and wing ribs.

U-8 Class E mishap

F series - Left main gear indicated unsafe during landing. Tower personnel said gear appeared to be down. Aircraft was landed without incident. Caused by defective electrical ground interconnect between landing gear warning switch and indicator switch.

C-12 Class E mishap

D series - No. 2 engine fire detector light came on. Caused by malfunction of fire detector warning system.

Maintenance

UH-1 Class E mishaps

H series - After about 30 minutes in flight, right auxiliary fuel switch was turned on to transfer fuel. Strong fuel odor was noted. Fuel switch was turned off and aircraft landed. Main fuel line coupling was not correctly tightened at

Mishap briefs

elbow during installation of right auxiliary fuel tank, allowing fuel to leak.

H series - Control stiffness in cyclic was felt during left cyclic application. Crew chief did not correctly secure wiring harness during installation of cyclic. Harness for pilot's cyclic was binding in the vicinity of the clevis assembly.

H series - Transmission oil pressure fluctuated during NOE flight, and transmission oil pressure light came on. Transmission hose was rubbing against a fuel line. Hole in transmission hose allowed loss of fluid.

UH-60 Class D mishap

A series - As aircraft was ground taxiing from parking pad to takeoff area, rotor downwash blew right rear door off a parked OH-58. OH-58 crew chief did not secure door after working on aircraft.

OH-6 Class E mishap

A series - Transmission oil temperature light came on during landing. Wiring to caution light panel was inadvertently disconnected when cold weather engine air inlet fairing was installed. Light came on when loose wire touched the airframe.

Messages received

• Safety-of-flight technical message concerning extension of time compliance to safety-of-flight message UH-1-84-11 (UH-1-85-01, 042200Z Jan 85). Summary: The priority classification in par. 3 of UH-1-84-11 safety-of-flight message is amended to read: "After 60 days, condition will be changed to a red X." Daily inspections pertaining to clevises will be continued until the new clevises are installed. Contact: Richard Smith, AUTOVON 693-1685, commercial 314-263-1685. ■

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Materiel failure PRAMs received without part numbers

One of the best ways to analyze materiel failures for accident prevention purposes is to retrieve from the Safety Center computer the part numbers of failed parts. However, approximately one-third of the PRAMs reporting materiel failures are received without a correct part number.

While EIR/QDR control number, NSN, part nomenclature, and TAMMS data are requested in block 14 of the PRAM, the part number is most important for computer retrieval and materiel failure analysis purposes. Safety officers submitting PRAMs are asked to place special emphasis on including the part number of the failed part in the PRAM.

Safety Center point of contact is Mr. Naumann, AUTOVON 558-2001/6585.

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Aircraft accident review

Flight into IMC

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Synopsis

As two UH-60 aircraft were transporting troops, they encountered low clouds and ground fog near the head of a small valley. Both aircraft came to an out-of-ground-effect hover, and the lead aircraft moved forward to try to get through to the next valley. While the lead pilot was apparently attempting vertical helicopter IFR recovery procedures (VHIRP), the aircraft hit trees 107 feet above the ground on rising terrain and crashed. The second aircraft turned around and flew out of the valley.

History of flight

Several UH-60 aircraft were participating in a joint field training exercise. The aircraft were involved in tactical support missions and near midday were approaching completion of their missions. The last mission for two of the aircraft was to transport 12 soldiers from one location to another. The lead aircraft took seven passengers aboard, and the No. 2 aircraft took five passengers. Three passengers in the lead aircraft were seated on the floor, without restraints, although two seats were available for them.

The flight progressed along an established, planned route for 25 minutes. At this point, deteriorating weather conditions forced the flight to deviate slightly to the north into a small valley and slow their airspeed to 30 knots. Aircraft separation was increased to about 300 feet.

The pilot of the lead aircraft told the crew of the No. 2 aircraft that conditions ahead looked worse but he thought he could make it over the ridgeline into the next valley. The crew of the second aircraft watched as the lead aircraft continued to move forward and disappear into the fog and low stratus clouds.

The pilot of the second aircraft called the lead aircraft to say that he thought the weather was too marginal and that he would try to circumnavigate the weather system to the north. The lead aircraft did not acknowledge this transmission or subsequent attempts to establish contact.

The second aircraft was successful in circumnavigating the weather and continued to its destination. The lead aircraft had disappeared from view of the second aircraft in a valley floor. While the lead pilot was apparently attempting VHIRP, he unknowingly paralleled a steep unslope about 500 meters. The main rotor blades hit one of two tall isolated trees as the aircraft passed just to the left of the tree. The strike occurred about 107 feet above the ground, and all main rotor blades were shed at that point. The impact caused the aircraft to roll right and yaw left. The tail cone then hit a second tree, and the tail rotor, stabilator, and vertical part of the tail cone separated. The fuselage then began a right yaw, hit the ground, and rolled, coming to rest on its left side. The crew chief and three passengers were killed. The other six occupants sustained critical injuries.

Crew experience

The 27-year-old pilot had almost 1,000 rotary wing flight hours, with more than 800 in the UH-60. The 29-year-old copilot had more then 750 rotary wing flight hours, with more than 550 in the UH-60.

Accident review

Commentary

Light rain was falling at the time of the accident, and the sky was obscured by clouds and fog extending to ground level. Horizontal visibility was less than a quarter of a mile. Although the low ceilings and rainshowers limited the ability of the crew to perform their assigned mission, the weather conditions were forecast and did not present any sudden surprise. The crew had been working in similar weather conditions for 6 months and were thoroughly familiar with the limitations that might be encountered due to weather. It was concluded therefore that the environment was not causal in nature, merely limiting, as evidenced by the second aircraft's circumnavigation of the weather and successful completion of the mission while continuing flight under visual flight rules.

Throughout the previous 6 months in country, the pilot and copilot of the mishap aircraft had encountered similar weather conditions and been able to climb to VFR conditions on top of the weather or find a hole in the weather which would allow them to complete their missions. The pilot's decision to continue visual flight into weather which was worse than anticipated was most probably influenced by overconfidence in his ability to successfully operate in this manner since the entire unit had been successfully operating in marginal weather.

Although the command overtly supported mission abortion for safety reasons, the unit aviators indicated that frequently they would search around until finding a hole through the weather and complete their mission. As this procedure had been followed on numerous occasions, peer pressure and a "can do" attitude emerged among the pilots and functioned to covertly negate the effects of the command's emphasis on safety and the exercise of prudent judgment. Each time an aviator stretched performance to the limits or deviated slightly from regulatory requirements and was not admonished for his actions, the resultant degradation to command safety emphasis was compounded. The end result was that such practices became commonplace and the accolades for such a high degree of mission accomplishment overshadowed the unsafe manner in which they were accomplished.

Since the environment created by the chain of command affects the manner in which the unit's pilots perform, the command environment in this instance functioned to condone the pilot's actions, even though this took place unconsciously.

The injuries sustained during the crash sequence were greater in severity than they should have been. Three of the passengers and the internal cargo were unrestrained. The loose cargo and passengers became unrestrained missiles inside the aircraft during the impact sequence, increasing the severity of injuries to the occupants.■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
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	November	3	3	November	**3**	**3**
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2nd Qtr	January	4	0	1 - 30 Jan	**5**	**0**
	February	4	4			
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3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**16**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 11-17 January

Utility helicopters

UH-1 Class A mishap

H series - Aircraft was on training mission. Copilot, flying from the left seat, was attempting a slope landing. As right skid was being placed on the slope, rear portion of skid sunk in a small mound of loose dirt. Copilot tried to return to a hover, and aircraft rolled over onto right side. 8516

UH-1 Class E mishaps

H series - When aircraft was lifted to hover for takeoff, pilot noticed severe lateral vibration. Crew did not notice buildup of clear ice on main rotor blade during preflight inspection.

H series - Pilot felt unusual feedback in cyclic during takeoff. Caused by leaking hydraulic cylinder servo.

H series - Fire warning light came on. Caused by defective fire detector control box.

V series - Pilot noticed rapid fluctuations in engine oil pressure gauge, and master caution light came on. Caused by failure of No. 3 and 4 bearing pack seal.

H series - Unusual cyclic feedback at hover was caused by failure of irreversible valve.

UH-60 Class E mishaps

A series - No. 2 engine failed during flight. Restart was accomplished and aircraft returned to airfield. Caused by failure of inlet particle separator blower assembly. Suspect broken shaft to accessory gearbox caused momentary interruption in fuel flow and engine shutdown.

A series - Pilot noticed excessive lateral vibration after takeoff. Suspect water accumulated in main rotor tip cap and froze. Temperature at takeoff was -15° C.

Attack helicopters

AH-1 Class D mishap

S series - AH-1, air taxiing to parking area, was flown between two parked OH-58s. Crew was preflighting one of the OH-58s. Pilot held the door, but it was blown from his hands, breaking the hinges. Ground control had cleared the AH-1 to taxi to parking area.

AH-1 Class E mishaps

S series - Fog and rain were worse than forecast, and crew landed in open field.

S series - Rpm light and audio activated and N2 remained at 100 percent during landing. Caused by failure of tachometer generator.

S series - As aircraft was picked up to a hover, severe and erratic oscillations occurred about the roll axis. Caused by failure of SCAS amplifier unit.

Cargo helicopters

CH-47 Class C mishap

A series - Crew heard loud banging sound from rear of aircraft, followed by left yaw. No. 1 engine chip detector light and engine transmission hot light came on. Flight engineer told pilots that No. 1 engine was smoking. Single-engine landing was made. No. 1 engine transmission failed and separated from mount, causing overtemp and foreign object damage to engine.

CH-47 Class E mishaps

C series - Transmission chip detector light came on during flight. Wire had come loose and was shorting out against terminal housing on transmission.

C series - No. 1 engine oil low light came on. Caused by failure of oil seal on No. 3 bearing pack.

Observation helicopters

OH-58 Class C mishap

A series - Three OH-58s were on cross-country flight. Cloud tops were higher than briefed by the National Weather Service. Flight tried to fly over the top of the cloud layer but couldn't. They then turned around but found that clouds had closed in behind and around them. Flight executed prebriefed IMC breakup procedure. Pilot of one of the aircraft was told to descend to 4,000 feet. When collective was lowered, engine quit and aircraft nose tucked to the right. Airspeed increased to 120 knots. Pilot increased collective to decrease rotor speed and rotor tachometer spun to zero. Aircraft was autorotated through the clouds to about 2,500 feet msl before entering visual conditions. Successful restart of the engine was accomplished just before touchdown. Aircraft came to a 1-to 2-foot hover as pilot terminated autorotation. Area directly underneath the aircraft was swampy, and pilot hovered to area about 100 feet away and landed. Tail boom was buckled, possibly due to dynamic forces, and rotor overspeed occurred.

Mishap briefs

OH-58 Class D mishap

A series - Mechanic's gas mask carrier hooked on collective as he reached in to check cannon plug on copilot's ICS box during runup. This caused aircraft to become airborne. Spike knock occurred. Pilot did not conduct crew briefing, allowing maintenance to be performed before pilot was ready to guard the controls.

OH-58 Class E mishaps

C series - While en route to destination with low fuel, pilot encountered heavy ground fog, necessitating alteration of course to prevent going VFR on top of fog clouds. Low fuel light came on short of destination. Aircraft was landed and refueled by tactical fuel truck.

A series - Master caution and transmission oil pressure lights came on. Caused by failure of transmission oil pressure switch.

Training helicopters

TH-55 Class C mishap

A series - Student pilot was performing straight-in standard autorotation. At the point of initial pitch, IP got on the controls. Aircraft was leveled and cushioning pitch applied. As slide-out continued, aft crossbeam broke, allowing tail rotor to hit the lane. Aircraft came to rest upright, with damage to tail rotor assembly, gearbox, and drive shaft.

Fixed wing

U-21 Class E mishap

H series - Left nacelle fuel cap began siphoning during flight. Caused by deteriorated O-ring on center of fuel cap.

OV-1 Class D mishap

D series - Nose gear would not indicate up and locked. Visual check with tower revealed nose gear was not fully retracted. Gear was lowered and aircraft landed. Failure of nose gear sequence valve allowed nose gear doors to close before nose gear assembly retracted completely. Gear door sheetmetal was crumpled and torn.

OV-1 Class E mishap

D series - Left main gear light indicated in transit. Visual check of gear revealed gear appeared to be down and locked. Landing was made without incident. Caused by failure of downlock switch.

Maintenance

UH-1 Class D mishap

V series - Postflight inspection revealed damage to 42-degree gearbox cover. Spool of safety wire was left in cowling area.

UH-1 Class E mishap

H series - Pilot felt binding in collective during takeoff. Collective friction was adjusted incorrectly.

AH-1 Class E mishap

S series - Forty-two-degree gearbox chip detector light came on. Incorrectly fastened gearbox cover chafed through chip detector wire.

OV-1 Class E mishap

D series - Landing gear handle light remained on and left main gear indicated in transit during climb after takeoff. Visual check confirmed left main gear was not up and locked. Caused by overserviced strut.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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Report of Army Aircraft Mishaps

Aircraft accident review

Inattention to airspeed

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Synopsis

A UH-60 was flying with an empty pallet as a slingload. The load hit the tail section and rotated up into the main rotor system. The UH-60 descended into trees, came to rest inverted, and burned.

History of flight

The unit was on a field training exercise. The crew of a UH-60 flew to a drop zone (DZ) where they were told to transport, as a slingload, an air delivery pallet to a rearm and refueling point about 8 kilometers from the DZ. A sling was rigged to the pallet and hooked to the aircraft. At this time, the pilot told the copilot that because the load was like an airfoil, it would fly up into the underside of the aircraft if they flew too fast. The pilot decided that he would fly the aircraft because of the nontypical load.

The aircraft took off from a hover, with the pilot flying from the right seat. About 4 minutes later, the pilot called the tower to say that he was entering downwind for landing at the refueling point. The pilot told the copilot to take the controls to complete the landing while he tuned the radios. Almost immediately, the crew chief yelled "Release the load" over the intercom. The pilot heard a loud banging noise from the tail boom section and tried to release the load.

The pallet flew up into the main rotor blades. The pilot took the controls, but the aircraft would not respond to control inputs. After losing the tail cone assembly, the aircraft rolled right in a nose-low attitude, crashed through trees, came to rest inverted, and immediately caught fire. Because of the inverted attitude of the aircraft at the time of impact, the crashworthy fuel cells could not withstand the negative g forces encountered and burst.

The copilot was killed on impact. The pilot and crew chief sustained serious injuries.

Crew experience

The 27-year-old pilot had more than 450 rotary wing hours, with almost 300 in the UH-60. The 24-year-old copilot had almost 400 rotary wing hours, with almost 200 in the UH-60.

Commentary

Witness statements indicated that the load had been properly rigged and flew well up to the point of control transfer from the pilot to the copilot. Immediately following transfer of control, and while the pilot was tuning the radios, the copilot allowed the airspeed to increase 10 to 15 knots in excess of the airspeed designated as the maximum (55 knots) by the pilot. This increase was enough to produce aerodynamic lift on the empty cargo pallet, causing it to start flying.

A computer analysis was made in an effort to determine the aerodynamic characteristics of the pallet. The results showed that at 30 knots forward airspeed, the pallet was capable of flying and that it would definitely fly at 60 knots. The pilot stated that he had not exceeded 55 knots airspeed and that the slingload was a "good load" as verified by the crew chief before transfer of the controls to the copilot. After the pallet entered the rotor system and the sling chain hit the tail rotor, the aircraft was not controllable.

The copilot's inattention to the airspeed was attributed to his relative inexperience in transporting nontypical external loads and the lack of adequate operator's manual cautions concerning such loads. Both the pilot and copilot were aware of the unstable potential of their load. However, neither were aware that when the load initially became unstable, it was already too late to take corrective action. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 18-24 January

Utility helicopters

UH-1 Class A mishap

H series - Unknown object struck tail rotor, causing tail rotor separation. Aircraft landed hard. 8517

UH-1 Class C mishaps

H series - Pilot became spatially disoriented by blowing snow during landing. Excessive cyclic input allowed main rotor blades to strike upper wire strike protection system, cutting lower surface of both blades. Lower wire strike system was slightly damaged on ground contact.

H series - As aircraft was taking off from landing zone, it hit three wires. Main rotor blades, antennas, cargo door windows, and hydraulic servo tube were damaged.

UH-1 Class D mishap

H series - Aircraft was in cruise flight at 100 knots and 38 psi torque. Collective crept up and torque indicated 60 psi.

UH-1 Class E mishaps

H series - Crew smelled fuel fumes after takeoff. Failure of crossover fuel transfer line from auxiliary fuel tank allowed fuel to be pumped into underside of aircraft.

H series - Shudders were felt in cyclic and collective controls, and crew smelled something burning. Caused by bearing failure in heater blower.

H series - Pilot heard unusual howling noise and felt high frequency vibration through floor and tail rotor pedals. One of the bolts in main drive shaft assembly which connects shaft end fitting to outer plate sheared, causing vibration and noise.

UH-60 Class C mishap

A series - Aircraft was flying with slingload when engine oil pressure fluctuated. During approach to drop off

slingload, engine oil pressure light came on. Load was released and single-engine landing was made. Postflight inspection revealed oil filter cap was off. Engine was replaced.

UH-60 Class D mishaps

A series - Passenger inadvertently pulled cargo window jettison handle during flight. Windows fell to the ground and were damaged.

A series - Aircraft was trail in flight of four. Because of blowing snow, pilot aborted first attempt to land in large landing zone but was successful on the second attempt. As planned, flight took off and then came back to the same LZ. Copilot of trail aircraft took the controls for this approach. During the landing, tail wheel hit the ground, but copilot did not decrease collective enough to put forward gear firmly on the ground. Copilot lost visual reference and allowed aircraft to slide down a 5-degree slope where blade tips hit some trees. Pilot took control, moved away from the trees, and repositioned to center of LZ. Copilot did not follow the procedure outlined in FM 1-202 which states that "once contact is made, reduce torque until the aircraft is firmly on the ground."

A series - No. 1 engine cowling came open in flight. Caused by failure of spring retainer on cowling latch.

UH-60 Class E mishap

A series - Master caution and transmission chip detector lights came on. Bearing on input flange of transmission deteriorated, causing complete loss of oil and excessive drive shaft play.

Attack helicopters

AH-1 Class D mishap

S series - Aircraft was No. 3 in a tactical formation of three, flying at about 50 knots and 30 feet agl. Copilot at the controls saw a wire about 10 feet ahead and slightly above the aircraft canopy. Copilot increased collective to clear the wire. Aircraft climbed about 8 feet, and wire hit forward cross tube. Forward motion of the aircraft caused the wire to stretch and break. Wire slid clear of aircraft. Pilot took control and landed. Fuselage was punctured. Aircraft was not equipped with wire strike protection system.

AH-1 Class E mishaps

S series - Transmission and engine oil temperatures fluctuated from zero to maximum during runup. Caused by sheared starter generator output shaft.

S series - Master caution lights came

on, engine oil pressure light did not extinguish after start, and pilot's cyclic control was stiff during runup. Master caution assembly was replaced.

Cargo helicopters

CH-47 Class C mishaps

C series - Lower rescue crew hatch door fell off during flight. Caused by sheared bolt.

C series - Flight engineer noticed fuel venting overboard on shutdown after ground run. Structural damage to airframe was caused by left main fuel cell overpressure.

C series - When engine condition levers were moved to flight, No. 2 engine accelerated faster than No. 1. Rotor exceeded 270 rpm. Torque exceeded 860 pounds for 10 seconds. Suspect No. 2 engine fuel control stuck.

CH-47 Class E mishaps

A series - When No. 1 engine condition lever was moved to ground after landing, several caution lights came on. AGB valve was stuck in open position.

C series - No. 1 engine normal beep would not respond during flight. Emergency beep trim was used. On short final, No. 2 engine beep trim would not respond. Running landing was made using No. 1 and No. 2 emergency beep trim. Caused by failure of engine trim control box.

Observation helicopters

OH-58 Class A mishap

A series - Engine failed and fire started during flight. Aircraft was autorotated to the ground and was destroyed by fire. 8518

OH-58 Class D mishap

A series - Pilot was attempting a battery start of the aircraft. After starter engagement, N1 climbed to 14.5 percent. Throttle was advanced to flight idle and TOT climbed rapidly toward maximum limit. Pilot determined hot start was occurring, depressed idle release plunger, and tried to close throttle. Throttle would not close until idle release plunger was pressed again. Starter was motored during throttle closure, but TOT was above 927° C. for 2 seconds. Engine was damaged. Suspect pilot's difficulty in activating flight idle release was caused by degraded dexterity in his hands. He had been at the aircraft for 45 minutes in -19° C. temperatures.

OH-58 Class E mishaps

A series - Master caution and transmission chip detector lights came on. Caused by failure of main transmission.

C series - Severe lateral vibration was felt during runup. Caused by ice in main rotor blades.

C series - Fuel filter light came on. Caused by failure of fuel pressure switch.

Fixed wing

C-12 Class D mishap

C series - Outer panel on copilot's side window cracked during flight.

OV-1 Class D mishap

D series - While following ground guide's instructions, pilot taxied aircraft with left wing close to ramp edge. Pilot turned aircraft to right, and fin on external fuel tank hit fire extinguisher.

T-42 Class D mishap

A series - Engine began surging and oil pressure dropped. Single-engine landing was made. Crank shaft on left engine was cracked.

U-21 Class E mishap

A series - Pilot noticed fuel leaking at nacelle cap during climb. Cap was installed incorrectly.

Maintenance

UH-1 Class E mishaps

H series - Master caution and transmission oil pressure lights came on. Oil pressure dropped to zero. Caused by incorrect installation of transmission oil filter gasket.

H series - Severe lateral oscillation in main rotor system was caused by incorrectly installed retaining bolt.

CH-47 Class E mishap

C series - Crew chief saw hydraulic fluid leaking from drain on side of aft

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	1-6 Feb	**0**	**0**
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**17**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Mishap briefs

pylon. Overtorque caused 90-degree elbow fitting on No. 1 flight boost return filter to fail.

U-8 Class E mishap

F series - As throttle was retarded to reduce manifold pressure during flight, engine rpm began to steadily drop. Engine was shut down and prop feathered. Aircraft was landed at airfield. Caused by incorrect torque on lower fitting of main oil line to oil pump.

U-21 Class E mishap

A series - Landing gear did not fully retract after takeoff. Gear was lowered and aircraft landed. Landing gear clutch assembly was out of adjustment.

Messages received

• Safety-of-flight technical message concerning one-time inspection of OV-1/RV-1 generators (OV-1-85-01, 151530Z Jan 85). Summary: New generators may have been delivered with improperly heat-treated machine screws. However, no known failures of this screw have occurred. A one-time inspection will be made to find and remove suspected generators. Contact: Jim Mitchell, AUTOVON 693-1639, commercial 314-263-1639. ■

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Supervisors mold attitudes

All of us, I'm sure, have seen someone breaking the rules, but we chose to ignore it for one reason or another. By our actions, we have contributed to an attitude that someday could lead to more serious infractions.

That same person you have allowed to get away with reporting late for work might just be the one who will embarrass you during the next infraction. Or the person you don't correct for driving a little fast might be the one who rams a flight line vehicle into a parked aircraft.

Good supervisors and managers lead by example. You influence the men and women who work for you whether you realize it or not.

You are a molder of attitudes. Your supervision and your influence are directly reflected in the way your people think and act. Their actions tell others "This is the way I was taught."

Take the time to correct mistakes, no matter how small. It will be time well spent. Not only will you improve efficiency in your unit, but you will help to mold attitudes that will create the desire to excel. ■

—from USAF Maintenance Magazine

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 25-31 January

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Utility helicopters

UH-1 Class E mishaps

H series - Master caution and 90-degree gearbox lights came on. Caused by failure of 90-degree gearbox.

H series - Pilot's door window separated from aircraft during flight. Cold weather conditions caused materiel failure.

H series - Aircraft was No. 3 in a flight of 5. Pilot overtorqued aircraft while making a steep climb in a ravine with a downdraft.

H series - Aircrew, nearing destination, was told of unforecast fog. Decision was made to return to point of origin. Unforecast dense fog was encountered again. Two GCAs resulted in missed approaches. Crew diverted to alternate airfield and landed.

UH-60 Class A mishap

A series - Aircraft was No. 3 in a flight of 5 on a troop insertion training mission. While terminating approach at tactical LZ, pilot brought aircraft to a hover at 10 feet. Snow engulfed the aircraft and pilot initiated descent. Aircraft landed hard on right main gear, which was upslope. Left side then hit hard, and aircraft rolled over onto left side. 8519

UH-60 Class E mishaps

A series - Vertical vibration was felt during takeoff. Caused by frozen antiflap stop.

A series - Aircraft was No. 3 in a flight of 4 on night vision goggles live fire training mission. When No. 3 aircraft drifted right, pilot of No. 4 aircraft thought some of his rounds had hit No. 3. Aircraft was shut down, but no damage was found.

Attack helicopters

AH-1 Class E mishaps

S series - Transmission oil bypass light came on. Caused by failure of transmission oil pressure switch.

S series - Master caution, alternator, and rectifier lights came on. Caused by failure of alternator.

S series - Engine oil pressure lights would not extinguish during runup. Caused by failure of engine oil pressure switch.

Observation helicopters

OH-58 Class E mishaps

A series - After opening throttle to full open during runup, N2 would not stabilize at 103 percent. N1 varied from 101 to 103 percent. Caused by defective double check valve on line from N2 governor to fuel control.

C series - Copilot terminated approach at 25 feet above obstacles into the wind. Winds were reported from 240 degrees at 8 knots. When copilot started right turn, turn could not be stopped and increased in rate. Copilot started loss-of-tail-rotor-effectiveness procedures without result. Pilot took controls and initiated the same procedures. Rate of turn decreased slightly, but aircraft continued to spin to the right. Aircraft

(continued on back page)

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	1-13 Feb	**0**	**0**
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**17**	**8**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Stacom

Standardization Communication

CY 84 STACOM Index

STACOM 97, 25 Jan - Operator's Manual and Checklist update

STACOM 98, 1 Feb - The aviator's role in aircraft maintenance, Wind awareness

STACOM 99, 7 Mar - Aircrew training manuals, Instrument flight evaluation, Orientation flights, Recommended changes to operator's manuals and checklists, Clarification of TM 55-1520-236-10, AH-1S helicopters, CY 83 STACOM Index

STACOM 100, 28 Mar - Origin and concept of STACOM, Recommended changes to publications and blank forms

STACOM 101, 25 Apr - Clarification of DOD Flight Information Publication (FLIP) General Planning (GP) and Department of the Army Technical Bulletin (TB AVN 1170), Night vision goggle update

Mini-STACOM, 16 May - Flights into turbulence

STACOM 102, 23 May - Operator's Manual and Checklist update

STACOM 103, 6 Jun - UPDATE, Actual or simulated hydraulic failure

STACOM 104, 4 Jul - Mission briefings, Thru-flights, C-12 operator's manual, Directional control margin, Recording night vision goggle flight time

STACOM 105, 15 Aug - NVG messages, Night vision goggles training and operations

STACOM 106, 5 Sep - DES update, Anti-collision lights, Change 2 to AR 95-1, Questions and answers

STACOM 107, 21 Nov - Checklists. Here we go again!, Aircrew information reading file, Aviators Annual Proficiency and Readiness Test evaluations■

Cyalume lightsticks

Having a problem getting light sources for night flight? If so, give the following information to your supply personnel.

Part Number/ Code	National Stock Number	Product Description	Color	Case Pack Each	Case Weight Lbs.	Price Ea. Case
95270-16	6260 00 106 7478	4" General Purpose Safety-Light Wand	Green	1000	28	$ .69/$690.00
95270-52	6250 01 074 4230	6" 30 Minute Hi-Intensity Safety-Light Wand	Yellow	100	6½	$ .95/$ 95.00
95270-53	6260 01 074 4229	6" 12 Hour General Purpose Safety-Light Wand	Green	100	6½	$ .89/$ 89.00
95277-19	6260 01 178 5559	6" 12-Hour Safety-Light Wand	Red	100	6½	$ .92/$ 92.00
95277-20	6260 01 178 5560	6" 8-Hour Safety-Light Wand	Blue	100	6½	$ .99/$ 99.00
95277-21	6260 01 196 0136	6" 12 Hour Safety-Light Wand	Yellow	100	6½	$ .92/$ 92.00
95270-48	6260 01 195 9753	6" 12-Hour Safety-Light Wand	Orange	100	6½	$ .92/$ 92.00
95270-58	6260 01 086 8077	Personnel Marker Light	Green	100	13	$3.85/$385.00
95270-90	6260 01 196 0637	Combat Light Device (6" Light Wand Holder)	O.D. Green	100	8	$1.94/$194.00
95275-01	6260 01 195 9752	6" Non-Visible Light Wand	Infra Red	100	6½	$2.89/$289.00

Update on field circular program

Number	Title	Status	Remarks
FC 1-209	AHIP ATM	New	Scheduled start date (new) 85-2 for publication 86-2
FC 1-210	Cdrs Guide	Published	Printed 31 May 84
FC 1-211	UH-1 ATM	Published	Printed 31 Jul 84
FC 1-212	UH-60 ATM	Published	Printed 31 Aug 84
FC 1-213	AH-1 ATM	Published	Printed 30 Sep 84
FC 1-214	AH-64 ATM	New	Hand off to DOTD 1 Apr 85 to be printed NLT 1 Jun 85
FC 1-215	Observation Helicopter ATM	Published	Printed 30 Oct 84
FC 1-216	CH-47 ATM	At printing plant, due out Feb 85	Delivered to printing plant 14 Dec 84
FC 1-217	OV-1 ATM	Published	Printed 30 Dec 84
FC 1-218	Utility Airplane	At printing plant, due out Feb 85	Delivered to printing plant 11 Jan 85
FC 1-219	Night Vision Goggles	Published	Printed 31 Dec 84
FC 1-221	IP Handbook, F/W	At publisher	Expected date of completion is 1 Apr 85
FC 1-222	IP Handbook, R/W	At DES for review	Scheduled for printing 3d Qtr 85

Amendments to FC 1-219

FC 1-219, dated 31 December 1984, NVG Training and Operations, is amended as follows:

- Page 2-12, par. 2-6:

a. Complete 9 flight hours of NVG or DVG each **semi-annual** period (NVG flight minimum is 4 hours).

c. Complete the **annual** tasks and iterations required by the TOE or TDA position in accordance with the Commander's Task List.

- Page 3-4, par. 3-2:

(ADD) c. (2) Preferred bulb with IR bypass filter is a 150w/28v/Par 46, NSN 6240-00-690-1094 (commercial equivalent is Sylvania or GE bulb #4571). Either bulb may be used.

- Page 2-13, table 2-4:

Delete task "Perform vertical helicopter instrument flight rules (IFR)[3]."

- Page 2-14, table 2-4:

Under task "Perform vertical helicopter instrument recovery procedures (VHIRP)" add an "X" to Qual/Stdzn Eval/Curr Eval columns.

These amendments will be published in a future change to FC 1-219.■

STACOM 109 13 Feb 1985
Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5000, 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.

Turner E. Grimsley

TURNER E. GRIMSLEY
LTC(P), Aviation
Director, DES

Mishap briefs

then rolled left and three or four loud slapping sounds were heard. Control was regained and aircraft landed after about nine complete rotations.

A series - Master caution and fuel pump lights came on. Caused by failure of fuel boost pump.

Fixed wing

U-21 Class E mishaps

A series - Fuel began siphoning from right nacelle cap during flight. Fuel cap was not seated correctly.

H series - No. 1 engine lost oil pressure during climbout. Suspect internal failure of carbon seal.

C-12 Class E mishap

C series - Ten minutes after gear retraction, right bleed air fail warning light came on. Bleed air warning system clamp in left wheel well had come loose.

OV-1 Class E mishaps

D series - Torque indication dropped from 104 percent to 73 percent during takeoff roll. Caused by malfunction of torque inverter.

D series - Crew chief saw smoke coming from rear left side of aircraft during engine start. Caused by short in APU power cable plug.

Maintenance

UH-1 Class E mishap

H series - Rmp warning light did not illuminate when throttle was reduced to flight idle during engine shutdown. Warning light box was out of adjustment.

OH-58 Class E mishap

C series - During contour flight, pilot began a descent by lowering the collective. When power was applied to stop the descent, collective binding occurred. Inspection revealed knurled nut to copilot's collective was loose.

U-21 Class E mishap

A series - Airspeed indicator remained at zero during takeoff. Pitot static drain valve was left open following 75-hour service. Crew was unable to inspect item during preflight.

OV-1 Class E mishap

D series - No. 1 engine egt became erratic during flight. Caused by dirty egt harness cannon plug.

Messages received

• Ground support equipment safety of use message concerning B-1 maintenance platform (SOU-GEN-85-MEM-01, 281200Z Jan 85). Summary: The lower end of the stair and platform elevating jack shafts on B-1 maintenance platforms may not be adequately secured to the lower frame mount. Continued operation of the jackscrews after the stand has been lowered onto the rests can cause the jack shafts to unscrew from the lower mount flange plate sockets. Since this area is encased in the accordion-type dust covers, this condition can go undetected. In subsequent elevation of the maintenance platform, the jackscrews can slip off their lower mounts, resulting in collapse of the raised stairs. Contact: Jerome Smith, AUTOVON 693-1617, commercial 314-263-1617.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

TM change

Change 13, dated 20 Nov 84, to TM 55-1520-214-10 for OH-6A helicopters, has been released.

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Craig B Schilder

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20 February 1985

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Report of Army Aircraft Mishaps

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 1-7 February

Utility helicopters

UH-1 Class D mishaps

H series - As aircraft was flying 50 feet above the ground, flock of birds entered flight path. One bird hit and broke copilot's chin bubble.

H series - Pilot made a high reconnaissance before landing and began an approach over a powerline. Aircraft had cleared the line when it hit another wire which was not seen by the crew. Aft cross tube was damaged during landing. Wire damaged scissors assembly, pitch change link assembly, and connecting link assembly. Wire passed above upper wire cutter and below main rotor blade, hitting main rotor mast assembly.

UH-1 Class E mishaps

H series - As approach was terminated, cyclic made abrupt forward motion. Efforts to recenter cyclic indicated hydraulic power had been lost. Caused by failure of hydraulic line.

H series - Master caution and transmission oil hot lights came on. Caused by faulty transmission oil sensing bulb.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	1 - 20 Feb	**2**	**2**
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**19**	**10**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Attack helicopters

AH-1 Class D mishap

S series - As aircraft crossed over a ridge, crew felt and heard something hit aircraft. Bird strike caused dent and crack on TSU fairing.

AH-1 Class E mishaps

S series - Engine oil pressure indicated 107 psi during takeoff check. Caused by failure of oil pressure transducer.

S series - Pilot overshot an approach to a holding area during NOE flight. Visibility was reduced because of light rain, ground fog, and decreasing ambient light. As pilot was returning to the holding area, he lost altitude and saw a tree at flight level. Within 30 seconds after passing the tree, master caution and tail rotor chip detector lights came on. Pilot landed in open field. Inspection showed that aircraft had flown through the top of the tree, but there was no visible damage other than minor scratches to skid fairing.

Cargo helicopters

CH-47 Class D mishap

C series - Slingload slings were being picked up and tightened before the load was lifted off the ground. Three pathfinder personnel were helping to keep the sling from being tangled around the load. Sling became tight quicker than expected. One of the soldiers did not let go of the clevis fast enough to prevent his hand from being caught. The load continued up with the soldier's hand caught between the load and the clevis assembly. The load was lifted to about 20 feet above the ground with the soldier still hanging onto it. The other soldiers alerted the crew

(continued on back page)

Mishap briefs

chief, and the pilot lowered the load. Soldier sustained lacerations and a dislocated joint.

CH-47 Class E mishaps

C series - No. 1 engine N_1 dropped and stabilized at 40 percent during landing. Caused by cracked fuel hose.

C series - Passenger sitting in jump seat noticed hydraulic fluid dripping in flight control closet during runup. Caused by crack in hydraulic line.

Observation helicopters

OH-58 Class D mishaps

C series - Main rotor blades hit tree during NOE flight. One blade was damaged 2 inches from tip.

C series - As pilot was hovering from refueling site, engine rpm decreased and low rpm audio and light activated. Aircraft was in left crosswind condition. As aircraft yawed left, pilot applied right pedal and left cyclic. Aircraft settled to the ground, bounced, and started a slight right roll. Pilot increased left cyclic as aircraft landed hard. Aft cross tube and cross tube straps were damaged. Suspect engine failure.

OH-58 Class E mishaps

A series - Master caution and engine fuel filter lights came on. Oil had clogged fuel filter bypass switch.

A series - Aircraft was on night vision goggles mission. Four kilometers from intended LZ, pilot determined they were 10 minutes ahead of schedule and decided to make a false insertion. Landing was begun to false LZ. At 25 feet agl and 30 knots, IP in left seat saw a wire. He yelled "Wires" and both pilots pulled collective. Front cross tubes caught the wire and it broke. Aircraft was landed without further incident.

Fixed wing

C-12 Class D mishap

C series - Ground guide was directing aircraft into parking spot. Pilot thought left wing was too close to fence and stopped. Ground guide indicated there was about 1-foot clearance and motioned pilot to come forward. Wing tip hit fence post.

C-12 Class E mishaps

D series - Pilot saw fuel venting from left inboard fuel cap during climbout. Anti-siphon valve located under fuel cap was stuck open about one-fourth inch.

C series - Flaps would not retract after takeoff. Caused by corroded split flap fuse holder.

U-21 Class E mishap

A series - Fuel was seen siphoning from right nacelle fuel cap during flight. Fuel cap was not seated correctly.

Maintenance

UH-1 Class C mishap

H series - Pilot tried to abort start because of low battery voltage. Crew chief told pilot there was an engine fire and started to fight the fire. Another soldier saw the fire and came over to help. When fire extinguisher was discharged, dry chemical went into the other soldier's eyes, causing injury. Crew chief mixed water with P.D. 680 for engine flush in extremely cold weather. Mixture froze, causing compressor drain valve to become clogged. Engine was damaged by fire.

Safety messages

- Maintenance information message concerning CH-54A/B engine torque indication (MIM-CH-54-85-01, 041810Z Feb 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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Report of Army Aircraft Mishaps

Aircraft accident review

Night vision goggles training flight

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Synopsis

Three UH-60A helicopters were on a night vision goggles (NVG) training mission. While flying 100 feet above the trees, the No. 2 aircraft was seen to make an abrupt right bank and crash into the trees.

History of flight

A night vision goggles training mission was scheduled for the crews of three UH-60 helicopters. The purpose of the mission was to gain experience navigating with night vision goggles and to arrive at predetermined checkpoints at a prescribed time.

The crews completed the required performance planning and weight and balance computations and took off from the airfield. The first part of the mission was uneventful and proceeded along the planned route. As part of the planned mission, the flight lead was changed, and the No. 3 aircraft moved into the No. 2 position.

After descending into a valley along a creek, the flight continued on their planned route in a staggered trail formation at an altitude of about 100 feet above the trees and 40 knots indicated airspeed. The pilots of the trail aircraft saw the No. 2 aircraft make an abrupt right bank and crash into trees.

The No. 2 aircraft first hit a 150-foot-tall tree with the main rotor blades. It then rolled inverted, crashed nose first into the mountainside on a slope, and rolled down the slope 120 feet. The fuel cells ruptured during the crash sequence, allowing a fire to ignite and burn for approximately 1 hour. The four personnel—pilot, copilot, and two crew chiefs—on board the aircraft died as a result of impact forces.

Crew experience

The 27-year-old pilot had more than 650 rotary wing flight hours, with more than 450 hours in the UH-60. He had 38 hours NVG time. The 32-year-old copilot had almost 500 rotary wing flight hours, with more than 300 in the UH-60. He had 32 hours NVG time.

Commentary

When the flight descended into a valley along a creek and leveled off at 100 feet above the trees, the crews lost reference to the horizon. A moon angle of 30 degrees shadowed the left side of the valley but illuminated the right side, producing an illusion that the aircraft was in a steep right bank. The pilots flying the No. 1 and No. 3 aircraft indicated later that this illusion made them very uneasy. Although the crew of the No. 2 aircraft may have identified this illusion, their workload increased significantly in order to maintain their orientation and relative position from the lead aircraft. It was concluded that, because of spatial disorientation provided by this illusion or some momentary distraction, the crew failed to recognize that they were drifting right of their intended flight path.

The route that the air mission commander (AMC) selected, which was subsequently approved by the unit commander, was familiar to the unit aviators. Premission aircraft performance planning was properly performed, the route plotted, and known hazards depicted on the required maps. The altitude selected for the flight was

Accident review

100 to 200 feet above ground level for the entire flight.

At this point, however, an error in planning occurred. The AMC and unit commander failed to consider the steep slopes along the leg of the flight where the accident occurred when they selected the flight altitudes. Flight at 100 feet above the trees in a valley having approximately 45-degree slopes leaves only 200 feet lateral clearance across the valley. With the main rotor disk occupying 58 feet of this 200 feet, and placing the aircraft in the center of the valley, only 71 feet of lateral clearance would remain to either side of the rotor disk. Considering this and the planned airspeed of 50 knots, any distraction of just slightly less than 1 second would allow the aircraft to travel the remaining 78 feet into the trees before the crew could react. For this reason alone, the altitude selected for this leg of the flight was considered too low.

Battalion policy required a day route reconnaissance be flown before missions of this type to identify hazards to low-level flight. Because of logging operations in this particular area, wires were often strung across valleys and creeks. The day reconnaissance was flown 6 days before the accident flight. The reconnaissance was flown in conjunction with a day VFR training flight at an altitude of 500 feet above the ground. The pilot selected for the reconnaissance mission was not scheduled to be a crewmember for the NVG flight nor was he NVG qualified. His instructions from the company commander did not address the specifics, such as altitude and airspeed, of the planned mission, nor did the commander advise the pilot that the planned mission was an NVG mission.

Although the commander's actions were not in direct violation of an existing policy, they were inconsistent with the intent of that policy. It would seem that the reconnaissance should be flown by an NVG-qualified aviator who would be familiar with the types of hazards peculiar to NVG flight. Certainly the reconnaissance pilot should know the mission specifics to properly perform his reconnaissance. A properly conducted daylight reconnaissance should have revealed that the altitude selected for the NVG flight was too low for safe NVG training operations. ■

Mishap data given to commanders

Commanders may contact the Safety Center for a search of the PRAM file. PRAM file searches are authorized only for accident prevention purposes or when necessary to assist commanders in determining which of their aviators are qualified for selected programs. This is a routine use of PRAM data in accordance with the Privacy Act Notice filed on PRAMs (see AR 340-21-6 for Privacy Act Notice A067.01 DAPE for details).

Commanders, MACOM aviation staff officers, and state aviation officers for the National Guard may request a PRAM file search in those instances where they need to know the mishap experience of a particular aviator being considered for PIC, IP, SIP, ASO, IFE, maintenance test pilot, advanced aviation training, and return to aviation duty in the Reserve components. Additionally, unit commanders may make PRAM file search requests on all of their aviators upon taking command and on newly assigned personnel as an aid in determining utilization of aviator assets.

Results of PRAM file searches cannot be used as evidence in collateral investigations, flight evaluation boards, or other administrative actions. Such use would violate paragraph 1-9a, AR 385-40, and DOD Directive 6055.7.

Commanders should send their requests for PRAM file searches to Commander, U.S. Army Safety Center, ATTN: PESC-D, Fort Rucker, AL 36362-5363. Questions on the release or use of aviation mishap data should be addressed to the Safety Center's Judge Advocate, Major Ivey, AUTOVON 558-3819/3005, FTS 533-3819/3005. ■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	1-3 Oct	**0**	**0**
	November	3	3			
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	3	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	37	35*	Total to Date	**0**	**0**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 14-20 September

Attack helicopters

AH-1 Class E mishaps

S series - Pilot could not get an airspeed indication during takeoff. Equipment stored behind pilot's seat broke pitot static line.

G series - Access door came open during flight. Caused by excessive wear of dzus fasteners.

Cargo helicopters

CH-47 Class D mishaps

B series - No. 1 engine failed on short final for landing. Aircraft was carrying 7,260-pound internal load. No. 2 engine was overtorqued. No. 1 engine failure was caused by fuel starvation. Quick disconnect coupling check valve failed.

D series - As aircraft was on approach for landing, bird hit and broke left chin bubble.

CH-47 Class E mishaps

C series - No. 1 engine failed during flight. Caused by internal disintegration of inlet and compressor sections.

A series - Flight engineer noticed slow leak of hydraulic fluid coming from utility hydraulic cooler fan housing. Caused by failure of utility hydraulic oil cooler.

C series - No. 2 hydraulic boost light flickered during slingload hookup. Caused by failure of seal on SAS extensible link.

Observation helicopters

OH-58 Class D mishaps

A series - High frequency vibration was felt and grinding noise heard during hover. Retainer ring on main drive shaft came loose, causing drive shaft seal to work loose and sling grease out of coupling.

A series - Front skid cross tube hit wire as aircraft was flying about 200 feet agl and 80 knots. Aircraft pitched and yawed, but pilot regained control and landed, with damage to skid, cross tube, and strap assembly. Wire hazards had been prebriefed, the wire was marked on the flight operations hazards map, and the pilots had been instructed to mark the wire hazards on their tactical maps. The pilot of this aircraft did not mark the wire on his map.

OH-58 Class E mishaps

A series - Pilot began hovering to downwind side of field for full length takeoff. When N_2 bled off to about 97 percent, pilot landed. Caused by failure of fuel control.

C series - Master caution light came on. Caused by failure of caution light annunciator control panel.

Fixed wing

U-21 Class E mishaps

A series - Fuel started siphoning from left nacelle during climbout. Fuel cap was incorrectly secured.

A series - Smoke was seen coming from instrument panel. Caused by failure of motor in combustion blower fan.

A series - Pilot noticed vibration in yoke during slow flight. Left elevator spar was cracked at outboard elevator hinge bracket.

C-12 Class D mishap

A series - Pilot checked crew oxygen system during preflight and heard oxygen leak at aft crewmember oxygen location. No leaks in system were noted with the system off. Pilots elected to fly to home base with oxygen off. After aircraft was landed, evidence of a fire was noted at aft oxygen outlet. Insulation, wiring, and oxygen lines were burned. Suspect electrical short in wiring to overhead light for toilet near oxygen line for aft oxygen outlet.

C-12 Class E mishap

C series - As aircraft descended, pilot saw bright flashes in the area of the inboard side of No. 1 engine nacelle. Postflight inspection revealed electrical short in condenser blower.

Maintenance

UH-1 Class E mishap

H series - At 20 percent N_1, crew chief told pilot to abort start because of fuel leak in engine compartment. Caused by incorrect installation of O-ring on fuel servo supply filter fuel control.

AH-1 Class D mishap

S series - At flight idle during MOC, pilot saw smoke and smelled something burning. Left and right engine cowlings had blown back against engine exhaust stack. Maintenance person had seen right engine cowling make contact with exhaust and had gone to right side to secure it. At that

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

time, left engine cowling had also made contact with exhaust stack and it was secured. Left and right engine cowling air intake scoops had been burned.

Utility helicopters

UH-1 Class A mishaps

H series - During final approach to ridgeline LZ, copilot felt vibration and decided to make a go-around. About the same time, rpm audio and light activated, and needles-joined engine rpm of 5900 was noted. Copilot lowered collective but could not regain rpm. After passing over the ridgeline, aircraft continued to descend down the opposite slope. Copilot leveled aircraft and tried to slow forward speed. Aircraft hit the slope with skids level and rolled inverted. Aircraft caught fire and was destroyed. Two major injuries and three minor injuries resulted. Suspect materiel failure. 8453

H series - After participating in a civil disaster drill, the crews of two UH-1s took off from the airfield in a loose trail formation. They flew for about 1 mile before turning back toward the airfield. With both pilots flying from the right seats, the aircraft formed up in a side-by-side formation to fly past a picnic area. As the aircraft were flying about 30 feet agl and 90 to 100 knots, the main rotor blades made contact, causing both aircraft to partially break up and crash. The collision resulted in two fatalities, seven major injuries, and eight minor injuries. 8454

UH-1 Class C mishap

H series - Student pilot was performing standard, straight-in autorotation. Airspeed was excessive at point of touchdown. IP, believing they were going off the end of the runway, took control and tried to roll throttle back on to get airborne again. He did not get enough rotor rpm before pulling in collective. Aircraft climbed to about 30 feet, started turning right, and settled into trees. Aircraft came to rest upright with damage to main rotor blades, tail rotor blades, left sink elevator, cargo door, chin bubble, skids, and cross tubes.

UH-1 Class E mishaps

H series - Master caution light came on during flight. Caused by failure of hydraulic pressure switch.

V series - Feedback was felt in tail rotor pedals on short final. Caused by failure of tail rotor grip bearing.

H series - Master caution and fuel filter lights came on. Caused by failure of fuel filter.

UH-60 Class C mishap

As aircraft was ground taxiing to parking pad, main rotor blade hit tail rotor of parked aircraft on adjacent pad, damaging main rotor blade and tip cap of taxiing aircraft and tail rotor paddle of parked aircraft.

Messages received

• Safety-of-flight operational message concerning ALQ-144 IR jammer installed on certain AH-1S, AH-1T, UH-1N, EH-1H, and UH-60A aircraft (GEN-84-03, 121345Z Sep 84). Summary: This message authorizes those units still having the silicon carbide sources to use them if the operational necessity should arise before receipt of replacement graphite sources. Use of these silicon carbide sources will require stringent inspection procedures. Contact: Jerry Dettmer, AUTOVON 693-1480, commercial 314-263-1480.

• Safety-of-flight maintenance mandatory message concerning daily inspection of pitch change link clevis on all series UH-1 helicopters (except C/M models) (UH-1-84-09, 141430Z Sep 84). Summary: Final solution to the clevis failure problem is 100 percent replacement with a redesigned clevis. Expedited procurements have been made with initial parts availability in mid September and sufficient quantities to replace all installed clevises by approximately 1 Feb 85. Affected helicopters will be inspected at the next daily inspection and thereafter until new type replacement clevises are installed. Contact: Ken Luber, AUTOVON 693-1683, commercial 314-263-1683.

• Maintenance information message concerning faulty fuel lines on UH-1 and AH-1 aircraft (MIM-UH-1-84-MEM-10/MIM-AH-1-84-MEM-08, 192000Z Sep 84).

For more information on selected mishap briefs, Call AUTOVON 558-4198/4202.

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Followups

Additional information on mishap briefs previously published

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Utility helicopters

UH-1 Class A mishap in 2 May 84 issue (8429) □ IP and two student pilots left the stagefield to do some hydraulics-off maneuvers. As aircraft entered a right turn to crosswind at about 400 feet agl, it pitched nose up, rolled to right, and crashed. During the right turn, the IP, using the floor mike because of an inoperative cyclic communication switch, communicated to the student pilot that the hydraulic switch was coming on. Because of climb power and a right crosswind, the student pilot had pressure exerted on the left pedal. As hydraulic power returned, the left pedal pressure had the servo spool valve at full travel and caused the servo to extend fully in less than one-half of a second. The tail rotor thrust, combined with the right cyclic applied, caused the aircraft to develop a right roll rate from which the IP was unable to recover. The IP was unable to block left pedal input because his right foot was on the floor mike.

UH-1 Class A mishap in 27 Jun 84 issue (8437) □ While test pilot was doing a power recovery from an autorotative descent to check the rotor rpm adjustment, power loss occurred. Pilot reentered autorotation and, about 200 feet agl, bled off rotor rpm during attempted power recovery. The low rotor rpm condition resulted in separation of the engine cowling, which severed a main rotor blade pitch control tube. Aircraft entered an uncontrollable spiral and crashed. Engine failure was caused by corrosion on the No. 1 main bearing. The engine had been allowed to sit for about a year without being properly preserved for storage.

Attack helicopters

AH-1 Class A mishap in 20 Jun 84 issue (8436) □ A nonrated operator (maintenance technician) sitting in the back seat started the engine for a 7-day runup and voltage regulator check. Two other technicians were helping. As rpm was beeped up to 6600, aircraft began to turn left. As the turn increased, the operator became confused and added more left pedal, which intensified the left turn rate. The aircraft rotated three complete revolutions, hit the ground power unit to which it was connected, and came to rest about 15 feet from the original parking spot. One of the technicians who was helping was hit by the aircraft and died a few hours later.

Observation helicopters

OH-58 Class B mishap in 4 Jul 84 issue (8441) □ Upgraded to Class A. Pilot started to pick aircraft up to a hover while looking to the rear over his right shoulder. Pilot did not notice that the cyclic control was in the aft right quadrant. Left skid came off the ground first, and aircraft began pivoting about the heel of the right skid. In this configuration, aircraft entered dynamic rollover and came to rest on its right side.

OH-58 Class B mishap in 13 Jul 84 issue (8435) □ Downgraded to Class C.

OH-58 Class A mishap in 22 Aug 84 issue (8449) □ As pilot was bringing aircraft to a hover, at about 2 feet above the ground he began a right clearing turn. It is suspected the pilot misjudged the clearance between the skid and the ground and made no collective input to maintain altitude. Skid hit the ground hard enough to cause a roll to the right and result in dynamic rollover. The impact of the advancing blade with the ground caused the helicopter to rebound sharply to the left and roll onto its left side.

OH-58 Class A mishap in 8 Aug 84 issue (8448) □ Aircraft on mountain navigation training flight descended in a nose-low, left-bank attitude into trees on a hillside and came to rest on its left side with the engine still running. It could not be determined why the crew, who was killed, allowed the aircraft to enter the trees. They may have crossed the hill at a low altitude and, seeing a tall tree to their front, made an evasive maneuver from which they could not recover at their low altitude.

Training helicopters

TH-55 Class A mishap in 23 May 84 issue (8432) □ Student pilot was on solo training flight. An unknown object hit a tail rotor blade, causing the blade to hit the tail skid. Tail rotor effectiveness was lost. The student, apparently disoriented, was in the process of making a right turn and did not have sufficient airspeed to prevent the aircraft from revolving about the vertical axis. The student then did not follow the emergency procedures from the operator's manual and neither regained airspeed nor apparently entered autorotation. Instead, he further aggravated the spin by reducing the airspeed to zero. The aircraft continued to spin and crashed.

Fixed wing

U-21 Class B mishap in 4 Jul 84 issue (8442) □ Downgraded to Class C. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 8-14 February

Utility helicopters

UH-1 Class D mishaps

H series - While aircraft was hovering over a load for pickup, ground personnel noticed that all the drive shaft covers were open and signaled pilot to land. Cover hinges were broken and No. 5 and 6 tail rotor drive shafts were scored. Crew chief was called away from the aircraft while the crew was preflighting, and pilot and copilot did not ensure all covers were secured.

H series - Aircraft flew into unforecast icing conditions. When aircraft was landed, damage to FM antenna was found. Suspect ice accumulation on antenna caused it to sway into tail rotor.

UH-1 Class E mishaps

H series - Crew heard loud noise during flight. Right greenhouse plexiglass had cracked.

H series - IP saw small flock of seagulls below the aircraft approximately one-half mile ahead. IP had just determined the flock was no threat to the aircraft when one seagull came down through the rotor system, hitting leading edge of one main rotor blade. Parts of the bird splattered on pilot and copilot windshields. While it did not matter in this particular case, neither pilot had his helmet visor down. An injury could have resulted if the bird had come through the windshield.

H series - Controls felt stiff to copilot on takeoff. Pilot took controls and felt high frequency vibration in tail rotor pedals. Pedals began to jump back and forth. Pilot turned back to the airfield and needed help from the copilot to keep aircraft straight. Running landing was made. Caused by failure of tail rotor servo.

H series - Master caution and left fuel boost pump lights came on. Caused by failure of boost pump.

H series - Feedback was felt in cyclic during runup. Caused by failure of hydraulic irreversible valve.

UH-60 Class D mishap

A series - Postflight inspection revealed left APU compartment door had separated from aircraft during flight. The beam assembly to which the APU compartment door is fastened was loose because of the loss of six machine screws which support it. Three of the screws were found in the APU compartment and three could not be located. Four of the other five aircraft in the unit also had several loose screws on the beam assembly.

UH-60 Class E mishaps

A series - Crew accepted medevac mission after weather briefing indicated a ceiling of 1,000 feet and visibility of 1 mile. As aircraft took off and passed 200 feet agl, instrument meteorological conditions were encountered. Crew executed inadvertent IMC procedures and requested approach back to takeoff point. Weather conditions did not permit a return and aircraft was landed in field.

A series - Passenger noticed oil flowing down side of aircraft during hover for takeoff. Caused by failure of primary servo seal.

Attack helicopters

AH-1 Class E mishaps

S series - Master caution and transmission oil bypass lights came on.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	1-27 Feb	**3**	**2**
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**20**	**10**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Caused by failure of transmission oil bypass switch.

S series - Pilot noticed ammo bay cowling was unsecure during flight. Pilot landed and secured cowling. Pilot tried to start aircraft three times, but ignitors would not engage. Inspection revealed ignitor circuit breaker was not fully engaged.

S series - Crew smelled smoke, and master caution and rectifier lights came on during runup. Caused by failure of alternator.

S series - Battery voltage dropped and start was aborted. Tgt was 450 degrees and rising when start was aborted. New battery was installed and second start attempted. About 12 seconds into start, flames were seen coming from tailpipe. Tgt was 325 degrees when second start was aborted.

S series - Aft fuel boost pump light would not extinguish during runup. Caused by failure of boost pump.

AH-64 Class E mishap

A series - Pilot felt lateral binding in cyclic. Caused by malfunction of lateral main rotor actuator.

Cargo helicopters

CH-47 Class C mishap

C series - Aircraft was slingloading a Howitzer when weather began to deteriorate. Pilot tried to make a left turn to avoid the weather. During the turn, aircraft entered inadvertent instrument meteorological conditions. Pilot leveled aircraft and started to climb. Load began to oscillate and aircraft control was marginal. Pilot jettisoned the load to regain control. Aircraft continued under IMC to nearby base and landed.

CH-47 Class D mishap

C series - As aircraft was crossing a ridgeline and flying about 1,000 feet agl, severe buffeting occurred throughout airframe. Aircraft pitched down and right. After pilot landed at field site, it was discovered that work platform on left side was hanging off the side and that No. 1 engine was damaged by platform hitting tail cone. All fasteners on the door were still locked in place and dzus fasteners securing the latches were locked. Attaching bars for fasteners on pylon were slightly bent but still intact. Indications are that severe turbulence caused aft pylon to twist sufficiently to allow the door to unlatch. Wire rope retaining strap snapped, allowing the platform to hit engine tail cone.

CH-47 Class E mishaps

C series - As aircraft was lifting off, pilot noticed low rpm and split in torque. Caused by failure of engine N_2 actuator.

C series - Transmission oil hot light came on. Caused by failure of temperature sensing bulb.

CH-54 Class D mishap

A series - Aircraft took off after picking up a load. As aircraft was about 50 feet above the ground, flight engineer saw an unsecured tent frame become airborne and hit other tents. Aircraft continued to climb to avoid further damage.

Observation helicopters

OH-58 Class E mishaps

A series - IP gave pilot simulated engine failure on downwind leg. Throttle was reduced to flight idle and collective lowered. Low rpm audio and light activated. Rotor did not disengage from engine when throttle was reduced to flight idle. Caused by malfunction of free wheeling unit.

A series - Unusual vibrations were felt during takeoff. After landing, ice was found on rotor head.

C series - Low rotor rpm audio sounded, rotor rpm light came on, and rotor tachometer fluctuated. Caused by failure of tachometer generator.

C series - After aircraft was refueled, passenger was strapped in. Passenger tried about four times to close his door. Pilot got out and tried to close the door. Pilot noticed that latch roller was sprung and had rotated 90 degrees. Inspection revealed latch lever was broken and latch lever pin had backed out. Caused by passenger using excessive force and not having door properly aligned for closing.

C series - Fuel quantity indicator remained at 600 pounds (150 pounds above normal) during runup. Caused by malfunction of fuel quantity indicator.

C series - Aircraft was landed on slope. One skid was on the ground. As the other skid was being lowered to the ground, banging noise was heard. IP took control and moved aircraft. No damage was found.

Fixed wing

U-8 Class D mishap

F series - No. 2 engine lost power during approach. Fuel injection nozzle was full of aluminum particles. Suspect internal failure of fuel injection pump.

U-8 Class E mishap

F series - Pilot noticed oil streaming over No. 1 engine cowling during climbout. Pilot apparently failed to seat dip stick correctly after checking the oil prior to takeoff.

OV-1 Class E mishap

D series - No. 2 engine oil temperature indicated maximum when battery was turned on. Caused by failure of VIDS display unit.

Mishap briefs

U-21 Class C mishap

A series - As aircraft was rolling out after touchdown, it began to veer left. Full right rudder did not correct left veer. Left gear hit snow berm, causing aircraft to pivot further left around left gear. Right prop hit snow berm, causing damage. Patches of ice on runway caused aircraft to veer.

T-42 Class E mishap

A series - Right wing flap stuck in down position when flaps were retracted. Caused by failure of flap motor.

Maintenance

CH-47 Class D mishap

A series - Ramp was in the up position with aft cargo door retracted. Crew chief rotated retainer pins to extend the door without first lowering ramp. When cargo door extended, piece of fiberglass was broken at right rear of aircraft.

C-7 Class D mishap

A series - Smoke was seen coming from right main landing gear during runup. Smoke was caused by excessive lubricant flowing down onto heated brake surface. Brake disc and pucks became glazed from heated lubricant.

UH-1 Class E mishap

H series - Pilot felt bump on tail rotor pedals during hover. Pedals would not move. IP saw that KY58 had fallen from mount platform and jammed pedals. Pilot slowly lowered collective until aircraft touched the ground. Maintenance personnel had removed KY58 and did not write it up on the 2407-13 form. KY58 was not secured correctly during reinstallation.

AH-1 Class E mishap

S series - Needles failed to split during simulated engine failure. Autorotational rpm was set too low.

Safety messages

• Safety-of-flight maintenance mandatory message concerning one-time inspection of stabilator amplifiers for locking potentiometers (UH-60A-85-01, 081745Z Feb 85). Summary: Stabilator amplifiers with nonlocking type potentiometers may have been furnished in fielded aircraft and as spares. The potentiometers are used in stabilator amplifiers to set the accelerometer null and bias functions for specific scheduling of the stabilator surface. These potentiometers must have locking type shafts to prevent their drifting from the calibrated settings. This message requires inspection and reporting and provides an interim fix for nonlocking potentiometers pending replacement at a future date. Contact: Tim Hughes, AUTOVON 693-1683, commercial 314-263-1683.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Urgent TB

TB 55-1520-228-20-33, dated 9 Jan 85, One-Time Inspection of All OH-58A Helicopters With MWO 55-1520-228-30-24 Installed Tail Rotor Drive Shaft Covers, has been released. ■

FM 1-506 published

The U.S. Army Aviation Logistics School at Fort Eustis has announced the publication of FM 1-506, Fundamentals of Aircraft Powerplant Maintenance. This manual supersedes TM 55-406, Fundamentals of Aircraft Powerplant Maintenance. ■

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Flying with a cold

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Let's face it. Pilots do fly with colds and they self-medicate even though they know it's against regulations and contrary to common sense. The combination of altitude changes and a cold can lead to ear and sinus blocks, severe headaches, incapacitation, surgery, and the possibility of grounding for as long as 6 months.

There are several air spaces in the head. These include the middle ear and eight sinuses that are generally located around the eyes and forehead. All of the sinuses have channels that connect to the outside through the nose. It is through these channels that pressure within the air spaces is able to equilibrate with the outside pressure. All of these spaces and their channels are lined with mucus membrane that swells just like the mucus membrane in your nose when you have a cold. Frequently, when this mucus membrane lining the small communicating channels swells, it partially or completely blocks the tube. When this occurs, pressure within the blocked-off air space cannot equilibrate with ambient pressure and if you are unlucky enough to be in an aircraft that is descending when it does, you will end up with a sinus block. The eustachian tube is the middle ear's link with the outside world. It opens into the back of the throat, is lined with mucus membrane, and normally allows middle ear pressure to equalize with ambient pressure.

When everything is working properly, air pressure within the sinuses and middle ears equilibrates with ambient pressure without conscious effort on your part as you change altitude. However, when the eustachian tube or the sinus channels are blocked or partly blocked from a cold, the tubes tend to act like flapper valves. Thus, air is allowed to escape during an ascent as the ambient air pressure decreases, but during descent air is not allowed to return to the blocked air space. This causes a pressure differential to develop between the air space and the outside and results in excruciating pain. Anyone who has experienced an ear or sinus block will know that to call the pain excruciating hardly does the pain justice!

As most pilots are aware, atmospheric pressure increases more rapidly with altitude change as one approaches the earth's surface. For example, the gradual change in atmospheric pressure at higher altitudes results in a difference of only 84mm mercury in a 10,000-foot descent from 40,000 to 30,000 feet msl. Compare this to the 237mm mercury increase in pressure when descending from 10,000 feet msl to sea level. The flutter valve-like construction of the eustachian tube makes it more difficult to keep the pressure across the eardrum equalized the faster the pressure increases, even under normal circumstances. Add to this situation the disadvantage of having the eustachian tube partially blocked by the mucosal swelling and mucus drainage resulting from "just a little cold" and this aviator has bought himself a painful ear block. A pressure differential of 60-80mm mercury across the eardrums will cause severe pain, and it takes a pressure differential of 100-500mm to rupture the eardrum.

As a UH-1 helicopter was descending from 4,000 to 700 feet during an ILS approach, the copilot developed severe ear pain that forced the crew to abandon the approach and climb back to altitude. During a subsequent attempt at the approach, the copilot

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 15-21 February

Utility helicopters

UH-1 Class E mishaps

V series - Rotor and engine tachometer needles separated during flight. Caused by failure of dual tachometer indicator.

H series - Feedback was felt in cyclic control during hover. Caused by failure of forward and aft magnetic brake.

H series - Master caution and engine fuel pump lights came on. Caused by defective fuel pressure switch.

H series - When hydraulic switch was turned off, hydraulics remained on and master caution light did not illuminate. Caused by defective hydraulic pressure switch.

H series - Transmission oil temperature rose and caution light came on during hover. Caused by malfunction of thermal relief valve.

UH-60 Class D mishap

A series - As aircraft was approaching field site, a 2-inch section of the No. 1 engine deswirl duct vane clamp broke and hit inboard area of tail rotor paddle.

UH-60 Class E mishaps

A series - No. 1 tail rotor servo light came on, followed by backup pump light and No. 2 tail rotor servo light. Shortly afterward, No. 1 primary servo light came on. Caused by failure of No. 1 transfer module.

A series - No. 1 engine failed during flight. Caused by broken P3 line.

A series - Stabilator failed in full down position during takeoff and would not reset. Caused by failure of No. 2 stabilator actuator.

Attack helicopters

AH-1 Class A mishap

S series - Aircraft on test flight had flown about 1.3 hours when it was seen to roll left and nose down into a 90-degree vertical dive. Aircraft crashed with very high G forces. Pilot and copilot were killed. Preliminary findings indicate swashplate failure. 8520

AH-1 Class C mishap

S series - Bang was heard during start and aircraft shuddered. Sudden stoppage of tail rotor system was caused by impact with main rotor tiedown rope, resulting in damage to tail rotor blades, tail boom, and tail boom vertical fin. Front tiedown rope was left connected during start. IP conducted final walk-around inspection in the dark. Aircraft was preflighted during the day, and a flashlight through-flight inspection was made before aircraft was started.

AH-1 Class E mishaps

S series - Engine oil pressure increased during hover. Caused by failure of oil pressure transducer.

S series - Transmission oil pressure and oil bypass lights came on, and oil pressure went to zero. Failure of internal transmission oil filter O-ring caused transmission fluid to leak out of filter.

S series - Master caution and engine fuel pump lights came on. Caused by failure of engine fuel pump pressure switch.

AH-64 Class E mishap

A series - Crew was notified by tower personnel that something was leaking from aircraft. Fuel was being transferred at the time. Postflight inspection revealed pilot valve in forward fuel cell failed to close, causing fuel to dump overboard during transfer.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	1 - 6 Mar	**0**	**0**
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**20**	**10**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Observation helicopters

OH-58 Class E mishaps

A series - Aircraft developed severe vibrations during climbout. Caused by frozen water in square hole of pylon stop which restricted drag pin from normal movement. This restricted movement caused rotor vibrations to be transmitted to airframe. Water was not removed from square hole of pylon stop during preflight.

A series - Airspeed indicator, altimeter, and VSI froze during final approach. Caused by buildup of grass, dirt, and debris inside pitot tube.

A series - Aircraft encountered unforecast icing conditions during flight. Ice accumulated on airframe and windscreen. Forward visibility was reduced and aircraft was landed.

Fixed wing

U-21 Class C mishap

A series - Aircraft was caught by windshear on final approach for landing. On touchdown, windshear pushed right wing up and nose down. Right prop touched runway, causing curled blades and sudden stoppage of engine.

U-21 Class E mishap

A series - During test flight, with flaps full down, aircraft required significant aileron and rudder to maintain trim. Flaps were retracted and three panels came full up. Outboard panel stayed at approach position and circuit breaker popped. Pilot reset flap circuit breaker and tried to raise flaps. Circuit breaker popped again. Aircraft was landed without further incident. Left outboard flap actuator cable nut broke on actuator end.

OV-1 Class E mishaps

D series - Smoke in cockpit was caused by failure of No. 3 inverter.

D series - Cockpit filled with smoke and hydraulic pressure indicated zero. Caused by ruptured hydraulic line.

C-12 Class E mishap

C series - Cabin temperature increased to 100° F. and toxic fumes were noted in cockpit. Temperature could not be controlled on auto or manual mode. Pilot descended to 10,000 feet msl and depressurized cabin. Fumes dissipated and temperature was controlled. Bleed air bypass valve had stuck in open position.

Maintenance

UH-1 Class E mishap

H series - Rotor failed to engage during engine start. Start was aborted, rotor blades repositioned, and restart attempted. Rotor began to turn at 11 percent but moved only 18 inches. Suspect incorrect reassembly after hot end inspection.

AH-1 Class E mishaps

S series - Loud bang was heard during hover, accompanied by tgt increase and right and left yaw. Bleed band was out of adjustment. Bleed band strainer was clogged with dirt and sand.

S series - Engine oil pressure light came on during landing. Caused by loose wire on cannon plug to oil pressure transducer.

CH-47 Class E mishap

D series - Severe vibration was felt during climbout. Pitch change link spacers were installed with nonbeveled side toward spherical bearing. Spacer failed, allowing greater radial rotation in pitch change links.

Safety messages

• Safety-of-flight message concerning inspection of the horizontal hinge pin bearing installation of CH-47C/D helicopters with fiberglass rotor blades (CH-47-85-01, 151545Z Feb 85). Summary: Essentially the same horizontal hinge bearing/pin installation is used in all CH-47 helicopters. The rate of failures of pins and bearings on CH-47A, B, and C models with metal rotor blades has not been great; however, D and C models with fiberglass rotor blades have a higher failure rate. Although these failures have never resulted in the loss of an aircraft, they pose a safety-of-flight problem. This message requires an inspection of the horizontal hinge pin bearing installation of CH-47C/D helicopters with fiberglass rotor blades every 400 flight hours. Contact: Mr. C. Caesar, AUTOVON 693-1597, commercial 314-263-1597.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Flying with a cold

again experienced severe pain but the approach had to be continued in spite of his pain due to low fuel. The copilot experienced bleeding into the middle ear and a secondary ear infection and was grounded for 2 weeks. A rapid descent from 10,000 feet to sea level with a blocked eustachian tube would produce enough pressure differential to cause temporary deafness, ringing in the ears, pain, and vertigo. Needless to say, in a single-pilot aircraft the results could be disastrous.

These and similar situations could be avoided if aviators and passengers alike would realize the consequences of flying with a cold. Few people stop to consider that even pressurized aircraft have cabin altitudes of approximately 5,000 feet when they are cruising at altitude. This is reduced to sea level when the aircraft descends for a landing. Also, the air in these cabins is extremely dry, which is an additional irritant to an already inflamed mucus membrane. Therefore, a passenger in an airliner may be just as prone to develop an ear or sinus block as a helicopter pilot flying at 5,000 feet if he flies with a cold.

So how do you avoid catching a cold so you can stay in the air? In truth, that is almost impossible. Avoiding people who have colds, not using other people's drinking glasses or utensils, and getting adequate sleep and nutrition will help. If you do get a cold and it's mild, the flight surgeon may, after an examination, elect to treat you with nasal sprays or a mild decongestant and still permit you to fly. If the cold is severe enough to affect your ears or sinuses, you are at risk for developing ear or sinus blocks and you will probably be grounded until your symptoms subside. Remember that as inconvenient as it is to you and your unit for you to be grounded with a cold, it is better than some of the potential alternatives. Barotrauma (injuries resulting from pressure differential) is extremely painful and incapacitating and usually leads to periods of grounding greatly in excess of the period of grounding associated with a cold.

Another thing to remember is that AR 40-8 prohibits aviators from self-medicating and specifically stipulates that aircrewmembers will be restricted from flying duties for 24 hours after taking an antihistamine. Most over-the-counter cold remedies contain antihistamines and, over the last few years, many of the more powerful antihistamines have been released for over-the-counter sale. All aviators should realize that the most common side effect of antihistamines is drowsiness which can be severe enough to slow your reaction time and cloud your judgment. Since your particular reaction to these drugs cannot be predicted by you or anyone else, they are deemed to be incompatible with flying.

The bottom line to all of this is don't fly with a cold until you are cleared by a flight surgeon. He will decide on the best treatment for you and let you know when you can safely resume your flight duties. If you do fly and complications arise, your period of grounding could be a lot longer than the 5 to 7 days usually required for a cold to run its course. ■

—Major Dennis Shanahan
Flight Surgeon
U.S. Army Safety Center

U.S. ARMY SAFETY CENTER

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Followups

Additional information on mishap briefs previously published

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Utility helicopters

UH-1 Class A mishap in 30 May 84 issue (8433) □ Pilot of No. 2 aircraft broke formation without notifying the air mission commander. Pilot flew over a lake and made a steep cyclic climb and a 180-degree turn, followed by a steep dive. Pilot pulled the aircraft out of the dive at about 30 feet and repeated the maneuver. The excessive rate of descent in the second dive could not be stopped, and the helicopter crashed. The maneuver was prohibited by regulations.

UH-1 Class A mishap in 13 Jun 84 issue (8434) □ As aircraft was being flown about 40 feet above trees at 20 knots airspeed on reconnaissance mission, engine rpm began to decrease and would not respond to the rpm increase switch. Aircraft settled into trees and crashed. The exact cause of the decreased engine performance could not be established through teardown and analysis efforts.

UH-1 Class B mishap in 11 Jul 84 issue (8443) □ Downgraded to Class C.

UH-1 Class A mishap in 4 Jul 84 issue (8439) □ On short final for landing, aircraft became engulfed in a dust cloud created by rotorwash. The copilot, who was on the controls, decided to make a go-around. Aircraft drifted left and main rotor blade hit a tree. Control was lost and aircraft hit several trees before coming to rest on left side. Copilot did not make an adequate reconnaissance of the area and landed on an unimproved dusty road rather than a larger grassy area next to the road. On short final, the copilot delayed making a decision to go around or continue the approach to the ground until the aircraft became engulfed in dust. The pilot did not properly supervise the flight or communicate with the copilot on short final.

UH-1 Class A mishap in 3 Oct 84 issue (8453) □ During final approach to ridgeline landing zone, copilot felt a vibration and elected to make a go-around. As this maneuver was initiated, the compressor section of the engine failed. Power to maintain flight was lost, and the crew entered autorotation. Aircraft touched down on a slope, rotated 180 degrees about the lateral axis, and came to rest inverted.

UH-1 Class A mishap in 3 Oct 84 issue (8454) □ After participating in a civil disaster drill, two UH-1 aircraft, crews, and passengers were ready to return to their home airfield. They took off and flew about 3 miles before turning back. With both pilots flying from the right seats, the aircraft formed up in a side-by-side formation. While flying at 95 knots and 25 feet above the ground, the wing aircraft converged on the lead aircraft. During an evasive maneuver by the pilot of the wing aircraft, the overlapping rotor blades of the two aircraft meshed, causing both aircraft to partially break up and crash. The type maneuver being flown is prohibited by AR 360-61, AR 95-1, local regulations, and standing operating procedures. The route of flight was not a properly designated low-level route. The pilot of the wing aircraft failed to follow procedures outlined in TC 1-201, Tactical Flight Procedures. He was flying below and virtually side by side the lead aircraft with blade overlap. The copilot of the wing aircraft did not tell the pilot they were too close to the other aircraft.

UH-1 Class A mishap in 5 Sep 84 issue (8451) □ Flight of four aircraft was hovering to parking area. When No. 1 aircraft came to a stationary hover, copilot of No. 2 aircraft thought he was getting too close and abruptly applied an excessive amount of collective pitch. The No. 2 aircraft climbed about 50 feet and entered a nose-low attitude. Pilot got on the controls, stabilized the aircraft momentarily, and then got off the controls. Descent continued until the aircraft crashed. Pilot, who was accustomed to flying with experienced pilots who did not require assistance, was overconfident in the ability of the inexperienced copilot to handle the situation.

UH-1 Class B mishap in 1 Aug 84 issue (8445) □ Upgraded to Class A. Rollover occurred when right landing gear hit the ground during right sideward flight. The IP, who was flying from the left seat, was hovering the aircraft while looking through the right rear cargo door. He did not detect the initial warning signs of rollover.

UH-1 Class A mishap in 4 Jul 84 issue (8438) □ Aircraft crashed during maintenance test flight. The pitch change link clevis of the red main rotor blade broke because of long-term fatigue fracturing of the outer two-thirds of the threaded portion of the clevis. The remaining one-third of the cross-section failed due to overstress, as it was unable to carry the load designed for the whole component. Design of the clevis was a primary factor in the failure in that the lightening hole prevented detection of the crack during the required magnetic particle inspection at the time of manufacture. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 22-28 February

Utility helicopters

UH-1 Class B mishap

H series - Aircraft was on NOE flight. IP heard grinding noise from transmission and aircraft began to settle. Aircraft touched down on heels and rocked forward. 8521

UH-1 Class D mishap

H series - Crew was practicing insertion of observation personnel. Pilot made approach to pinnacle and came to a low hover over a scrub oak. As aircraft was positioned for simulated offload, bottom of fuselage hit the scrub oak, tearing holes in bottom of aircraft.

UH-1 Class E mishaps

H series - Cyclic was binding in left rear quadrant during landing. Caused by defective irreversible valve.

H series - Pilot felt feedback in cyclic curing flight. Failure of tang washer on servo allowed nut to back off.

H series - Antitorque pedals began to bind during hover. Caused by defective magnetic brake.

H series - Master caution and left fuel boost pump lights came on. Caused by defective fuel boost pump.

H series - Engine fire warning light came on. Caused by failure of fire warning control unit.

H series - Antitorque pedals began to creep during flight. Caused by defective tail rotor servo cylinder.

UH-60 Class A mishap

A series - Aircraft was involved in a local unit demonstration mission with a follow-on training period to conduct engine loss emergency procedures. Initial investigation indicates that the aircraft completed the first traffic pattern iteration with some altitude problems. On the second iteration, aircraft appeared to lose power on crosswind leg. Aircraft crashed right side low, causing major injuries to both pilots and minor injuries to crew chief and medic. 8522

UH-60 Class E mishaps

A series - A.C. instrument circuit breaker popped, causing No. 1 tgt and No. 1 engine oil pressure gauge to read zero. Fuel quantity gauge decreased from 1800 pounds to 230 pounds. Caused by malfunction of fuel condition analyzer.

A series - Copilot felt heavy resistance when he tried to make forward input with cyclic. Roll-on landing was made. Suspect ice on pitch trim assembly caused binding. Aircraft had been washed the day before and accumulation of moisture in pilot assist area froze as aircraft ascended.

Attack helicopters

AH-1 Class E mishaps

S series - Aircraft was flying into the sun in a river valley. Pilot saw wires at his flight level at the same time the copilot announced wires. To miss the wires, pilot had to pull 112 percent torque. Postflight inspection revealed no damage. Wires were marked on map.

S series - Nine percent difference in pilot's and gunner's torque gauges was caused by malfunction of pressure transducer.

Cargo helicopters

CH-47 Class E mishaps

C series - NVG lights failed on downwind and red cockpit lights came on. Caused by failure of NVG light rheostat.

B series - Lateral vibration on No. 1 engine was caused by excessive wear of bushing on engine mount.

Observation helicopters

OH-58 Class E mishaps

C series - Engine oil bypass light came on. Engine oil reservoir cap was open. Crew did not ensure cap was secured during preflight.

A series - Fuel filter light came on during hover. Caused by faulty fuel pressure switch.

A series - Engine oil bypass light came on during hover. Caused by seeping oil bypass filter.

A series - Master caution and engine oil bypass and chip detector lights came on. Engine oil was about four-tenths of a gallon low. Metal particles were found on engine chip detector plug.

Fixed wing

OV-1 Class E mishap

D series - Pilot saw compass flag appear on course indicator during level flight. Compass card became fixed and attitude indicator began to wobble.

Caused by failure of ASN 33 navigation computer and amplifier assembly.

C-12 Class E mishaps

C series - As power levers were advanced for takeoff, aircraft pulled left of runway centerline. Crosscheck of instruments showed that left engine was not developing full power. Caused by cracked tube assembly.

C series - When gear handle was placed up, left gear up indicator switch showed unsafe condition. Caused by failure of indicator switch.

Maintenance

OH-6 Class E mishap

A series - Lateral feedback was felt in cyclic, along with lateral vibration. Two opposing main rotor dampers were out of phase. Torque spread between them was 120 inch pounds.

U-21 Class D mishap

H series - Left engine N1 would not decrease below 80 percent during runup. Aircraft was blocking access to the runway, so IP taxied aircraft away from runway. Aircraft pulled to the right during taxi and left brake was used to keep aircraft straight. Crew was told by pilot of another aircraft that left brake was on fire. Brake assembly, wheel, and tire were damaged. Fuel line, which had been rerouted during calibration, was misrouted, causing 11-inch rod on fuel control to jam. Rod would not return to idle.

U-21 Class E mishap

A series - Pilot received no airspeed indication during takeoff roll. Pitot drain valve had been incorrectly safetied in the open position.

Safety messages

• Safety-of-flight maintenance mandatory message concerning one-time inspection and replacement of UH-60 stabilator amplifier (UH-60A-85-03, 200028Z Feb 85). Summary: There are still amplifiers and modules with suspect capacitors that have not been located and reworked. UH-60 aircraft will be inspected for defective stabilator amplifiers. Contact: Tim Hughes, AUTOVON 693-1683, commercial 314-263-1683.

• Safety-of-flight maintenance mandatory message changing the autorotation rpm limits on the UH-60 (UH-60A-85-02, 221700Z Feb 85). Summary: This message cancels safety-of-flight messages UH-60A-81-16 and UH-60A-82-02 and revises main rotor power-off (autorotation) rpm limits. Contact: Tim Hughes, AUTOVON 693-1683, commercial 314-263-1683.

• Safety-of-flight technical message concerning one-time inspection of CH-54 helicopters for defective tail rotor servo links (CH-54-85-01, 251400Z Feb 85). Summary: Cracks have been found in servo cylinder links that provide control input to the tail rotor. A link is located in each of the two redundant flight control systems. This message imposes an inspection of these links for cracks. Cracked links will be analyzed in a metallurgical lab to determine cause. Corrective action to prevent recurrence will be taken when the cause is defined. Contact: Robert High, AUTOVON 693-1597, commercial 314-263-1597.

• Safety-of-flight technical message concerning recurring and one-time inspections of AH-1 and TH-1 swashplate bearing, lubrication, and interval of bearing inspection (AH-1-85-01, 282145Z Feb 85). Summary: A recent AH-1 accident was caused by failure of the swashplate bearing. Bearing failure allowed the rotating swashplate drive links to contact the nonrotating swashplate. This caused a loss of control. The bearing failure was caused by insufficient lubricant. This message requires a one-time inspection, clarifies the lubrication requirement, and adds inspection requirements during service. Contact: F. Barhorst, AUTOVON 693-1687, commercial 314-263-1687.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	1 - 13 Mar	**4**	**14**
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**24**	**24**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Recap of AVSCOM messages

Following is a list of AIG 8881 addressed messages transmitted by AVSCOM (AMSAV-M) from 1 October through 31 December 1984.

UH-1-84-10 Safety-of-flight maintenance mandatory message concerning special inspection of all UH-1 main rotor blades (except C and M models) for skin delamination.

CH-47-84-12 Safety-of-flight technical message concerning inspection of aft transmission upper housing.

UH-60A-84-13 Safety-of-flight maintenance mandatory message concerning one-time inspection and replacement of tail rotor control brass turnbuckles.

UH-60A-84-14 Safety-of-flight technical message concerning one-time inspection of tail rotor control cables.

OV-1-84-05 Safety-of-flight technical message concerning one-time inspection of defective brass turnbuckles.

OV-1-84-06 Safety-of-flight technical message concerning inspection of propellers - barrel nut interference.

U-21-84-03 Safety-of-flight technical message concerning inspection of defective brass turnbuckles.

CH-54-84-02 Safety-of-flight technical message concerning one-time inspection of defective brass turnbuckles.

C-12-84-01 Safety-of-flight technical message concerning inspection of defective brass turnbuckles.

C-12-84-02 Safety-of-flight technical message - supplement to C-12-84-01.

U-8-84-01 Safety-of-flight technical message concerning inspection of defective brass turnbuckles.

U-3-84-01 Safety-of-flight technical message concerning inspection of defective brass turnbuckles.

UV-18-84-01 Safety-of-flight technical message concerning inspection of defective brass turnbuckles.

UH-1-84-11 Safety-of-flight technical message concerning replacement of all pitch change clevises on UH-1 aircraft (except C/M models)

UH-60A-84-15 Safety-of-flight maintenance mandatory message concerning extension of time to replace tail rotor control brass turnbuckles.

UH-1-84-12 Safety-of-flight technical message concerning one-time inspection of UH-1H/V and EH-1H/X aircraft main rotor pitch change link turnbuckle barrels for cracks.

CH-47-84-13 Safety-of-flight maintenance notice concerning changes to inspection of rotor head assemblies.

UH-60A-84-16 Safety-of-flight maintenance mandatory message concerning removal and replacement of gas generator rotors at certain life limits.

UH-60A-84-17 Safety-of-flight technical message concerning one-time inspection of main gearbox dowel pins.

AH-1-84-03 Safety-of-flight maintenance notice concerning a service life extension of the AH-1S canopy removal system.

CH-54-84-03 Safety-of-flight technical message concerning one-time inspection of CH-54A helicopters for defective main rotor blades.

OH-58-84-02 Safety-of-flight technical message concerning one-time inspection of OH-58A helicopters with MWO 55-1520-228-30-24 installed tail rotor drive shaft covers.

U-3-84-02 Safety-of-flight maintenance mandatory message concerning operational check of landing gear system.

Addressees requiring copies of messages should contact their higher headquarters. ■

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Report of Army Aircraft Mishaps

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 1-7 March

Utility helicopters

UH-1 Class D mishap

H series - Bird hit and broke FM antenna.

UH-1 Class E mishaps

H series - Safety NCO asked pilot to set helicopter down to check out a jammed weapon. The weapon charging handle was already to the rear. The weapon was placed on safety and the feed tray cover was opened. The safety NCO noticed a piece of brass between the open bolt and chamber. At that time, a round in the chamber cooked off. The weapon jammed because a round did not eject completely, placing a spent shell between the bolt and live round in the chamber.

H series - Collective pitch control became loose during hover. Caused by defective control stick.

H series - Crew did not follow checklist and tried to start aircraft with main rotor blade tied down. N_1 did not exceed 10 percent.

H series - Three UH-1 aircraft were flying through the mountains at approximately 3,500 feet msl with night vision goggles. Aircraft were in a staggered left formation with about eight rotor disks' separation. After the aircraft cleared the last mountain range and were starting their descent, they entered instrument meteorological conditions (IMC). The lead aircraft was the first to enter IMC. The pilot immediately announced heading and ordered IMC breakup procedures. Pilot of No. 3 aircraft lost sight of lead and noticed he had gone IMC just before receiving the call from lead. No. 2 aircraft entered IMC as lead was ordering IMC breakup. All of the pilots later stated there was no time to avoid entering IMC. Suspect the use of night vision goggles allowed gradual penetration into unforecast fog or low cloud layer before pilots lost contact with ground lights. All pilots performed IMC breakup. Lead broke through to VFR conditions after 3 to 4 minutes and returned to airfield. No. 3 aircraft remained in the clouds for 20 minutes and made a ground controlled approach at airfield. Pilot of No. 2 aircraft contacted GCA, but GCA was unable to get a radar fix on the aircraft. No. 2 aircraft remained IFR for 1 hour, finally broke through to VFR conditions, and landed near a civilian airfield.

H series - Transmission oil pressure fluctuated during hover. Caused by defective pressure relief valve.

UH-60 Class D mishap

A series - Aircraft developed vibration during takeoff. Postflight inspection revealed two antiflap assemblies were broken. Suspect antiflap stuck in up position and hit antiflap stop during takeoff.

UH-60 Class E mishaps

A series - Engine oil temperature increased during flight. Transmission oil cooler radiator was clogged with grass. Aircraft had made several landings in areas with loose blowing grass.

A series - Main module chip detector light came on during hover. Caused by defective main transmission module.

Attack helicopters

AH-1 Class D mishaps

S series - Rivets on fuel port retaining ring were broken during rapid refueling operation. POL personnel were seen having trouble removing the refueling nozzle from other aircraft. Suspect rivets were broken when nozzle was moved up and down excessively.

S series - Aircraft was at 10-foot hover over a bean bag light. Rockets

were being fired when roll SCAS channel hardover occurred. IP momentarily lost reference to the ground because of the flash of the rockets. Aircraft rolled left and IP recovered as left skid hit the ground. Aircraft was flown to airfield and landed to a hover while personnel placed mattresses under the nose and left wing stores.

S series - As pilot exited aircraft during refueling operation, he noticed that tail rotor drive shaft cover on vertical fin was flipped open. The lower four dzus fasteners had worn through their retainer and the upper fastener tore through sheetmetal of vertical fin cover.

AH-1 Class E mishaps

S series - Cyclic feedback and binding occurred during flight, accompanied by high frequency noise. Caused by failure of No. 2 hydraulic pump.

S series - Aircraft rolled right and left erratically during takeoff. Caused by malfunction of SCAS.

G series - Master caution light came on, followed by failure of No. 1 hydraulic system. Caused by failure of O-ring.

Mishap briefs

Cargo helicopters

CH-47 Class E mishaps

C series - Loud squealing noise was heard and utility hydraulic pressure dropped. Caused by fractured rigid hydraulic line.

C series - Three loud banging noises were heard during landing. Copilot's and pilot's self-tuning vibration absorbers were inoperative and bottomed out against their stops, causing the banging sounds.

D series - Smoke and flames were seen coming from rear of aircraft. Caused by failure of oil cooler fan drive shaft.

CH-54 Class C mishap

A series - After No. 1 engine was started, flight engineer saw a fire. Engine was shut down. Auxiliary power plant was on fire. Hydraulic line had ruptured, spraying hydraulic fluid into intake of operating auxiliary power plant and causing an explosion. Tail rotor cables located under auxiliary power plant were also damaged.

Observation helicopters

OH-6 Class E mishap

Engine quit on downwind at 1,000 feet msl and 80 knots airspeed. Aircraft was landed in a pasture. Caused by fuel exhaustion. Aircraft had flown 1.6 hours. Fuel quantity indicator read 200 pounds. Low fuel light did not illuminate.

OH-58 Class A mishap

A series - Aircraft was repositioning from assembly area to the unit TOC. As aircraft was flying upslope on a heading of 160 degrees and 60 feet above the ground, main rotor hit a tactical AM antenna which neither the pilot nor the copilot saw. They had seen the TOC and FM antennas but failed to spot the AM antenna. A nylon guy rope from the antenna wrapped around the mast and push-pull tubes. Crew lost control of aircraft. Aircraft crashed and came to rest on right side. 8523

OH-58 Class E mishaps

A series - During APU start, engine autoaccelerated when starter was released. Aircraft, which was on packed snow, rotated 30 to 40 degrees to right as N_2 rapidly accelerated to 110 percent. Pilot applied full left pedal and closed throttle while copilot shut off main fuel. Suspect ice formed over and blocked airflow restrictor on fuel control, causing fuel control to go full rich.

A series - Transmission oil hot light came on during hover. Caused by failure of transmission temperature switch.

A series - Loud noise was heard from right side of engine during takeoff. N_1 fluctuated with changes in collective pitch and power adjustments. Caused by failure of bleed air valve in open position.

Fixed wing

C-7 Class E mishap

A series - Crew saw fuel siphoning from right wing fuel filler cap area during takeoff. Caused by deteriorated packing.

OV-1 Class E mishaps

B series - Aircraft shuddered during takeoff and left main gear indicated unsafe. Hydraulic pressure dropped to zero. Caused by ruptured flex line to pressure port of nose gear door actuator.

D series - Right drop tank light came on. Caused by failure of d.c. motor on pump assembly.

C-12 Class E mishap

D series - Copilot saw fuel siphoning from right main fuel cap during climbout. Fuel cap was not properly seated.

U-21 Class C mishap

D series - Aircraft veered to right on touchdown, left runway, and came to rest on sod. Right main gear separated from aircraft. Right wing, flaps, and prop were damaged. Right torque knee broke, causing loss of directional control.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	1-20 Mar	**6**	**14**
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**26**	**24**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

U-21 Class E mishap

G series - Nose gear indicated unsafe when gear handle was placed down. Aircraft was landed without incident. Points on nose gear downlock microswitch became pitted and did not allow proper electrical contact.

Maintenance

UH-1 Class D mishaps

H series - Aircraft had undergone a hanger bearing repack. Tail rotor drive shaft was inspected by soldiers performing the work, by the technical inspector, and by the maintenance test pilot. Aircraft was flown on test flight. Several days later, aircraft was flown for 3 hours. Aircraft was preflighted for another flight, but mission was cancelled. Crew chief noticed dents on tail rotor drive shaft, opened cowlings, and discovered a wrench in the drive shaft area. Maintenance personnel did not inventory toolboxes after completion of job nor was the work area properly inspected. TI overlooked misplaced tool during inspection and maintenance pilot didn't detect tool on preflight. Two additional dailies and preflights were conducted without the tool being discovered.

H series - Hoist mount cover panel came off in flight and hit left synchronized elevator. Panel had last been removed from the aircraft for installation of vibrex wiring harness. Upon removal of the vibrex equipment and reinstallation of the cover panel, it was noticed that cover panel gasket was missing. Crew chief was notified, but the deficiency was not entered on the 2404-13 and no corrective action was taken. Experimentation with other UH-1 aircraft indicates that the installation of the cover panel without the gasket allows the cover retention bracket screw to bottom out without putting tension on the cover or retention bracket. The screw turns quite easily in this condition. Suspect airframe vibration caused the retention bracket screw to back out from the loose cover, allowing the cover to leave the aircraft.

H series - Oil was added to 42-degree gearbox prior to flight. As aircraft was landing, crew from another aircraft noticed oil spill on tail boom along 42-degree gearbox. Crew chief had not secured gearbox filler cap.

UH-1 Class E mishap

H series - Hydraulic pressure caution light came on during landing. Pinched O-ring caused hydraulic fluid to leak out.

AH-1 Class E mishaps

S series - When start was attempted, N1 rose to 12 degrees without igniter discharge or rise in tgt. Inspection revealed that safety was missing and cannon plug was loose on start fuel solenoid.

S series - As pilot was hover/taxiing for takeoff, cyclic motoring occurred, causing aircraft to rock left and right. Lateral SCAS card was out of balance.

S series - Pilot felt excessive sticking in collective stick during hover. Droop cam assembly was sticking because of dirt and lack of lubrication.

CH-47 Class C mishap

B series - No. 2 engine transmission cowling, bolts, and nuts were removed to facilitate MOC. While both engines were operating at normal rpm, crew chief climbed up right side of aircraft to inspect engine and engine transmission area for leaks. Shop rag in crew chief's pocket was ingested into the engine. Pilot warned crew chief not to take loose objects up on the aircraft. Crew chief did not realize the rag would be drawn out of his pocket. He was being trained on CH-47s.

OV-1 Class E mishap

D series - Fifteen minutes after takeoff, pilot was told to return to base. Aircraft was landed without incident. No. 1 propeller was serviced the evening before. Because of the late hour, runup check was deferred until morning since the aircraft was not scheduled for flight. Proper entries were not made in the logbook. Early the following morning, the aircraft was used as a replacement aircraft for a training mission. Once the aircraft departed, the error was realized and the aircraft was called back.

Safety messages

- Safety-of-flight technical message concerning magnetic particle inspection of UH-1 turnbuckles (UH-1-85-02, 011330Z Mar 85). Summary: This message establishes a standardized procedure for the magnetic particle inspection required in message UH-1-84-12 and revises part disposition instructions originally provided. Contact: Chuck Holtgreven, AUTOVON 693-1248, commercial 314-263-1248.
- Safety-of-flight maintenance mandatory message concerning one-time inspection and replacement of UH-60 stabilator amplifier (UH-60A-85-04, 011900Z Mar 85). Summary: This message revises date time group and reporting date of SOF message UH-60A-85-03. Contact: Lyell Myers, AUTOVON 693-3300, commercial 314-263-3300.
- Safety-of-flight technical message concerning revision to recurring and one-time inspections of swashplate bearing, lubrication and interval of bearing inspection (AH-1-85-02, 071230Z Mar 85). Summary: This message revises and clarifies message AH-1-85-01. The .155 inch minimum clearance is revised and the measuring procedure is explained in more detail. Contact: F. Barhorst, AUTOVON 693-1687, commercial 314-263-1687.
- Maintenance information message concerning safety-of-flight compliance (MIM-GEN-85-MEM-01, 051600Z Mar 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Followups

Additional information on mishap briefs previously published

Utility helicopters

UH-1 Class B mishap in 4 Jul 84 issue (8440) ☐ Pilot heard loud banging sound and entered autorotation. He did not maintain the aircraft in trim and at an airspeed conducive to a successful autorotation. The airspeed was reduced to a point which placed the aircraft inside the red zone on the height velocity diagram. The pilot's final attempts to complete the autorotation were unsuccessful, and the aircraft hit the ground hard. It was concluded that the banging sound was produced by a seatbelt which was not secured.

Attack helicopters

AH-1 Class B mishap in 16 May 84 issue (8431) ☐ Loud bang was heard, followed by grinding noise. Engine rpm increased and main rotor rpm decreased. Pilot entered autorotation and selected the best available landing site, which turned out to be a marshy area. As aircraft settled into 4 feet of water, right skid sank deeper than left and aircraft leaned to right, causing the advancing main rotor blade to hit the mud and water three or four times. Tail rotor drive shaft was severed. Failure of the main drive shaft was caused by insufficient lubrication. After an extensive storage period, the drive shaft was returned to the active supply channel without being inspected for adequate lubrication and without being freshly lubricated.

8431

Observation helicopters

OH-6 Class A mishap in 18 Jul 84 issue (8444) ☐ Aircraft was on a mission to locate three escaped prisoners. Two civilian law enforcement personnel were on board the aircraft. Contrary to command regulation, the pilot was flying too low, and the aircraft hit wires and crashed. The pilot's attention was divided between trying to fly the aircraft, navigating, and communicating with the passengers using written messages. There was no qualified observer on board, and neither of the passengers had any way to communicate with the pilot over the aircraft intercommunication system.

OH-6 Class B mishap in 29 Aug 84 issue (8450) ☐ Downgraded to Class C.

OH-58 Class B mishap in 9 May 84 issue (8430) ☐ Downgraded to Class C. ■

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 only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Direct communication is authorized by AR 10-29.

Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

Stacom

Standardization Communication

Mountainous terrain versus designated mountainous areas

Table 4-1, AR 95-1, refers to mountainous terrain. Is mountainous terrain the same as designated mountainous areas? No. Designated mountainous areas apply to IFR flights. Table 4-1, AR 95-1, applies to VFR uncontrolled airspace flights only. Rules developed for designated mountainous areas have nothing to do with VFR flights referred to in table 4-1. In fact, there is a lot of flat terrain in designated mountainous areas and some mountainous terrain in areas that are not designated mountainous areas. Just try telling someone from Arkansas that the Ozarks are not mountainous.

What then is mountainous terrain? Mountainous terrain contains mountains. The word "mountain" is defined in Webster as "a land mass that projects conspicuously above its surroundings." To a flatlander from south Alabama, a mountain may be 300 feet above the valley in which he/she is flying. An aviator who flies regularly in Nevada has an entirely different idea about how high a piece of terrain must be before it qualifies as a mountain.

Table 4-1 lists minimum ceiling and visibility requirements to enhance safety. If, in the best judgment of the aviator and his/her commander, terrain is "mountainous," the higher minimums in table 4-1 apply. ■

Night vision systems versus night vision goggles

DES has received numerous questions from the field concerning logging flight time for night vision systems (NS) and night vision systems with day filters (DS).

These hours cannot be combined with night vision goggle (NG) time on either the DA Form 759 or the DA Form 759-1. Hours should be logged as stated in table 7-1, column q(a), FM 1-300. When completing the DA Form 759-1 consolidation sheet, a separate entry should be made to reflect hours flown using these systems. If necessary, there should be a double entry in lines 6 and 8, column q.

The DA Form 759 will have separate statements for NVG and NVS qualifications and flight time. These statements will be in block 17 of the DA Form 759.

Until the new draft of FM 1-300 is sent to the field, operations personnel should follow these procedures. ■

FC 1-216 (Cargo Helicopter)

DES was queried recently concerning the discord between AR 95-1 and FC 1-216 with reference to the reduction allowed to semiannual flight-hour requirements through use of the CH-47 synthetic flight training system.

Paragraph 3-4c, AR 95-1, allows for a maximum credit of 12 hours per semiannual period toward helicopter

ATM requirements. However, paragraph 5-2h(1) and table 5-1 of FC 1-216 reflect, additionally, that an extra 7 hours for FAC 1 or 3 hours for FAC 2 aviator positions may be credited toward semiannual minimums.

Until AR 95-1 can be changed to correspond with the appropriate ATM, the reductions indicated by the aircrew training manual, FC 1-216, should be applied. ■

ATM corrections

FC 1-216 (Cargo Helicopter)

Standardization Flight Evaluation/Training Gradeslips, figures 8-1 and 8-2, were mistakenly placed in FC 1-216. Cargo helicopter aviators should continue to use DA Form 4507-R until the corrected gradeslip for FC 1-216 is fielded.

FC 1-217 (Surveillance Airplane, OV-1)

- USAAVNC (DES) Form 2150-9, figure 8-2, was mistakenly placed in FC 1-217 (Surveillance Airplane). Refer to FC 1-218, figure 8-2, for correct gradeslip.
- Page 6-9, item 5, should read "rotation/lift-off speed," instead of "rotation or lift-off speed."
- Page 6-9, item 6, should read "best angle/best rate climb speeds" (two engines).
- Page 6-103, paragraph c, fourth line, should read "cruise power with props at 1600 rpm . . ."
- Page 6-63, change paragraph 4 to read:

Zero-thrust power setting (propeller lever at detent) for the following airplanes is—

(a) U-21. With propeller lever at detent, set power lever to approximately 120 to 150 pounds of torque.

(b) C-12. With propeller lever at detent, set power lever to approximately 6 to 8 percent torque.

- Page 6-64, change paragraph 4 to read:

Zero-thrust power setting (propeller at detent) for the following airplanes is—

(a) U-3/T-42. With propeller lever at detent, set throttle to 10 to 12 inches of manifold pressure.

(b) U-8F. Set propeller lever at minimum of 2400 rpm, and set throttle to 14 or 15 inches of manifold pressure.

FC 1-218 (Utility Airplane)

- Table 2-1, pages 2-10 and 2-11, is incorrect. An errata sheet which replaces this table is being enclosed with the manual as it is fielded.
- USAAVNC (DES) Form 2150-8, figure 8-2, was mistakenly placed in FC 1-218 (Utility Airplane). Refer to FC 1-217, figure 8-2, for correct gradeslip.
- Paragraph 2-1b should read: "Tables 2-1 through 2-6."
- Page 6-60, sixth line, should read "high rpm" instead of "right rpm."

New ATM office

Effective 27 February 1985, the responsibility for coordinating input, writing, and issue of the aircrew training manuals (ATM) was transferred from the Directorate of Evaluation and Standardization (DES) to the Aviation Training Brigade (ATB), located at the U.S. Army Aviation Center, Fort Rucker. All correspondence and telephone inquiries should be addressed to the new proponent. The address is: Aviation Training Brigade, ATZQ-FT-O (ATM), Fort Rucker, AL 36362-5000. Their telephone number is (205) 255-2188/2464 or AUTOVON 558-2188/2464. ■

STACOM 110 20 Mar 1985

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5000, 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.

TURNER E. GRIMSLEY
LTC(P), Aviation
Director, DES

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Fort Rucker, Alabama 36362-5363

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Report of Army Aircraft Mishaps

Little things lead to disaster

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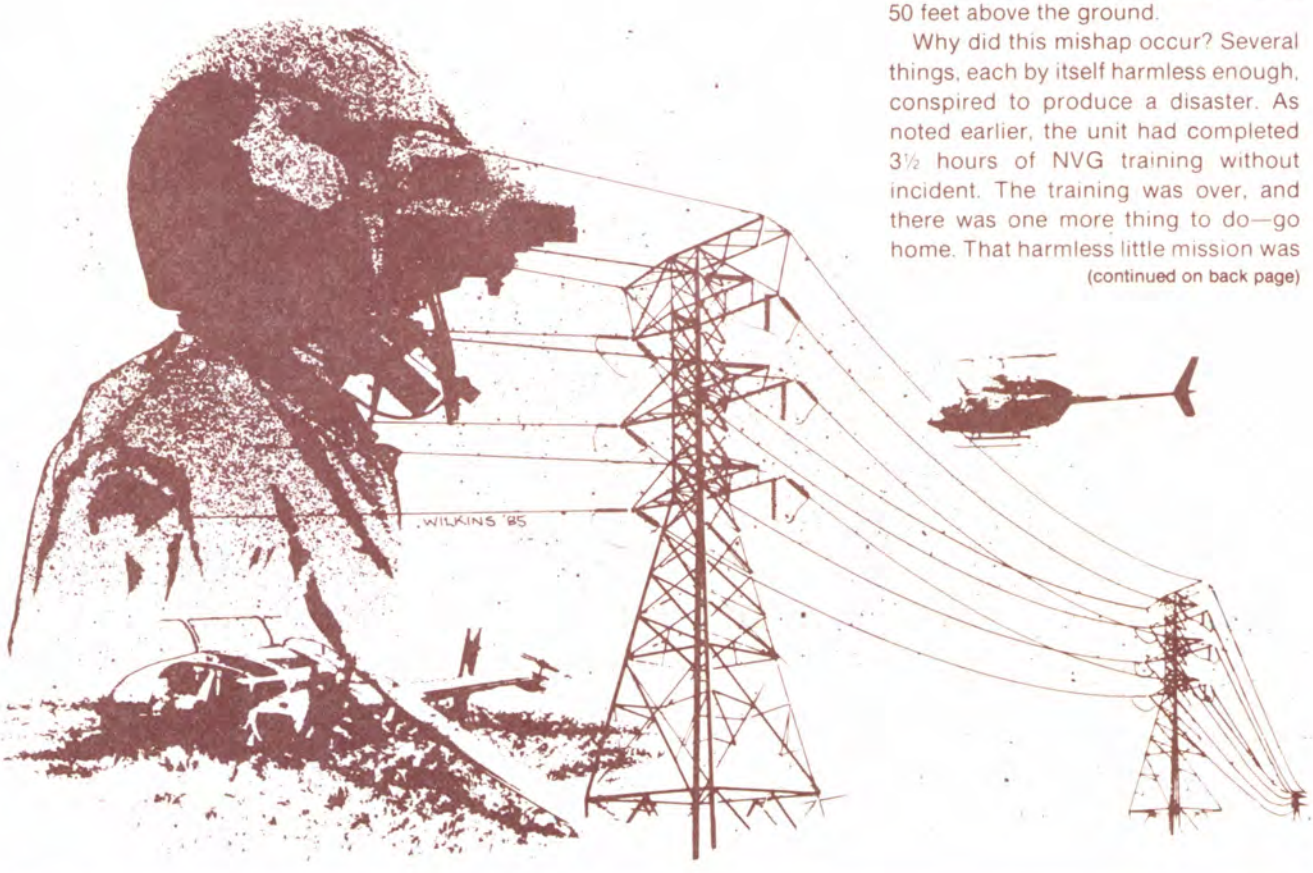
An OH-58C, leading a flight of four, departed a dispersal area at night for a 5-minute flight back to home base. The pilot was the NVG unit trainer, and the copilot was considered to be the unit's best navigator. The unit had just completed 3½ hours of very successful ARTEP training with night vision goggles. Less than 1 minute after lift-off, the lead OH-58 hit powerlines and crashed. The copilot was killed and the aircraft was destroyed.

The crew knew the wires were there. They were marked on every tactical map in the unit. The pilot knew where he was. He was a good pilot—conscientious and highly respected. Yet the flight ended in disaster. Why? All the ingredients for success were present. It was the simplest kind of mission, to fly from point A to point B. What could possibly go wrong? Well, therein lies part of the answer. When the simplicity of a mission convinces us nothing can go wrong, we are asking to learn a bitter lesson one more time.

Let's first look at what happened, and then we will look at why it happened. The pilot of the mishap aircraft was told by the platoon leader to lead the flight back to home base. He departed before the remainder of the flight was quite ready. As he was climbing to an intended altitude of 200 feet agl, the platoon leader called him and told him to wait for the flight. He began a 360-degree left turn to allow the flight to close. Halfway through the turn, he saw the flight climbing out, so he continued his turn. After coming back to his original heading, he applied power to accelerate and climb. Less than 30 seconds later, the aircraft struck wires 50 feet above the ground.

Why did this mishap occur? Several things, each by itself harmless enough, conspired to produce a disaster. As noted earlier, the unit had completed 3½ hours of NVG training without incident. The training was over, and there was one more thing to do—go home. That harmless little mission was

(continued on back page)



Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 8-14 March

Utility helicopters

UH-1 Class E mishaps

H series - Transmission oil pressure reading dropped 10 pounds in 2 hours and transmission oil light came on. Caused by defective pressure relief valve.

H series - Crew smelled strong fuel odor shortly after takeoff. Caused by failure of fitting on fuel return line from governor to fuel tank.

V series - Because of windy conditions, main rotor was kept tied down during preflight and before-starting check. Tiedown was forgotten during start procedure. Engine started and broke tiedown straps.

H series - Binding was felt in pedal controls during hover. Caused by defective servo cylinder assembly.

H series - Master caution and hydraulic pressure lights came on. Caused by failure of master caution panel circuit card.

V series - Smoke was seen coming from engine compartment during hover. O-ring behind starter generator garloc seal failed, spraying oil on engine.

UH-60 Class A mishap

A series - Aircraft was No. 3 in a flight of three. While at an altitude of 50 to 75 feet agl and 100 to 105 knots forward airspeed, aircraft was seen to pitch nose up and then dive into the ground, coming to rest inverted. Aircraft burned and all 12 occupants were killed. 8524

UH-60 Class D mishaps

A series - Stabilator was damaged during landing at tactical site. Landing zone consisted of uneven terrain with many small depressions. Apparently, tail wheel was placed in depression, permitting stabilator to hit the ground.

A series - Postflight inspection revealed hole in left side of 105-degree gearbox cover. When cover was removed, damage was discovered to No. 5 drive shaft. Caused by failure of camlocks.

UH-60 Class E mishap

A series - Crew heard whining noise during flight. Cabin filled with smoke. Doors and windows were opened, and a.c. power was turned off. After aircraft was landed, inspection revealed particle separator blower had failed, causing blower to come loose in its mount, damaging accessory gearbox drive oil seal and allowing oil leakage in hot area of engine.

Cargo helicopters

CH-47 Class D mishaps

D series - Aircraft landed in dusty desert environment. As ramp was lowered, it hit a rock. Hole was torn in skin and honeycomb on underside of cargo ramp.

D series - Aft rotor blades hit top of tree during landing. Pilot and copilot were using night vision goggles. They did not see the tree. Crew chief did not have night vision devices, and he did not see the tree.

CH-47 Class E mishaps

C series - As aircraft was hovering for takeoff, flight engineer saw fluid leaking from forward transmission area. Oil was leaking from elbow fitting. O-ring was replaced and fitting tightened.

C series - No. 2 engine oil pressure indicated 190 psi during flight. Caused by failure of engine oil transmitter.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	1-27 Mar	**9**	**14**
3rd Qtr	April	1	3			
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**29**	**24**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Attack helicopters

AH-1 Class A mishap

S series - Aircraft was one of four on night vision goggles training mission. The training was completed and the AH-1 was en route to the airfield when it crashed. The wreckage was spread over three-fourths of a mile. IP and pilot were killed. 8525

AH-1 Class B mishap

S series - Aircraft was on night gunnery firing mission. During right turn, aircraft settled into trees, damaging skids, transmission mounts, and tail rotor drive shaft. 8526

AH-1 Class E mishaps

S series - Antitorque pedals started motoring during flight. Pedals became stiff and would not move when pressure was applied. Caused by failure of tail rotor control servo.

S series - Transmission oil pressure fluctuated during hover. Caused by failure of oil pressure transducer.

S series - Alternator light came on during flight. Caused by failure of alternator relay.

Observation helicopters

OH-58 Class A mishap

A series - Shortly after takeoff, at 60 knots and approximately 200 feet agl, pilot began a right turn. Rpm bled off. Pilot did not lower collective before aircraft hit the ground in a level attitude. Aircraft spun and came to rest on its right side. 8527

OH-58 Class D mishap

A series - Aircraft was No. 2 taking off from a field site. Wires about 30 feet high were on left side of aircraft and wires 40 feet high were about 100 yards to the front of the aircraft. Copilot in the left seat was at the controls and pilot in right seat was watching the lead aircraft and the wires. At about 50 feet, with zero airspeed, copilot looked to the left for aircraft position. Pilot came back on instruments just in time to see torque gauge approaching 92 psi. Pilot immediately began applying downward pressure on collective and yelling to copilot. Copilot had pulled in collective with more pressure than pilot could overcome. Pilot watched torque gauge go to 93 to 94 psi before copilot relaxed pressure on collective. Engine was replaced because of overtorque.

OH-58 Class E mishap

A series - Left rear cabin door came open on takeoff. Passenger was unable to close door and held it until aircraft could be landed.

Fixed wing

C-12 Class E mishap

D series - Strong fumes entered cockpit during climb. Caused by failure of forward ventilation blower.

U-21 Class E mishaps

H series - Landing gear would not retract. Caused by corroded up-limit switch.

A series - When aircraft leveled off, crew noticed fuel siphoning from cap on right main fuel tank. Fuel cap was not seated correctly.

A series - Flaps would not extend during landing. Caused by failure of flap motor.

Maintenance

UH-60 Class E mishaps

A series - As aircraft was hovering for takeoff, tgt marconi lights and digits on No. 1 engine went to 950° C. Cannon plug was not seated correctly.

AH-1 Class E mishap

S series - Pilot's ICS became inoperative during runup. As crew chief was checking the cannon plug and refastening it, his foot slipped off the step and he allowed a screwdriver to touch the SCAS control head wiring harness. This caused a short which left the SCAS inoperative.

OH-58 Class E mishap

A series - Inverter failed during flight. Soldered wire connections were improperly soldered.

OV-1 Class D mishap

D series - Crew chief was taxiing to tiedown area after performing engine runup. He applied reverse thrust to slow the aircraft. Loud noise was heard, and crew chief saw, in his mirror, an object flying through the air. Upper ring cowling had been struck by propeller. Crew chief did not check for adequate security of cowling before engine run.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Image intensifiers possibly defective

The AVSCOM Supply Bulletin reports that six image intensifier assemblies, MX-9916/U, may contain a possible latent defect. One of them, SN 134257, has been installed in night vision goggle AN/PVS-5A, SN 16203. Serial numbers of the other five MXs are 135105, 135106, 135107, 135108, and 135110.

Check your stocks of these items to see if you have any. If you do, ship them to Litton and let AVSCOM know. They'll get you a replacement. The Litton address is Litton Systems, Inc., Litton Industries, Electron Tube Division, 1215 South 52nd Street, Tempe, Arizona 85281. The M/F contract number is DAAB07-81-C-1065. ■

Little things lead to disaster

not planned. The lead pilot was not briefed on the altitude to be flown, and neither was anyone else. The lead pilot's planned altitude was appropriate, and if he had achieved it, nothing would have happened. But what if the lead aircraft had cleared the wires? The other aircraft, not having been given an altitude, were simply following the leader. So the lack of a briefing did not cause the lead aircraft to hit the wires, but it could have caused one of the others to hit them.

After the lead aircraft took off, a lot of little things began to happen. They very quickly piled up and compounded the problem until the disaster happened. First, the lead pilot was told to wait for the remainder of the flight. This caused him to stop his planned climb to 200 feet agl. He was wearing night vision goggles, so he had no reference to instruments for airspeed and altitude indications. He transitioned from an accelerating climb to a level turn by feel. His "feel" was imperfect. While in the left turn, the aircraft lost airspeed and altitude, but the pilot did not know that. That little fact was critical. After the turn was completed, the pilot added power to reestablish an accelerating climb. Again, the pilot had to do this by feel, because he could not see his instruments. If he had been in a level turn as he thought, the power he applied would have been sufficient to reestablish the accelerating climb. But because he was in a descent when he added power, he managed only to stop his descent and establish a level acceleration. This is why he did not clear the wires.

By now you may have wondered what the copilot/navigator was doing all this time. Just about the time everything was beginning to go awry, unit operations began trying to contact the platoon leader, who was No. 3 in the flight of four. The platoon leader was not answering the radio call, and the copilot of the lead aircraft took the call and attempted to relay between the platoon leader and unit operations. The copilot/navigator effectively removed himself from his duties to the pilot in terms of critically needed input. The pilot was aware of this and was upset by it. He wanted to tell the copilot to get off the radio, but there was still one more problem. The pilot had no VHF side tone, so he could not actually hear the radio conversation between the copilot and unit operations. He began concentrating on listening for a break in the conversation by noting the squelch break. Now, both the pilot and copilot were mentally inside the cockpit flying straight toward the wires. A few seconds before impact, the pilot tried to help himself by refocusing one tube of the NVG to check his instruments. He saw the wires about 1 second before impact.

The lessons this mishap teach are clear. As pilots, we must remember that there is no such thing as a "simple mission." About the only time you are immune to a mishap is when you are not flying and do not intend to fly. The only time you can safely let your guard down is when the mission is over and the blade is tied down.

There is a good reason why the Army requires two pilots on an NVG mission. Two pilots are necessary. All the attention and skills of both pilots are necessary to keep the aircraft safely airborne. ■

—Ronald Cox
Investigation Division
Army Safety Center

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Aircraft accident review

Unauthorized low-level flight

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Synopsis

A UH-1H pilot broke away from the rest of the flight and descended to an altitude of 50 to 75 feet agl. The pilot put the aircraft into an aerobatic flight from which he could not recover. The UH-1 crashed in a near-level attitude and came to rest on its left side.

History of flight

Three helicopters were scheduled for a troop transport training mission. The air mission commander filed a flight plan and received a weather briefing. He briefed the crews of the other aircraft on the weather, route of flight, formations, and altitudes to be flown.

The three aircraft left the airfield and joined up in a V formation. The flight then reversed course and flew over a town at an altitude of 500 feet above the ground. After passing the town, the air mission commander directed a change from the V formation to a tactical trail formation. No change in altitude was directed.

At this time, the pilot of the No. 2 aircraft descended to 50 to 75 feet agl in an area that was not an approved low-level training area. The aircraft then approached a lake, and the pilot dropped to an altitude of 20 to 50 feet. Indicated airspeed was 100 knots. After passing the lake, the pilot began a cyclic climb, gaining 300 to 400 feet of altitude and dissipating airspeed to 40 to 50 knots.

The aircraft then turned sharply to the right about 180 degrees, followed by a dive. About 100 feet agl, the aircraft was pulled out of the dive and another steep climb was begun. After gaining some altitude, the aircraft was again turned sharply to the right about 180 degrees with a bank angle of 60 degrees. Rolling out of the turn, the pilot dove the aircraft towards the ground in a 45- to 50-degree dive angle. This resulted in a high rate of descent from which the pilot could not recover.

The UH-1 hit the ground in a near-level attitude and rebounded. The nose yawed right and the tail boom separated. On the second impact, the main rotor blades hit the ground on the right side of the fuselage, separating the main rotor head and causing the aircraft to roll left. The Huey came to rest on its left side. One passenger was killed, two passengers and the crew chief sustained critical injuries, the pilot sustained major injuries, and the copilot and one passenger sustained minor injuries.

Crew experience

The 35-year-old pilot had more than 4,500 rotary wing hours, with more than 800 in the UH-1. The 33-year-old copilot had more than 200 rotary wing hours, with more than 60 in the UH-1.

Commentary

The pilot of the No. 2 aircraft deviated from the flight profile briefed by the air mission commander and operated his aircraft in a careless and reckless manner. He performed aerobatic flight with passengers on board, which endangered life and property and which is a violation of AR 95-1. Numerous witnesses were interviewed about the accident, and all essentially agreed about the nature of the maneuvers leading up to the accident.

About 1 year before this accident, the unit commander began receiving indications from unit personnel that the pilot was "cowboying" the aircraft and displaying undesirable piloting techniques. The commander called the pilot and the platooon leader into a counseling session and told the pilot of the allegations made by unit personnel. He also told the pilot what would happen if his unprofessional action countinued.

Shortly after the counseling session, the unit participated in a field training exercise. On the return flight, the pilot did not follow the instructions of the air mission commander but rather flew independently of the other seven aircraft. Again, he was counseled by the commander.

Everything went okay for several months. Fifteen days before this accident, another unit aviator saw the pilot taking off in an extreme nose-low attitude with high power from a pad. This was followed by a low-level run and an abrupt cyclic climb to clear a tree line. The aviator who witnessed this action told the platoon leader about it. The platoon leader decided to discuss the matter with the commander, but something came up and he was not able to. He was not aware that the pilot was scheduled to fly the mission which resulted in the accident.

The copilot graduated from flight school about 3 months before the accident. This was the first time he had flown with the pilot. The copilot became very concerned when the pilot descenoed to 50 feet, but he did not say anything. There was not a hazard map on board the aircraft, and the copilot was actively looking for wires and other hazards. Also, he did not know where the No. 3 aircraft was and he was busy looking for it.■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 15-21 March

Utility helicopters

UH-1 Class C mishap

H series - After completion of HIT check, pilot attempted takeoff to hover. As aircraft became light on the skids, right skid came off the ground. Cyclic control immediately moved to the 8 o'clock position, and the aircraft started bouncing on the heel of the left skid. Aircraft began rapid turn to left, pivoting around the left skid. Aircraft spun 360 degrees twice before pilot set aircraft down hard. One main rotor blade hit main rotor blade of aircraft parked to the rear.

UH-1 Class D mishaps

H series - Main rotor blade hit tree during NOE hover. Hole was torn in blade.

H series - Aircraft was landed on narrow concrete road. Aft end of right skid was 1½ feet off the concrete and left skid was about 2½ feet off the concrete. Aircraft was shut down and blades tied. As crew disembarked, aircraft began to tip tail low. Crew immediately stepped back onto aircraft to return it to its proper position. Aircraft was then repositioned. Left skid was bent during rotation of aircraft over edge of concrete.

UH-1 Class E mishaps

H series - Master caution and transmission oil pressure lights came on. Transmission oil pressure gauge went to zero. Transmission oil line quick disconnect was worn, causing high internal oil pressure in transmission and failure of internal oil filter gasket.

H series - During power recovery of forced landing, crew saw N2 overspeed of 7200 rpm, rotor rpm at 345, N1 speed at 98 percent, egt at 490, and torque less then 35 psi. Caused by pilot rolling on throttle too rapidly during power recovery.

H series - Flight controls began to bind. Caused by malfunction of right lateral servo bellcrank.

H series - Pilot felt binding in pedals during hover. Caused by malfunction of tail rotor quill sprocket guard.

UH-60 Class D mishaps

A series - Load had been released and aircraft was being relocated. Drum with steel bar was not seen under the aircraft. As aircraft was being set down from a hover, steel bar punctured fuselage aft of left main landing gear.

A series - While inspecting LZ for suitability, IP directed his attention to the pink light filter because the light was reflecting off blowing dust and reducing visibility. The copilot at the controls allowed aircraft to drift right into trees. Tip caps of main rotor blades were damaged.

UH-60 Class E mishap

A series - No. 2 engine quit during takeoff. Caused by air being drawn into engine through leak in No. 2 fuel selector valve in transmission oil cooler compartment.

Attack helicopters

AH-1 Class E mishaps

G series - Low rpm audio came on and rotor rpm dropped to zero. Caused by failure of rotor tachometer.

S series - Eight percent difference was noted in pilot's and copilot's torque gauges during hover. Caused by failure of torquemeter transducer.

S series - Master caution light came on during flight. Caused by failure of master caution warning panel.

Cargo helicopters

CH-47 Class D mishap

D series - Right aft pylon work platform opened during landing, causing damage to platform and

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	1 - 3 April	**0**	**0**
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**29**	**24**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

support cables. Suspect work platform dimensions were inadequate for dimensions of pylon opening and aft latch of platform disengaged under stress of pylon torsion.

CH-47 Class E mishaps

D series - No. 2 transformer rectifier off light came on. Caused by faulty relay.

C series - No. 2 engine rpm went high and transmission nose box dropped below 20 psi. Engine started to smoke and was shut down. Caused by oil leak in engine transmission nose box.

C series - Master caution and No. 1 engine transmission hot lights came on. Engine transmission temperature sensing element cannon plug had a broken wire.

Fixed wing

C-12 Class D mishap

C series - Pilot noticed difficulty with nose wheel steering for left turns while taxiing for departure. Lock nut on rod assembly had backed off, allowing nose steering link assembly to extend 6 to 8 inches. This forced rear link nose steering tube to bend.

C-12 Class E mishaps

A series - Oil was seen coming from right engine nacelle during climb. Oil cap had come loose, allowing oil to siphon.

A series - As aircraft started takeoff roll, nose wheel steering was not effective in keeping aircraft on runway centerline. Pilot had to use right brake to keep aircraft on runway. Takeoff was aborted. Caused by left brake locking up.

T-42 Class E mishap

A series - Right crosswind landing was made, requiring near full left pedal. Pilot inadvertently had some right brake pedal applied, and tire blew out.

Observation helicopters

OH-58 Class A mishaps

A series - Aircraft was landing at airfield. Winds are reported at 350 degrees, 11 knots gusting to 18 knots. Pilot made downwind landing on a heading of 200 degrees. At termination to a hover, pilot had turned 90 degrees to the left when loss of tail rotor effectiveness occurred. Aircraft began spinning to the right. Pilot's attempt to fly out of the spin was unsuccessful. Throttle was closed and hovering autorotation attempted. Aircraft entered left roll. At touchdown, main rotor hit the ground and severed tail boom. 8528

C series - Aircraft was landing to the north at a field location. Winds were from the north at approximately 15 knots. At 10 feet agl, pilot determined that the proposed landing site was unsuitable and turned aircraft 180 degrees to the left. Aircraft began spinning to the right. Pilot applied full left pedal and lowered the nose. Spin accelerated and aircraft crashed and came to rest on its right side. 8529

C series - Aircraft crashed during training mission and was destroyed by fire. Pilots escaped with minor injuries. 8530

OH-58 Class E mishaps

A series - Loose debris was ingested into rotor system during NOE training mission.

A series - Cyclic binding occurred during liftoff with an indicated torque reading of 45 percent. Caused by malfunction of swashplate and support assembly.

A series - Engine-out audio and light activated during flight. Caused by failure of N1 tachometer.

Maintenance

AH-1 Class E mishap

S series - Airspeed indicator did not register during takeoff. Airspeed indicated 60 knots during return to takeoff point. Incorrect tightening of pitot static drain system kinked the line, causing reduction in ram air pressure and erroneous airspeed indications.

CH-47 Class E mishaps

C series - Aircraft took off with external sling load. On climbout, cargo hook open light and master caution light came on, but cargo hook remained closed. Cargo hook microswitch was out of adjustment.

D series - Pilot noticed binding in cyclic during takeoff. Because of improper temporary repair of floor panel, floor switch fell through panel and was hanging against cyclic control.

OH-6 Class E mishap

A series - Engine flamed out during runup after aircraft was refueled from 55-gallon drum. Drum was not properly cleaned, and foreign matter in the drum was pumped into aircraft fuel tanks.

C-7 Class E mishap

A series - Left engine lost power during flight. Caused by excessive antiseize compound on spark plugs.

Safety messages

• Safety-of-flight message prohibiting in-flight training and operation of the UH-60 in engine ECU lockout condition (UH-60A-85-05, 142200Z Mar 85). Summary: During UH-60 ECU lockout flight training, engine failure occurred on the engine still operating on the ECU. This may have contributed to a Class A accident. This message

Mishap briefs

prohibits ECU lockout training and in-flight practice pending further notice. Contact: Tim Hughes, AUTOVON 693-1683, commercial 314-263-1683.

• Safety-of-flight maintenance mandatory message concerning one-time inspection of UH-60 primary servos and control rods (UH-60A-85-06, 211530Z Mar 85). Summary: This message requires inspection of the main rotor servo and input control rods to ensure bearing retention devices are installed. If the retention devices are not installed, it may lead to improper control of the servo valve. Contact: Jim Carter, AUTOVON 693-1892, commercial 314-263-1892.

• Aviation life support equipment message concerning components of aircrew survival vests (SRU-21/P and OV-1) (ALSE 85-2, 181130Z Mar 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

ATM corrections

The ATM corrections in the STACOM portion of the 20 March 85 **Flightfax** (page 6) were listed incorrectly. Following is the corrected copy.

FC 1-216 (Cargo Helicopter)

Standardization Flight Evaluation/Training Gradeslips, figures 8-1 and 8-2, were mistakenly placed in FC 1-216. Cargo helicopter aviators should continue to use DA Form 4507-R until the corrected gradeslip for FC 1-216 is fielded.

FC 1-217 (Surveillance Airplane, OV-1)

• USAAVNC (DES) Form 2150-9, figure 8-2, was mistakenly placed in FC 1-217 (Surveillance Airplane). Refer to FC 1-218, figure 8-2, for correct gradeslip.

• Page 6-9, item 5, should read "rotation/lift-off speed," instead of "rotation or lift-off speed."

• Page 6-9, item 6, should read "best angle/best rate climb speeds" (two engines).

• Page 6-103, paragraph c, fourth line, should read "cruise power with props at 1600 rpm . . ."

FC 1-218 (Utility Airplane)

• Table 2-1, pages 2-10 and 2-11, is incorrect. An errata sheet which replaces this table is being enclosed with the manual as it is fielded.

• USAAVNC (DES) Form 2150-8, figure 8-2, was mistakenly placed in FC 1-218 (Utility Airplane). Refer to FC 1-217, figure 8-2, for correct gradeslip.

• Paragraph 2-1b should read: "Tables 2-1 through 2-6."

• Page 6-60, sixth line, should read "high rpm" instead of "right rpm."

• Page 6-63, change paragraph 4 to read:

Zero-thrust power setting (propeller lever at detent) for the following airplanes is—

(a) U-21. With propeller lever at detent, set power lever to approximately 120 to 150 pounds of torque.

(b) C-12. With propeller lever at detent, set power lever to approximately 6 to 8 percent torque.

• Page 6-64, change paragraph 4 to read:

Zero-thrust power setting (propeller at detent) for the following airplanes is—

(a) U-3/T-42. With propeller lever at detent, set throttle to 10 to 12 inches of manifold pressure.

(b) U-8F. Set propeller lever at minimum of 2400 rpm, and set throttle to 14 or 15 inches of manifold pressure.

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Why pilot reports (PIREPs)?

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"Mommy, where do PIREPs come from?"

"Why, they appear like magic each day in Air Weather Service (AWS) units around the world."

It sounds silly, but some people must believe that to be the case, since the tried-and-true procedures of "ASKING" a pilot for a PIREP seems to be a dying art! A recent meeting with aviators from throughout the Air Force's Military Airlift Command revealed that many pilots think forecasters no longer really want PIREPs. Granted, PIREPs do take time out of an already busy duty schedule, but let's look at the consequences of neglecting these "observations from above."

The most obvious result of not obtaining a PIREP when opportunity knocks is that significant weather phenomena (icing, turbulence, thunderstorms, wind shear, etc.) might be completely overlooked. This can be disastrous to the pilot who is subsequently briefed into that weather with no forewarning. In fact, Meteorological Watch Advisories (MWS) for turbulence and icing conditions can easily be missed without that input from a pilot who encounters it, and many times the first indication of a thunderstorm in the area is when the thunder clap announces its arrival overhead. Obviously, a pilot flying in the area might have been able to provide a heads-up warning of the approaching thunderstorm in a PIREP. Many more examples could be cited, but it is already obvious that it's in everyone's best interest to actively seek and transmit a PIREP when you have the opportunity.

So, who benefits when you transmit the PIREP? The first will be pilots at your installation. Flight schedulers, operations officers, flying unit commanders, and air traffic controllers all make many important decisions each day which impact directly on the safety of others. Obviously, the more information available during the decision-making process, the more reliable the decision. And when the PIREP is transmitted longline, the number of beneficiaries increases dramatically. For instance, other weather units receive the information and subsequently use it to update and improve their pilot briefings and forecasts. Also, the forecast centers use the information in preparation of their products, i.e., military weather advisories, weather warnings, special mission briefs, and weather analysis and forecast packages.

Of course, the real object of the PIREP program is the enhancement of pilot safety, and that means that pilots are also included in the number of beneficiaries. In other words, a lot of people may be denied access to critical data when a pilot does not transmit a significant PIREP, and, of course, **everyone** loses if the weatherman fails to request it in the first place!

The bottom line is that PIREPs constitute a valuable source of atmospheric information that should not be overlooked, and it's in everyone's best interest to judiciously request and transmit them. PIREPs are a simple, but effective way to ensure that the best possible service is provided. Air Weather Service forecasters **must** continue to request PIREPs and pilots **must** transmit PIREPs at every opportunity.■

—Submitted by Major Thomas F. Beaver, Det 1, 7th Weather Sqdn. Adapted from an article in the Air Weather Service Ops Digest.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 22-28 March

Utility helicopters

UH-1 Class A mishap

H series - At approximately 300 feet during takeoff, three loud bangs were heard. Pilot began left turn in attempt to return to airfield. Additional compressor stalls occurred and rotor rpm continued to deteriorate as aircraft descended toward trees. IP entered autorotation. Aircraft entered trees and came to rest nose low on left side. Suspect engine failure. 8531

UH-1 Class B mishap

H series - Crew heard five loud bangs on short final to field site, and rpm dropped. Pilot reduced power to land and engine quit. Autorotation was entered, and aircraft landed hard. 8532

UH-1 Class E mishaps

H series - Excessive feedback in lateral cyclic control was felt during landing. Caused by failure of right lateral servo cylinder.

H series - N1 gauge fluctuated and then dropped to 10 percent. Caused by failure of tachometer generator.

H series - Metal-to-metal type noise was heard. Caused by excessive wear in main mast bearing.

H series - Aircraft became almost uncontrollable during flight. Pilot entered autorotation and landed. About 10 feet of upper skin had peeled off of main rotor blade.

H series - Tail rotor chip detector light came on during hover. Caused by defective 90-degree gearbox.

UH-60 Class E mishaps

A series - Transmission oil pressure fluctuated between 25 and 60 psi during hover. Transmission oil level was 5 quarts low.

A series - Postflight inspection revealed oil on side of aircraft. Caused by failure of No. 2 viscous dampner bearing.

A series - Loud noise was heard during takeoff. Caused by failure of antiflap stop.

Attack helicopters

AH-1 Class D mishaps

S series - Pilot untied main rotor and rotated system 90 degrees but failed to remove tiedown from blade. Engine was started. Tail rotor blades and gearboxes were damaged.

S series - Pilot heard loud bang during flight and landed. IR light and filter were missing. Filter bracket was broken.

S series - Aircraft hit trees during training mission. Both main rotor blades were damaged.

AH-1 Class E mishap

S series - No. 2 system hydraulic pressure switch failed during flight, causing pitch and roll SCAS to disengage.

Cargo helicopters

CH-47 Class D mishap

B series - Pilot was receiving instruction in external load operations. As he was trying to raise the load, the sling straps became entangled with the load. As flight engineer was trying to untangle the straps from his position inside the helicopter, pilot allowed aircraft to settle onto the hookup ring of the load, causing damage to rescue hatch lower door and structural beam aft of rescue hatch. Suspect IP allowed pilot to place himself in an unrecoverable position by incorrect use of the thrust lever magnetic brake while decreasing thrust. Downward pressure applied to the thrust lever before releasing the magnetic brake will cause a momentary rapid downward movement of the helicopter when the brake is released. The underside of the

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**2**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	1-10 April	**0**	**0**
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**28**	**24**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

helicopter was 2 to 3 feet above the load.

CH-47 Class E mishaps

C series - Left side fuel boost pumps failed during takeoff. Inspection revealed an electrical connection had shorted out.

C series - No. 2 engine would not start. Engine N1 actuator failed in full flight position, keeping actuator K2 relay open.

Observation helicopters

OH-58 Class A mishap

A series - Aircraft was at NOE altitude when it flew over a ridgeline into a valley. Aircraft hit three powerlines. Wires did not engage the wire-cutting device but instead wrapped around the mast, severing control linkage. Aircraft crashed on the side of a hill. 8533

OH-58 Class D mishaps

C series - During hot refueling operation, crew chief told refueler that aircraft was not receiving fuel. Refueler retracted CCR nozzle a few inches and jammed it back in before crew chief could stop him. As refueler jammed CCR into aircraft, fuel cap, secured to the aircraft by a lanyard, got between CCR and aircraft and was forced into fuselage, causing structural damage to honeycomb panel below fuel port.

A series - Tail rotor blades hit tree during NOE flight.

OH-58 Class E mishaps

A series - Pilot tried to start aircraft with main rotor blades tied down. Pilot heard a snap and immediately shut down aircraft without damage.

C series - Pilot encountered unforecast weather conditions and asked for alternate route to continue mission. None was available so pilot returned to home station.

OH-6 Class E mishaps

A series - Aircraft yawed left and engine-out audio sounded. Caused by malfunction of engine power-out box.

A series - Airspeed indicator did not register increase in speed during takeoff. Flexible tubing from pitot to airspeed indicator had become brittle with age and broke at fitting.

Fixed wing

C-7 Class E mishaps

A series - As pilot was lining up for takeoff, nose wheel started turning right while aircraft was still motionless. Caused by failure of nose wheel steering actuator.

A series - During taxi for takeoff, directional control could not be maintained with nose wheel steering control. Caused by failure of hydraulic line to pressure side of nose wheel steering actuator.

U-21 Class D mishap

A series - Piece of nose gear torque knee was lost from aircraft during landing. Caused by fatigue failure.

OV-1 Class E mishap

D series - No. 2 fire light came on. Caused by failure of fire detector relay in forward bay.

C-12 Class E mishap

C series - No. 2 engine was shut down in flight for pilot training. Engine would not restart. Flow divider apparently did not open to allow fuel flow. Igniters were changed.

T-42 Class E mishap

A series - Inverter warning light came on. All radios were inoperable. Caused by broken cable to main electrical buss.

Maintenance

UH-1 Class E mishap

H series - Excessive left cyclic input was necessary to maintain aircraft stability during hover. Cyclic was rigged incorrectly.

CH-54 Class E mishap

A series - Crew chief used cyclic intercom switch instead of floor switch and inadvertently pushed cargo release button, releasing external load.

For more information on selected mishap briefs, call AUTOVON 588-4198/4202.

U.S. ARMY SAFETY CENTER

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Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

Ten tactics for better aviation operations

In-depth surveys of selected units, interviews with commanders and safety officers, and information from the Army Safety Management Information System show that units with successful safety programs share ten positive common denominators.

1. Direct command involvement and supervision of all flight operations.
2. Training tailored to specific mission requirements with aviation safety officer participation in planning phases.
3. Detailed briefing of every mission by the chain of command to ensure mission requirements and limitations are understood by all crewmembers.
4. Risk management practiced by everyone in the organization.
5. All risk factors identified and understood so good risk management decisions can be made.
6. Risk management decisions made at the proper level—the greater the risk, the higher the decision level.
7. Breaches of flight discipline not accepted by anyone in the organization.
8. High risk aviation personnel identified and eliminated.
9. Experienced aviators paired with the inexperienced.
10. Command attendance and participation in safety meetings that produce countermeasures.

These ten tactics pay big dividends by allowing high performance units to train smart and safe, achieving better mission results.

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Report of Army Aircraft Mishaps

Check your helmet modifications

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Fort Rucker, Al 36362

Many of YOU may be wearing unsafe helmets.

CW2 Garey, the aviation life support equipment officer for the 3/507 Medical Company, Fort Hood, wrote us about an incorrect helmet modification. A helmet belonging to a pilot who transferred into the company was incorrectly modified for night vision goggles. This modification resulted in two screws protruding one-fourth inch into the energy-absorbing liner. The helmet had been modified by aviation life support equipment personnel at the pilot's previous duty station.

Figure 1 shows a helmet correctly modified for night vision goggles. The person who modified the pilot's helmet used screw C to mount the clamp at mounting point B rather than using the screw already at point B. Screw C is more than one-fourth inch longer than screw B and more than one-eighth inch longer than screw A. Mounting point A is the **correct** place to mount the clamp. Even if the clamp had been mounted in the correct place using screw C, there still would have been a one-eighth inch protrusion into the energy-absorbing liner.

Many of you may be wearing unsafe helmets. Make sure the correct screw is used at the correct mounting point. ■

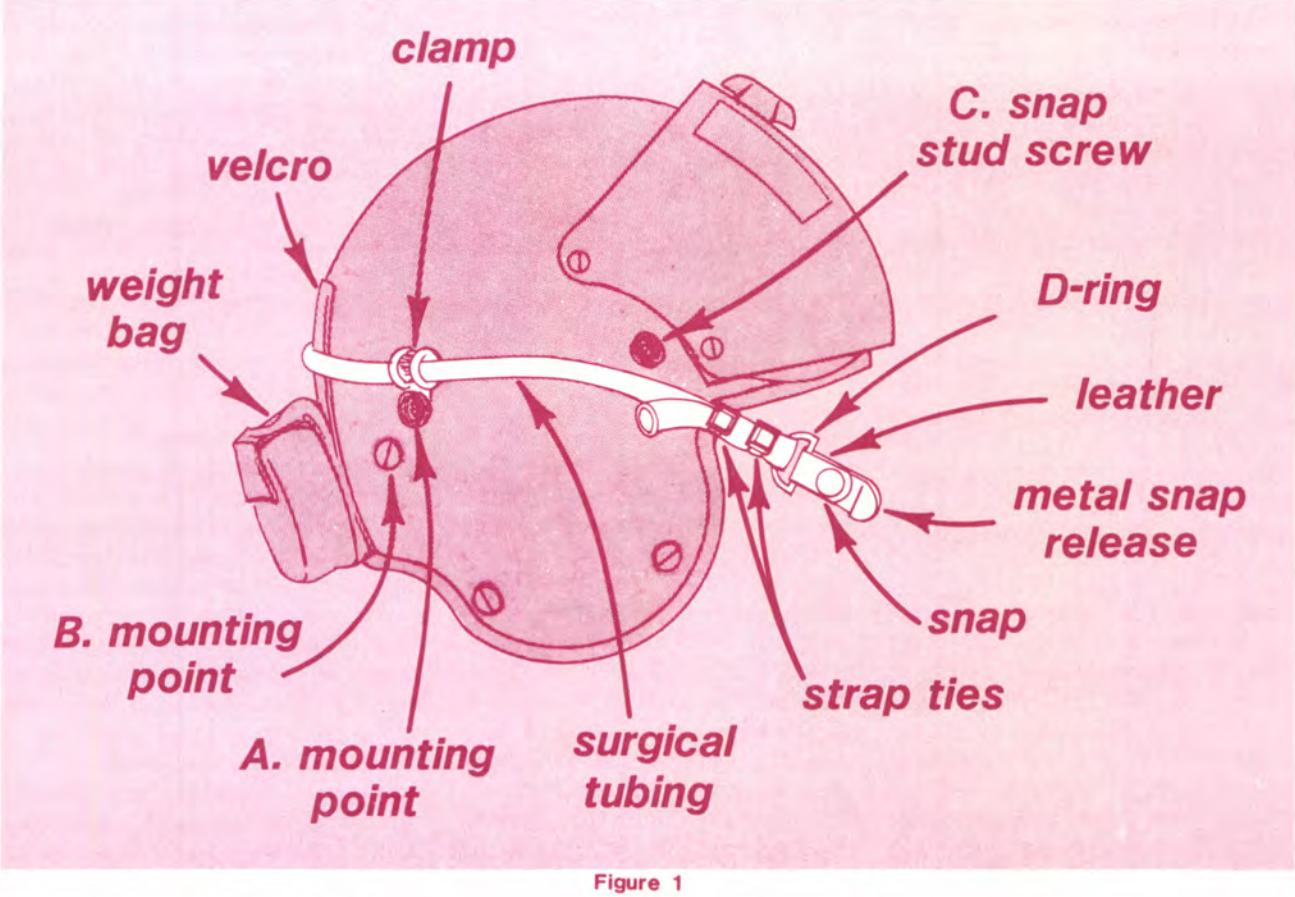

Figure 1

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 29 March-4 April

Utility helicopters

UH-1 Class D mishaps

H series - During approach to tactical area, crew saw commo wire in landing area. During go-around, pilot saw wires to his front and increased pitch to miss them. Crew chief saw torque at 60 psi and decreasing.

H series - Aircraft was set down in river bed containing football-sized rocks. Right skid tube was bent from contact with rock.

H series - As pilot was hovering aircraft to parking spot, rotorwash caused jump door of a parked aircraft to blow open and hit FM antenna mount. Crew of parked aircraft did not adequately secure jump door before leaving aircraft.

UH-1 Class E mishaps

H series - Master caution and hydraulic pressure lights came on. Caused by failure of right cyclic hydraulic servo seal.

H series - Cabin filled with smoke. Heater was turned off and aircraft landed. Caused by seized bearing in muff heater blower assembly.

H series - Rpm light came on and N2 engine tachometer needle dropped to zero. Caused by failure of engine tachometer generator.

H series - Fuel warning light came on with fuel quantity indicating 400 pounds. Caused by defective fuel boost pump.

UH-60 Class D mishap

A series - After landing at hot refueling site, crew chief saw that lower piston had pulled out of left main landing gear shock assembly, with the strut resting on drag beam assembly. Landing gear fairing was cracked. Separation of piston was caused by failure of strut assembly retaining device.

UH-60 Class E mishap

A series - No. 1 hydraulic system failed during flight. Hydraulic pump return line cracked.

Attack helicopters

AH-1 Class E mishaps

S series - Master caution and No. 2 hydraulic lights came on. Caused by failure of pressure switch.

S series - Copilot, flying from front seat, noticed that collective was excessively stiff. Pilot tried to reduce collective and returned to airfield. Torque remained at 69 percent. En route to airfield, pilot was able to reduce power. Aircraft descended from 300 feet to 50 feet before pilot was able to stop descent. Pilot tried to use emergency hydraulic pump and boresight without success. Two running landings were attempted before a successful landing was made at 60 knots indicated airspeed. Aircraft slid 1,850 feet on snow, ice, and water-covered runway. Suspect ice on friction collet.

S series - Transmission oil pressure fluctuated during hover. Caused by failure of oil pressure transducer.

Cargo helicopters

CH-47 Class D mishaps

D series - External cargo training of two aviators and seven crew engineers was being conducted. The external cargo consisted of a 9,000-pound concrete block rigged with a standard 4-leg, 25,000-pound sling assembly. IP briefed pilot and copilot on specific procedures for arming and disarming cargo hook release system and issued a specific caution that hand/finger placement on cyclic control must be such that inadvertent cargo release not occur. Approximately 10 practice loads were picked up and immediately set back down. After hookup training was completed, three traffic pattern circuits were completed around the training area with the training load. The fourth circuit was uneventful until the load was 7 to 10 feet off the ground. The pilot inadvertently pressed the cyclic cargo hook release button, causing premature release of the load. As the hook opened, the crew standardization officer reached over and pulled the soldier directing the load away from the cargo hook access to ensure he would not get hit by the hook. Later that day, the standardization officer learned that he had separated his left shoulder and was put on restricted work status.

B series - Aft gear steering went out of phase during right turn into parking area. Aircraft was lifted off the ground to return wheels to trail. As aircraft was set down, crew heard noise. When crew chief put chocks in place, he noticed drag strut was cracked.

Observation helicopters

OH-58 Class D mishap

C series - When pilot got out of aircraft to monitor refueling, door did not close completely. Wind blew door open against hinge, breaking hinge.

OH-58 Class E mishaps

C series - Master caution and fuel boost lights came on. Caused by failure of fuel boost pump.

C series - Aircraft was being test flown for torquemeter malfunction. During autorotational rpm check, engine and flight instruments were checked. Torquemeter was at 60 percent when it should have been closer to zero. Caused by failure of hose assembly to torquemeter.

A series - Pilot applied forward cyclic as downslope skid touched down tail low on 5-degree slope. Spike knock occurred as aircraft settled on slope.

Fixed wing

OV-1 Class E mishaps

D series - No. 1 engine generator and No. 3 inverter lights came on. Caused by failure of starter adapter for No. 1 engine.

D series - When pilot lowered landing gear, indicator showed unsafe gear condition. Gear was lowered manually and landing was made. Caused by malfunction of down-lock switch.

U-21 Class E mishaps

A series - Fuel was seen siphoning from right nacelle filler cap during flight. Fuel cap was not seated correctly.

A series - No. 2 engine torque rose to 1300 psi during climb. Single-engine landing was made. Caused by failure of N1 fuel control drive shaft bearing.

C-12 Class E mishap

C series - Right bleed air light came on during climbout. Caused by ruptured poly flow line.

Maintenance

UH-60 Class E mishaps

A series - Loud noise was heard from APU during runup. Cockpit filled with smoke through heater vents. APU was shut down and inspected. Straw had accumulated around the screen, causing it to become clogged. Further inspection showed parts of a thin plastic sheet in cabin door heater vent.

A series - Pilot smelled fuel during flight. Crew chief confirmed fuel leak with presence of fuel in cabin area. Fuel line was loose at prime fuel shutoff valve on No. 1 fuel cell.

OH-58 Class E mishaps

C series - During runup, loud grinding noise was heard in transmission area every time collective was increased. Large chunks of metal were found on transmission chip detector plugs. Transmission chip detector light did not function because one wire had a splice in it and no contact was being made. The other wire had a boot around the end of the plug fastened with two plastic ties and was broken between the ties.

C series - During hover check, altimeter indicated 1,440 feet below field elevation. Fitting on pitot static line was installed incorrectly.

U-21 Class E mishap

A series - Heavy smoke filled cockpit immediately after takeoff. Copilot's vent window was opened and aircraft landed. Ram air vent had been taped over because of the low outside air temperature. After takeoff, cabin heater was turned on. Although it was written up as inoperative, turning on the heater without airflow caused the heater to ignite momentarily. The vent fan forced the resulting smoke through the cabin because the ram air vent was closed.

U-8 Class D mishap

F series - As aircraft was turning onto taxiway, right main landing gear locked up. One of the landing gear brake assembly mounting bolt nuts came loose, allowing the bolt to drop off and lodge between the outer tire rim and brake assembly housing. The brake assembly had recently been removed for installation of brake pads. Self-locking nuts of brake assembly housing were inadequately torqued when assembly was reinstalled.

Safety messages

- Safety-of-flight emergency message concerning inspection of UH-60 flight controls (UH-60A-85-07, 051200Z Apr 85). Summary: This message requires a general inspection of the flight control system for any condition such as missing bolts, nuts, and cotter pins or incorrect items installed. Any abnormalities in the flight control system are to be reported to AVSCOM. Contact: Tim Hughes, AUTOVON 693-1683, commercial 314-263-1683.
- Maintenance information message concerning AH-1 and UH-1 ground handling wheels (MIM-UH-1-85-MEM-01/MIM-AH-1-85-MEM-01, 291800Z Mar 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**2**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	1-17 April	**0**	**0**
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**28**	**24**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

New eyeglasses available for use with night vision goggles

Recent modifications to the faceplate of the AN/PVS-5 night vision goggle (NVG) now permit standard-issue aviator spectacles to be worn with the goggles. This modification has resolved or minimized some major problem areas associated with goggle wear.

Research by the U.S. Army Aeromedical Research Laboratory indicates that, while tempered glass and CR-39 plastic ophthalmic lenses provide some protection from impact, polycarbonate lenses are many times more impact-resistant. In practical terms, this means personnel wearing standard glass ophthalmic lenses in conjunction with night vision goggles are not as well protected following accidental impact with the goggle eye tubes as they would be with polycarbonate lenses.

Current Army regulations state that only tempered (safety) glass lenses will be issued for aviator wear. This includes clear prescription lenses as well as the tinted nonprescription type. However, a recent waiver permits the temporary use of polycarbonate lenses for use with NVGs.

Before the introduction of any new ophthalmic material into Army aviation, it is necessary to obtain information concerning its performance in the aviation environment. A program is being developed to evaluate polycarbonate lenses under these conditions. To support this program and, simultaneously, provide enhanced eye protection, it is requested that all aviators required (1) to wear corrective lenses when they fly and (2) to fly regularly with night vision goggles report to their local eye clinic or flight surgeon with their health records at their earliest convenience. New spectacles with polycarbonate lenses will be ordered at that time. Because of the large number of orders being processed in a short period of time, there may be a short delay in the receipt of the new spectacles.

There are two requirements concerning this program. (1) The new spectacles should always be worn when flying with night vision goggles, and (2) personnel are requested to fill out a short questionnaire after having worn the lenses for a period of time. The questionnaire will be mailed to each study participant at a later date. For this reason, it is very important that your current mailing address be provided to the eye clinic or flight surgeon when ordering the glasses.

Participation in this program is voluntary. However, it should be understood that continued NVG flight with tempered glass lenses does place the wearer at increased risk should he be involved in an accident.

Point of contact for this project is Dr. Crosley, U.S. Army Aeromedical Research Laboratory, P.O. Box 577, Fort Rucker, AL 36362-5000. His telephone number is AUTOVON 558-6824 or commercial (205) 255-6824. ■

U.S. ARMY SAFETY CENTER

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Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

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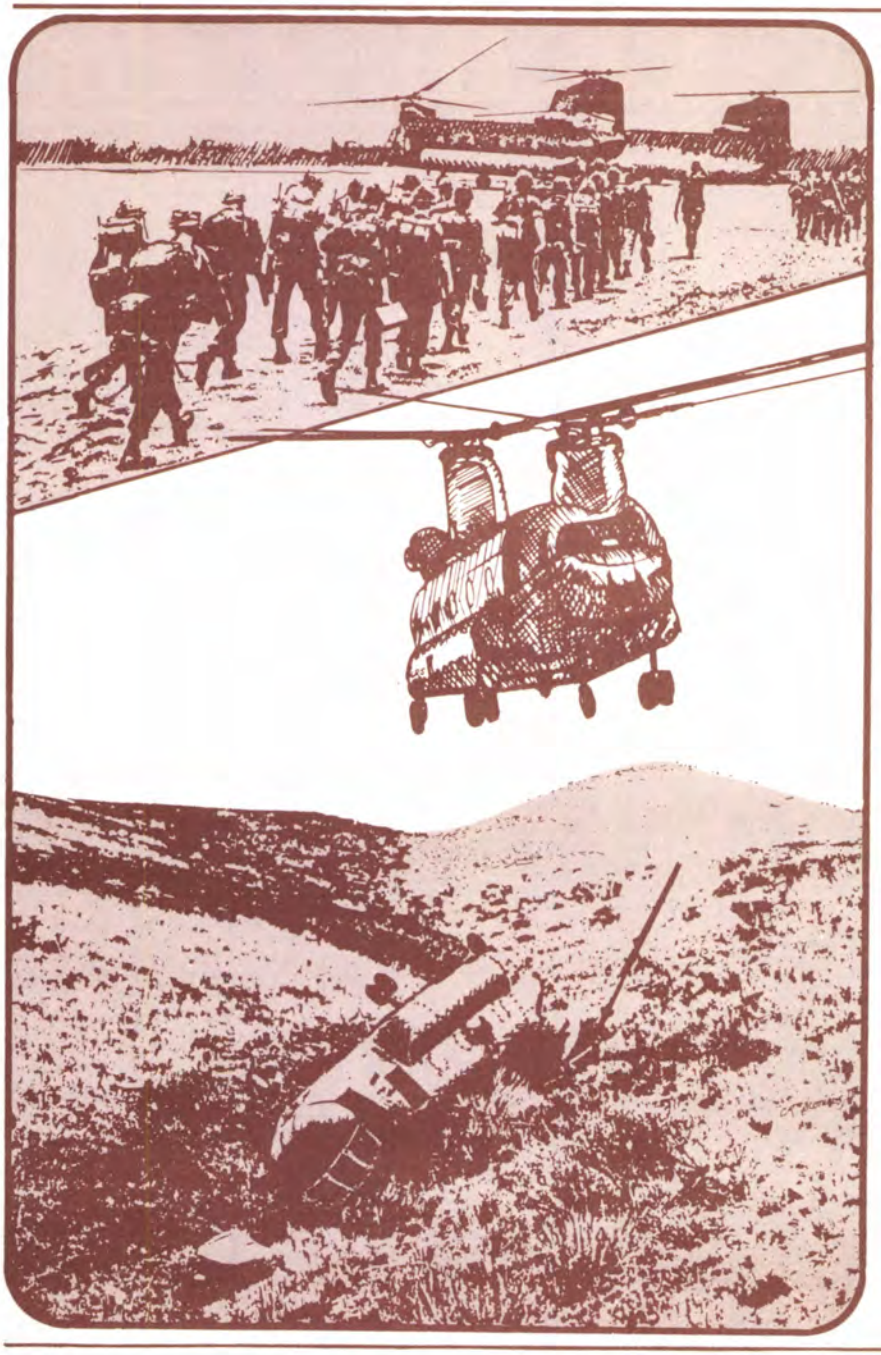
What could have been done?



Early one morning, during a field training exercise, the flight crews were awakened and informed of a multi-ship two-phase mission later that morning. The pilots met in the briefing tent and received their tasks.

The first phase of the mission called for a CH-47 to carry some troops to an airfield, drop them off, and return to refuel. After refueling, the CH-47 was to stand by as a maintenance backup for the second phase.

The first phase of the mission was completed successfully, and the CH-47 was shut down. As the crew broke the seals on their morning ration packets, they were called on the radio. One of the helicopters that was to take the second phase of the mission had a flickering caution light. The CH-47 would have to take its place and carry a scout platoon to a drop zone.

Twenty soldiers and their equipment were loaded, and the CH-47 took off. As the helicopter approached what was determined by the navigating copilot to be the prearranged landing area, the pilot decided he would make an aft gear slope landing below the crest of the ridge to keep from compromising the platoon's position. He told the crew what he was going to do.

The pilot picked out an area he felt was adequate for the aft gear landing. At about a 10-foot hover, he turned the tail of the aircraft into the slope and started to descend. The crew chief was lying on the ramp, which was in a full-up position, calling down the aft gear: "Gear off 8 feet, 5 feet, 4, 3, 2, gear off 1 foot, left gear is on the ground, right gear is on the ground." The flight engineer was moving from left to right in the cabin area, looking out the windows trying to see the rotors.

What could have been done?

With the gear on the ground, the pilot decided the aircraft was not stable enough to offload the troops. He told the crew he was going to pick the aircraft up and select a new area. He picked the aircraft up to a 10-foot hover and repositioned to a new location. The crewmembers took up their positions again, and the crew chief called out "Gear off 5 feet, 4 feet, 3, 2, gear off 1 foot, right gear is on the ground."

And then it happened. The aft rotor blades hit the hillside at the 6 o'clock position. Everyone felt the helicopter shudder. The pilot looked down the draw and decided to try to fly the aircraft into the draw to keep it from rolling down the hill. Flying down the draw and maintaining marginal control, the crew felt the aft rotor blades hit the ground several more times. Each time the vibrations in the airframe increased. Three hundred yards down the draw, when control of the aircraft was questionable, a forward blade hit the side of the hill. The rotors meshed and one of the forward blades went through the cabin section, severely injuring one of the passengers. The helicopter fell 20 feet to the ground, slid another 20 feet down the draw, and rolled inverted. Everyone on board except the passenger who was hit by the rotor blade escaped with minimal injuries.

A mistake has been made, an accident has occurred, an aircraft is destroyed, a soldier is seriously injured. The pilot misjudged the slope and that error resulted in a Class A accident. Now the accident investigation begins.

The slope was estimated to be 25 degrees. This, combined with the normal 5-degree nose-high attitude of the CH-47, resulted in the pilot making a judgmental error in assessing the slope and in selecting the landing area.

How could something like this happen? What can we do to keep it from happening again? As we think about this, let's ask some more questions. Should the landing have been attempted at all? Would better communications between the crewmembers have altered the decision to attempt the landing? If the flight engineer or crew chief had been in another position, could they have better observed the rotor system and warned the pilot he was dangerously close to the slope? Many other questions come to mind with this type of accident, but these three seem to be the most prominent.

Let's look at the situation. We have an aircraft operating close to the ground near obvious obstacles. Two crewmembers are trying to clear the aircraft for landing. In assessing the actions taken in this situation, let's look at how others might handle the same type of situation with CH-47 airframes.

The Canadian forces have seven CH-47 airframes (Canadian version CH-147) in which they train and conduct missions. Within the training system at Ottawa, pilots, flight engineers, and loadmasters (LM) are trained in confined areas and slope and terrain

Aft rotor blades of CH-47 hit the ground during slope landing, causing aircraft to crash. Pilot misjudged the relative slope angle.

landing operations, as well as the full range of flight maneuvers. The training received by each of the crewmembers is laid out in their CH-147 Standard Maneuvers Manual, CH-147 Chinook Loadmaster Traffic Technician Manual, and Course Training Standard Trade Specialty Qualification CH-147 Flight Engineer Operational Manual. The Canadians also have developed a rotor clearance procedure for mountain operations that is followed any time an aircraft is maneuvered near a hazard and a landing is anticipated.

Now let's go back to the questions about this accident. Should the landing have been attempted at all? The Canadian training program establishes a 30-foot rotor clearance from any obstacle. This rotor clearance is expressed by pilot, copilot, flight engineer, and loadmaster within their area of responsibility. This area of responsibility is also designated in their training manuals. The pilot from the right seat clears from 11 o'clock to 3 o'clock, the copilot from the left seat from 9 o'clock to 1 o'clock, the flight engineer from the ramp from 5 o'clock to 9 o'clock, and the loadmaster from the main cabin door from 2 o'clock to 5 o'clock. So from the Canadian's view, the type of landing which resulted in this accident would not have been attempted for no other reason than it would have allowed the aft rotor blades to come within 30 feet of a hazard (the slope) in the flight engineer's and loadmaster's areas of responsibilities.

This carries us to the next question. Would better communications between the crewmembers have altered the decision to attempt the landing? Again, in the case of the Canadians, if this landing had been attempted, as soon as the aft rotor blades came within 30 feet of the hazard, the flight engineer and LM would have automatically warned the pilot of the situation. Because of established procedures, the pilot would have been required to abort the landing. Here again we see that with the Canadian's established areas of responsibility and automatic communications requirements, the pilot's decision could have been altered. Keep in mind that the Canadians train their crewmembers in the rear of the aircraft to make standard responses without request from the cockpit.

Now for the last question. If the crewmembers in the rear of the aircraft had been in another position, could they have better observed the rotor system? With the ramp all the way up, or with the ramp level and a crewmember lying on the ramp, the crewmember can easily see the aft disc. But if the crewmember on the ramp is preoccupied with the gear, that wouldn't matter.

Would the decision to attempt the landing have been altered by better communications between the crew?

Let's look at the Canadian procedure for landing in unimproved terrain. Before the aircraft is set down from a hover, the crewmembers, according to their areas of responsibility, identify all hazards. Then, when everyone is aware of where the hazards are, the crewmembers in the rear position themselves to direct the pilot down to the ground, continually clearing the rotor disc. The flight engineer lies prone on the ramp, with the ramp in the level position, clearing the rotor disc and the area around the back of the aircraft (not the gear). The LM opens the cabin door and lies prone on the floor with the top one-third of his body leaning over the edge of the door and step so he can see the belly and all four gear of the aircraft. Both the flight engineer and LM are secured to a floor tiedown with their restraint devices. It's the LM who clears the gear down, simultaneously clearing the belly and crosschecking the rotor disc clearance. Remember, he has previously cleared the disc for at least a 30-foot clearance before the descent for landing.

This technique works very well for the Canadians, and it highlights some other benefits than just rotor clearance and gear height. With the LM at the front cabin door observing the entire underside of the aircraft, any possibility of setting the aircraft on a stump or lowering any one of the gear into a hole is eliminated. There is no other place on the aircraft where anyone can adequately observe the forward left landing gear. One note of concern on this technique is the possibility of the LM falling out of the aircraft. This will not happen if the LM's restraint device is secured and properly adjusted to the floor and he supports himself with his hand on the step.

We can see from this discussion that there are ways to prevent this type of pilot-error accident. It all boils down to total crew training—training flight crews as a team to complete a specific task, such as the landing that resulted in this accident. Any one of the four crewmembers could have and should have said "We are too close, we need to select another area" or "We can't land in this area."

The CH-47 is a big helicopter, and distances can be deceptive. Give yourself an added margin of safety. That margin of safety helps eliminate any judgmental errors on distance. The Canadians chose 30 feet for that very reason. It gives them the safety margin to judge rotor clearance that is acceptable for operations in confined areas, on slopes, and in terrain landings.

I strongly advise the use of the Canadian terrain landing technique and the improvement of crew communications to keep you and your crew from becoming a CH-47 rotor strike statistic. Why do I advise this? I was the CH-47 pilot involved in this accident.

Thanks to the 447th Squadron at Edmonton and to the 450th Squadron at Ottawa for their assistance in the preparation of this article. A special thanks to CPT Terry Swanson of the 450th Squadron. ■

—CW3 Francis E. White
243d Aviation Company (ASH)
Fort Lewis, Washington
AUTOVON 357-4056/4883

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 5-11 April

Utility helicopters

UH-1 Class D mishap

H series - As aircraft was on the ground at rapid refueling point, crewmember noticed tail rotor drive shaft cowl on vertical fin was open. Cowl was bent. Suspect dzus fasteners, some of which were worn, vibrated loose during flight.

UH-1 Class E mishaps

H series - Tail rotor control was lost and aircraft began uncommanded left turn during takeoff. Pilot followed turn with cyclic in attempt to gain airspeed. After completion of 360-degree turn, pilot made running landing. Caused by failure of ball bearing annular (crosshead bearing).

H series - Excessive pressure was necessary to move tail rotor pedals. Caused by failure of tail rotor servo.

H series - Excessive 1:1 vibration was noted during landing. Caused by defective bearing in mixing lever assembly.

H series - Right boost pump light came on. Mesh screen of T fitting was clogged.

UH-60 Class D mishap

A series - Aircraft was landed to top of building. Only the left main gear was touched down because troops were already on top of the building. During offloading, left cargo door hit corner of building, causing tear in cargo door.

UH-60 Class E mishap

A series - Main rotor deice fail light came on. After shutdown, it was found that main rotor blade deice blankets had shorted out.

Attack helicopters

AH-1 Class D mishaps

S series - Unit trainer (UT) was flying aircraft from back seat at 25 to 35 feet agl and 40 to 45 knots. Aircraft was paralleled on the right by a wood line and on the left by a set of wires. As aircraft approached the end of the wood line, the UT and pilot detected a wire support pole behind the trees to the right of the aircraft at a range of 25 to 30 feet. UT applied aft cyclic and collective N2 bleedoff until low rpm warning sounded. Aircraft hit wires, severing first wire with belly wire strike protection system and second and third wires with tail boom and VHF antenna. Antenna separated from aircraft. Aircraft was landed without further damage. Pilot was 300 meters off on navigation and failed to warn UT of wires marked on hazard map.

S series - On short final, pilot noticed right outboard forward wing panel was missing. Caused by failure of inner dzus fasteners on panel.

AH-1 Class E mishap

G series - Aircraft pitched up and rolled left during flight. IP disengaged SCAS and regained control. Caused by failure of SCAS amplifier.

AH-64 Class E mishap

A series - Oil low utility hydraulic light came on. Caused by failure of hydraulic pump.

Cargo helicopters

CH-47 Class E mishaps

B series - IP noticed high torque indication on No. 1 engine and high rotor rpm after decreasing thrust for landing. Caused by malfunction of engine quadrant assembly box.

C series - No. 1 engine condition lever light remained on with No. 1 engine condition lever in flight position. Caused by failure of engine N1 actuator.

C series - Hydraulic fluid started spraying from utility hydraulic pump during runup. Caused by failure of hydraulic pump.

Observation helicopters

OH-6 Class E mishap

A series - As pilot was hovering to runway, loud bang was heard, followed by engine failure. Caused by compressor failure.

OH-58 Class C mishap

A series - Pilot heard loud explosion during landing, and aircraft yawed to left and lost power. Rpm audio/light activated and smoke entered cockpit. Pilot autorotated to plowed field. N1 turbine exploded, damaging engine, engine cowling, and two rotor blades.

OH-58 Class D mishap

A series - During door gunnery exercise, doors were removed and seatbelts were secured on takeoff. After hot refueling operation, rear seatbelt was left unsecured, and it hit side of aircraft several times.

OH-58 Class E mishaps

C series - While rolling throttle to full open position during runup, IP noted high frequency vibration in airframe.

Mishap briefs

Caused by worn tail rotor trunnion assembly.

C series - Fuel boost caution light came on. Caused by failure of fuel boost pump.

A series - Pilot did not ensure that main rotor blades were untied before energizing starter. Pilot released starter button at 14 percent N1, without opening the throttle, after realizing main rotor blade was still tied down.

Fixed wing

U-21 Class C mishap

A series - On downwind, during prelanding check, pilot placed gear handle in down position. Two indicators were green, left main gear had no light, and red light was on in gear handle. Flyby was made to confirm gear position. Crew attempted high g maneuver to move gear down to locked position. This was not successful. Crew tried to bounce gear down by making several touch-and-go landings on right main gear. This was not successful. Gear was retracted, and aircraft was flown to airport where gear-up landing was made to foamed runway. Inspection revealed locknut on bolt attaching inner spline to torque tube (TT) backed off, allowing bolt to come out of TT and disconnecting the driven inner spline from TT when left gear was about two-thirds extended.

OV-1 Class D mishap

D series - As aircraft was on final approach for landing at night, flock of geese suddenly loomed out of the darkness ahead and slightly below aircraft. Pilot felt slight thud. ADF sensing antenna was broken.

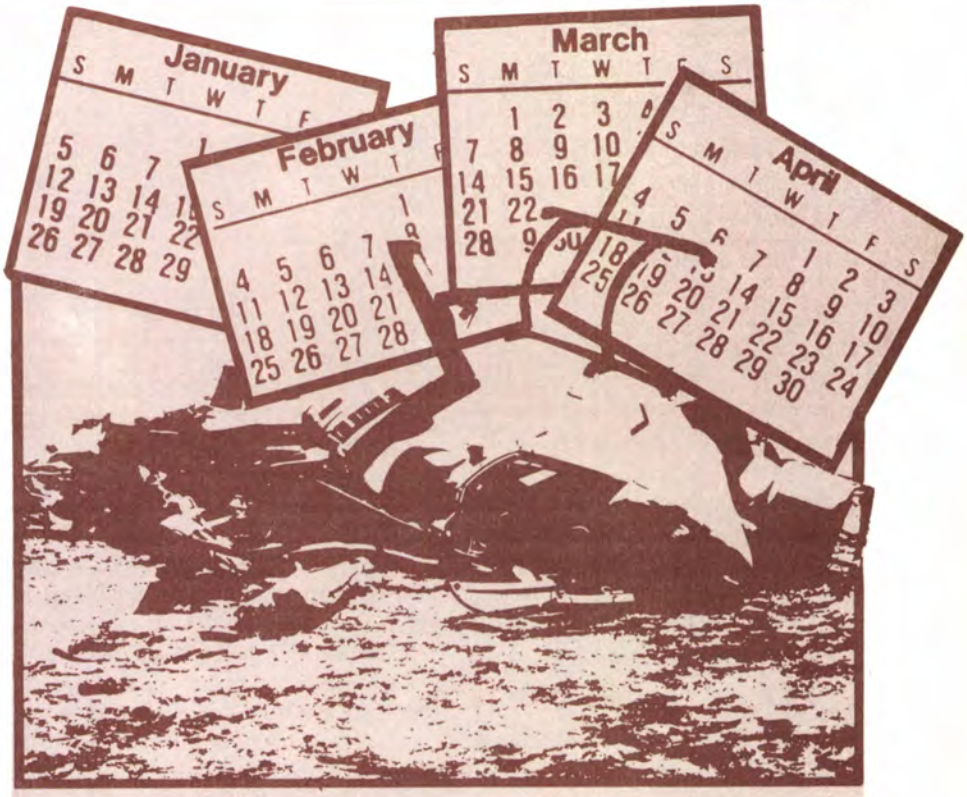
Maintenance

UH-1 Class E mishap

H series - Two loud bangs were heard from engine compartment during flight. Bleed bands were out of adjustment.

OV-1 Class E mishap

D series - No. 2 engine had several compressor stalls during flight. Tube assembly feed linkage to inlet guide vane actuator was out of adjustment.



FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**2**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	1-24 April	**2**	**3**
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**30**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Mishap briefs

Safety messages

• Safety-of-flight technical message concerning recurring inspections and lubrication of UH-1 and EH-1 series swashplate bearing (UH-1-85-03, 092235Z Apr 85). Summary: Preliminary investigation reveals that a recent AH-1 accident was caused by failure of the swashplate bearing due to contact stress fatigue. A similar swashplate is used on UH-1 and EH-1 series aircraft. The bearing failure allowed the rotating swashplate drive links to contact the nonrotating swashplate. This caused a loss of control. This message implements a one-time inspection, clarifies the lubrication requirement, and adds inspection requirements during service. Contact: Ken Luber, AUTOVON 693-1685, commercial 314-263-1685.

• Maintenance information message concerning CH-47 fiberglass rotor blade information (MIM-CH-47-85-01, 051400Z Apr 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Mini STACOM

Night Vision Goggle Training Packet

A night vision goggle exportable training packet (NVG ETP) dated March 1985 was mailed to all units on the FC 1-219 mailing list. 35mm slides to support the NVG ETP can be obtained by having your installation TASO contact the Fort Rucker TASO.

The following listed extension course lessons (BOI 166) can be used to support the NVG ETP.

• 902-011-5810A Parts and Functions of the Eye

• 902-011-5811A Types of Vision and Visual Properties of Various Colors

• 902-011-5812A Night Vision: How to Achieve and Protect It

• 902-011-5826 Ambient Light

• 902-011-5847F Aviator Night Vision Imaging System AN/AVS-6 (Part I)

• 902-011-5848F Aviator Night Imaging System AN/AVS-6 (Part II)

• 902-011-5851F Night Vision Goggle Mission Planning

• 902-011-5852F Night Vision Goggle Terrain Flight Analysis

A limited quantity of these extension course lessons are available for distribution, so please limit your requests for these lessons to the amount needed to fulfill your training requirements.

For your information: TRADOC Pam 310-12 is the governing publication for distribution of all Field Circulars (FCs).

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Aircraft accident review

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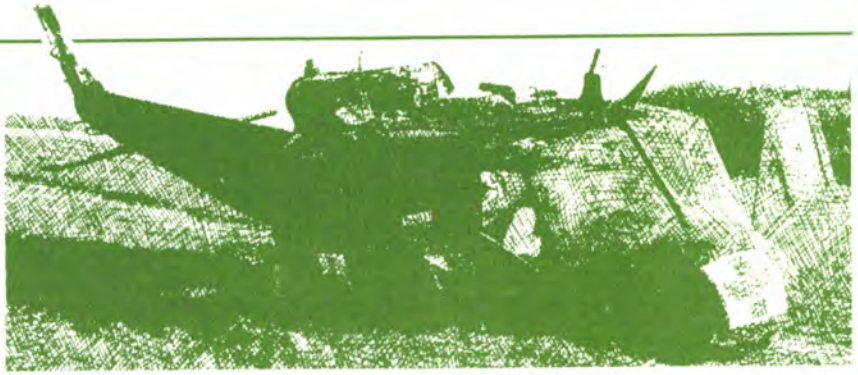
Two helicopters collide in midair



Synopsis

Two UH-1H pilots decided to make a low-level, high-speed flyby. As the aircraft were in a side-by-side formation, the wing aircraft converged on the lead aircraft. During an evasive maneuver by the pilot of the wing aircraft, the overlapping rotor blades of the two aircraft meshed. Both helicopters crashed.

History of flight

Two UH-1 helicopters, crews, and passengers had participated in a mock disaster drill. After eating dinner, the crew and passengers boarded the aircraft for the flight back to their home base. The two pilots decided to do a flyby as a way of saying farewell to the people they had supported. The two copilots were not included in this discussion and were not briefed concerning the flyby or any specific copilot duties.

The lead helicopter, with nine people on board, took off. The No. 2 aircraft, with eight people on board, lifted off shortly afterward. Both pilots were flying from the right seats. Because of other airport traffic, both aircraft continued north for about 3 miles until receiving permission to return for the flyby.

Both aircraft turned to an approximate heading of 180 degrees for the flyby. They joined in formation flight at an altitude of approximately 25 feet above the ground and an airspeed of 95 knots. As they went by the crowd of people, the aircraft were side by side with a separation of less than 48 feet. The crew chief of the No. 2 aircraft warned the pilot that they were getting too close. After the third warning, the pilot recognized the danger and banked his aircraft to the right. When the rotor disc tilted up to the right, the blades of the two aircraft meshed. Both pilots lost control of their aircraft.

Aircraft No. 1 continued straight and level, hitting the ground in an almost level attitude. It slid 326 feet before coming to rest upright. Aircraft No. 2 hit the ground in a right nose-low attitude and tumbled approximately 292 feet before coming to rest in an inverted position. The pilot and one passenger aboard the No. 2 aircraft were killed. The other 15 people aboard the two aircraft received varying degrees of injuries.

Crew experience

The 35-year-old pilot of the No. 1 aircraft had more than 4,600 rotary wing flight hours, with more than 550 in the UH-1H. The 24-year-old copilot of the No. 1 aircraft had more than 200 rotary wing flight hours, with almost 150 in the UH-1H.

The 36-year-old pilot of the No. 2 aircraft had almost 2,800 rotary wing flight hours, with more than 700 in the UH-1H. The 23-year-old copilot of the No. 2 aircraft had more than 200 rotary wing flight hours, with more than 150 in the UH-1H.

Commentary

The pilot of the lead aircraft made an incorrect decision to conduct a low-level, high-speed flyby. AR 360-61, local regulations, standing operating procedures, and AR 95-1 prohibit this type of maneuver. Also, the route of flight was not a properly designated low-level route. The other crewmembers were not briefed on the maneuver, nor was there proper coordination between the two pilots as to the type of formation, separation requirements, altitude, and airspeed to be flown.

The decision to do the flyby resulted from a lack of command emphasis on complying with regulations and procedures. This type of maneuver had been done on several previous occasions without incident or repercussion from the command. It was considered normal to end disaster drills with a flyby. Almost all of the people interviewed were unaware that this type of maneuver is prohibited.

Failure of the pilot of the No. 2 aircraft to maintain adequate clearance on the designated lead aircraft was the ultimate cause of the accident. The No. 2 aircraft was flying below and virtually side by side the lead aircraft with blade overlap. Several factors contributed to

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 12-18 April

Utility helicopters

UH-1 Class D mishaps

H series - Large bird hit and broke chin bubble.

H series - As aircraft was picking up to hover, combination of rotorwash and winds blew maintenance stand into parked aircraft. Tail boom was damaged.

UH-1 Class E mishaps

H series - Excessive vibrations were felt in cyclic. Caused by defective bellcrank assembly.

H series - Loud whine was heard from engine. Caused by failure of No. 2 bearing pack in engine.

H series - Master caution light came on and transmission oil pressure indicated zero. Transmission had locked up because of lack of transmission oil which had been blown out through broken cuno seal.

H series - Engine oil temperature increased during flight. Caused by failure of engine oil bypass valve.

H series - Hydraulics failed during landing. Caused by hole in return line of right hydraulic servo.

V series - When hydraulic switch was turned off, left pedal moved forward. Excessive pressure on right pedal was required to compensate and aircraft could not be held in trim. Caused by failure of tail rotor servo.

H series - Low rpm warning light came on and rotor rpm went to zero. Caused by failure of rotor tachometer generator shaft.

UH-60 Class A mishap

A series - Aircraft crashed during landing. Three fatalities. Suspect materiel failure. 8534

UH-60 Class D mishap

A series - As pilot, wearing night vision goggles, was hovering over a jeep for hookup, aircraft descended too low. Antenna mount on jeep punctured bottom of aircraft. Ground guide was too close to aircraft. Loads were placed too close together in pickup zone, causing rotorwash of other aircraft to interfere. Hookup man was standing on the ground instead of on the load. The sling was too short for these conditions.

UH-60 Class E mishaps

A series - No. 1 tgt fluctuated from 0 to 900 degrees. Caused by failure of signal data converter.

A series - Rpm fluctuated and No. 1 engine indicated 0 torque. Caused by broken load demand cable mounting bracket.

A series - Master caution, boost servo off, SAS off, and No. 2 reservoir low lights came on. Caused by failure of logistic hydraulic control unit in right relay panel.

A series - No. 2 engine chip detector light came on. As aircraft was landing, smoke was seen behind aircraft from No. 2 engine. Postflight inspection revealed oil on tail boom. No. 4 bearing pack of No. 2 engine was deteriorated.

Attack helicopters

AH-1 Class C mishaps

G series - As approach was terminated at a hover, copilot, in front seat, increased collective and tried to apply left pedal. Pedal stuck and aircraft began to spin. Pilot, in rear seat, tried to increase left pedal but could not. Hovering autorotation was made. Front cross tube of landing gear broke at saddle mount on left side. Turret hit the ground and turret cowling was damaged. Broken cross tube gouged left panel beneath pilot's canopy. Left skid was crushed at rear cross tube mount. Two links in silent chain had broken. One link rotated and came in contact with chain guard, preventing left pedal application.

S series - Main rotor blades hit tree during NOE flight. Both blades were damaged.

AH-1 Class D mishaps

S series - Bird hit aircraft, bounced off copilot's windshield, and hit left tow fairing. Nose fairing was damaged.

S series - Gun fired before round was completely chambered. Shrapnel cut three wire bundles to stow control and blew hole in aft turret bulkhead.

Cargo helicopters

CH-47 Class D mishaps

C series - As aircraft lifted off the ground, crew chief noticed one leg of sling slipped around side of water trailer tank. Load was landed and rolled on its side. One leg of sling was cut by the chassis. Sling leg was positioned incorrectly.

C series - Right aft pylon work platform opened during flight. Caused by failure of latching mechanism.

CH-47 Class E mishap

C series - No. 1 engine chip detector light came on. Caused by faulty wire to cannon plug on engine transmission.

Observation helicopters

OH-58 Class D mishaps

A series - Pilot felt unusual control pressures. As control feedback became intense, pilot made hydraulics-off running landing at night. On touchdown, aircraft rocked forward and back, causing tail boom damage. Loose hydraulic return line caused total loss of hydraulic fluid.

A series - Large hawk hit and broke pilot's windshield. Pilot's visor was down.

OH-58 Class E mishaps

A series - Copilot taxied aircraft to a parking spot on asphalt runway. When in position over parking spot, copilot lowered collective and aircraft began

slow descent. Parking spot was slightly sloped. As aircraft descended, right skid hit the ground first. Left skid then hit the ground and right skid came up. This occurred two more times. Collective was rapidly lowered and aircraft firmly touched down. Spike knock was heard. Suspect poor pilot technique.

A series - Noises were heard from engine area during landing. N1 fluctuated erratically. Caused by dirty compressor.

TH-55 Class C mishap

A series - Engine began running rough. As student pilot began approach to open field, he smelled burning rubber. During descent, student pilot saw that field was rough and terraced, so he changed direction to land on a highway. Aircraft landed hard, damaging landing gear.

Fixed wing

U-8 Class E mishap

F series - Landing gear would not extend. Go-around was made and gear was extended using emergency system. Caused by malfunction of landing gear control switch.

C-12 Class E mishap

A series - Fuel gauge showed rapid decrease during climb. Increased aileron pressure was necessary to maintain wings level. Pilots noted fuel vapors trailing from fuel vent. Postflight inspection revealed motive flow valve was loose in mount. Jet pump for auxiliary tank was partially blocked and tank contained contamination.

U-21 Class E mishaps

A series - Right engine fire detection light came on. Cannon plug to fire detector at engine firewall was corroded, causing short in fire detector wiring.

A series - As power levers were advanced for takeoff, No. 1 engine would only develop 600 psi torque and 1800 propeller rpm. Caused by failure of blade on power turbine wheel.

Maintenance

UH-1 Class D mishaps

H series - After aircraft was landed, crew chief noticed damage to tail rotor drive shaft cowling. Following scheduled hanger bearing repack, No. 3 hanger bearing was installed upside down. This raised the height of the hanger bearing enough to allow the tail rotor drive shaft couplings to contact the drive shaft cowling during operation. The MOC, which was usually done with the cowlings closed, was done with them open. Immediately after the rotors stopped, the cowlings were closed. Therefore, the sound of the couplings contacting the cowling was not noted.

H series - As rotor was coasting to a stop during MOC, pilot moved cyclic in the four quadrants to check for central movement clearance and play. Scissors assembly struck swashplate and tore a hole in it. Maintenance personnel did not detect out-of-rig condition before MOC.

UH-1 Class E mishap

H series - Three loud bangs were heard, aircraft yawed, and rpm fluctuated during hover. Variable inlet guide vane actuator and bleed band were adjusted incorrectly.

AH-1 Class E mishaps

S series - During attempted OGE check, pilot applied left pedal and felt binding in pedals. Crew chief did not properly secure wire bundle in gunner compartment, causing wire bundle to entangle in tail rotor controls.

S series - Master caution and engine oil bypass lights came on. Caused by failure to properly close engine oil drain cock, allowing oil to leak from oil reservoir.

Safety messages

• Safety-of-flight emergency message concerning immediate grounding of UH-60/EH-60 series aircraft (UH-60A-85-09, 190600Z Apr 85). Summary: All UH-60/EH-60 series aircraft are grounded because of a recent accident. Contact: Edward Branhof, AUTOVON 693-3300, commercial 314-263-3300.

• Safety-of-flight technical message concerning one-time inspection of all UH-1D/H/V and EH-1 series aircraft for chem fab left and right elevator assemblies (UH-1-85-04, 182010Z Apr 85). Summary: Certain right and left elevator assemblies exhibit an out-of-rig condition when installed on the aircraft. Thus, they cannot be adjusted, rigged, or rerigged by shimming to meet installation requirements. Contact: Ken Luber, AUTOVON 693-1685, commercial 314-263-1685.

• Safety-of-flight technical message concerning recurring inspection and replacement of main rotor pitch link assemblies on OH-58A and C helicopters (OH-58-85-01, 191700Z Apr 85). Summary: A report from an OH-58C user states that a 1 3/8-inch-long crack was found in the coarse thread area of main rotor pitch link assembly, P/N 206-010-342-3. The crack was found during a preflight inspection. The purpose of this message is to require a recurring inspection of all installed main rotor pitch link assemblies, P/N 206-010-342-1 and -3 for cracks. Users are also required to order and replace all main rotor pitch link assemblies with assembly, P/N 206-010-360-3. Contact: Charles Cioffi, AUTOVON 693-1689, commercial 314-263-1689.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

U.S. ARMY SAFETY CENTER

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Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

Accident review

the pilot's inattention in maintaining adequate separation:

• Inadequate planning of the maneuver and inadequate crew briefing by the air mission commander (pilot of the lead aircraft).

• The speed and altitude at which the maneuver was being flown.

• Distraction caused by an aircraft on the ground in close proximity to the flight path.

• Distraction caused by the crowd on the ground.

The copilot of the No. 2 aircraft did not help the pilot maintain separation. The copilot was inexperienced and he had not been briefed on his duties. He was dividing his attention between the crowd on the ground and his perceived duties, never noticing that aircraft separation was not adequate.

The overall mission commander, who was the copilot of the lead aircraft and relatively inexperienced, did not recognize that the maneuver was unauthorized or dangerous. Therefore, no attempt was made on his part to abort the maneuver. The copilot was confident that the highly experienced air mission commander could perform the maneuver, and he knew the maneuver had been done on several previous occasions.

The unit had adequate written policies and procedures, but they were not being complied with. The unauthorized flyby was not an uncommon occurrence. When the commander did not take appropriate corrective measures to enforce regulations, he was, in effect, condoning the practice. Several other violations of regulations were also noted. It is believed that only the flying capabilities of the unit aviators prevented a serious accident from occurring previous to this. ■

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**2**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3			
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**30**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

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United States
Army Safety Center
Fort Rucker, Alabama 36362-5363

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Report of Army Aircraft Mishaps

Followups

additional information on mishap briefs previously published

Utility helicopters

UH-1 Class A mishap in 30 Nov 83 issue (8413) □ Aircraft was on maintenance test flight following completion of swashplate change, hanger bearing repack, overspeed governor replacement, and a binding cyclic writeup. During the flight, unsecured bolts which attach the vertical cyclic control tubes to the lower linkage of the fore and aft and lateral hydraulic servo cylinder assemblies worked loose, resulting in a flight control disconnect and subsequent loss of control over the main rotor system. Main rotor system separated and struck aft fuselage area. Fuselage entered high-speed descent and crashed. The disconnecting of the flight controls was not properly documented in the aircraft's maintenance records, nor were the controls properly reconnected with self-locking nuts and cotter pins.

UH-1 Class A mishap in 1 Feb 84 issue (8417) □ Pilot noticed that right cargo door had vibrated open about 2 feet. Fearing separation of the door, pilot began an approach to a snow-covered sod field. Pilot did not use the correct snow landing technique and terminated the approach to a high hover rather than continue to the ground. Rotorwash began to blow the snow until the pilot could no longer see the ground. Right skid hit ground, and aircraft rolled right and came to rest inverted.

UH-1 Class A mishap in 22 Feb 84 (8421) □ Pilot brought aircraft to a 10-foot hover and proceeded across a field covered with about 2 feet of snow. About two-thirds of the way across, pilot misjudged the height of the hover and the skis attached to the skids

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8417

8419

Followups

touched the snow. Aircraft continued in a forward left slide with the left ski pushing the snow for 74 feet. At this point, the left ski caught in the snow, and aircraft rolled left and came to rest inverted.

UH-60 Class A mishap in 15 Feb 84 issue (8419) ☐ Two UH-60 helicopters were on a day VFR service mission. After 20 minutes of flight, fog forced the crews to fly low level through valleys and over rising terrain. The second aircraft dropped back while the flight leader moved forward to try to find a route through the fog. The crew of the lead aircraft tried to maintain visual flight in instrument conditions. While they were trying to transition to instrument flight, the main rotor blades hit a large tree on rising terrain. Aircraft crashed inverted.

UH-60 Class A mishap in 4 Apr 84 issue (8428) ☐ Aircraft was transporting as a slingload an empty air delivery pallet. Copilot allowed the airspeed to increase to 70 knots, 15 knots higher than the maximum airspeed directed by the pilot. This increase was sufficient to produce aerodynamic lift on the empty pallet, causing it to start flying. The pallet hit the tail boom and slid up the side of the tail boom into the main rotor system. Control was lost and the aircraft crashed in a near inverted attitude.

Observation helicopters

OH-58 Class A mishap in 16 Nov 83 issue (8411) ☐ Aircraft was on a range sweep mission, flying over some ravines. At an altitude of 50 feet agl and airspeed of 50 knots, pilot misinterpreted a temporary low rotor rpm audio and sudden downward movement of the aircraft as an engine failure and did not verify his interpretation with available instruments. Pilot focused only on reaching his intended landing area and did not properly coordinate control inputs that would have allowed him maximum control and survivability during the impact. Aircraft crashed on the slope of a ravine. Pilot was operating aircraft in the caution area of the height velocity diagram and placed himself in a flight regime that severely restricted his reaction time and ability to respond to a perceived engine failure emergency.

OH-58 Class A mishap in 1 Feb 84 issue (8418) ☐ Pilot hovering down a washed-out area saw some loose communications wire on the ground. Pilot brought aircraft to stable hover and diverted his attention to the wire. Aircraft drifted left and descended. Main rotor blades hit large rock outcropping, and aircraft crashed in right roll attitude.

Fixed wing

C-7 Class A mishap in 15 Feb 84 issue (8420) ☐ Aircraft lost hydraulic pressure during takeoff because of ruptured hydraulic pressure line. Crew lowered landing gear using emergency extension procedure, but right main gear failed to lock. As aircraft was landing, right main gear collapsed. Pilot did not correctly interpret the condition of the right main gear safe light, which was not operational.

OV-1 Class A mishap in 26 Oct 83 issue (8404) ☐ No. 2 engine malfunctioned during takeoff from airfield. When No. 2 propeller went into automatic feather, pilot and observer ejected. Caused by incorrect installation of overspeed governor drive shaft.

U-8 Class A mishap in 2 Nov 83 issue (8407) ☐ Aircraft was on qualification training flight. Slow flight maneuvers were being conducted at an altitude of approximately 1,950 feet above the ground. IP allowed the rated student pilot to stall the aircraft at a low altitude, failed to initiate control recovery at the onset of the stall, and allowed the stall to progress to a descending spiral. Aircraft crashed into trees.■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	1-10 Oct	**2**	**0**
	November	3	3			
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**2**	**0**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 21-27 September

Utility helicopters

UH-1 Class D mishaps

H series - Engine oil pressure dropped to zero. As aircraft was landing, left skid tube hit rock, bending tube. Oil pressure indication was caused by failure of gauge.

H series - Postflight inspection revealed damage to tail rotor blade. Tail rotor control sprocket cover had separated from aircraft and hit tail rotor blade. Failure of safety wire allowed lower attaching bolt to back out and cover to separate.

H series - Bird hit and broke left chin bubble.

UH-1 Class E mishaps

V series - Aircraft developed sudden left and right yaw during flight. Caused by failure of overspeed governor.

H series - Pilot tried to open console heat duct by placing left arm between collective pitch lever and console. As he removed his arm, his jacket or glove caught the edge of the emergency governor switch, lifting it up momentarily. IP was at the controls and was able to retard the throttle to control rpm buildup as pilot returned governor switch to automatic position. Normal N_2 rpm was recovered without further incident.

H series - Aircraft vibrated severely during climbout. Caused by crack in main rotor blade tip cap.

H series - Engine oil temperature increased rapidly after bleed air was turned on. Bleed air line to turbine blower was partially clogged.

H series - Aircraft yawed and engine rpm dropped during flight. Caused by malfunction of fuel control.

UH-60 Class D mishap

Aircraft hit and severed three powerlines, damaging rotor blade and tip cap. Numerous aircraft had flown the same course over a 1-week period, but the wires had not been reported.

UH-60 Class E mishaps

Aircraft vibrated during takeoff and flapping noise was heard. Main rotor blade skin bonding had separated, causing blade deterioration.

Aircraft began pitching nose up and down, and computer capsule light came on. Caused by failure of SAS computer.

Attack helicopters

AH-1 Class C mishap

S series - AH-1 was flying over wooded area, flying cover for an OH-58. AH-1 banked left and then right. During right bank, main rotor blade hit tree. Sun glare off flat canopy made visibility limited at times.

AH-1 Class D mishap

S series - Aircraft was flying 175 to 200 feet above the ground. While pilot was maneuvering to avoid wires, main rotor blades hit a tree. Wires were strung from ridgeline to ridgeline with no center support on valley floor.

AH-1 Class E mishaps

S series - Master caution and transmission pressure lights came on. Oil drain valve fitting in oil cooler fan compartment broke, allowing transmission oil to drain out at oil cooler.

S series - Initial start was aborted because of a weak battery. Another battery was obtained and aircraft started. The second battery was unconnected and battery connector was laid on the metal slide channel. Battery switch was still on, causing battery connector to arc off slide channel.

S series - Aircraft was on final approach at night. Reduced visibility and low illumination masked a tree on approach path, causing pilot to apply 107 percent torque to miss the tree.

S series - Pilot heard loud bang, and aircraft yawed and shuddered. Compressor stall was caused by internal deterioration of engine.

Cargo helicopters

CH-47 Class E mishaps

A series - Single-engine approach was made with No. 1 engine condition lever at ground. After landing, lever was moved to flight, but engine would not accelerate. Aircraft had been operating in dusty conditions, and dirt had accumulated in engine condition control box, preventing microswitch from making proper contact.

C series - Leak in aft transmission area was caused by failure of utility hydraulic cooler.

CH-54 Class E mishap

B series - Crew heard loud noise and aircraft shuddered during takeoff. Engine failure was caused by foreign object damage.

Observation helicopters

OH-58 Class E mishaps

A series - Pilot noticed TOT at 800° C. during flight. Left customer bleed air

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

fitting at diffuser stripped and blew out of diffuser, causing high TOT.

A series - Smoke was seen coming from overhead console during takeoff. Wires from engine and deice motor came in contact with engine diffuser scroll. Engine deice circuit breaker did not function as designed, causing wires to burn.

C series - Pilot, hovering up the back side of a hill over trees, began left cyclic turn and increased collective. At the same time, he glanced at the TOT gauge and then at the torque gauge. He then applied left pedal. Torque went from 95 percent to 102 percent. Pilot had been flying OH-58As and was constantly watching TOT gauge instead of torque gauge.

Fixed wing

U-21 Class E mishap

H series - Left fuel transfer pump failed during flight.

OV-1 Class E mishaps

D series - Hydraulic fluid was seen dripping from right side of instrument panel during flight. Windshield wipers failed and hydraulic pressure indicated zero during landing. Failure of windshield wiper motor caused hydraulic fluid to leak into cockpit.

D series - Master caution and fuel boost pump lights came on. Caused by failure of aft boost pump.

T-42 Class E mishap

Gear would not extend and had to be lowered manually. Caused by failure of landing gear motor.

Maintenance

UH-1 Class E mishaps

H series - Transmission oil pressure dropped to 35 psi. Pressure relief valve was out of adjustment.

H series - Crew chief smelled fuel fumes on takeoff. Caused by loose connection between fuel transmitter and check valve manifold.

UH-60 Class D mishap

When gun was slingloaded, crew chief did not secure excess length of strap and left it dangling below aircraft. Metal clip on end of strap damaged tail boom.

UH-60 Class E mishap

Several caution and advisory lights came on during flight. Caused by ruptured No. 1 tail rotor servo hydraulic line. Clamp around hydraulic line chafed through rubber clamp cover and hydraulic line.

AH-1 Class D mishap

S series - Noise was heard from rear of aircraft during takeoff. Grounding cable was still plugged into pilot station and extended aft to right synchronized elevator. Tail rotor blade was dented.

AH-1 Class E mishap

S series - All electrical power was lost during engine shutdown. Chafed wire above antenna broke, causing a short which overloaded current transformer.

OH-58 Class E mishap

C series - Aircraft was hovering to burn off fuel. On several occasions, low rotor rpm audio and light activated. Postflight inspection revealed double check valve and accumulator were loose.

U-21 Class E mishap

A series - When press-to-test switch was pressed, right engine chip detector light would not illuminate. PC board for annunciator panel had been wired so that chip detector light was controlled by indirect white light rheostat.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Urgent TB

TB 55-1520-200-20-3, dated 8 August 1984, concerning one-time inspection of anti-icing valve poppet seat screw and pin for T63-A5A/T63-A-700 and T63-A-720 engines on OH-6A and OH-58A/C helicopters, has been released.

TM change

Change 3, dated 15 Aug 1984, to TM 55-1520-214-PMS for OH-6A helicopters has been released.

Renumbering of publications

The U.S. Army Transportation and Aviation Logistics School at Fort Eustis has announced the renumbering of Aviation Doctrinal Literature publications from the 55 to the 1 series. This change applies only to Aviation Doctrinal Literature publications. The first publications to be changed are as follows:

55-63 to 1-563
55-41 to 1-500
55-412 to 1-5412 ■

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Aircraft accident review

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OH-6 hits wires during search mission

While it is the policy of the Army Safety Center not to identify any accident in **Flightfax** as belonging to a particular unit or MACOM, an exception is necessary in the following case. This accident review involves a National Guard aircraft. The aviator was on state militia status, that is, he was flying pursuant to orders, not as a member of the National Guard of the U.S., but as a member of the state militia or state National Guard. He was being compensated from state funds, and the state paid for operation of the aircraft.

It is a violation of Federal criminal law to use Army personnel to assist state or Federal law enforcement officials off military installations except under very limited circumstances. The Posse Comitatus Act, 18 U.S. Code, Section 1385, provides 2 years imprisonment or $10,000 in fines (or both) for those convicted of wrongfully using Army or Air Force personnel to assist local law enforcement within the United States. Use in this case of a National Guard aircraft is not a Posse Comitatus Act violation. Use of National Guard personnel not on state status, all USAR, and all active duty military personnel in identical circumstances would be a Federal criminal offense.

—Major Karl Ivey
Judge Advocate
AUTOVON 558-3819/3960

Synopsis

An OH-6A pilot, trying to locate three escaped prisoners, flew his helicopter into a small valley. The main rotor blades hit powerlines, and the OH-6 crashed.

History of flight

When three prisoners escaped from a prison farm, the governor's office requested assistance from the aviation facility. An OH-6 and a pilot were selected to fly the mission.

When the pilot arrived at the prison, he was told that one of the police helicopters had developed an engine oil leak and that he would be needed to fly search missions. One prison official got in the aircraft, and a short reconnaissance mission was flown. The pilot then dropped off the prison official and flew to an airport to refuel and eat lunch.

When he returned to the prison that afternoon, the pilot was told that the prisoners had been spotted. He was asked to fly two prison officials to the area of the spotting to see if the escapees could be located from the air. One of the passengers got in the front seat. Neither passenger was a trained observer, and neither had a headset which would enable them to talk to the pilot through the aircraft's internal communication system.

After flying for almost 2 hours, the pilot flew the OH-6 into a small valley. The main rotor blades hit powerlines 130 feet above the ground. The impact tore the main rotor and mast assembly from the aircraft. The aircraft hit the ground on the left side, bounced back into the air, and again hit on its left side

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 19-25 April

Utility helicopters

UH-1 Class E mishaps

H series - On takeoff, engine oil temperature increased rapidly and engine oil pressure decreased. Caused by stuck engine oil thermal bypass valve.

H series - Aircraft developed binding in right rear quadrant of cyclic control during hover. Caused by defective bell-crank assembly.

H series - Master caution and hydraulic lights came on, with control feedback. Caused by loss of hydraulic fluid from leak at main hydraulic line coupling.

V series - Controls became stiff and hydraulic pump cavitated during landing. Caused by failure of hydraulic pressure line from cyclic servo irreversible valve.

H series - Hydraulic light came on during hover. Caused by failure of pressure switch.

H series - Pilot felt vibration in pedals during takeoff. Caused by failure of sprocket gear in 42-degree gearbox.

UH-60 Class E mishap

A series - No. 1 engine lost power during hover. After landing, engine resumed normal operation. During transient power loss, No. 1 engine audibly "wound down" and No. 2 engine torque went to 100 percent. Caused by malfunction of ECU.

Attack helicopters

AH-1 Class D mishap

S series - Postflight inspection revealed damage to leading edge of main rotor blades. It is not known when damage occurred.

AH-1 Class E mishaps

S series - Master caution and chip detector lights flickered during takeoff. Caused by failure of 42-degree gearbox.

S series - Loud popping sound was heard from engine during takeoff, and tgt decreased. Caused by engine compressor stall.

S series - Crew saw another helicopter on a collision course with their Cobra. Copilot took evasive action by making a sharp left climbing turn over high terrain. Front seat torque was 99 percent, and back seat torque was 102 percent for 1 second. Inspection revealed overtorque occurred, with no damage to aircraft.

Cargo helicopters

CH-47 Class A mishap

D series - Aircraft was landed and shut down after 4 ¾-hour training flight. Aircraft was then restarted and had been running for 10 minutes while waiting to taxi to POL point. Aircraft shuddered hard and rotor blades began to mesh, destroying aircraft. Suspect failure of aft main transmission. 8535

CH-47 Class D mishap

B series - Flight engineer detected oil leak from vicinity of C box. After aircraft was landed, flight engineer discovered that No. 1 engine drive shaft cowling had blown loose and scored drive shaft. Leak was coming from No. 2 engine nose box oil line.

CH-47 Class E mishaps

C series - IP moved No. 2 engine condition lever to ground position to simulate engine failure. Engine did not respond and remained at full power. Caused by failure of N1 actuator in flight position.

C series - While going through checklist before engine start, the pilot smelled what he thought was fumes from heater. Heater was shut down. After a couple of minutes, pilot noticed smoke coming from under the floor by his pedals. Generators, battery, and APU were turned off. Two fire extinguishers were emptied on pilot searchlight housing. Another crew had noted the night before that searchlight would not stow properly and motor was running constantly. Crew had pulled searchlight generator circuit breaker and continued flight. They did not note the deficiency on the dash 13 at the end of the flight. The mishap crew, unaware of the malfunction, pushed circuit breaker in, allowing searchlight motor to overheat. A broken wire allowed the searchlight to stow partially extended and inverted. Searchlight was on while pilot attempted to extend light. Intense beam from light caused fiberglass housing to heat up and smoulder.

Observation helicopters

OH-58 Class D mishap

A series - Engine lost power twice, regained rpm, and then failed completely. IP autorotated to a very small clearing in trees. Some of the rotor rpm had to be pulled to make the clearing. This low rpm condition set up a vibration in the tail boom, resulting in a small tear and "oil canning" on top of tail boom 3 feet from tail boom attaching point. Aft cross tube was also damaged.

OH-58 Class E mishaps

C series - Mechanic heard whistling sound as blades were coasting down. Skin on underside trailing edge of blade had started to separate from blade at the seam created by the tip cap and blade end.

A series - Pilot noted N2 at 102 percent during flight. Caused by faulty dual tachometer.

A series - About 10 minutes into flight, pilot encountered unforecast low ceilings and fog in hills along the route. Pilot maintained VMC and tried to circumnavigate the hills to the south. About 15 minutes later, pilot again encountered unforecast low ceilings and fog. Turn was begun to maintain

VMC. During the latter part of the turn, aircraft entered IMC. Pilot initiated inadvertent IMC procedures. Pilot could not contact anyone on guard frequencies. After 5 minutes, communication was established with tower at departure airfield. Pilot landed at departure airfield. Passenger assisted pilot by pulling the approach plates from pilot's publication bag and opening them to the appropriate page, allowing pilot to keep his attention on the instruments.

Fixed wing

C-12 Class C mishap

D series - Engine oil was seen coming from hole aft of No. 1 propeller. During descent for landing, aircraft was struck by lightning. Postflight inspection revealed lightning had exited in two places—through the nose wheel rim assembly and through the right elevator tip cap. Oil leak was caused by split strainer sleeve cap packing.

C-12 Class E mishap

C series - Red light remained on after gear was raised. Caused by shorted-out microswitch.

U-21 Class E mishaps

A series - Torque and fuel pressure of both engines fluctuated 40 pounds psi. Caused by malfunction of topping governor.

A series - Landing gear would not extend. Emergency extension was used. Caused by defective landing gear relay circuit breaker.

Maintenance

UH-1 Class E mishaps

H series - As pilot was rolling throttle to full operating rpm after completing hovering autorotation, master caution and engine fuel pump lights came on. IP looked out of aircraft and saw fuel spraying outside of cowling. Incorrect hardware was used to reinstall fuel pressure differential switch. Nut was installed on elbow and held by 1 to 1½ threads. Suspect vibration of aircraft caused elbow to back out of switch, allowing fuel to spray outside of fuel system. Engine was not getting enough fuel to function properly.

H series - After hot refueling operation, pilot saw fuel dripping from inlet portion of fuel filter. The wrong O-ring had been installed.

OH-58 Class E mishaps

C series - Engine was at flight idle during refueling operation. Engine stopped without pilot input. Caused by incorrectly rigged throttle linkage.

A series - Master caution and tail rotor chip detector lights came on. Tail rotor chip detector plug, which was incorrectly installed, fell out.

C series - Pilot noticed N2 would not return to 100 percent after a droop. Caused by incorrectly rigged N2 governor.

C-7 Class E mishap

A series - When landing gear was lowered, right gear did not lock down. Gear was recycled and it locked down safely. Cotter key was left out of nut attaching shortening mechanism to strut assembly capsule attachment.

Safety messages

• Safety-of-flight technical message concerning one-time inspection of Black Hawks (UH-60A-85-10, 222000Z Apr 85). Summary: On 5 April AVSCOM issued a safety-of-flight message immediately grounding all Black Hawks for a one-time precautionary visual inspection of the flight control system. This inspection was phase 1 and entailed a security check of all linkages and bolted connections in order to obtain feedback information to aid in the analysis of the flight control system and to ensure no unusual conditions existed. This message is phase 2 and identifies the range and scope of reported discrepancies and requires further inspections. Contact: Mike Hoffmann, AUTOVON 693-1683, commercial 314-263-1683.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**2**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	1 - 8 May	**0**	**0**
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**30**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Accident review

about 30 feet from the point of the first impact. All three occupants were killed.

Crew experience

The 43-year-old pilot had more than 8,000 rotary wing flight hours, with almost 950 in the OH-6.

Commentary

The wires the aircraft hit were 370 feet below the lowest flight altitude authorized by command regulation. Initially, it was thought that the pilot was trying to land or take off. However, a witness to the accident stated that the helicopter was in straight and level flight when it hit the wires.

The most probable reason for the violation was that the pilot knew the regulation allows descent below 500 feet during rescues and other emergencies. He considered this mission to be an emergency mission which, in his opinion, could be accomplished at the lower altitude.

The pilot probably did not see the wires in time to miss them because of a lack of division of attention. Neither of his passengers was aviation oriented and neither could communicate with him through the intercommunication system. The pilot was flying, navigating, and trying to communicate with the passengers through other means. A note pad containing questions such as "Where are we?" was found in the wreckage. It is also reasonable to assume that the pilot was trying to spot the prisoners.

The requirement for this pilot to have to divide his attention was the result of poor mission planning due to a lack of information as to what was going to be required. The mission was given to the facility commander to provide an aircraft and pilot to assist in the operation. Details of the operation were sketchy and did not specify what the aircraft and pilot were going to be required to do. Mission assignment and any requirements were passed over the telephone; therefore, no record was available to determine exactly what transpired. Had the commander been made aware of the type mission to be flown, he could have provided a qualified observer or, as a minimum, told the pilot to take helmets/headsets so he could use the aircraft intercommunication system.

Although civil assistance missions were common, adequate written procedures were not available. Guidance in regulations is general and spread throughout several regulations. Written guidance concerning civil assistance missions, such as equipment required for the mission, communication compatibility with civil authorities, flight following procedures, coordination procedures, crew selection, and responsibility of the crew was not available. To ensure that everyone involved in a mission of this type is fully aware of all requirements to safely complete the mission, a single document, such as an SOP, should be developed and distributed to military and civil authorities.

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Report on first half FY 85 aircraft accidents

Seventeen Class A aircraft mishaps occurred during the second quarter of this fiscal year. Three of the 17 mishaps resulted in 16 fatalities. These 17, together with the 12 recorded during the first quarter, bring the total to 29 Class A mishaps and 24 fatalities for the first half of this fiscal year.

The number of Class A mishaps, total fatalities, accident rate, and dollar costs were all considerably higher for the first half of this year compared to the same period last year.

The overall increase reflects a higher number of Class A mishaps involving UH-1 and OH-58 aircraft. These two aircraft accounted for two-thirds of the Class A mishaps for first half fiscal 85.

Although the nine UH-1 accidents accounting for one-third of all accidents is higher than in previous periods, analysis does not indicate any UH-1 system-peculiar trends. Only two of the UH-1 accidents were materiel-related. In general, UH-1 accident cause factors this year are the same as they have been for the previous 4 years.

OH-58 accidents also totaled nine for the first half of this year.

The UH-60 Class A accident rate has been, and continues to be, higher than the rate for other rotary wing aircraft. Two of the five first half FY 85 UH-60 accidents were materiel-related.

One trend emerging from analysis of these accidents, which seemed to apply to all aircraft, was the number of accidents occurring during night operations. Forty-seven percent of all rotary wing Class A mishaps this year, less those with materiel implications, happened at night. Half of the tactical training accidents happened at night. About 25 percent involved the use of night vision devices.

Materiel factors were involved in 7 of the first half FY 85 Class A mishaps, 3 of which accounted for 16 of the 24 fatalities.

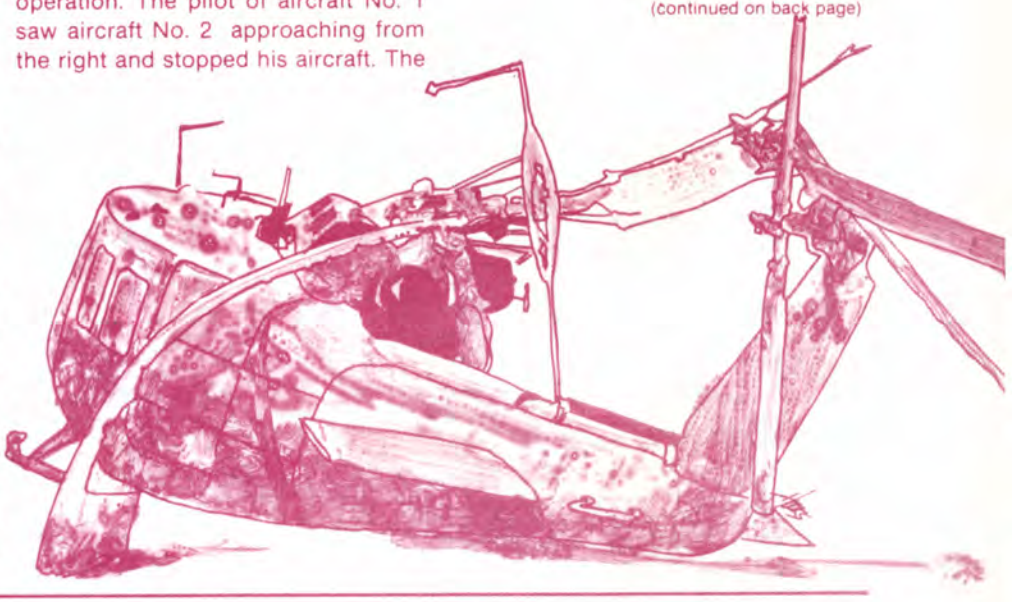
Human error

Human error continues to be the primary cause of accidents in all types of rotary wing aircraft. Twenty of the 27 Class A rotary wing accidents for the first half of this year involved human error. Following are synopses of some of the human-error mishaps for the second quarter of FY 85.

• A UH-60 (aircraft No. 1) was ground taxiing along the primary taxiway. Another UH-60 (aircraft No. 2) was ground taxiing from the parking area toward the primary taxiway, approaching the right side of aircraft No. 1. All crewmembers were wearing night vision goggles, and the anti-collision lights of both aircraft had been taped for night vision goggles operations. The control tower was not in operation. The pilot of aircraft No. 1 saw aircraft No. 2 approaching from the right and stopped his aircraft. The crew of aircraft No. 2 did not see the other aircraft. Aircraft No. 2 hit the right side of aircraft No. 1. Both helicopters were destroyed during the disintegration of the rotor systems. Seven parked helicopters were also damaged, one of them extensively. This accident was caused by inadequate clearing and inadequate communication on an uncontrolled airfield.

• A UH-1 was involved in a static line training parachute drop. The aircraft had been modified with large pads to cover the cargo doors. These pads supposedly protected the static lines but were not reflected in, or required by, the unit SOP. They had been used for about 5 years. During a refueling stop, the pad cords on the right door had to be cut to get the cargo door closed for refueling. After the second drop, the right door pad came off the aircraft and hit the tail rotor. Tail rotor control was lost and a descent was begun. About 200 feet above the

(continued on back page)



Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 26 April-2 May

Utility helicopters

UH-1 Class C mishaps

V series - Loud bang was heard, aircraft yawed left, and master caution and rpm lights came on. Worn compressor blades caused compressor stall. Aircraft was operating in the desert, and sand caused blades to erode.

H series - As rappeller hit the ground, his leg and arm were fractured.

UH-1 Class D mishap

H series - As copilot was making VMC approach, aircraft hit the ground hard and rocked up on nose of skids. Wire cutter stuck into the ground.

UH-1 Class E mishaps

H series - Crew heard loud noise. A few seconds later, master caution and hydraulic lights came on, and controls became stiff. Caused by failure of left hydraulic irreversible valve.

H series - Aft cyclic could not be applied during descent. Cyclic freed after about 30 seconds. Caused by malfunction of magnetic brake.

H series - Copilot of No. 3 aircraft lost sight of No. 2 aircraft while landing in blowing dust. Copilot started a go-around. At 25 to 30 feet and 15-20 knots airspeed, pilot noticed that torque gauge indicated 55 psi. Pilot landed without further incident. Inspection revealed no damage. Copilot did not tell pilot he was IMC and was making a go-around, and pilot was late in taking control of aircraft.

UH-60 Class C ground mishap

A series - No. 1 engine was started with gust lock engaged and main rotor blade tied down. Suspect gust lock failed due to overtorque. Blade hit tail boom and broke. Windshields, tail rotor drive shafts, and gearboxes were also damaged.

UH-60 Class E mishap

A series - Aircraft was on short final with a slingload. No. 2 engine lost torque, and No. 1 engine torque went to 112 percent. Slingload was released about 4 feet from the ground, with no damage. Aircraft was landed 25 feet beyond the load. No. 2 engine load demand control cable support bracket had broken, freezing the cable.

Attack helicopters

AH-1 Class D mishaps

S series - Main rotor blades hit tree during NOE flight. Both blades were damaged.

S series - Aircraft was the No. 5 aircraft in a flight of five. The flight was following a tree line while approaching a holding area. The flight continued to follow the tree line into a 90-degree right turn which placed them in the holding area. As the pilot of the No. 5 aircraft made the right turn, he scanned to his front and to the right. To the front, he saw the rest of the flight at NOE altitude and was deceived into thinking the other aircraft had just flown through the airspace to his front. The IP, in the front seat, was updating the doppler with the coordinates of the holding area. Aircraft hit a wire at about 50 feet agl and was immediately landed. The wire, which was marked on the map, was not seen because of a green foliage background and the fact that the pole to the right was located 40 meters into the forest.

S series - IP aligned refueling port on aircraft with hose and grounding stake on refueling pad, then landed on the pad. As rear seat pilot climbed out, aircraft nose rocked up. Aft portions of skids were not on concrete pad. Pilot climbed back in, and IP moved aircraft forward. Both skid tubes were creased.

S series - Armament personnel dropped an ammo drum on ammo bay door, tearing inner skin of door.

S series - Smoke and fumes came from behind pilot's instrument panel during engine runup. Painted circuit panel behind fire detector test switch had chafed against instrument panel, causing a short.

AH-1 Class E mishap

S series - Aircraft was landed at field site for hot refueling. After pilot got out of aircraft, refueler grounded aircraft, opened fuel port, and inserted CCR nozzle into port. When refueler lifted pump handle, nozzle flew out of port, splashing fuel over the aircraft and refueler. CCR nozzle was found to stick at about the half lock position because of dirt. Refueler did not ensure nozzle was locked to aircraft and opened the pump handle full open, causing nozzle to be forced out of aircraft.

Cargo helicopters

CH-47 Class B mishap

C series - Aircraft landed to offload troops. Nose of aircraft lifted up and then began to pitch downward. Aft end of aircraft left the ground. Pilot took the controls and moved aircraft forward. During this time, No. 1 engine failed. During movement, torque on No. 2 engine was above 100 percent for about 15 seconds. Aircraft was landed. Structural former was broken, and ramp and landing gear strut were damaged. 8536

CH-47 Class E mishaps

C series - Crew noticed excessive hydraulic fluid leak in flight control closet during runup. Caused by failure of No. 2 SAS roll link.

C series - As aircraft was being refueled with both engines at ground idle, flight engineer heard grinding sound coming from No. 1 engine. Nut plate from upper FOD screen was ingested by engine.

CH-54 Class E mishap

A series - Pilot experienced collective binding during approach to confined area. Aircraft was flown to another area. On landing, collective could not be moved to full down position. Aircraft became airborne. IP took control and forced collective full down. Binding was caused by survival kit contacting aft pilot's collective. Kit was not stored properly.

Observation helicopters

OH-58 Class D mishaps

A series - Owl flew out of trees into rotor system as aircraft was on NOE flight. Main rotor PC link was bent.

A series - Maintenance test pilot hover taxied aircraft about 60 feet from OH-58. Left cargo door of OH-58 swung forward, breaking left front windshield and door hinges.

C series - Main rotor blade hit tree branch during NOE flight. Blade tip cap was damaged.

OH-58 Class E mishaps

C series - When throttle was rolled back to flight idle following landing, pilot noticed that rotor needle was still at 100 percent. Caused by failure of tachometer indicator.

A series - D.C. generator caution light came on. Caused by failure of voltage regulator.

Fixed wing

C-7 Class B mishap

A series - Loud noise was heard, and fire was seen coming from No. 1 engine. Single-engine landing was made. Engine sustained extensive fire damage. 8537

C-12 Class E mishap

D series - Gear would not extend electrically. Manual extension was successfully completed. Relay contacts inside controller welded together in retract position.

U-8 Class E mishaps

F series - No. 1 engine tachometer dropped to zero during flight. Caused by broken tachometer generator shaft.

F series - Right main gear indicator showed unsafe condition. Tower personnel indicated gear appeared to be down. Aircraft was landed without incident. Right main outboard downlock switch wire terminal was loose and corroded.

Maintenance

UH-1 Class E mishap

H series - As engine was being shut down, technical observer detected fuel odor and saw fuel leaking from internal fuel filter. Incorrect procedure during replacement caused O-ring to crimp and fuel to eventually leak from fuel filter.

UH-60 Class E mishap

A series - Crew chief noticed No. 1 engine cowling was open during takeoff. Crew chief did not fully latch cowling after completion, of maintenance.

CH-47 Class E mishap

C series - Flight engineer saw oil on side of aircraft leaking from vicinity of forward transmission. Jam nut on transmission oil line had backed off. Crew chief had not correctly tightened nut.

Safety messages

- Safety-of-flight maintenance mandatory message concerning one-time inspection of UH-60 main rotor spindles (UH-60A-85-11, 292345Z Apr 85). Summary: Main rotor spindles will be inspected, and serial numbers, part numbers, and hours reported. The data will be used to analyze the cause of a recent mishap and to assist in achieving a solution. Contact: Mike Hoffman, AUTOVON 693-1683, commercial 314-263-1683.
- Maintenance information message concerning reduction of retirement life on UH-1 tail rotor grips (MIM-UH-1-MEM-85-02, 012030Z May 85).
- Ground support equipment safety-of-use message concerning aerial recovery kit, NSN 1670-00-264-8941 (SOU-GEN-85-MEM-02, 302200Z Apr 85).

For more information on selected mishap briefs, call 558-4198/4202.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	1-15 May	**2**	**0**
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**33**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

First half FY 85 report

ground, the 90-degree gearbox came off. The UH-1 spun to the right and crashed.

• An OH-58 was landing at an airfield. Winds were reported at 350 degrees, 11 knots gusting to 18 knots. The pilot made a downwind landing on a heading of 200 degrees. At termination to a hover, the pilot had turned 90 degrees to the left when a gust of wind lifted the tail and rotated the aircraft. The pilot misinterpreted movement of the aircraft as loss of tail rotor effectiveness and applied forward cyclic, causing the main rotor blades to hit the ground. The pilot then tried to complete a hovering autorotation, and the aircraft crashed.

• A UH-60 was No. 3 in a flight of five on a troop insertion training mission. While terminating his approach to a tactical landing zone, the pilot brought the aircraft to a hover at about 10 feet. Snow engulfed the helicopter, and the pilot began a descent. The aircraft landed hard on the right main gear, which was upslope. The left side then hit hard, and the aircraft rolled over onto its left side. This accident was caused by the pilot using an incorrect snow-landing procedure.

• An OH-58 at NOE altitude flew over a ridgeline into a valley. The aircraft hit three powerlines, which wrapped around the mast and severed the control linkage. The OH-58 crashed on the side of a hill. The wires did not engage the wire protection system.

Willful violation of rules and/or established operating procedures by aircrews and supervisors accounts for about 40 percent of the human error problem each year. This percentage has remained relatively constant over the past 4½ years. Willful direct supervisory error declined slightly in the first half of FY 85—from 16 percent to 11 percent.

Command involvement

Eighty-six percent of the areas requiring corrective actions as identified by centralized investigation and analysis of human-error-related accidents during the first half of this year have been targeted at unit-level deficiencies. This percentage has also been relatively consistent for the past 4½ years. A root cause of the problem appears to be the command management decisions at unit level.

An analysis of any success in saving lives and equipment in the aviation world underscores the value of direct leader involvement in the safety business. Where the chain of command is directly involved in safety, the accident trend is down. Unfortunately, the converse is also true.

No place is command involvement more critical than in the area of aviation safety. Safety won't happen without a conscious commitment by command.

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

More on OH-58 LTE problem

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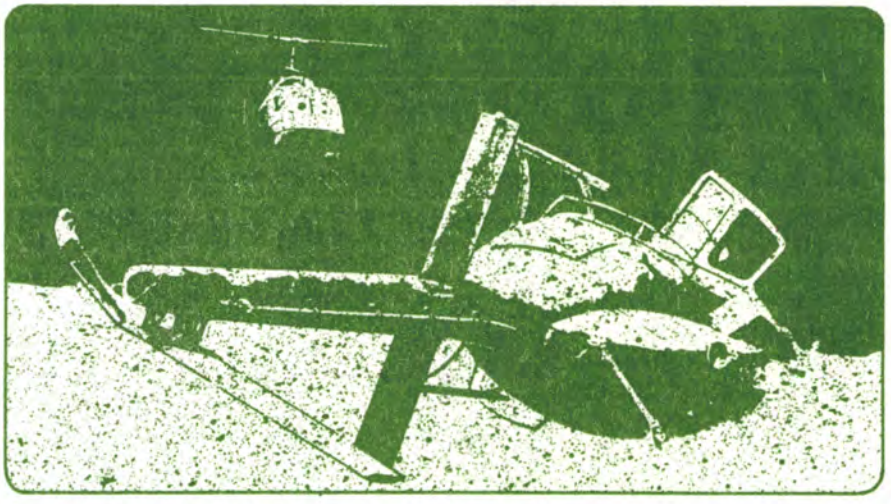
After an absence of 14 months, an OH-58 loss of tail rotor effectiveness (LTE) occurred again in March. In the latest mishap, the helicopter was landing to the north at a field location. Winds were from the north at 20 to 25 knots. About 10 feet above the ground, the pilot decided that the proposed landing site was unsuitable and turned the aircraft tail into the wind. Tail rotor effectiveness was lost, and the helicopter began spinning to the right. The pilot applied full left pedal and lowered the nose. The spin accelerated, and the aircraft hit the ground on its left rear. The main rotor blades then hit the ground. The OH-58 came to rest on its right side and was consumed by a postcrash fire which started in the engine area. It is worthwhile to revisit the topic as a refresher.



What is LTE?

LTE is defined by the operators manual as the occurrence of an uncommanded and rapid right yaw which does not subside of its own accord and which, if not quickly reacted to, can result in loss of aircraft control.

To understand LTE, the pilot must understand the function of the tail rotor. The tail rotor's function is to counteract the torque generated by the main rotor. On American-made single-rotor helicopters, the main rotor rotates counterclockwise. The torque produced by the main rotor causes the nose of the helicopter to turn right. The tail rotor counteracts this inherent right yaw with a thrust that pushes the nose left. Therefore, the tail rotor thrust provides directional control. Tail rotor thrust is the result of tail rotor blade pitch which is controlled by the pilot. If the tail rotor generates more thrust than is required to counter the main rotor torque, the helicopter will yaw to the left; yet, if less tail rotor thrust is generated, the aircraft will yaw to the right. By varying the thrust generated by the tail rotor, the pilot can control the heading of the helicopter at a hover.

In an environment of prefectly steady air, for a given main rotor torque setting, there is an exact amount of tail rotor thrust required to prevent the helicopter from yawing either left or right. This is known as tail rotor trim thrust. However, in the environment in which Army scout pilots fly, the air is seldom steady. Pilots are continuously subjected to constantly changing wind directions and velocities as well as turbulent air from main rotor system wake.

The required tail rotor thrust in actual flight is modified by the effects of the wind. If an uncommanded right yaw occurs in flight, it may be because the wind reduced the tail rotor "effective" thrust. The wind can also **add** to the tail rotor thrust. In this case, the helicopter will react with an uncommanded left yaw. In other words, the winds can and will cause tail rotor thrust variations to occur. Certain relative wind directions are more likely to cause tail rotor thrust variations than others. These relative wind directions or regions form the LTE conducive environment.

Extensive flight and wind tunnel tests identified three relative wind azimuth regions as capable of adversely affecting aircraft control and dramatically increasing pilot workload. Although specific wind azimuths are identified for each region, the pilot must realize the azimuths may shift depending on the ambient conditions. The three regions are:

- Weathercock stability (120-240 degrees). Winds within this region will attempt to weathervane the aircraft into the relative wind. The helicopter exhibits a tendency to make a slow uncommanded yaw to either the left or

More on OH-58 LTE problem

right depending upon the exact wind direction. Due to the inherent yaw characteristics of the OH-58, the yaw rate will increase unless arrested by the pilot. A right yaw can develop into an LTE condition and requires immediate correction.

• Vortex ring state (210-330 degrees). Winds within this region will cause a vortex ring state to develop around the tail rotor which, in turn, causes tail rotor thrust variations. The helicopter exhibits a tendency to make uncommanded pitch, roll, and yaw excursions. Subsequent aircraft reactions require multiple pedal, cycle, and collective inputs by the pilot. Maintaining a precise heading in this region will be impossible. Pilot workload in this region will be high; therefore, the pilot must concentrate fully on flying the aircraft and not allow a right yaw rate to build.

• Disc vortex (280-330 degrees). This region produces the most rapid and violent onset of LTE. Relative winds at velocities of about 10 to 30 knots from the left front can blow the main rotor disc vortex into the tail rotor. This main rotor disc vortex is a circular, rotating column of air that can be deflected into the tail rotor by the relative wind. When the tail rotor comes into the presence of the main rotor disc vortex, the tail rotor can experience a reduction of thrust. The reduction in tail rotor thrust comes from the air flow changes experienced at the tail rotor as the main rotor disc vortex moves across the tail rotor disc. This thrust reduction will occur suddenly. Under normal conditions, this can occur when the relative wind azimuth is between 280 and 330 degrees. LTE can occur if the pilot does not quickly react by applying additional left pedal. The helicopter will yaw to the right because of the reduced tail rotor thrust and resultant lack of trim. When operating within the vicinity of this region, the pilot must be aware that the reduction in tail rotor thrust can happen quite suddenly and he must be prepared to counter that reduction with additional left pedal input.

What can you do to avoid an LTE situation?

As a Scout pilot, you cannot avoid the environment that could lead to an LTE occurrence. But you can avoid the situation in most instances by remembering these five important points:

1. Develop a feel for the aircraft and how it will react under varying wind conditions.

2. Know the direction of the winds. Develop the ability to read the winds. By observing trees, smoke, grass, and other objects you can estimate the direction and velocity of the wind.

3. Make left turns if possible. When making a left turn the pilot will in effect be increasing the tail rotor thrust and therefore be more sensitive to the need for left pedal input.

4. Avoid excessive movement of the flight controls. Overcontrolling increases the likelihood of getting behind the aircraft. By smoothly coordinating control inputs the chances of encountering an LTE situation can be reduced.

5. Fly the aircraft. This is really a summation of the above four points. Terrain flight is very demanding and requires the pilot to give the flying of the aircraft his full attention. You must be sensitive to what the aircraft is doing.

Any maneuver which requires the pilot to operate in a high-power, low-airspeed environment with a left cross- or tailwind creates an LTE-conducive condition. Within the OH-58 ATM, there are 15 maneuvers or tasks which place the pilot in possible conditions conducive to LTE. They are:

2501 Normal Takeoff
2502 Simulated Maximum Performance Takeoff
3502 Normal Approach
3504 Shallow Approach
3505 Steep Approach
3509 High Reconnaissance
3510 Confined Area Operations
3512 Pinnacle/Ridgeline Operations
4501 Instrument Takeoff
4512 Tactical Instrument Takeoff
5005 NOE Flight
5006 Masking and Unmasking
5007 NOE Deceleration
5009 Terrain Flight Takeoff
5010 Terrain Flight Approach

The new OH-58 ATM will identify these tasks and include a note to warn pilots of the hazards involved.

What can you do if you get into an LTE situation?

If you find yourself in an accelerating uncommanded right yaw, it is critical that you simultaneously apply left pedal and forward cyclic. The use of the collective will be at the pilot's discretion based on altitude. This sounds simple, but remember, this procedure must be done instantly. Other factors which may be present and may influence the onset of LTE include gross weight, density altitude, low indicated airspeed, and power droop.

The new emergency procedure found in the OH-58 operators manual was tested repeatedly with right yaw rates in excess of 115 degrees per second. **Left pedal and forward cyclic always stopped the spin.** This was true with the standard and the improved tail rotor.

A new videotape on tail rotor effectiveness has been released to the field. The title is "Loss of Tail Rotor Effectiveness—What Is It?" It was released under TVT 46-127 and SAVPIN 701651. The tape gives the definition of loss of tail rotor effectiveness, causes, and actions to take to avoid accidents. It describes in detail the actions which occur when the pilot encounters weathercocking, vortex ring, and disc vortex situations. Using a model helicopter, all three of these dangerous situations which can cause a decrease in tail rotor thrust are demonstrated.

This tape should be available through your local Training and Audio-visual Support Center. It should be viewed by all OH-58 pilots.

—Portions of this article were extracted from an article in the *U.S. Army Aviation Digest* by Captain David M. Snellen on OH-58 loss of tail rotor effectiveness.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 3-9 May

Cargo helicopters

CH-47 Class E mishaps

C series - Transmission hot light came on. Caused by malfunction of transmission temperature selector switch.

C series - Pilot's and copilot's rotor tachometer failed during landing. Caused by failure of tachometer generator.

B series - No. 2 hydraulic caution and SAS lights came on. Hydraulic fluid was seen spraying from aft pylon. Caused by cracked elbow tube in hydraulic system.

B series - No. 1 flight boost pressure dropped below 2000 psi during flight. Pressure line under aircraft swiveling actuator cracked at bend, allowing pressure to escape.

CH-54 Class D mishap

A series - Postflight inspection revealed that No. 2 engine tailpipe assembly was torn on forward end from top to bottom at mounting flange.

CH-54 Class E mishap

A series - Left forward lift ring bolt on RTT 142 came loose during flight, releasing left forward load levelizer.

Utility helicopters

UH-1 Class D mishap

H series - As IP was entering aircraft after serving as fireguard, pilot, attempting to check hydraulics off, mistakenly identified emergency governor switch as hydraulic switch and placed it in emergency governor mode. Aircraft was at 6600 rpm. Engine overspeed in excess of 7200 rpm occurred.

UH-1 Class E mishaps

M series - Master caution light came on, and transmission oil pressure dropped to zero. Caused by failure of transmission gasket for internal oil filter element.

H series - Jolt was felt in rear of aircraft, followed by stiffness in antitorque pedals. Hole was found in hydraulic line on tail rotor servo.

H series - Feedback in cyclic control was caused by malfunction in hydraulic cylinder.

H series - As aircraft was picked up to hover, rpm bled off. Caused by failure of overspeed governor.

H series - Engine oil temperature rose to 140 degrees during flight. Caused by failure of engine thermal valve.

H series - Binding in left forward quadrant of cyclic control during takeoff was caused by failure of bearing in bellcrank.

Observation helicopters

OH-6 Class D mishap

A series - Pilot heard explosion-type noise, and cockpit was filled with flying glass. Left door frame was broken loose at top and plexiglass was missing. Upper hinge pin on door vibrated out, and top of door opened into slipstream. Bottom hinge sheared rivets and rotated, allowing door to hit rear of door frame.

OH-58 Class D mishaps

A series - IP was acting as fireguard while pilot was starting aircraft. During starting sequence, TOT went to and stayed at 830° C. After 7 seconds, pilot closed throttle while continuing to motorize the starter. TOT did not decrease until pilot was told to tap the TOT gauge. The platoon SIP, IPs, and several pilots failed to write up the stuck gauge, which was common knowledge for several weeks. A hot-end inspection revealed heat damage to the power turbine section. This damage was the result of prolonged overtemperatures during many engine starts.

C series - Postflight inspection revealed tear in aft engine firewall. Tail rotor drive shaft had one-half-inch vertical and lateral play. Caused by failure of No. 1 tail rotor hanger bearing.

OH-58 Class E mishaps

A series - Transmission oil hot light came on. Cannon plug connector on roof of aircraft, forward of hydraulics servos, had water in it. Aircraft had flown through heavy rain.

C series - High frequency vibration was caused by bad bearing in starter generator.

Attack helicopters

AH-64 Class E mishaps

A series - Air flow from ENCU stopped during flight. No. 2 engine air turbine starter line had come loose.

A series - Accessory gearbox oil light came on. Caused by failure of pressure switch.

A series - No. 2 nose gearbox was seen to be leaking during runup. Caused by failure of O-ring.

AH-1 Class E mishaps

G series - No. 1 hydraulic system failed during flight. Loss of fluid was caused by cracked fitting.

S series - Transmission oil pressure fluctuated. Caused by failure of oil pressure transducer.

Fixed wing

U-8 Class E mishap

F series - When pilot lowered gear, in-transit indication was received. When emergency gear extension was attempted, clutch handle would not turn 90 degrees and gear handcrank would not work. After several tries, gear locked down. Caused by failure of landing gear motor assembly.

OV-1 Class D mishap

D series - Crew heard grinding noise during taxi. Wheel bolt had broken, causing damage to brake.

T-42 Class E mishap

A series - Fuel was seen siphoning from left auxiliary fuel cap during climb. Fuel cap was not secured correctly.

U-21 Class D mishap

A series - Bird hit and broke right engine oil cooler fairing.

Maintenance

UH-1 Class E mishaps

H series - Pilot noticed that application of upward collective was stiffer than usual and noticeably different from downward movement. Inspection revealed two set screws on collective friction mechanism were adjusted unevenly.

H series - Master caution and hydraulic pressure lights came on. Two hydraulic fittings and one hydraulic line from hydraulic filter were overtorqued and split.

Safety messages

• Safety-of-flight emergency message concerning immediate grounding of CH-47D aircraft (CH-47D-85-02, 040100Z May 85). Summary: A recent CH-47D mishap was caused by failure of the aft transmission. This transmission is peculiar to the CH-47D aircraft only and is not used on the CH-47A, B, or C. Contact: Edward Branhof, AUTOVON 693-3300, commercial 314-263-3300.

• Safety-of-flight maintenance mandatory message concerning one-time and repetitive inspections of T700-GE-700/-701 engines (AH-64A-85-01, 040445Z May 85). Summary: Recent inspections of T700 engines revealed cracking in the air nozzle flange of the power turbine casing. Six instances of cracks exceeding allowable limits have been reported. Thirteen stage 3 nozzle bolt failures have also been reported in Army T700 engines. Although these bolt failures did not cause secondary damage, the failure of a bolt head on a GE commercial engine resulted in the bolt head going through the gas flow path of the engine. Contact: Richard Hazlewood, AUTOVON 693-1726, commercial 314-263-1726.

• Safety-of-flight maintenance mandatory message concerning one-time and repetitive inspections of T700-GE-700 engines (UH-60A-85-12, 040430Z May 85). Summary: Same as AH-64 safety-of-flight message above. Contact: Richard Hazlewood, AUTOVON 693-1726, commercial 314-263-1726.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	1-22 May	**3**	**0**
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**34**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Shortfax

Fourteen receive Broken Wing Award

Fourteen aviators received the Broken Wing Award from October 1984 through March 1985.

CW4 Thomas G. Armstrong
Company D, 149th Aviation Battalion, Arizona ARNG, Phoenix, Arizona

CW2 Richard J. Guy
DOFT,
Fort Rucker

Captain Patrick R. Hassett
DOFT,
Fort Rucker

CW2 Van G. Hulen
Company A, 158th MI Battalion, Georgia ARNG, Winder, Georgia

CW4 David A. McAdams
Command Aviation Company, Davison Aviation Command, Fort Belvoir

CW2 Dwight A. McDonald
A Company, 7th Combat Aviation Battalion, Fort Ord

CW2 Connie M. Norwood
Command Aviation Company, Davison Aviation Command, Fort Belvoir

Major Robert W. Robinson
Hq, STARC, North Dakota ARNG, Bismarck, North Dakota

CW3 Robert L. Scott
421st Medical Company, APO New York 09061

CW2 John E. Sharkey
Troop E (Air), 19th Cavalry, Hawaii ARNG, Wheeler AFB, Hawaii

CW3 Dennis L. Story
4th Platoon, 507th Medical Company, Fort Sill

CW2 Richard H. Walch
421st Medical Company, APO New York 09061

CW4 Roger L. Walker
TRADOC Flight Detachment, Fort Monroe

CW3 Joseph L. Wittstrom
205th Aviation Company, APO New York 09185

An idea about weather mishaps

A Chinook pilot with 10 years experience and 2,900 hours was flying with a slingload. He had to release the load when he inadvertently entered IMC. He had these words to say after the mishap.

"For many years I have read **Flightfax** and wondered why so many instrument-rated pilots in instrument-equipped aircraft come out of the sky upside-down after inadvertently encountering IMC. Now I know. Until having had this experience, one cannot appreciate the crisis situation of those first few seconds. I consider myself a proficient instrument pilot and the CH-47 the best instrument helicopter in the Army (my only serious problem was the external load). But a less experienced pilot in a smaller aircraft would have a serious struggle to survive.

"Inadvertent IMC training is essential, but prevention is the best cure. This means timely and accurate weather information. Obtaining this information is most difficult under field conditions, when it is needed the most. Passing weather through the echelons by field phone is slow and unreliable. A pilot-to-forecaster frequency or other means of direct communication could be an important step to prevention of further weather-related mishaps." ■

CCAD teardown analysis control numbers

Army Safety Center centralized accident investigation teams have teardown analysis (TDA) control numbers available to submit exhibits to Corpus Christi Army Depot (CCAD) in support of investigations. The Systems Division of the Safety Center can also issue TDA control numbers to requesting units per DA Pam 385-95.

The TDA program monitored by the Safety Center is not intended to usurp or circumvent the Quality Deficiency Report (QDR)/Equipment Improvement Recommendation (EIR) program outlined in TM 38-750 and administered by the U.S. Army Aviation Systems Command. TDA control numbers will be issued to requesting units when precipitating events/conditions warrant a higher priority for determining materiel failures than is available through the EIR program. Materiel failures which have safety implications for the entire fleet warrant a priority request. Units are urged to prudently assess materiel failures to determine the appropriate means to obtain/document necessary information concerning the failure. Before a TDA control number is issued by the Safety Center, the requesting unit is required to submit an EIR/QDR in the format(s) shown in TM 38-750.

Point of contact at the Safety Center on TDA control numbers is the Systems Division, AUTOVON 558-4198/6595. ■

Recap of AVSCOM messages

Following is a list of AIG 8881 addressed messages transmitted by AVSCOM (AMSAV-M) from 1 January through 31 March 1985.

UH-1-85-01 Safety-of-flight technical message concerning extension of time compliance to SOF message UH-1-84-11

UH-1-85-02 Safety-of-flight technical message - supplemental message to SOF message for the magnetic particle inspection of UH-1 turnbuckles

UH-60A-85-01 Safety-of-flight maintenance mandatory message concerning one-time inspection of stabilator amplifiers for locking potentiometers

UH-60A-85-02 Safety-of-flight maintenance mandatory message to change the autorotation rpm limits

UH-60A-85-03 Safety-of-flight maintenance mandatory message concerning one-time inspection and replacement of stabilator amplifier

UH-60A-85-04 Safety-of-flight maintenance mandatory message concerning one-time inspection and replacement of stabilator amplifier, revision to UH-60A-85-03

UH-60A-85-05 Safety-of-flight operational message prohibiting in-flight training and operation of the UH-60 in engine ECU lockout condition

UH-60A-85-06 Safety-of-flight maintenance mandatory message concerning one-time inspection of primary servos and control rods

CH-47-85-01 Safety-of-flight technical message concerning inspection of horizontal hinge pin bearing installation of CH-47C/D aircraft with fiberglass rotor blades

CH-54-85-01 Safety-of-flight technical message concerning one-time inspection of CH-54 aircraft for defective tail rotor servo links

AH-1-85-01 Safety-of-flight technical message concerning recurring and one-time inspection of swashplate bearing, lubrication and interval of bearing inspection

AH-1-85-02 Safety-of-flight technical message concerning revision to recurring and one-time inspection of swashplate bearing

OV-1-85-01 Safety-of-flight technical message concerning one-time inspection of a.c. generators

U-8-85-01 Safety-of-flight technical message concerning one-time inspection for suspected engine gauge units and conformance to FAA Airworthiness Directive ■

U.S. ARMY SAFETY CENTER

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Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

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An IP's thoughts on proficiency

As the pilot of a UH-60 terminated his approach to a tactical landing zone, he brought the aircraft to a hover about 10 feet above the ground. Snow engulfed the aircraft, and the pilot began a descent. The UH-60 landed hard on the right main gear, which was upslope. The left side then hit hard and the aircraft rolled over.

After this accident, an instructor pilot familiar with the accident events made the following comments which we would like to share with you.

I feel that this kind of accident could be prevented by an Army-wide program of increased emphasis on all aspects of the basics of piloting Army aircraft and on maintaining proficiency and currency to a much greater degree than is currently required by regulations. I think there has been a shift away from the technical details and operational aspects of basic and advanced aircraft operation and a shift toward an emphasis on the many time-consuming duties not directly related to aircraft operation, e.g., excessive details associated with AMC duties that will not be possible to accomplish in war. Also, it seems that the additional duties of unit aviators (both commissioned and warrant) are receiving more and more emphasis and requiring more and more time, taking the aviator away from the cockpit (where a large sum was spent to train him).

The unit aviator's time spent in an environment where valuable review, study, planning, and incidental learning take place has also been eroded to a considerable degree. This time is valuable because of the ever-increasing complexity of Army aircraft, the sophistication of their systems, the increasing volume of knowledge necessary to remain combat-ready today and tomorrow, and the demanding environment in which Army aviation is expected to routinely operate.

It seems that comprehensive aviator training programs are encouraged at all levels, but taskings of the unit from the higher levels many times cause the training program to be one in name only, or it is implemented on a "shoestring" basis, with unit commitments always taking priority, even though this may be unintentional. This results in aviators in the cockpit who are marginally trained and only "current" by regulation.

I would recommend that the aviation unit training program receive increased emphasis. This would probably result in a reduced quantity of support for the ground commander in the short term, but it would, in the long run, result in better quality support at reduced risk which would, in turn, result in a reduced accident rate.

I believe that some aviation units are trying to go full speed ahead by trying to satisfy **all** commitments **all** of the time, while at the same time operating aircraft that are increasingly complex, in more demanding environments. They are doing all this with aircrews that have been minimally trained and who are trying to keep up with several other duties and taskings that are, in many cases, not directly related to the **business** of maintaining total combat aviation readiness.

Aviation mishaps can't be regulated or threatened out of existence. Flying and fighting and supporting the ground commander is an exacting, serious business. Any incapacity, neglect, or lack of preparation will extract a high price for a mistake.

Some people, after hearing the previously mentioned suggestions, reply that "it's just the system" as if to offer an excuse as to why things have to be the way they are. Perhaps the "system" needs to be changed or maybe we need a new "system."

—CW3 Terry W. Strong
E Co., 501st ABC
Ausbach, Germany
APO NY 09326

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 10-16 May

Utility helicopters

UH-1 Class E mishaps

H series - As aircraft was landing in unprepared area, IP noticed a piece of metal tubing on the ground. IP was concerned about the metal piece flying up into the main rotor system on departure, so he picked it up and tossed it sidewards away from aircraft. Metal piece flew up into rotor system, causing skin damage to leading edge of main rotor blade.

H series - Cyclic moved hard right and then left during flight. Caused by defective cyclic servos.

H series - Loud bang was heard from aft of pilot's station. Caused by broken transmission lift link mount point.

H series - Aircraft was at full operating rpm while voltage regulator check was being made. Pilot was resting his forearm on center pedestal and bending over to see voltmeter. When pilot raised up to seating position, his sleeve cuff caught emergency governor switch and moved it to the emergency position. Engine rpm increased to 7100 before pilot was able to reduce throttle.

H series - Master caution and transmission oil pressure lights came on. Caused by defective pressure relief valve.

Cargo helicopters

CH-54 Class E mishaps

A series - Main transmission oil temperature gauge needle fluctuated from 90 to 150 degrees C. Caused by failure of temperature transmitter.

A series - Severe vibration was noted during takeoff. Bracket assembly was cracked, allowing main rotor blade to feather.

Observation helicopters

OH-58 Class A mishap

A series - Pilot heard several popping sounds while hovering 200 feet above trees. Pilot partially lowered the collective and applied forward cyclic in an attempt to gain airspeed. Glancing at his instruments, pilot saw TOT in the low side of the yellow arc and rpm decaying. Aircraft descended into trees as rpm audio activated. Pilot continued to apply collective pitch. Aircraft came to rest on left side. Suspect engine failure. 8538

OH-58 Class E mishaps

A series - Throttle was left in full on position when battery start was attempted, resulting in rapid rise in TOT to 980 degrees. Pilot was undergoing OH-58 transition. No problems were encountered on four previous starts because IP announced "check throttle closed" before each start. On the fifth start, IP did not say anything about closing the throttle, and pilot forgot to check it.

C series - Aircraft hit bird during night flight.

C series - Student pilot riding in the back seat became nauseated. Flight surgeon determined that student pilot

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	1-29 May	**4**	**0**
	June	5	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**35**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

had eaten some contaminated mushrooms.

A series - Pilot tried to start aircraft with main rotor blades tied down. He was stopped by other unit personnel before engine reached N1 reading of 25 percent.

Attack helicopters

AH-1 Class B mishap

S series - Postflight inspection after NOE flight revealed damage to both main rotor blades. 8539

AH-1 Class E mishap

S series - Low rpm audio activated and rpm light came on during approach. Caused by failure of droop compensator shear pin.

AH-64 Class C mishap

A series - Postflight inspection revealed damage to tail rotor blades. Crew had been performing "bob-up" target acquisition maneuvers.

AH-64 Class E mishap

A series - No. 2 engine tgt was 8 degrees more than allowed during HIT check. Engine had ingested a foreign object.

Fixed wing

OV-1 Class A mishap

D series - During climbout, both engines had compressor stalls. Pilot reduced, then reapplied, power. Compressor stalls occurred again. Pilot again reduced power and reapplied power to No. 2 engine while jettisoning the wing tanks. No. 2 engine stalled again. Pilot told crew chief to eject, and then pilot ejected. 8540

C-12 Class D mishap

A series - Aircraft hit two birds, damaging engine air inlet.

C-12 Class E mishap

A series - Rapid decompression occurred during flight. The first indication was loud noise in rear of aircraft. Cabin pressure differential showed zero, and cabin altitude indicator showed a greater than 6,000 foot-per-minute rate of descent. Caused by failure of cargo door seal.

Maintenance

UH-1 Class E mishaps

H series - Fire warning light came on. Caused by loose connector plug on fire warning element.

H series - IP smelled burning odor during takeoff. Searchlight wire had not been insulated when it was removed for maintenance. Wire shorted out when it touched aircraft.

C-7 Class E mishaps

A series - Left main landing gear failed to retract after takeoff. Aircraft had been sitting unused in high humidity conditions. Strut mechanism was binding.

A series - Right propeller feathering button indicator light flashed on and off several times during reverse and feathering checks. Feather button light switch was dirty and corroded.

U-21 Class D mishap

J series - Fuel seepage was seen coming from leading edge of right wing during flight. Aircraft had been stored for a long time and tanks dry rotted.

OV-1 Class E mishap

D series - No. 2 engine torque fluctuated during takeoff. Caused by accumulation of oil on engine torque gauge cannon plug.

Safety messages

• Safety-of-flight message concerning one-time and repetitive inspections of CH-54B aircraft for defective main rotor blades (CH-54-85-02, 142030Z May 85). Summary: A cracked spar has been found on an Air Force H-53 main rotor blade. The crack originated at a screw hole outboard of the blade inspection method (BIM) tip seal and, therefore, was not BIM detectable. Spar failure at this location could result in loss of the entire counterweight train. To detect any such cracks that might occur in CH-54B main rotor blades, a visual inspection for cracks will be required. This inspection will be repeated at 200-hour intervals. Contact: Robert High, AUTOVON 693-1597, commercial 314-263-1597.

• Safety-of-flight technical message concerning one-time inspection and modified flyable storage procedures for the UH-60A (UH-60A-85-13, 160100Z May 85). Summary: This message presents procedures which will permit the UH-60 to be ground run and thereby eliminate the need to place the aircraft in storage. Contact: Mike Hoffman, AUTOVON 693-1683, commercial 314-263-1683.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Fuel sample sent in rusty can

A fuel sample from a crashed OH-58 was recently sent to a laboratory for tests. The sample was submitted in a very rusty 5-gallon can with a hole in the top. The plastic pour spout also had several cracks in it.

The fuel sample failed the total solids test. The residue from the test was rust, which probably came from the rusty sample can. A low vapor pressure may have been the result of the hole and cracked pour spout. Some of the lighter volatiles could have evaporated.

To be sure a sample is truly representative of the fuel you want tested, use sample cans, NSN 8110-00-128-6819, when you send fuel to a laboratory. ■

Overreaction not the answer

Reports from unit safety officers indicate that several blade strikes have been attributed to the evasive maneuvers used by crews when they tried to break acquisition while using MILES/AGES equipment. Crews are reminded that overreaction is not the answer to the problem. Prior mission planning and heads up in the cockpit will ensure minimum exposure and reduce your chances of having a mishap. ■

— from TAC Attack

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Aircraft accident review

Overcontrol results in crash

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Synopsis

Four UH-1H helicopters were hover taxiing to a refueling area. The No. 1 aircraft came to a stationary hover. The copilot at the controls of the No. 2 aircraft could not stop his aircraft and applied an excessive amount of collective pitch. Control was lost and the Huey crashed.

History of flight

Four UH-1 helicopters were returning to their home base. The flight to the en-route refueling site was uneventful until termination. After the approach was terminated to a hover, the flight made a left turn toward the refueling area.

While in trail formation, the No. 1 aircraft came to a stationary hover. The No. 2 aircraft, with the copilot at the controls, began closing on No. 1. The copilot said he was bumping the aft limits with the cyclic control. Fearing that he would overrun the No. 1 helicopter, the copilot of the No. 2 helicopter applied collective pitch. The UH-1 climbed to 40 to 50 feet, turned right about 270 degrees, and descended, apparently out of control, in a nose-low attitude. The helicopter hit the edge of the taxiway, bounced, traveled 142 feet, and came to rest on its left side. Seven of the nine occupants sustained minor injuries.

Crew experience

The 39-year-old pilot had almost 2,000 rotary wing flight hours, with more than 500 in the UH-1H. The 25-year-old copilot had almost 300 rotary wing flight hours, with almost 250 in the UH-1H.

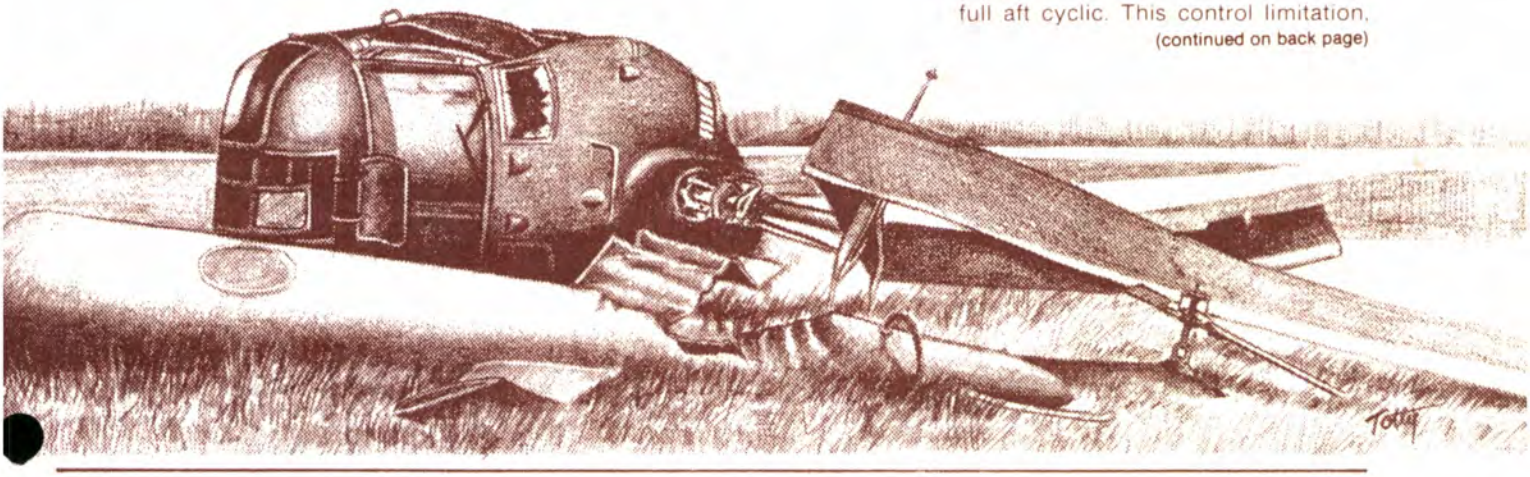
Commentary

While hovering, the inexperienced copilot at the controls applied full aft cyclic as the tail of the aircraft rose. He could not stop the forward movement of the aircraft and thought he was going to hit the lead aircraft. At this point, the copilot apparently lost his composure and applied excessive collective pitch while the cyclic was in the aft position. The copilot commented that he didn't realize he had applied such a large amount of collective, and he was unaware of the position of his pedals or any application of pedal.

The copilot continued to hover while having difficulty controlling the aircraft without asking for help from the pilot or informing him of his problems. He believed he would be able to regain control of the aircraft. It was concluded that the copilot's incorrect flight control actions were the result of his inexperience, overconfidence in his ability, and a loss of composure.

The copilot was flying the aircraft with his seat in the full up and full forward position with the pedals to the rear. Evaluation of this seat position on other aircraft, as well as the mishap aircraft, revealed that there is a restriction of aft cyclic with the seat in that position. Therefore, it is probable that the copilot was not obtaining full aft cyclic control when he tried to apply full aft cyclic. This control limitation,

(continued on back page)



Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 17-23 May

Utility helicopters

UH-1 Class A mishap

V series - As UH-1 was flying 700 feet above the ground, the copilot on the controls noticed a shadow on the ground of a fixed wing aircraft. The copilot told the pilot, sitting in the left seat, and the pilot took control and put the UH-1 in a left descending turn. The copilot saw the airplane go into a steep right bank. The UH-1 crew heard a bumping sound and felt vibrations. Power-on landing was made to a sloping area, and aircraft landed hard. The civilian airplane crashed, killing the pilot. The right wing had been chopped off by the UH-1's rotor blades. 8541

UH-1 Class C mishap

H series - As pilot picked aircraft up to a hover for HIT check, loud bang was heard and aircraft yawed left. Aircraft was then landed. Engine had exploded and sent shrapnel through engine deck. Main rotors and cowlings were also damaged.

UH-1 Class E mishaps

H series - IP heard loud squealing noise during hover. Caused by internal engine failure. No. 3 and 4 bearing packs seized and numerous turbine blades were damaged or missing from power turbine.

H series - Fuel quantity indicator fluctuated and then dropped to zero. Caused by defective fuel quantity indicator.

H series - Master caution and fire warning lights came on. Caused by failure of fire warning control box.

H series - Loud noise was heard and torque needle dropped when power was added to lift aircraft to a hover. Postflight inspection revealed foreign object damage to engine compressor blades.

H series - Transmission oil pressure light came on. When collective was lowered, crew heard grinding noise from main transmission and smelled hot fluid. Worn transmission oil line quick disconnect coupling caused fluid to leak from transmission.

Attack helicopters

AH-1 Class A mishap

S series - Crew had just finished simulating engagement of a tank and was in the process of overflying the tank to get the "buzz" number on top of the tank for accountability purposes. Aircraft flew into 50-foot trees and came to rest on its left side. Pilot and copilot were injured. 8542

AH-1 Class D mishap

S series - AH-1 was being repositioned in parking area with the aid of a ground guide. An unsecured door on a nearby OH-58 was not detected by the ground guide or the flight crew. Rotorwash caused damage to the door frame of the OH-58.

AH-1 Class E mishaps

G series - Fire light came on. IP allowed rotor rpm to build to about 342 during descending right turn. Failure of fire warning sensing element caused illumination of light.

S series - When IP applied left pedal, it moved about 1 inch and locked. Pedal then started moving left again. Thread in tail rotor servo was stripped.

Cargo helicopters

CH-47 Class D mishaps

A series - Flight engineer placed wheel chocks in aircraft. While raising the door, he noticed mic cord was binding. He pulled the cord, causing the chocks to move and become caught between the upper airframe structure and ramp door. Door and airframe structure were damaged.

C series - Approach to landing with external load was terminated at a hover. Blowing dust and sand caused crew to make go-around. About 40 feet above the ground, cargo hook opened and external load jettisoned. Suspect copilot inadvertently pressed cargo hook release switch.

CH-54 Class E mishaps

A series - AFCS and first-stage tail rotor servo caution lights came on. Utility hydraulic pressure gauge fluctuated between zero and normal. Caused by ruptured utility hydraulic hose.

B series - Main rotor tachometer dropped to zero. Caused by failure of tachometer generator.

Observation helicopters

OH-58 Class D mishaps

C series - While making out-of-ground-effect hover, copilot saw a tank moving toward aircraft. Evasive maneuver resulted in overtorque of 105 to 110 percent for 2 to 3 seconds.

C series - During takeoff, copilot had pilot's map case on his lap. This restricted cyclic from moving aft. Aircraft rocked forward and aft. Lower wire cutter and stinger hit the ground. Wire cutter and vertical fin were damaged.

OH-58 Class E mishaps

A series - Aircraft was on reconnaissance mission in support of a

ground unit. As pilot was transitioning from NOE to contour flight, right lower plexiglass hit ground vehicle antenna. Pilot was flying too low over the ground unit. NOE climb up slope caused pilot to misjudge the height of the vehicle.

C series - Smoke was seen coming from behind instrument panel during engine start. Caused by burned resistor.

A series - Master caution and generator lights came on. Caused by sheared starter generator shaft.

A series - N1 would not reach 15 percent during attempted start. Pilot did not allow battery to recharge after several short flights.

C series - As aircraft was being picked up to a hover from a slope landing, noise was heard and aircraft banked right. Skid had caught under branch of cedar tree, restricting movement of aircraft.

Fixed wing

OV-1 Class D mishap

D series - During flight, pilot noticed that No. 1 engine inboard cowling door was missing. Inspection of the remaining cowling on engine revealed that forward stud portion of cowl latching system failed, allowing cowling to be torn away by the slipstream.

U-21 Class E mishap

A series - Fuel was seen siphoning from fuel cap after takeoff. Cap was not installed correctly.

U-8 Class E mishap

F series - During letdown from 4,000 feet to 2,000 feet, pilot noticed that manifold pressure would not respond to a reduction in throttle. Engine ran rough during taxi after landing. Caused by failure of No. 8 cylinder induction air pipe of No. 1 engine.

Maintenance

UH-1 Class E mishap

H series - Master caution and hydraulic lights came on. Pilot felt surges in cyclic and collective and heard grinding noise from hydraulic pump. Running landing was made. Incorrect installation of metal hydraulic tubing caused fatigue failure.

AH-1 Class D mishap

G series - Master caution light flickered several times. After aircraft was landed, master caution and 90-degree gearbox chip detector lights came on. Chip detector plug was found dangling from the wire. Ninety-degree gearbox had been drained and flushed the day before. Hole was also found in tail rotor blade. Screw was missing from tail rotor fairing. Fairing had been removed during gearbox flush.

CH-47 Class D mishap

C series - Shortly after takeoff, copilot's jettisonable door came off. Lower latch was out of adjustment, resulting in latch not being centered in latch plate detent.

OV-1 Class E mishaps

D series - Pilot detected unusual vibration during flight. Caused by loose HF antenna connector.

D series - Nose gear would not retract after takeoff. Gear door linkage was out of adjustment.

Safety messages

• Safety-of-flight technical message concerning one-time inspection of CH-54B main gearbox chip detector assembly for correct installation (CH-54B-85-03, 212330Z May 85). Summary: During a recent CH-53D main gearbox overhaul teardown, it was found that the sump chip detector was installed incorrectly. The rotation of the screened outlet port of the detector relative to the mounting flange hole pattern was found to be backwards. This could result in chips not being detected, with potential loss of oil pressure resulting in a possible failure of the main gearbox. Since the design of the CH-54B main gearbox chip detector is basically identical to that of the CH-53D, it is mandatory that an inspection for proper orientation of the main gearbox sump chip detector be performed before further flight. Contact: Bob High, AUTOVON 693-1597, commercial 314-263-1597.

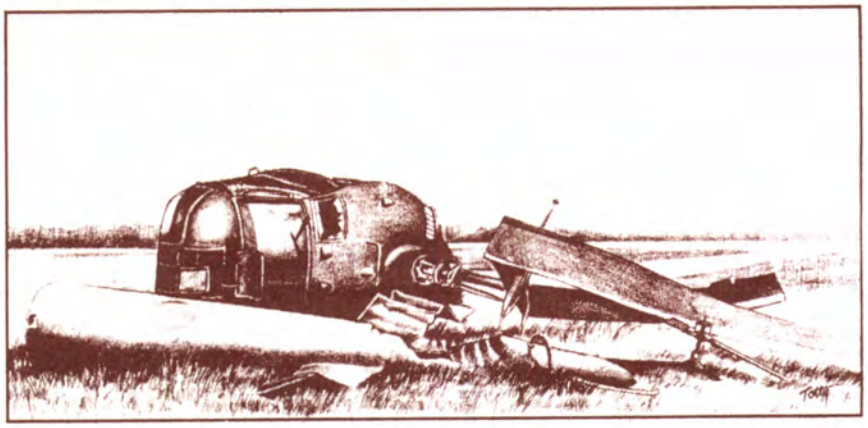
For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	1-5 June	**0**	**0**
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**36**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Accident review



combined with the center of gravity which was computed at 131.1, may have added to the copilot's difficulty in stopping the aircraft at a hover. However, the copilot had flown the UH-1 during flight school and throughout his flight periods with his seat in that position. He did not hit the stop any other time during the mission.

The pilot had overall responsibility for the safe operation of the aircraft in accordance with AR 95-1 and the unit standing operating procedures. He did not take timely actions when the copilot was having difficulty hovering the aircraft. He indicated that he was about to tell the copilot to set the aircraft down, but at that time the copilot applied excessive collective pitch.

At the peak of the unusual attitude at about 50 feet, the pilot got on the cyclic controls and momentarily stabilized the aircraft. He did not apply any control action to the pedals or collective, nor did he announce that he had the controls. The pilot said he did not want to provide false feedback to the copilot and got off the cyclic controls to allow the copilot to control the aircraft.

Witnesses said the aircraft seemed to stabilize momentarily and then entered a severe nose-low attitude. This would correspond with the time at which the pilot got off the cyclic control and the copilot overcontrolled the aircraft, causing it to enter the nose-low attitude.

The pilot should have taken control of the aircraft during the unusual attitude. He thought the copilot could handle the aircraft in the hover and in the unusual attitude situation. He was reluctant to take the controls because he was not an IP and was not used to flying with inexperienced pilots where taking the controls might be required. His previous years of flying had been with individuals with a great deal of experience, and he had not previously encountered a situation which required him to take the controls. ■

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Aircraft accident review

Huey hits wire over river

Synopsis

A UH-1H was on final approach to a tactical landing zone. About 200 feet above the ground, the helicopter hit a wire. Control was lost, and the aircraft crashed.

History of flight

Four aircraft were providing air lift support during a tactical exercise. Three stopovers had been made. A fuel tanker was supposed to meet the flight at a fourth stopover point. When the aircraft arrived at the field site, the fuel tanker was not there.

One of the UH-1s had more fuel remaining than the others because it was equipped with an auxiliary fuel cell. The pilot of this aircraft decided to fly down a road to try to find the tanker and lead it to the site. After flying south for about 5 miles, the crew reduced their altitude to 200 to 300 feet because of aircraft in the area above them. The return route to the field site was over a river, allowing the crew to see the road east of the river.

About 1 mile from the intended touchdown point, while on final approach to the field site, the Huey hit a single strand of copper wire which severed both cyclic push-pull control tubes. During descent, the main rotor blade hit the tail boom. The helicopter crashed about one-half mile from where it hit the wire. The crew chief sustained major injuries, and the pilot and copilot sustained minor injuries.

Crew experience

The 37-year-old pilot had more than 4,400 rotary wing flight hours, with 2,800 in the UH-1H. The 31-year-old copilot had more than 400 rotary wing flight hours, with more than 350 in the UH-1H.

Commentary

The helicopter hit the lowest of five wires crossing the flight path. The aircraft hit the wire above the wire strike protection system and below the main rotor blades. The wires were extremely difficult to see and inadequately marked. They stretched across a river and were attached to a set of wooden poles in the trees on a hillside about 200 feet above the river. The wires were marked with two small panels located in the center of the wires and to the left side of the wires along the approach path. The wire strike was on the right side where there was no marker. The wires and the panels blended into the surrounding terrain and were not visible to the crew.

The pilot was not using a map that was updated with wire hazards in the area of operation. The unit operations

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 24-30 May

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Utility helicopters

UH-1 Class E mishaps

H series - Force trim failed during hover, followed by excessive right lateral cyclic pressures. Caused by failure of left lateral cyclic cylinder.

H series - Cyclic control binding in all quadrants during flight was caused by failure of magnetic brake.

H series - Engine oil temperature rose to 99 degrees with FAT at 26 degrees. Caused by defective oil temperature thermostat valve.

H series - Engine oil pressure fluctuated excessively during hover. Caused by defective pressure relief valve.

H series - Main generator light came on. Caused by defective voltage regulator.

Attack helicopters

AH-1 Class A mishap

S series - Aircraft, participating in field training exercise, descended into trees. Suspect engine failure. 8543

AH-1 Class E mishap

S series - Engine oil temperature rose to 100° C., and engine oil pressure fluctuated between 70 and 90 psi. Inspection revealed that turbine oil cooler fan shaft had broken and bearings had disintegrated.

AH-64 Class E mishap

A series - Velocity vector, acceleration cue, and horizon gave false information during night flight. Caused by failure of heading and attitude reference system.

Cargo helicopters

CH-47 Class E mishaps

B series - No. 2 engine egt rose to 830 degrees during start. Caused by malfunction of fuel control.

C series - APU started smoking during hot refueling process. APU engine oil was dripping into air intake. Caused by failure of internal seal on accessory gearbox.

A series - No. 1 engine went to 10 percent during start and utility pressure went to zero. Caused by failure of utility hydraulic pump.

Observation helicopters

OH-6 Class E mishap

A series - Loud popping noise was heard and aircraft vibrated while hovering at end of runway. Pieces of plastic lunch bag were found on two main rotor blades.

OH-58 Class E mishaps

A series - Master caution and hydraulic lights came on, and pilot felt feedback in controls. Caused by failure of hydraulic pump.

C series - Rotor rpm increased to 112 percent for 1 second during descending left turn. Suspect strong winds. Left turn into the wind could have contributed to increase in rotor rpm.

Fixed wing

OV-1 Class E mishap

D series - No. 1 engine oil temperature climbed to 130° C. Caused by malfunction of VIDS power box and No. 1 engine temperature probe.

C-12 Class E mishaps

D series - No. 2 engine tgt fluctuated and stabilized at 200° C. with engine at idle. Caused by broken tgt wiring harness.

D series - No. 1 engine torque and fuel flow indicators went to zero during flight. Caused by blown 3-amp fuse.

U-21 Class E mishaps

F series - No. 2 engine oil pressure fluctuated between 50 and 65 psi, and torque fluctuated between 1200 and 1450 psi during takeoff. Caused by failure of No. 2 bearing.

J series - Master caution and right bleed air fail lights came on during climb. Caused by small hole in bleed air detection line.

Maintenance

U-21 Class E mishap

A series - Fuel was seen siphoning from left main tank during takeoff. Fuel cap had been adjusted by maintenance before the flight because it was too tight. Adjustment was made too loose.

Safety messages

• Safety-of-flight maintenance mandatory message concerning change in allowable rotor head operating time on CH-47 helicopters with fiberglass rotor blades (CH-47-85-03, 231835Z May 85). Summary: Recent calculations show that pitch shaft fatigue life is much less than initially determined on the CH-47D and somewhat less on the CH-47C with fiberglass rotor blades. Message reduces the TBO on specified CH-47D rotor heads and requires annotation of DA forms for rotor heads on CH-47C helicopters with fiberglass rotor blades. Contact: C. Caesar, AUTOVON 693-2106, commercial 314-263-2106.

• Safety-of-flight maintenance mandatory message on CH-47D short-term storage procedures (CH-47D-85-04, 231835Z May 85). Summary: A recent grounding message caused concern regarding preservation of the

CH-47D helicopter. Information in this message may conflict with technical manuals in some areas. Contact: N. Huston, AUTOVON 693-1415, commercial 314-263-1415.

• Safety-of-flight technical message concerning one-time inspection of flare dispensing switches in CH-47C helicopters with M-130 installation (CH-47-85-05, 302300Z May 85). Summary: This message requires an inspection of CH-47C cyclic control sticks to ensure only normally open switches are used with the M-130 system. Contact: Bob Clark, AUTOVON 693-1597, commercial 314-263-1597.

• Safety-of-flight maintenance mandatory message concerning records inspection of UH-60 main rotor shaft (UH-60A-85-14, 021400Z Jun 85). Summary: Main rotor shafts, P/N 70351-08131-044, -045 or -046, presently have a retirement life of 2,400 hours and are replaced at depot level during the 2,400-hour overhaul cycle of the main transmission. The 2,400-hour retirement life of the main rotor shaft is currently under review for possible realignment to a new retirement schedule. The purpose of this message is to identify all main rotor shafts with these part numbers and report them to AVSCOM. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

• Safety-of-flight maintenance mandatory message concerning records inspection of UH-60 main rotor hub (UH-60A-85-15, 021600Z Jun 85). Summary: Main rotor hubs, P/N 70103-08112-041 or -043, presently have a retirement life of 4,400 hours. The 4,400-hour retirement life of the main rotor hub is currently under review for possible realignment to a new retirement schedule. The purpose of this message is to obtain data on all main rotor hubs with these part numbers. The data will be used in support of the ungrounding effort. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	1-12 June	**0**	**0**
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**36**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

U.S. ARMY

AVIATION STANDARDIZATION

Mini STACOM

FAA certification

Is a Department of the Army civilian (DAC) flight instructor required to maintain a current FAA flight instructor rating to fly as an IP in an Army aircraft?

AR 95-1, paragraph 1-8a(2), authorizes civilian employees of government agencies and government contractors who have **appropriate certifications or ratings** to fly Army aircraft. Chapter 3 of AR 95-1 lists the training necessary to be rated in Army aircraft and the currency requirements. The glossary defines a DA civilian pilot (aviator) as "a civil service employee who holds appropriate qualification and who must comply with DA aviation related regulations." FAR, Part 1, defines a public aircraft as an "aircraft used only in the service of the government." It also defines civil aircraft as an "aircraft other than public aircraft." Pilot certification requirements of FAR, Part 61.3, relate only to civil aircraft and not to public aircraft. Therefore, a DAC flight instructor may fly an Army aircraft per provisions of AR 95-1 and does not need FAA certificates.

Civil service hiring standards require FAA certificates in order for an individual to be hired initially as a flight instructor. Once hired, FAA certification is no longer required. An effort is being made to change the civil service hiring standards to permit the Army to hire flight instructors based on military ratings as an alternative to FAA certificates.

Since there is no requirement for renewing FAA certification, U.S. Army funds should not be spent to send DAC flight instructors to FAA refresher training designed for renewing civilian ratings. ■

Accident review

officer had received a 1:100,000 scale overlay of the hazards in the area of operation before the unit deployed to the country for a large training exercise. He posted the overlay, which consisted of onionskin paper annotated with tick marks for aligning with a 1:100,000 scale map, in unit operations without a corresponding map of the country in which they were operating. Therefore, the aviators were unable to post the hazards on their 1:50,000 scale map because they could not determine coordinates of the hazards with only a blank onionskin overlay. The unit safety officer was aware of the situation but did nothing to correct the problem and ensure that hazards were posted.

The operations officer had no procedures to ensure that information concerning hazards was disseminated to all personnel. The pilot of this aircraft had been on leave before the unit left its home station, and he had departed with an advance party shortly after returning from leave. After arriving in country, he and the copilot were located 5 miles from unit operations and were not aware of the hazards overlay.

The fact that the pilot was not exposed to the hazards overlay at unit operations did not relieve him of the responsibility of obtaining such information. He could have asked if the unit had a hazards overlay, or he could have used other sources of information, such as other airfields that he flew out of that did have hazard maps posted. The pilot was very confident in his ability to identify and avoid hazards.

Interviews with numerous personnel in the unit revealed that the unit commander had continuously stressed hazard avoidance and the need for safe operating procedures. However, the emphasis among individual aviators was on visually identifying hazards—not on use of an updated hazards map. This may have been the result of the difficulty encountered in trying to post maps and the numerous hazards located in the training area. Many of the aviators felt that the posting of hazards was an unmanageable task because of the large number of wires located in the area.

Although it did not contribute to the accident, the helicopter was being flown with an inoperable locking device on the auxiliary fuel tank cap. The cap was held in place with green tape, which was found to be loose after the accident. This seriously jeopardized the integrity of the crashworthy fuel system which could have resulted in more serious injuries. The crew's reluctance to record this as a red X condition was the result of excessive motivation to complete the assigned mission. ■

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Report of Army Aircraft Mishaps

Followups

Additional information on mishap briefs previously published

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Utility helicopters

UH-1 Class A mishap in 17 Oct 84 issue (8501) □ Aircraft, en route to its home base at night, entered known and forecast instrument meteorological conditions. While trying to maintain VFR flight, the crew descended to an altitude below 200 feet agl. The aircraft hit the top cable of a powerline extending across a highway and crashed on the shoulder of the highway. It is suspected the pilot allowed a sense of urgency to influence his decision to attempt flight into forecast instrument meteorological conditions. The aviation unit commander, who was on board as a passenger logging copilot time, allowed the flight to continue into rapidly deteriorating weather.

UH-1 Class A mishap in 28 Nov 84 issue (8508) □ While aircraft was on a night cross-country flight, the engine stopped as a result of fuel exhaustion. The UH-1 landed hard 200 meters from the approach end of a runway. At engine failure, the fuel quantity gauge indicated 140 pounds of fuel remaining, and in-flight fuel consumption calculations called for fuel burn-out 23 minutes later than it actually occurred. These errors were caused by an improperly adjusted fuel quantity gauge and two out-of-tolerance fuel transmitters. The crew did not calculate their ground speed and estimated time en route in forecast adverse wind conditions, and they continued flight beyond the "point of no return."

UH-1 Class A mishap in 9 Jan 85 issue (8510) □ The aircraft was on a troop insertion mission. The pilot, while making a left turn with a bank angle of 40 degrees, did not add power to maintain obstacle clearance. He was flying 10 to 20 feet above the trees and at airspeeds of 70 to 80 knots. The aircraft descended into the trees and was destroyed on impact with the ground. The pilot's actions were a result of inadequate attention resulting from heavy task loading and overconfidence in his ability to perform all contour flight duties without assistance from the copilot.

8508

UH-60 Class B mishap in 14 Nov 84 issue (8504) □ Aircraft was on night tactical support mission, transporting a jeep as a slingload. Pilot was wearing night vision goggles. While flying about 185 feet above the ground, aircraft entered dense fog. As the slingload and the aircraft descended into trees, the crew chief immediately jettisoned the slingload. The pilot used vertical helicopter instrument recovery procedures, climbed out of the trees and above the fog bank, and flew to an airfield.

Attack helicopters

AH-1 Class A mishap in 9 Jan 85 issue (8511) □ Aircraft hit wires as pilot was flying 100 feet above the ground, trying to maintain visual flight at night in deteriorating weather conditions. Control was lost and the aircraft crashed. The crew did not properly plan the flight, obtain a weather briefing, file a flight plan, or maintain the required minimum altitude above the ground.

Cargo helicopters

CH-47 Class A mishap in 17 Oct 84 issue (8502) □ Aircraft was transporting troops to an LZ on a mountain ridgeline. The IP selected a landing site in a drainage area descending from the ridgeline. He evaluated the area while at a hover and selected a site requiring a downslope landing. The IP calculated the slope to be too steep to place all

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 31 May-6 June

Utility helicopters

UH-1 Class E mishaps

H series - Fuel quantity indicator dropped from 1,000 pounds to zero in 30 minutes. Caused by defective indicator.

H series - Engine oil temperature rose during flight. Air inlet screen was partially clogged with grass.

H series - Binding in pedals during hover was caused by failure of tail rotor servo.

H series - Master caution light came on. Caused by failure of 42-degree gearbox.

H series - Compressor stalls occurred during power application to slow descent. Red flashes were seen, aircraft yawed left, and five loud bangs were heard. Three bolts that secure first power turbine nozzle assembly failed to hold torque.

H series - Transmission oil hot light came on. Caused by broken wire to transmitter.

H series - Swishing noise was heard during landing. Main rotor blade skin had separated on the underside.

H series - Binding was noted in cyclic control. Caused by defective right lateral servo valve.

Attack helicopters

AH-1 Class D mishap

S series - As aircraft was being flown at NOE altitude, copilot noticed debris blowing up from the ground. Postflight inspection revealed damage to both main rotor blades.

AH-1 Class E mishaps

S series - Transmission oil pressure light came on, and oil pressure dropped. Caused by failure of seal.

S series - As aircraft was accelerating through 90 knots during NOE training flight, it was engaged by MILES equipment. Pilot began an evasive left turn, and torque rose to 59 psi.

S series - Aircraft entered downwind condition at low airspeed and 25 feet agl and immediately settled to the ground. Left skid hit the ground, but no damage occurred. Crew was briefed at field site on winds of 10 knots gusting to 15 knots. Crew was not informed of MET Watch in effect for gusts up to 50 knots.

AH-64 Class E mishaps

A series - Master caution and oil low utility hydraulic lights came on. Caused by failure of pressure switch.

A series - As aircraft came around a bend in a mountain pass, it met a flock of birds. Pilot took evasive action, but three or four birds hit the aircraft.

Cargo helicopters

CH-47 Class C mishap

C series - Rescue hoist malfunctioned while two soldiers were being lowered to the ground. When crewmembers left their clearing stations to help with the winch, aft rotor blades hit a dead tree.

CH-47 Class D mishap

C series - Aircraft was slingloading a howitzer. Crew chief released the howitzer before it was in a stable position on the ground. Howitzer rolled onto left side.

CH-47 Class E mishaps

C series - No. 2 engine oil pressure rose during flight. Caused by failure of oil pressure transducer.

C series - No. 1 engine torque split and rotor rpm dropped. Caused by failure of voltage regulator.

Observation helicopters

OH-58 Class D mishap

A series - Pilot landed into the wind to a 4-foot hover. While pilot was hovering forward and looking for a suitable landing area, aircraft began an uncommanded descent. Vertical fin hit a sand mound. Leading edge of fin was dented. Pilot applied insufficient collective to stop uncommanded descent.

OH-58 Class E mishaps

A series - TOT registered high when aircraft was picked up to hover during maintenance test flight. Loud bang was heard from engine compartment, and TOT rose above 1,000° C. Small metal particles were found over entire engine compartment. No external damage to engine was found.

C series - Aircraft was flying at 250 feet agl when it hit a small bird. Pilots were wearing night vision goggles and did not see the bird.

C series - OH-58 crew, flying down a valley, saw some Cobras coming toward them. Copilot, who was on the controls, broke left and lowered collective. Aircraft began to settle toward trees. Copilot increased torque to 115 percent for 1 second. Pilot was navigating and was unable to react until overtorque occurred.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
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4th Qtr	July	2	3			
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	September	4	3			
	Total for Year	39	35*	Total to Date	**37**	**27**

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Fixed wing

C-12 Class D mishap

A series - As aircraft was landing, a bird flew up from the runway and hit the bottom of the aircraft, breaking ADF antenna.

OV-1 Class E mishap

D series - Nose gear would not retract after takeoff. Caused by failure of nose gear sequence valve.

U-21 Class E mishap

A series Pilot saw smoke coming from No. 1 engine cowling during post-flight. Wiring bundle had contacted inboard exhaust stack and scorched electrical wire protective sleeve.

Maintenance

UH-1 Class E mishap

H series - Master caution light came on. Caused by loose cannon plug.

OH-58 Class D mishap

A series - Pilot heard loud squealing sound during landing, and hydraulic light came on. Maintenance personnel misrouted hydraulic line, and it failed due to chafing.

Safety messages

- Safety-of-flight maintenance mandatory message concerning correction to one-time records inspection of UH-60 main rotor hub (UH-60A-85-16, 042120Z Jun 85). Summary: This message changes the sentence in paragraph 10b(5) of safety-of-flight message UH-60A-85-15 to read: "Main rotor hub time since new." Contact Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Followups

8502

four wheels on the ground but sufficient to place the aft wheels and still provide clearance for the aft rotor system. The IP did not recognize the degree of actual slope and the increase of the relative angle, and the aft rotor hit the ground. The aircraft slid down a ravine, rolled over, and came to rest on its left side. The IP did not communicate to the crew the hazards identified in the landing zone. The principal hazard was upsloping terrain to the rear as opposed to obstructions underneath the aircraft. With the instructions received from the cockpit, the crew chief in the rear of the aircraft concentrated on clearing the aft wheels instead of the aft blades.

Observation helicopters

OH-58 Class A mishap in 9 Jan 85 issue (8512) ☐ Pilot, flying alone and using night vision goggles, was unable to orient himself on the desired route, change radio frequencies, receive weather information, and provide for terrain clearance during darkness with deteriorating weather conditions. The aircraft crashed on a 40-degree slope of a mountain, 377 feet from the top, killing the pilot.

Fixed wing

U-21 Class B mishap in 14 Nov 84 issue (8505) ☐ As the aircraft was well into the takeoff roll, several deer ran onto the runway directly into the path of the aircraft. The aircraft hit one of the deer, causing the nose wheel gear assembly to collapse. The left and right propeller blades hit the runway, and the U-21 slid down the runway on its nose section, stopping 1,400 feet from the point of impact. No one anticipated the deer were near the runway, and it was too dark to see the deer without illumination. There were no procedures established at the airfield to alert aircrews that deer might be on or around the runway.

U-21 Class A mishap in 9 Jan 85 issue (8513) ☐ Pilot allowed aircraft to descend below the published decision height while attempting a missed approach at night in weather conditions well below the minimums published for the landing runway. The U-21 crashed in trees, killing all four people on board. It is suspected that inadequate division of attention contributed to the accident. Although the pilot was timely advised the aircraft had reached the authorized decision height altitude by the GCA controller, it is apparent the pilot failed to properly interpret and respond to the aircraft flight instruments at the decision height altitude to prevent further descent. Because inadequate attention and improper control response at decision height altitude are manifestations of a lack of proficiency, it is suspected the pilot erred due to inadequate unit training and a lack of training facilities.

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Aircraft accident review

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Engine failure caused by corrosion

Synopsis

A UH-1M was on a test flight. The engine malfunctioned during attempted power recovery from an autorotation. Aircraft vibrations generated by the attempted power recovery and resultant changes in aircraft attitude, along with reduced rotor rpm, caused the engine cowling to separate from the aircraft. A section of the cowling severed a rigid connecting link, resulting in loss of control. The aircraft entered a left descending turn and crashed.

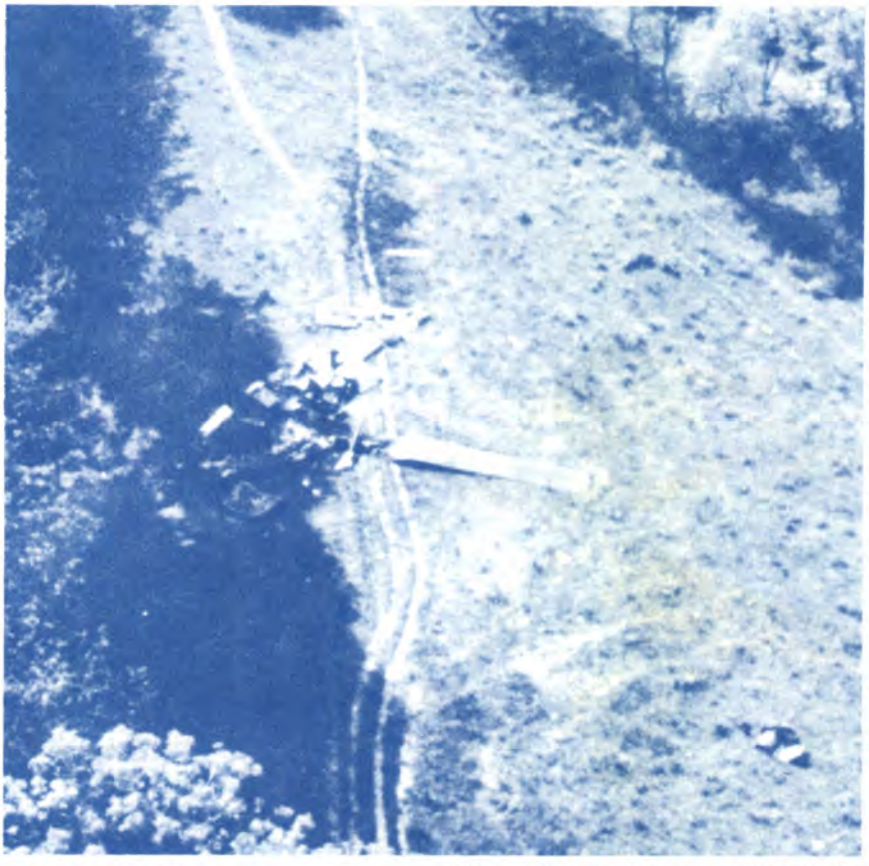
History of flight

A UH-1M was scheduled for a test flight. The test pilot and a mechanic flew to the test flight area. The pilot made one large orbit of the test flight area at altitude and entered autorotation to check autorotative rpm settings which was a required part of the test flight. During the attempted power recovery, the engine malfunctioned. The change in aircraft attitudes and reduction in rotor rpm during the attempted recovery caused sufficient airframe vibrations to dislodge the engine cowling. The cowling separated from the aircraft at an altitude of 200 feet above the ground. A section of the cowling severed one of the rigid connecting links, causing loss of control.

The UH-1 entered a tight left descending turn and crashed on its left side. A postcrash fire consumed most of the aircraft. The two occupants were killed on impact.

Crew experience

The 36-year-old test pilot had more than 3,000 rotary wing flight hours, with more than 1,500 in the UH-1 and almost 200 in the UH-1M.



Commentary

The aircraft was received by the unit about 14 months before the accident as a UH-1C approaching a phase inspection. The decision was made to perform the phase inspection and convert the aircraft to a UH-1M simultaneously. A T53-L13 engine was ordered and received for the aircraft.

At the same time, another UH-1M was having engine oil sample problems which the unit had been unable to correct. Because this aircraft was needed for training purposes, the decision was made to put the new T53-L13 engine in this aircraft and to request depot on-site repair of the other engine. Following repair, the old engine was installed in the mishap aircraft, which was then maintained in a nonflyable status for about 12 months. During this period, the engine was not operated nor properly serviced for storage. This was of particular concern in view of repeated requests by the depot that the engine be operationally checked and in view of the engine's poor oil sample history.

Two previous attempts to test fly the aircraft were terminated because of

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 7-13 June

Utility helicopters

UH-1 Class D mishap

H series - Aircraft encountered light turbulence while flying over mountains. Crew heard loud bangs from left rear of aircraft and landed. Ammo box cover, which was retained by a safety cable, had broken loose and hit aft cargo door window, breaking plexiglass and damaging frame. Several more ammo box covers were loose. Units are not drilling holes through the forward latch of the ammo cans and inserting a locking pin.

UH-1 Class E mishaps

H series - Transmission oil pressure fluctuated and then dropped to zero. Caused by failure of O-ring.

H series - Engine oil temperature rose to 120° C. Caused by failure of thermostat flow control.

H series - Start was attempted with main rotor blades tied. Start was aborted with no limitations exceeded.

H series - Egt rose to 640° C. during takeoff. Engine was changed because of FOD indications on compressor blades.

H series - Master caution light came on. Caused by corroded cannon plug on hydraulic pressure switch.

Attack helicopters

AH-1 Class D mishaps

S series - Crew heard unusual noise during runup. Inspection revealed holes in tail rotor blades. Main rotor tiedown was not removed before start.

G series - Aircraft developed binding in lateral cyclic approximately 20 minutes into flight. SCAS was disengaged, but binding continued. ECU temperature sensor failed to limit low side temperature. The resulting ice buildup on flapper valve in diffuser duct under pilot's cyclic stick caused binding in lateral control tube. Duct was pushed up against control tube.

S series - Rotor oversped during deceleration of autorotation. Caused by poor trim control.

AH-1 Class E mishap

S series - Roll SCAS light would not go out during runup. Caused by malfunction of roll channel SCAS.

AH-64 Class E mishap

A series - Air flow from ENCU stopped during approach for landing. Postflight inspection revealed pressurized air system PAS line to starter regulator had come loose.

Cargo helicopters

CH-47 Class B mishap

B series - As aircraft was on training mission, crew noticed a thunderstorm approaching from the west. Aircraft returned to airfield. During shutdown, high winds caught the slow-turning aft rotor blades and caused them to flex down into the fuselage. The droop stops had engaged. All three rotor blades were destroyed. The fuselage was damaged at the mid-cabin point. Airfield tower and base operations had closed before the aircraft left on the training flight. A toll-free number which was available for receiving weather was not used. 8544

CH-47 Class C mishap

B series - Aft rotor blades hit tree during NOE training flight. Blades were damaged.

Observation helicopters

OH-6 Class E mishap

A series - Pilot accidentally rolled throttle slightly beyond the off position during start procedure. IP noticed rapid increase in N1. When he looked at TOT gauge, it was passing through 927 degrees. Pilot called for emergency shutdown. TOT reached 980 degrees. Hot end inspection revealed no damage to engine.

OH-58 Class C mishap

A series - IP gave pilot simulated forced landing with throttle reduction. Pilot established autorotational glide. Full throttle was applied. Pilot began bringing in power about 50 feet with aircraft in deceleration. About 20 feet agl, crew heard low rotor audio. Aircraft landed hard, damaging fuselage, cross tubes, main rotor hub, and forward transmission cowling.

OH-58 Class E mishap

A series - N2 fluctuated, loud popping sound was heard, and aircraft vibrated. Caused by failure of bleed valve assembly.

Fixed wing

OV-1 Class E mishaps

D series - Left engine fire warning light came on. Caused by failure of fire warning control unit.

D series - Left main landing gear indicator showed down when gear handle was in "up" position. Caused by faulty pressure switch.

D series - Pilot received No. 1 engine hydraulic indication of zero pressure. Landing gear was extended by using pressure from No. 2 engine hydraulic

pump. Caused by failure of No. 1 engine hydraulic pump.

UV-18 Class E mishap

A series - No. 1 engine oil pressure gauge fluctuated between 40 and 80 psi, followed by loss of torque pressure and illumination of oil pressure caution light. Single-engine landing was made. Chip detector plug had sheared at the engine case.

C-7 Class E mishap

A series - Left engine hydraulic pump light came on. Caused by failure of hydraulic pump.

Maintenance

UH-1 Class E mishap

H series - Mechanic opened right engine cowl for bleed band actuator check. Mechanic then entered aircraft and closed cargo door. Test pilot took off and was approximately 25 feet in the air when he was advised by radio that cowl was still open. Aircraft was landed immediately with no damage.

OH-58 Class E mishap

A series - Aircraft yawed left and pedal control inputs were not effective. Running landing was made. Inspection revealed that bolt holding bellcrank was not the right one. It did not have a safety and it was too short. Inspection of other OH-58 aircraft in the unit revealed one other aircraft with the incorrect bolt.

Safety messages

• Safety-of-flight technical message concerning UH-60 engine output shaft recurring inspections and vibration limits (UH-60A-85-17, 081600Z Jun 85). Summary: Investigation has indicated that engine output shaft problems are caused by shaft assembly imbalances that produce vibrations and that shaft failures can be greatly reduced by using shafts with lower vibration levels. With this message, shafts and input module flanges with vibration levels of greater than 1.3 inches per second will be purged. Contact: Ron Branson, AUTOVON 693-1683, commercial 314-263-1683.

• Safety-of-flight technical message concerning requirements for un-grounding the Black Hawk (UH-60A-85-18, 101501Z Jun 85). Summary: This message provides detailed inspection and modification procedures which, when complied with, will return the UH-60 series aircraft to operational flight status. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

• Safety-of-flight technical message concerning one-time inspection of the C-12 for installation of stall strips (C-12-85-01, 101400Z Jun 85). Summary: Some aircraft do not have the required stall strips installed. Aircraft without stall strips will not be used for training or slow flight maneuvers. Stall strips must be installed not later than 25 flying hours or 15 calendar days after receipt of this message. Contact: Gary Johnston, AUTOVON 693-1639, commercial 314-263-1639.

• Safety-of-flight technical message concerning one-time inspection of the U-8 for installation of stall strips (U-8-85-02, 101405Z Jun 85). Summary: Same as C-12-85-01 message above. Contact: Gary Johnston, AUTOVON 693-1639, commercial 314-263-1639.

• Safety-of-flight technical message concerning one-time inspection of the T-42 for installation of stall strips (T-42-85-01, 101410Z Jun 85). Summary: Same as C-12-85-01 message above. Contact: Gary Johnston, AUTOVON 693-1639, commercial 314-263-1639.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	1-26 June	**1**	**0**
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**37**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Accident review

weather or maintenance problems. According to the test flight log found in the wreckage, a complete test flight was to be conducted during the mishap flight. The last entry on the log was in the margin and was turbine engine analysis check data. The next logical check, not in numerical order, in the sequence would have been autorotative rotor rpm. It was determined that this check was performed. However, during power recovery, an engine malfunction caused the pilot to reenter autorotation. This low power available situation is attributed to engine impeller housing damage found during depot analysis. This damage was the result of the installation of an improper shim and No. 1 bearing failure which allowed the impeller to shift forward and contact the housing.

The increased demand for power had two catastrophic effects: (1) It caused complete failure of the No. 1 bearing which resulted in engine failure, and (2) it increased main rotor blade angle of attack sufficiently to cause rapid rpm deterioration following engine failure. The ultimate result of these two effects was severe vibration, in-flight breakup, and loss of control.

Depot analysis revealed that failure of the No. 1 bearing resulted from corrosion caused by incorrect maintenance. The engine was incorrectly preserved for storage. This situation existed for about a year.

Spare parts cannibalization in the unit was not properly controlled. Cannibalization was often accomplished before any of the required paperwork was completed. Work would be completed before approval for the action was obtained, and, in some instances, records were nonexistent.

The maintenance supervisor made cannibalization decisions in an attempt to maintain the highest possible operational readiness rate without consulting the commander. While this problem could have been a spinoff of the overall poor recordkeeping, it is felt that the commander's involvement in a cannibalization program is the single most important element in preventing "hangar queens." The unit's standing operating procedures concerning cannibalization were adequate and would have solved the problem had the procedures been properly implemented.

Although not contributing to this accident, maintenance actions were not properly documented on the maintenance records. In some instances, DA Forms 2408-13 did not reflect required inspections or maintenance operational checks. Other entries were confusing or illegible. Continued poor recordkeeping of this nature could result in a nonflyable aircraft being considered airworthy. ■

U.S. ARMY SAFETY CENTER

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Terence M. Henry
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Report of Army Aircraft Mishaps

Aircraft accident review

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Cobra hits wires along highway at night

Synopsis

The AH-1G hit wires as the pilot was flying 100 feet above the ground, trying to maintain visual flight at night in deteriorating weather conditions. Control was lost and the aircraft crashed.

History of flight

A local college requested an aircraft for a static display for the college's homecoming activities. The crew was selected, and the pilot was given three briefings on the mission by the operations officer. The pilot was briefed not only on the mission but also on safety aspects in accordance with a standard briefing format which the unit used. During the last briefing, on the day of the flight, the operations officer made a point of telling the pilot about the potential for bad weather and that an overnight stay was acceptable should the need arise.

The AH-1 left its home field about mid-morning and arrived at the college 1 hour later. The static display was uneventful, and the mission formally ended the middle of the afternoon. The crew remained at the college for 3½ more hours, participating in the festivities.

Leaving the college, the crew flew to an airport 5 minutes away, where they refueled. Because it was raining, the crew remained in the aircraft as it was being refueled. They did not get a weather briefing before this leg of the flight. During this period, the weather at the airport at which the aircraft was refueling went below VFR minimums with a measured ceiling of 900 feet broken and 5 miles in light rain and fog.

After cranking and hovering to the ramp for takeoff, the crew called for departure and was told of the weather conditions, which mandated a special VFR clearance. They obtained the special clearance and departed to the south. They remained below 600 feet agl to avoid a cloud cover and followed an interstate highway.

Twenty-seven minutes after taking off from the airport, the AH-1, flying about 100 feet agl, at an estimated airspeed of 100 to 120 knots, hit the top two strands of a transmission line crossing the interstate highway. Control was lost, and the helicopter crashed 780 meters from the point of the wire strike. The pilot and copilot were killed.

Crew experience

The 36-year-old pilot had more than 1,400 rotary wing flight hours, with more than 50 in the AH-1G. The 38-year-old copilot had almost 700 rotary wing flight hours, with more than 50 in the AH-1G.

Commentary

While the aircraft was being refueled, the crew did not get out of the aircraft,

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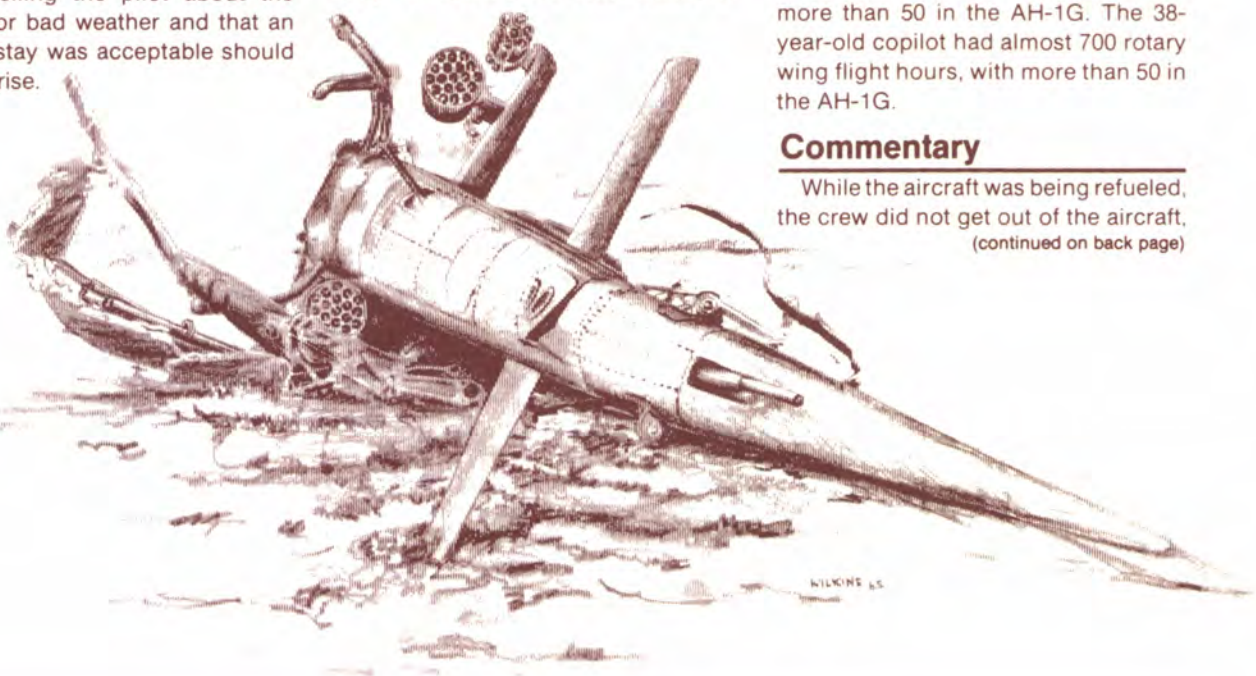

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 14-20 June

Utility helicopters

UH-1 Class A mishap

H series - Aircraft was on training mission. Engine low rpm audio and light activated during maximum performance takeoff from confined area. As IP took control, he saw that engine N2 and rotor rpm were decreasing. Aircraft descended into trees and crashed in a swampy area. The IP and three student pilots were injured. 8545

UH-1 Class E mishaps

H series - Master caution and hydraulic lights came on, and hydraulic control was lost. Caused by failure of irreversible valve O-ring.

H series - Transmission oil pressure dropped to zero. Caused by failure of oil pressure transmitter.

H series - Aircraft shuddered, N2 fluctuated, egt increased, and loud noise was heard. Caused by malfunction of fuel control.

H series - Engine oil temperature exceeded 93° C. for 10 minutes. Caused by failure of engine oil thermostat.

H series - N2 rpm dropped during takeoff. Caused by defective overspeed governor.

Attack helicopters

AH-1 Class D mishaps

S series - Engine failed during flight. Pilot entered autorotation. Cross tubes and skids were damaged during landing.

S series - All aspects of standard autorotation maneuver were normal down to the initial pitch application, which IP thought was too high. IP told rated student pilot to hold the remaining pitch for cushioning, but student pilot pulled all remaining pitch at 1 foot agl. Rotor rpm deteriorated, and aircraft landed hard, damaging push-pull tubes.

AH-1 Class E mishaps

S series - When throttle was advanced to full open, crew felt high-frequency vibration in airframe and controls. Caused by failure of oil cooler fan bearing.

S series - Crew heard whistling noise and felt vertical vibration. Caused by separation of leading edge rubber boot.

S series - Master caution and transmission oil bypass lights came on. Caused by failure of transmission oil bypass switch.

Cargo helicopters

CH-47 Class E mishap

C series - Loud bang was heard during runup. Hydraulic fluid sprayed from forward transmission area onto passenger in troop commander's seat. Inspection revealed failure of No. 1 flight boost transducer fitting.

CH-54 Class D mishap

A series - Jeep was being externally lifted to field location. Flight engineer failed to move aircraft away from load before releasing clevis assembly. Clevis shattered windshield.

Observation helicopters

OH-58 Class D mishaps

A series - Main rotor blade hit tree limb during NOE flight. IP failed to divide his attention between navigation and IP duties.

A series - Aircraft hit wire during

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	1-3 July	**0**	**0**
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**37**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

recon mission. Wire was cut by wire strike protection system.

OH-58 Class E mishaps

C series - Amperage gauge indicated 65 amps during approach and dropped to zero during shutdown. Caused by overheated battery.

C series - Pilot noted engine underspeed during NOE deceleration, followed by overspeed and another underspeed. Suspect failure of governor overspeed assembly.

Fixed wing

T-42 Class E mishap

A series - Flaps stuck down during slow flight. Caused by failure of flap motor.

C-12 Class E mishap

C series - Battery charge light came on when gear was retracted. Caused by failure of battery.

U-21 Class E mishaps

A series - Electric elevator trim clutch remained engaged during landing. Caused by failure of pitch trim servo.

A series - Flaps failed to extend during landing. Caused by failure of flap motor.

Maintenance

UH-1 Class E mishaps

H series - Loud noises were heard from engine during climb. Engine bleed bands were adjusted incorrectly, and forward engine oil bearing seal was leaking. Compressor was also dirty.

H series - Pilot was unable to decrease N2 rpm with governor switch on approach. Inspection revealed low oil in 42-degree gearbox. Gearbox cap was not secured correctly.

OH-58 Class E mishap

A series - N2 rpm bled off below 95 percent with constant power. Caused by loose double check valve line.

C-12 Class E mishap

C series - During climbout, copilot noticed left rear cowling bolt of No. 2 engine top cowling was loose, allowing part of cowling to lift up. Cam lock bolt

was out of adjustment and lock vibrated loose.

OV-1 Class E mishaps

D series - No. 2 propeller rpm indicated 1800 steady state during takeoff roll. Prop was underserviced.

D series - During climbout after takeoff, gear handle could not be positioned to full up because of binding. During three additional cycles, gear indicated up and down. Screw was found lodged at gear handle linkage, limiting gear handle travel.

Safety messages

• Safety-of-flight technical message concerning one-time inspection of the U-21 for installation of stall strips (U-21-85-01, 181300Z Jun 85). Summary: Some aircraft do not have the required stall strips installed. Aircraft without stall strips will not be used for training or slow flight maneuvers. Stall strips must be installed not later than 25 flying hours or 15 calendar days after receipt of this message. Contact: Gary Johnston, AUTOVON 693-1639, commercial 314-263-1639.

• Safety-of-flight maintenance mandatory message concerning CH-47D forward and aft transmission government/contractor team inspection and subsequent aircraft release for flight requirements (CH-47-85-06, 142000Z Jun 85). Summary: CH-47D aircraft have been grounded because of a recent mishap caused by failure of an aft transmission. The failure occurred when the bearing retainer bolt assembly disengaged from the second stage planetary carrier and lodged between the ring gear and the planet gears. A special flange on the bolt had been only partially engaged during assembly of the transmission, and it worked loose during operation. Government/contractor teams are performing a fiber optic borescope inspection of the forward and aft transmissions using contractor-furnished equipment. Contact: C. Caesar, AUTOVON 693-1597, commercial 314-263-1597.

• Safety-of-flight technical message concerning one-time inspection of CH-47B/C/D pitch link connecting bolts (CH-47-85-07, 180130Z Jun 85). Summary: Defective bolts are identified by FSCM 8U928 on the top of the bolt head. These bolts are not acceptable for use and will be removed from aircraft and stock. Contact: C. Caesar, AUTOVON 693-1597, commercial 314-263-1597.

• Safety-of-flight maintenance mandatory message concerning CH-47D ungrounding authorization requirements (CH-47-85-08, 182115Z Jun 85). Summary: To provide management visibility with respect to the fleet operational readiness status, a daily telephonic report to the logistical POC is required no later than 0800 hours central daylight saving time providing aircraft flight status by serial number. Logistical point of contact: Roy Western, AUTOVON 693-1415, commercial 314-263-1415.

• Safety-of-flight maintenance mandatory message concerning CH-54A rotor hub torque tube assembly bracket (CH-54-85-04, 182130Z Jun 85). Summary: Sikorsky and AVSCOM Engineering have determined that the bracket is fatigue susceptible and must be inspected. This message establishes the time limits and procedure for a one-time inspection. Contact: Bob High, AUTOVON 693-1597, commercial 314-263-1597.

• Maintenance information message concerning inspection of UH-1/AH-1 engine mount fitting (MIM-UH-1-85-MEM-05, MIM-AH-1-85-MEM-02, 201615Z Jun 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Accident review

did not obtain a weather briefing, and did not file a return flight plan with the flight service station as required by SOP. The crew also did not attempt to get a weather update by radio.

When the aircraft was started and takeoff permission was granted, the crew was told by tower personnel that the airfield was operating under IFR because of marginal weather conditions. This did not prompt the crew to get a current weather briefing. Instead, they requested a special VFR departure, which was granted.

After takeoff, the crew flew at an altitude of 600 feet agl because of the low cloud cover. A review of their flight path by radar showed that they flew over the interstate highway for the entire flight. It was concluded that this was done in an attempt to maintain visual contact with the highway for navigation in the deteriorating weather. Because of gradually rising terrain and deteriorating weather, the flight altitude steadily decreased to 100 feet.

After an evaluation of regulations and procedures, it was concluded that the crew failed to follow procedures outlined in the premission briefing as evidenced by initiation of the flight at a time when weather conditions were less than required for visual flight. The crew failed to follow regulations when they did not properly plan the flight, get a current weather briefing, file a flight plan, and maintain a specified minimum altitude above the ground. It was concluded that the crew was knowledgeable of the requirements, well trained, and experienced but decided to attempt the flight because they were in a hurry to get home.

Although it probably did not contribute to the accident, the pilot had taken an over-the-counter medicine containing an antihistamine within 12 hours of the crash. Effects of antihistamines include mild sedation, loss of alertness, and, possibly, slowed reaction time. AR 40-8, Temporary Flying Restrictions Due to Exogenous Factors, requires (1) crewmembers be restricted from flying duties until convalescence is completed, and (2) that the restriction will be for 24 hours (for antihistamines) after discontinued use or after side effects have subsided, whichever is longer.

The unit had a well organized and active safety program. Safety meetings were held monthly, and subject matter and attendance were well documented. The safety meeting held the month before this accident was attended by both of the AH-1G crewmembers killed in the crash. One of the topics discussed was the hazard of wire strikes while trying to maintain visual flight in IMC. ■

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Report of Army Aircraft Mishaps

Aircraft accident review

UH-1 descends into trees

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Synopsis

A UH-1H was on a troop insertion mission. As the pilot was making a left turn, the aircraft descended and the main rotor blades hit trees. The aircraft continued through the trees, hit the ground, bounced into the air, rolled left 360 degrees, and came to rest in a level attitude.

History of flight

The mission called for the aircraft to fly to a field site, pick up some troops, and carry them to another site. A unit IP was assigned as pilot-in-command for the mission. A copilot and crew chief were also assigned to the mission. The pilot briefed the mission to the copilot and crew chief, and they took off from the airfield.

Because the copilot was relatively new in the unit, the IP told him that they would not fly directly to the designated landing site but would fly a planned route of about 40 nautical miles around the eastern edge of the training area for an area orientation. The crew flew this route and arrived at the field pickup site.

The pilot got out of the helicopter to coordinate the airlift and to do the passenger safety briefing. The 14 people to be airlifted were divided into two groups of seven for two airlifts. The first seven passengers boarded the helicopter and were secured.

The UH-1 took off from the field site. The pilot flew at contour level to simulate the tactical environment. The copilot was navigating. He was not briefed about his duties for the flight. He assumed navigational duties on his own because that was his duty during the earlier area orientation flight.

While flying 10 to 25 feet above trees and at an airspeed of about 80 knots, the pilot began a left turn of approximately 40 degrees angle of bank to fly down a small creek. While in the left turn, the aircraft descended into rising terrain. The pilot applied collective pitch to stop the aircraft's descent at what he thought was 25 feet above the trees.

Realizing the helicopter was still descending, the pilot applied more collective pitch and aft cyclic to gain altitude. The main rotor blades hit 18- to 20-foot-high trees on the left side of the aircraft. The UH-1 crashed through the trees and came to rest in a level attitude. The pilot sustained critical injuries, the copilot and crew chief sustained minor injuries, and the seven passengers received varying degrees of minimal to minor injuries.

Crew experience

The 28-year-old pilot had almost 1,400 rotary wing flight hours, most of them in the UH-1H. The 23-year-old copilot had more than 200 rotary wing flight hours, with more than 150 in the UH-1H.

Commentary

The pilot did not anticipate that additional power would be required in a steep left turn to maintain altitude, and sufficient power was not applied. A turn of 40 degrees angle of bank, without a reduction in airspeed, requires a 31 percent increase in power to maintain altitude. Given the airspeed, altitude, gross weight, and maximum torque available, there was enough power available to complete the maneuver if power had been applied at the beginning of the maneuver. The pilot did not add power but, in fact, reduced it.

The pilot was flying the aircraft at contour altitude and airspeed while trying to navigate and anticipate upcoming events. By the time he recognized the problem, it was too late. The pilot did not brief the copilot as to the duties expected of him. Terrain flight is a demanding task which allows little planning time during its performance. Thorough premission planning, with special emphasis on individual pilot and copilot duties, is critical to the success of such missions. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 21-27 June

Utility helicopters

UH-1 Class D mishaps

V series - During through-flight inspection after fuel stop, crew found hydraulic fluid leaking from aircraft. Inspection revealed that right friction damper mount had failed, allowing contact with hydraulic line and resulting in fluid leak.

H series - As pilots approached aircraft, they noted the main rotor blades 90 degrees to the fuselage. Copilot checked right main rotor blade and noticed that tiedown was removed. Copilot thought crew chief had turned the blades 90 degrees and untied them. Copilot started the aircraft. Pilot, who had gone to check the weather, returned and told copilot to shut down because the weather was bad. After shutdown, inspection revealed tiedown attached to the blade with about 12 inches of strap remaining. Tiedown had failed in gusty wind conditions and blade had rotated. A knot in the strap hit the tail rotor blades, damaging them. Copilot did not ensure that the remaining part of the tiedown was removed from the blade before starting the aircraft.

H series - Daily inspection revealed damage to tip of tail rotor blade. Investigation revealed that the damage occurred during touchdown of a poorly performed standard autorotation. IP continued to fly aircraft for the remainder of the training period and then did not do a proper postflight inspection.

UH-1 Class E mishaps

H series - Aircraft was about 3 feet above the ground during landing when a section of engineer tape that was staked to the ground dislodged and wrapped around tail rotor hub. Tape was not secured correctly.

H series - Binding was felt in left forward cyclic quadrant. Caused by defective bellcrank.

H series - Hydraulic light came on during takeoff, and control feedback was felt. Caused by leaking seal in collective servo.

H series - Engine oil pressure fluctuated and then dropped below 80 psi. Caused by defective pressure relief valve.

M series - Antitorque pedals became stiff and master caution and hydraulic lights came on. Caused by broken fitting on No. 1 hydraulic fluid line.

H series - Master caution and engine chip detector lights came on. Caused by internal failure of engine.

H series - Master caution light came on. Hydraulic pressure cannon plug had water and corrosion in it.

Attack helicopters

AH-1 Class D mishaps

S series - When turret slewed left, 40mm belt caught between turret and fairing aft of turret, tearing hole in skin. Armament personnel did not ensure ammo chute was clear between aircraft and turret.

S series - Postflight inspection revealed hole in main rotor blade.

S series - As aircraft was being shut down, it shuddered. As crew chief was tieing down main rotor blade, he saw that tail rotor blade had made contact with vertical fin. Winds were from the 10 o'clock position at 25 knots with gust spread of 12 knots.

AH-1 Class E mishaps

S series - During runup, crew chief saw fuel spraying from forward fuel cell

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	1-10 July	**0**	**0**
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**37**	**27**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

pressure line. Caused by ruptured pressure line.

S series - Pilot was just starting to perform HIT check when he saw engine oil pressure at 65 psi and engine oil temperature at 99° C. Aircraft was at full operating rpm. Caused by seized engine oil cooler fan.

S series - Crew noted what appeared to be a slight 1:1 vibration after a brief encounter with light to moderate turbulence. Postflight inspection revealed main rotor blade skin separation and punctures on upper surface of blade.

Cargo helicopters

CH-47 Class E mishaps

C series - Crew chief saw hydraulic fluid spraying in the ramp area. Caused by failure of utility hydraulic pump.

C series - High frequency vibration during runup was followed by loud squealing noise. No. 1 engine failed.

C series - Master caution and No. 2 hydraulic boost lights came on. Rear of aircraft filled with smoke during descent. Caused by chafed hydraulic line.

C series - Crew noticed fuel being vented during landing. Check valve was stuck open.

CH-54 Class E mishap

B series - Master caution and servo pressure lights came on. Caused by cracked hydraulic line.

Observation helicopters

OH-6 Class C mishap

A series - SIP gave pilot simulated engine failure. Pilot correctly responded to the situation and selected his proposed landing area. Rotor rpm was in the normal operating range. As the maneuver continued, pilot made a small change in attitude for better alignment with the landing area. Rotor rpm climbed to 550 for 1 second. Pilots were not used to operating in such high density altitude conditions.

OH-58 Class D mishaps

A series - Pilot heard low grinding noise and saw N2 and rotor rpm needles split. Aircraft was autorotated to field. Lower wire strike protection system tip was broken. Noise and split needles were caused by failure of engine to transmission drive shaft.

A series - Postflight inspection revealed dent and crack in fuselage aft of left passenger door. Damage was caused by loose seatbelt.

OH-58 Class E mishaps

C series - Pilot allowed aircraft to settle on one skid and rock laterally, causing spike to contact transmission support mount.

C series - Crew doors were removed before takeoff. During taxi, copilot noticed armament panel would not remain in the closed position. Armor plate latch was too short to prevent panel from being securely latched in place.

C series - Binding was felt when cyclic was moved aft. Force trim wire bundle on copilot's cyclic stick was too short.

A series - N2 rose during flight. Caused by failure of governor.

A series - Pilot saw fuel dripping from drain line during hot refueling operation. Caused by failure of seal in pressure differential switch.

A series - TOT reached 760 degrees for 2 seconds during engine start. One minute later, engine failed. Fuel samples revealed high water content. Aircraft had been flown 1 hour earlier.

A series - As aircraft was being shut down, crew chief saw large amount of oil on tail boom and cowling. Oil was leaking from high pressure line at accessory gearbox. Line was cracked.

Fixed wing

OV-1 Class D mishap

D series - No. 2 engine inboard and top cowlings came off during flight.

OV-1 Class E mishaps

D series - No. 1 engine chip detector light came on. Caused by failure of western accessory gearbox.

C series - No. 2 engine was secured as part of test flight checks. Air start was attempted. N1 accelerated to 4 percent and then dropped to zero. Air start was attempted using the starter. N1 would not move nor would egt indicate ignition of fuel. Caused by malfunction of fuel shutoff valve.

U-21 Class E mishaps

A series - No. 2 propeller fluctuated between 2000 and 2150 rpm during runup. Caused by failure of autofeather dump valve solenoid.

A series - Right gear light would not illuminate when gear was placed down. Caused by broken wire on right main gear switch.

Maintenance

AH-1 Class D mishap

S series - Loud popping sound was heard during runup, and main rotor system vibrated. During coastdown, part of the feather bearing housing cap fell to the ground. Both housing caps were found to be cracked. Suspect incorrect main rotor blade grip spacing.

Mishap briefs

OH-58 Class E mishap

C series - Aircraft could not be started. Starter generator wires were installed incorrectly. Battery could not recharge.

UH-1 Class E mishaps

H series - Master caution light came on. Voltage regulator was adjusted incorrectly.

M series - Hot sparks fell from overhead panel during landing. Small wrench had been left in circuit breaker panel.

C-12 Class E mishap

C series - Left bleed air light came on during climbout. Left inner wheel well bleed air tee fitting clamp was loose.

Safety messages

• Safety-of-flight technical message concerning one-time inspection and correction of AH-64 backup control system (AH-64A-85-02, 291415Z Jun 85). Summary: The purpose of this message is to inspect the AH-64 hydraulic servo cylinders and totally disable the backup control system actuator plungers. Contact: Roger Wallace, AUTOVON 693-1582, commercial 314-263-1582.

• Safety-of-flight maintenance mandatory message concerning UH-60 main rotor spindle retirement life change (UH-60A-85-20, 292200Z Jun 85). Summary: This message authorizes a 1,400-hour life on those spindles previously restricted to 1,000 hours. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

• Safety-of-flight technical message concerning one-time inspection of all UH-1C/M/H/V, EH-1, and TH-1/TAH-1/AH-1 series aircraft for defective tension torsion (TT) straps (UH-1-85-05, AH-1-85-03, 212200Z Jun 85). Summary: A UH-1H rotor hub was recently disassembled. The hub TT straps were found to be unserviceable. The straps were from a quantity manufactured using Caytur 21 as a urethane curing agent. Caytur 21 contains chlorides which are retained in the urethane cover after cure, resulting in corrosion problems with the encased steel wires. Caytur 21 parts were manufactured during the 1973 to 1975 timeframe. Aircraft will be inspected to determine if defective TT straps are installed. Contact: UH-1: Ken Luber, AUTOVON 693-1685, commercial 314-263-1685; AH-1: Jack Hepler, AUTOVON 693-1687, commercial 314-263-1687.

• Safety-of-flight technical message concerning one-time inspection for the installation of stall strips on the U-8 (U-8-85-03, 251945Z Jun 85). Summary: Additional review by the Beech Aircraft Corporation has determined that the installation of stall strips on U-8F aircraft is not required as indicated in SOF message U-8-85-02. Contact: Jim Mitchell, AUTOVON 693-1639, commercial 314-263-1639.

• Maintenance information message concerning inspection of UH-60 sequence valves (MIM-UH-60A-MEM-85-01, 281700Z Jun 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Aircraft accident review

Maintenance error and design deficiency

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Synopsis

As a rated student pilot on a UH-60 training mission began an autorotative descent, a loud noise was heard, followed by severe vibrations. The IP took control and continued the approach toward a sod area. As airspeed was slowed, the helicopter began spinning to the right. Engine power control levers were positioned off, and the aircraft landed hard, with substantial damage.

History of flight

Two rated student pilots, supervised by an instructor pilot, preflighted a UH-60 in preparation for a training flight. No discrepancies were noted. The engines were started, and the aircraft took off. Arriving at a heliport, the IP had one of the student pilots do several maneuvers. After a power check, the student pilot did a maximum performance takeoff and remained in closed left traffic for an autorotation to the lane.

At an altitude of 1,000 feet and 100 knots airspeed, on established final for the lane, the student pilot lowered collective pitch to begin an autorotative descent. A loud noise was then heard, followed by severe vibrations. The IP immediately took the controls. He elected to continue the descent with power because he was unsure of the origin of the noise and was feeling severe feedback in the cyclic control.

The IP decreased the approach angle slightly to terminate the approach in a sod area located immediately beyond the departure end of the lane. As the aircraft crossed the departure end of the lane and began to decelerate, ground witnesses saw the tail rotor gearbox separate from the aircraft. The aircraft then nosed down momentarily, regained a near-level attitude, and began to spin to the right.

The IP told the student pilot to cycle the engine condition levers. This was done, and the UH-60 continued to spin about five revolutions while slowly drifting forward at an altitude of 15 feet above the ground. The aircraft then descended abruptly and hit the ground in a slight right roll, nose-low attitude. The main rotor blades continued to turn for about 10 seconds, with the tips hitting the ground to the right side of the aircraft. Because both engine condition levers had been turned to off when the aircraft began to spin, neither engine was developing full power when the aircraft hit the ground. Damage to the aircraft was extensive.

The IP sustained compression fractures to his lower spine region. He normally flew in a slumped posture, leaning to the left. This would account for why he did not fully benefit from the vertical force attenuation provided by his seat. The student pilot in the right front seat sat properly upright through the crash sequence and sustained no injuries. The student pilot in the right jump seat sustained a slight injury to his arm.

Crew experience

The 40-year-old IP had more than 4,800 rotary wing flight hours, with more than 800 in the UH-60.

Accident review

Commentary

The first significant event in the accident sequence was the in-flight separation of the main rotor pylon forward sliding cover assembly. Maintenance personnel working on the aircraft the night before the accident, incorrectly aligned the front rollers of the forward cover when they reinstalled the cover after it had been removed to facilitate the change of a yaw trim servo. The forward part of the cover floated up into the windstream when an autorotative descent was begun. The cover was then struck by the main rotor blades and swept aftward, hitting the tail rotor blades.

Although the removal of the cover should have required an entry on DA Form 2408-13, a red X status, and a technical inspection to clear the entry, these requirements were not fulfilled in accordance with TM 38-750. Some confusion existed among the maintenance personnel concerning when the entry was required and who should make it.

Tests on other UH-60 helicopters were conducted to determine all possible configurations which would allow the cover assembly to be unsecured while appearing to be locked in place. It was determined that the latches which lock the cover assembly to the main rotor pylon can be secured even though one or more of the forward alignment/retaining pins are not engaged in their retention receptacles. This can occur when the lower front rollers are not properly aligned. With these rollers on top of their tracks, the middle alignment/retention pins can rest on top of their retention brackets and the forward pins' position above their brackets, making no contact. With the forward retention pins not in their receptacles, the cover can separate from the aircraft even though the aft portion is closed and latched and the aft four retention pins are seated in their receptacles.

The forward lower rollers can be disengaged from their tracks during cover installation if the forward portion of the main rotor pylon is lifted too high. Also, the forward lower rollers can be jostled from their proper position when the cover is moved to the forward position to allow inspection of the hydraulics and flight control area. The cover can also be closed easily with the forward rollers riding on top of their tracks. Visual inspection of the cover assembly in this condition revealed areas of slight separation from the normal closed configuration. The most predominant difference could be seen at the forward portion of the cover where the separation from the cabin roof was 3 inches greater than normal. Careful inspection at this point revealed the forward retention brackets were empty and not engaged by the retention pins.

The "install" task for the cover in TM 55-1520-237-35-5 does not illustrate proper roller-to-track alignment or tell how to check alignment. As a result, maintenance personnel must use their own judgment in insuring proper alignment.

When the crew did their preflight inspection, the cover reportedly slid open and closed and then latched properly. Therefore, the crew had no reason to further inspect the cowl, according to current UH-60 preflight inspection criteria.

As a result of this accident, a safety-of-flight message was issued with the following inspection procedures outlined: "Any time the sliding cover assembly is moved to the forward position and subsequently returned to the closed position, a visual inspection shall be made while the cover is being moved aft to verify that the forward lower roller assemblies are seated in their tracks. After the cover assembly is locked with the locking latches, lift both right and left sides of the forward portion of the cover to assure the alignment/retaining pins are seated. These procedures are essential because it is not possible to otherwise verify that the cover is properly seated." ■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	1-17 Oct	**2**	**0**
	November	3	3			
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**2**	**0**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 28 September-4 October

Utility helicopters

UH-1 Class A mishap

H series - Aircraft was transporting personnel from field training location at night. It was raining and foggy. As crew was trying to traverse a mountain pass along an interstate highway, aircraft hit two cables of an electrical transmission line. Part of the main rotor, both tail rotor blades, and 90-degree gearbox were lost, and aircraft crashed on the shoulder of the highway. One passenger was seriously injured. 8501

UH-1 Class D mishap

H series - Engine No. 4 bearing cap dust cover came off in flight, damaging main rotor blade. Records and interviews confirmed that cover was in place and properly installed prior to flight.

UH-1 Class E mishaps

H series - Fuel pressure gauge fluctuated and thumping sound was heard from rear of aircraft. Master caution and left fuel boost pump lights came on. Caused by failure of boost pump.

H series - Engine oil temperature gauge indicated 130° C. during takeoff. Caused by failure of engine oil bypass valve in closed position.

H series - Fire warning light came on. Caused by water in fire warning control box. Aircraft had been parked outside for several hours and had flown in heavy rainshowers.

H series - Hydraulic fluid leak was caused by deteriorated packing.

H series - Egt gauge fluctuated during flight. Caused by failure of temperature indicator.

UH-60 Class D mishaps

As aircraft was landing to rocky LZ, tail wheel hit a rock, breaking tail wheel rim. Brownout conditions obstructed visibility.

Aircraft was parked in UH-1 parking area for washing. Aircraft could not be hover taxied out of the area because of other aircraft with open cowlings. IP took controls to ground taxi out. While IP was looking to the rear of the aircraft to clear tail wheel from 2-foot-high water faucet, main rotor blade severed FM antenna of UH-1. Antenna then hit tail rotor blade.

UH-60 Class E mishaps

Binding in tail rotor pedals was caused by failure of yaw boost servo.

Left chip input module light came on. Caused by failure of main module.

Cargo helicopters

CH-47 Class A mishap

B series - IP was making rear-wheel landing to unload troops on a mountain ridgeline. Aft rotor had insufficient terrain clearance and it hit the slope above the landing site. Severe vibrations caused aircraft to travel forward down a ravine for a short distance until forward rotor and transmission separated from aircraft. Aircraft rolled on left side and slid 20 to 30 feet before coming to rest. One passenger was critically injured by the rotor striking the cabin area, and four passengers sustained minor injuries. 8502

CH-47 Class D mishap

C series - Puff of smoke was seen trailing from aircraft. Pilot suspected No. 2 engine problem and landed. Top part of strut mount had broken, causing ski to pivot and break as it hit bottom of ramp.

CH-47 Class E mishaps

A series - Rotor rpm, No. 1 engine torque, and N_1 increased. No. 2 engine torque decreased. Caused by broken No. 1 engine N_2 actuator control rod.

C series - Master caution and No. 1 engine oil low light came on. Engine oil level was low at 11 quarts.

Observation helicopters

OH-58 Class C mishap

A series - Main rotor blade hit tree during left turn.

OH-58 Class D mishap

C series - Aircraft was shut down and crew was unloading equipment. UH-1 overflew OH-58, blowing unsecured right rear door open. Door was bent and window cracked.

OH-58 Class E mishaps

C series - Pilot took evasive action to avoid wire on downwind approach for landing. Torque rose to 110 percent. Pilot did not perform recon to determine wind direction and obstacles.

A series - While hovering at 20 to 30 feet on search mission, aircraft hit cable with left skid. Aircraft rotated 180 degrees and cable came loose from skid. Pilot was familiar with the location of the cable but thought it was only 5 to 10 feet high.

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

A series - Hydraulic pressure light came on. Caused by clogged hydraulic filter.

Attack helicopters

AH-1 Class C mishap

S series - Engine oil temperature rose rapidly after takeoff. Temperature reached 140° C. and oil pressure dropped to 70 psi. Caused by failure of oil cooler fan and housing. Engine is being replaced.

AH-1 Class D mishap

S series - Pilot on low-level night vision goggles flight saw powerline about 30 feet in front of aircraft. Pilot immediately applied aft cyclic and increased collective input. IP took the controls and stopped collective input. Tail boom and tail skid hit and severed powerline. Aircraft was landed with damage to tail boom. Flight route was close to a lightly traveled road. An approaching car's headlights caused the goggles to dim.

AH-1 Class E mishaps

S series - Aircraft rolled to left during hover. Pilot disengaged SCAS, reengaged pitch and roll channels, and landed. Caused by malfunction of servo cylinder.

S series - Engine stalled and banged four times during hover. Before aircraft could be landed, tgt rose to 900° C.

S series - Crew heard loud noise during hover, and master caution and No. 2 hydraulic pressure lights came on. Caused by cracked hydraulic fitting.

S series - Master caution and transmission oil hot lights came on. Caused by defective transmission oil hot switch.

Fixed wing

U-21 Class E mishaps

A series - No. 2 engine torque and engine oil pressure fluctuated. Oil was seen leaking from No. 2 engine cowling. Single-engine landing was made. Crew had failed to insure security of oil filler cap.

A series - Flaps stuck in approach flaps position. Caused by failure of flap motor.

OV-1 Class E mishaps

D series - Pilot received unsafe landing gear indication. Caused by failure of gear down lock switch.

D series - When gear was lowered, No. 2 hydraulic pressure dropped from 3200 to 2800. Caused by malfunction of VIDS.

C-12 Class E mishaps

C series - Left brake pedal failed to actuate left brake during landing rollout. Failure of O-ring allowed brake fluid to leak out.

A series - Left forward top engine cowling came unsecured during flight. Attaching rivets on cowling lock broke, allowing lock to turn.

Maintenance

UH-1 Class E mishaps

H series - Pilot smelled fuel odor when auxiliary tank pump was turned on. Caused by pinched O-ring in floor fitting of auxiliary tank connector.

H series - Rotor rpm and N2 dropped, and low rpm light came on. Fuel control static filter was incorrectly installed, causing screen to split and O-ring fragments to pass into fuel control.

AH-1 Class E mishap

S series - Master caution and engine oil pressure lights came on. Mechanic overtorqued ball valve, causing loss of oil.

OH-58 Class E mishap

A series - Transmission chip detector light came on during flight. Automatic transmission fluid had been inadvertently added to main transmission.

CH-47 Class E mishap

C series - During hover check, IP noticed feedback in roll axis of cyclic controls. Through bolt for roll axis bellcrank in pilot's pedal box was torqued incorrectly.

OV-1 Class E mishap

D series - IP noticed flickering light on right wing and determined that countermeasure set was on fire. Fuel flow to countermeasure set was adjusted too high.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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Aircraft accident review

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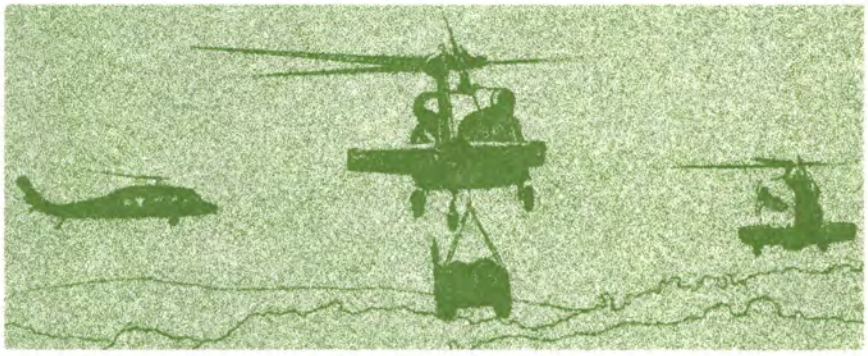
UH-60 enters trees in dense fog

Synopsis

A UH-60 was transporting a jeep as a slingload at night. While flying about 185 feet above the ground, the aircraft entered dense fog. As the aircraft proceeded along rising terrain, the slingload and the aircraft descended into trees. The crew chief jettisoned the load, and the pilot flew the aircraft out of the trees to an airfield.



History of flight

The mission was a night tactical airmobile movement. Three UH-60 helicopters were to be used. The weather forecast was for clear skies with 6 miles visibility in haze. Visibility was not forecast to deteriorate until 2 to 3 hours after the mission was completed.

The three aircraft moved several loads and then returned to an airfield to be refueled before completing the mission. The No. 1 aircraft was the last to refuel. En route back to the pickup zone, the crew noticed fog starting to appear in the area. The crews of the other aircraft in the pickup zone assured the pilot the fog was not bad.

The No. 1 aircraft landed and took five passengers aboard. A jeep with a TOW weapon system was picked up as a slingload. As he left the pickup zone, the pilot noticed the fog was getting denser. He decided to fly another route to the drop zone because of a hard-surfaced road along the route which would be easier to see in the reduced visibility.

As the No. 1 aircraft was en route to the drop zone, the pilot of aircraft No. 3, who was also the unit standardization instructor pilot, called that the fog was much worse toward the drop zone. He requested the No. 1 crew to report their progress every 3 minutes. The No. 1 crew reported that visibility at that point was down to about 1½ to 2 miles with scattered pockets of fog throughout the area.

About 200 feet above the ground, the pilot noticed a large fog bank ahead of the aircraft in the headlights of a car on the road. Almost simultaneously, both the pilot and copilot lost outside visual reference. The external load started oscillating to the point that the crew chief became alarmed and jettisoned the load about the time it entered the trees. As the aircraft entered the trees, the pilot increased collective and climbed back out of the trees and above the fog bank, which topped out about 400 feet agl.

Regaining outside visual reference, the crew could see the base runway lights ahead at about 5 miles. Because of the fog, aircraft stability, and normal operating indications, the crew decided to fly to the airfield for landing without declaring an emergency with ATC. The aircraft was landed without further incident.

The jeep was destroyed, and the aircraft sustained Class B damage from impact with the tops of the trees.

Crew experience

The 32-year-old pilot had almost 1,000 rotary wing flight hours, with more than 700 in the UH-60A. The 26-year-old copilot had almost 800 rotary wing flight hours, with almost 600 in the UH-60A.

Commentary

Although the dense fog was not forecast, the pilot was well aware that visibility was deteriorating because of haze and patches of dense ground fog. He had also received a call from the unit SIP that conditions were deteriorating, and he had varied his flight route to avoid dense ground fog. Further, he had received a report from another pilot concerning the weather conditions. Therefore, the pilot should have taken actions to either increase his altitude or terminate the mission.

When the pilot decided to fly to an airfield after the tree strike, he did not declare an emergency with ATC. As a result, emergency crews and equipment were not on hand to meet the damaged aircraft in case a safe landing could not be made. Pilots should not hesitate to declare an emergency when faced with a damaged aircraft or when a safe landing is questionable.■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 28 June-4 July

Utility helicopters

UH-1 Class D mishaps

M series - While taxiing from POL area to parking area, IP decided to evaluate pilot on an engine failure from hover altitude. IP closed throttle while taxiing forward at 3 to 4 feet with pilot at the controls. Aircraft descended straight ahead. At approximately 1½ feet, pilot applied aft cyclic and some collective as aircraft hit on left rear skid. Aircraft pivoted to the right, bounced forward, and hit on left forward skid. Aircraft came to rest with damage to skid and cross tubes, tail boom bulkhead, main transmission, and main drive shaft.

H series - Pilot allowed N2 rpm to increase to 7200 during emergency governor hover check. The terrain at the temporary hover pad location was uneven, causing the pilot to become distracted.

UH-1 Class E mishaps

H series - Transmission oil pressure fluctuated during flight. Caused by defective oil pump.

H series - Master caution and hydraulic lights came on. Caused by broken hydraulic line.

H series - Master caution and left fuel boost lights came on. Caused by failure of boost pump.

H series - Torque fluctuated during landing, and two bangs were heard from engine. Failure of fuel control caused bleed band cycling.

Attack helicopters

AH-1 Class E mishaps

S series - Engine oil temperature increased to 100° C. after landing. Caused by frozen bearings in oil cooler fan.

S series - Pitch SCAS hardover occurred during landing. Caused by failure of SCAS sensor amplifier.

S series - Master caution and No. 2 hydraulic lights came on. Caused by broken hydraulic lines to turret.

Observation helicopters

OH-58 Class E mishaps

C series - Pilot saw smoke coming from transponder during taxi. Aircraft had been flown in the rain. Suspect rain penetrated cockpit and leaked onto center console.

A series - Rotor rpm light, engine-out light, and low rpm audio activated during takeoff. Inspection revealed water in cannon plug connected to rpm warning box. Aircraft had been washed before the flight.

A series - Fuel boost light came on. Caused by defective fuel pressure switch.

Cargo helicopters

CH-47 Class C mishap

C series - As aircraft was flying at 130 knots, copilot's door came off. Door meshed with rotor system, causing damage to two forward blades and one aft blade.

Training helicopters

TH-55 Class C mishap

A series - IP demonstrated one autorotation and told student to follow him through on the controls for the second autorotation. IP then told student to do an autorotation. Student began a deceleration 25 to 35 feet above the ground. At about 8 feet, student applied collective pitch control and excessive left pedal. Aircraft turned left 180

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	1-17 July	**2**	**1**
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**39**	**28**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

degrees and hit the ground. Tail rotor blades, tail skid, tail boom, tail rotor drive shaft, aft cross beam, and oleo struts were damaged.

Fixed wing

C-12 Class E mishap

C series - Master caution and fire extinguisher lights came on during takeoff. Caused by bad wiring connection on fire squib.

OV-1 Class E mishap

D series - No. 1 and No. 2 generator lights came on. Caused by failure of d.c. generator volt regulators.

Maintenance

UH-1 Class E mishap

V series - Master caution and hydraulic pressure lights came on. Caused by incorrectly installed O-ring.

OV-1 Class E mishap

D series - D.C. voltage indicated 25 volts with both generators in parallel. Caused by loose voltage regulator adjustment screw jam nut.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

The 10 Commandments of Good Crew Coordination

I. **Pilots-in-command**
Think people!
Remember you are working with people who have feelings of worth, need, and dignity.

II. **Pilots-in-command**
Set the tone
If you're the director of a one-man band, you won't foster much crew coordination. You, the pilot, set the tone of the crew. If you encourage and are receptive to an exchange of information, you'll probably get it. Also, let each crewmember know what you expect of him.

III. **Pilots-in-command**
Solicit information!
Ask for opinions or suggestions. It's not a sign of command weakness to ask what the other crewmembers think.

IV. **Pilots-in-command**
Use other crewmembers' experience
That old engineer probably has a lot of experience which can help you. Use it.

V. **Crewmembers**
Don't be shy!
If you've got something bothering you, speak up. You may know something that someone else doesn't know.

VI. **Crewmembers**
Be persistent!
Keep the pilot and other crewmembers informed. Don't let one crewmember snuff you out.

VII. **Crewmembers**
Remember who's in command!
Make your input to the boss but remember he makes the final decision.

VIII. **Pilots-in-command and crewmembers**
Be tactful!
Don't close the channels of communication in crew coordination through immature or unprofessional behavior.

IX. **Pilots-in-command and crewmembers**
Reinforce good coordination!
When your crew flies a successful mission, it involves a lot of successful efforts by your crew and other support people. Reward people for special efforts with a thank you or a letter to their commander. Remember, a small "thank you" goes a long way with the other crewmembers and team players.

X. **Pilots-in-command**
Don't shirk your responsibility!
Think people; set the tone for crew coordination; solicit information; use experienced people, reinforce good coordination; BUT, remember you must make the final decision and be responsible for it. ■

—adapted from the MAC Flyer

U.S. ARMY

AVIATION STANDARDIZATION

Mini-STACOM No. 4

Excusing aviators from ATP requirements

Paragraph 3-3c, AR 95-1, authorizes a commander to excuse aviators from ATP requirements within 6 months of retirement. Will an aviator be allowed to fly after being excused from ATP requirements?

When a commander determines that the services of an aviator who is within 6 months of retirement are no longer needed, he may excuse that aviator from **all** ATP requirements. The reason for excusing that aviator **is not** to reduce the tasks required to maintain proficiency; rather, it is to save a significant amount of money in fuel, aircraft parts, and maintenance man-hours. If savings are to be realized, the excused aviator must not fly. Therefore, excusal from ATP requirements under the provisions of paragraph 3-3c, AR 95-1, means that the aviator is restricted from flying Army aircraft. ■

Sixteen receive Broken Wing Award

Sixteen aviators received the Broken Wing Award from April through June 1985.

CW3 Marty L. Anderson
271st Aviation Company,
APO San Francisco 96271

CW2 Roger H. Anderson
Company E, 9th Aviation Training Battalion, Fort Rucker

CW4 Richard W. Arkin
Headquarters, 79th ARCOM,
Hagerstown, Maryland

CW3 David M. Battle
79th ARCOM, AFA 111,
Hagerstown, Maryland

CW2 Dean E. Doudna
D Company, 4th Aviation Battalion,
Fort Carson

SSG Monroe W. Hogan
208th Transportation Company
Connecticut Army National Guard,
Camp Hartell, Windsor Locks,
Connecticut

CW2 Michael S. Holt
Company A, 82d Combat Aviation Battalion, 82d Airborne Division,
Fort Bragg

1LT Michael H. Keogh
Company C, 9th Aviation Battalion,
Fort Lewis

CW3 Ernest D. Kingsley
3/5th Cavalry, Fort Lewis

CPT Robert Krieger
208th Transportation Company,
Connecticut Army National Guard,
Camp Hartell, Windsor Locks,
Connecticut

CW2 Terry E. Martin
208th Transportation Company,
Connecticut Army National Guard,
Camp Hartell, Windsor Locks,
Connecticut

CW2 Thomas A. Montgomery
Company C, 9th Aviation Battalion,
Fort Lewis

CW3 Earl G. Peay
Company A, 394th Transportation Battalion, APO New York 09061

WO1 Stephen Suttles
Company A, 82d Combat Aviation Battalion, 82d Airborne Division,
Fort Bragg

CW4 Harry R. Ward
B Company, 2d Aviation Battalion,
APO San Francisco 96224

CW2 Robert E. White
3d Platoon, 498th Medical Company,
Fort Stewart ■

U.S. ARMY SAFETY CENTER

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Terence M Henry
Colonel, Aviation
Commander, Army Safety Center

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Report of Army Aircraft Mishaps

Aircraft accident review

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Fort Rucker, AL 36362-5000

OH-58 flies into mountain

Synopsis

An OH-58A pilot, wearing night vision goggles, flew his aircraft into a mountain. The pilot was flying in the dark in deteriorating weather conditions.

History of flight

The unit was operating out of a field site. An OH-58 pilot was given a mission of an early morning flight back to home base to pick up an instructor pilot.

The pilot went to the unit tactical operations center and tried to contact the squadron to get a weather briefing. Unable to get a briefing, he returned to the commander's tent and requested permission to file in the air, which the commander authorized. The pilot then proceeded to his aircraft and took off.

After departure, the pilot did not contact unit operations to advise them he had departed, nor did he file a flight plan. About 5 minutes after takeoff, the pilot contacted a weather service and received a briefing. About this same time, the aircraft was seen circling in a valley.

Flying at 50 to 60 knots, the OH-58 crashed on a 40-degree slope of a 1,130-foot mountain, 377 feet from the top, 5 miles from the field site. The pilot was killed, and the helicopter was destroyed.

Crew experience

The 27-year-old pilot had almost 900 rotary wing hours, with more than 700 in the OH-58A. He was an aviator readiness level (ARL) 1 aviator and was appointed a pilot-in-command 10 days before the accident. A review of his flight and aircrew training records indicated he was neither current nor qualified to perform the assigned mission. He had not received a commander's instrument evaluation or completed an operator's manual examination when assigned to the unit.

The pilot had an incomplete contact evaluation, incomplete ARL 1 evaluation, and incomplete night vision goggles PIC evaluation. All evaluations were missing various maneuvers required by TC 1-134 and TC 1-137 to be qualified and current in the OH-58. (Newly published FCs had not arrived at the time of the accident.) The pilot had not flown the hours required by the Aircrew Training Manual to maintain ARL 1 designation within the previous 6-month training period. He had not completed a written PIC evaluation as required by command and unit policy before designation as a PIC.

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 5-11 July

Utility helicopters

UH-1 Class A mishap

V series - Aircraft crashed into water during night vision goggles training mission. 8546

UH-1 Class D mishap

M series - Aircraft was returning to pad to rearm. As IP completed steep approach over wires, chin bubble hit a cement pillar partially obscured by tall grass. Chin bubble was broken.

UH-1 Class E mishaps

H series - IP felt cyclic binding during takeoff. Caused by failure of hydraulic servo.

H series - Crew heard loud squealing sound during flight. Engine quit during autorotation. Caused by defective engine.

H series - N2 tachometer failed during hover. Caused by sheared tachometer generator shaft.

H series - Pilot noticed burning odor and fumes during hover. Caused by overheated battery.

H series - IP heard thumping sound, following by illumination of master caution and hydraulic lights. Servo pressure line had burst, causing loss of hydraulic fluid.

H series - Feedback in cyclic pitch control during takeoff was caused by failure of cyclic servo.

Cargo helicopters

CH-47 Class D mishaps

A series - Postflight inspection revealed that piece of fiberglass fairing on No. 2 engine drive shaft access area had been bent back in flight. Turnlock fastener had rotated loose.

C series - Aircraft was participating in aerial gunnery training. M24 subsystem M60D machinegun jammed and would not fire. Weapon was pointed at the target and remained so for at least 5 minutes. Weapon was then removed from mount, carried to rear of aircraft to be cleared, and set down with muzzle facing aft. As weapon was set down, it discharged. Round struck aircraft chalks and split into two pieces. The two pieces ricocheted, tearing holes in the sheetmetal at the left rear of the aircraft. Safety NCO thought 5 minutes was enough time to allow for cooling before removing the weapon. Also, he was having trouble with the ejection control bag dumping brass overboard when he tried to clear the weapon on the mount.

CH-47 Class E mishap

B series - No. 1 engine beep trim failed to the high side and No. 2 engine static beep trim failed during hover. Caused by failure of resistor in No. 2 engine N2 control box.

Observation helicopters

OH-58 Class E mishaps

A series - While taking off from airfield runway, copilot allowed lower wire strike protection system to touch the ground. Airspeed was approximately 3 to 4 knots. Breakaway tip separated without damage.

A series - Master caution light came on. Caused by failure of turbine engine components.

A series - Master caution and fuel boost lights came on during hover. Caused by failure of pressure switch.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	1 - 24 July	**3**	**1**
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**40**	**28**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Attack helicopters

AH-1 Class D mishap

S series - Engine had been running about 12 minutes during maintenance operational check. Master caution and engine oil bypass lights came on. Engine oil pressure gauge indicated zero. Pilot immediately rolled off throttle, turned off fuel, and motored engine for about 1 minute because there was smoke coming from the stacks. Exhaust had a puddle of oil in it. Large amount of oil was also in cooler compartment and on the ground. Caused by failure of engine cooler.

AH-1 Class E mishap

G series - Transmission oil temperature climbed to 100 degrees during flight and then rose to 130 degrees during landing. Ground wire from transmission oil pressure transmitter was not making contact.

Fixed wing

C-7 Class E mishaps

A series - No. 1 fire warning light came on. Caused by broken fire warning loop.

A series - Left main landing gear would not indicate up and locked when gear was retracted after takeoff. Excessive friction between inner sleeve and strut barrel caused slow retraction.

T-42 Class E mishap

A series - Crew noticed severe vibrations during takeoff. Caused by broken right main landing gear lower knee assembly.

OV-1 Class E mishaps

D series - No. 1 engine chip detector light came on. Caused by malfunction of forward main fuel tank boost pump.

D series - No. 2 engine failed as pilot was preparing to take off. Caused by failure of fuel control unit.

U-21 Class E mishap

A series - Grease was seen on left engine cowl behind prop spinner after shutdown. Caused by failure of prop blade grip seal.

Maintenance

AH-1 Class E mishap

S series - Pilot smelled odor of something burning and saw smoke coming from under sun shield. Numerous metal shavings were found on electrical connectors in copilot's compartment. Maintenance personnel had not removed shavings after completion of MWO.

CH-47 Class E mishap

B series - During landing, flight engineer saw something leaking around aft transmission area. No. 2 flight boost return line was installed resting on a mount in aft transmission area, causing line to chafe and leak.

OH-58 Class E mishaps

A series - TOT would not rise on three battery start attempts. Mechanic failed to purge fuel system after filter change.

C series - As aircraft was picked up to hover, pilot noticed unusual left cyclic was required to hold position. Aircraft was set down. Pilot's cyclic was rigged about 2 inches left of center. Cyclic mount bolts were loose.

Safety messages

• Safety-of-flight maintenance mandatory message concerning UH-60 main rotor spindle and tie rod retirement life change (UH-60A-85-21, 081600Z Jul 85). Summary: This message authorizes a 1,400-hour life on those spindles previously restricted to 1,000 hours and authorizes the modification and flight of spindles with 260.1 to 1,000 hours since new. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

• Safety-of-flight operational message concerning UH-60/EH-60 flight restrictions with engine sequence valve assemblies/pressurizing and overspeed unit assemblies (UH-60A-85-22, 112110Z Jul 85). Summary: This message authorizes flight of UH-60/EH-60 aircraft with uncertified sequence valves installed on one or both engines subject to certain restrictions; authorizes flight of UH-60/EH-60 aircraft with certified sequence valves or pressurizing and overspeed units installed on both engines subject to certain restrictions; and reiterates the procedures by which uncertified sequence valve assemblies will be removed for test/adjustment and replaced by certified sequence valve or pressurizing and overspeed unit assemblies. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

• Maintenance information message concerning OH-58A and C main rotor hub pillow block mounting hardware.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

AH-1 impulse cartridges

The Safety Center has received several inquiries about the necessity of having impulse cartridges (exploding bolts) installed in AH-1 aircraft. The Safety Center's position is that if the impulse cartridges are not installed, the aircraft should not be flown with those armament subsystems attached which are jettisoned by the activation of the impulse cartridges. ■

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Terence M Henry
Colonel, Aviation
Commander, Army Safety Center

Accident review

Commentary

The pilot, while flying alone and using night vision goggles, was unable to orient himself on the desired route, change radio frequencies, receive weather information, and provide for terrain clearance during darkness and deteriorating weather conditions.

Although the pilot did not get a weather forecast before the flight, he was aware of the characteristics of the weather in the area. The fact that he elected to depart before sunrise in dark, rainy conditions made the weather a consideration but not an unknown. The weather briefing obtained after takeoff put en route visibility below that required for flight. After receiving the weather information, the pilot continued to fly toward his destination.

Several factors contributed to the accident. The mission was determined to be necessary the evening before the flight, and it was considered by the unit commander to be briefed and briefed back. The briefing was not conducted in accordance with the procedures contained in a Department of the Army message on mission briefings. The message specifies that the briefback will verify that all required premission planning has been accomplished. The mission was not logged through operations nor was the data logged on the mission briefing sheet. The unit was operating on a condensed version of the squadron checklist. This version appeared to leave several topics in the "taken for granted category."

When the operations officer saw the pilot in operations trying to contact the weather people, he thought the pilot was getting a weather briefing for the unit. He was not expecting the pilot to fly. When the pilot took off, the weather was considered to be deteriorating, and there was much discussion in operations about whether to continue with the training exercise. There were no radio calls from the aircraft, and no one tried to contact the aircraft. The weather had deteriorated substantially, and unit personnel assumed the pilot was weathered in. They were surprised when the IP whom the pilot had been sent to get showed up. It was then that the things that had gone wrong surfaced—no flight plan, no flight following, no known routing, and no mission parameters.

The pilot was off course 1.5 km east. A witness saw the aircraft circle just before impact and then depart on a southerly heading. The correct route required a southerly heading. Instead of turning around after receiving the weather briefing that visibility was lower than required for operation in the area, the pilot continued on. His selected course was along a converging ridge, on which the aircraft crashed.

Although single-pilot night vision goggle missions are prohibited, the pilot was wearing NVGs. There was no evidence to show that the unit advocated or condoned this.

It is not known why the pilot felt compelled to "press on" and take so many shortcuts to accomplish the mission. Had any one of the following procedures been completed, the mission might have been aborted:

- First—formal mission assignment and initial mission briefing sheet completed.
- Second—logging of the mission with troop operations, who would notify the squadron.
- Third—designation of a person to receive a formal briefback and time for it.
- Fourth—a radio call establishing the identity of the aircraft and causing a return to complete the above elements.

As it was, things just "fell through the crack," resulting in an unknown, unscheduled, unmonitored flight at troop operations, the destruction of an aircraft, and the death of the pilot.

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Report of Army Aircraft Mishaps

Aircraft accident review

UH-1 hits wires while flying in instrument conditions

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Synopsis

A UH-1H on a training mission at night entered deteriorating weather. The IP allowed the helicopter to descend below 200 feet above the ground. The main and tail rotor blades hit a powerline, and the UH-1 crashed.

History of flight

An instructor pilot received a mission to transport battalion staff members from home base to another location and return. An aircraft currency ride was to be administered on one leg of the flight, and a commander's evaluation and pass orientation were to be conducted on the return leg.

Takeoff was delayed about 3 hours because en route weather was forecast below VFR. The weather gradually improved enough to allow VFR flight through a mountain pass.

The flight to destination was uneventful. After flying around the area for awhile, the helicopter was refueled for the return flight. The aviation maintenance officer was the pilot for this leg of the flight. The IP checked the weather before takeoff and again about 9 minutes into the flight. The pilot continued to fly along an interstate highway toward the mountain pass for about 15 more minutes. The IP then asked for another weather update. By this time, visibility had been reduced by darkness and light rain, and the low ceiling had forced the aircrew to descend. Flight was continued for about 12 more minutes—until the helicopter hit the top cable of a 3-cable powerline extending across the highway.

Because of the weather, the IP had taken the controls about 2 minutes before the wire strike and had slowed the airspeed to turn around. After hitting the wire, the UH-1 began to spin to the right. Realizing he could not stop the spin, the IP reduced power and followed the spin with cyclic. The helicopter descended rapidly and crashed in a left roll. All four occupants were injured, with the injuries ranging from minor to major.

Crew experience

The 33-year-old IP had more than 1,000 rotary wing hours, with more than 900 in the UH-1H. The 26-year-old pilot had almost 700 rotary wing hours, with more than 600 in the UH-1H.

Commentary

Transcripts of three conversations between the crew of the aircraft and weather watch established that all mountain passes were forecast below VFR conditions. The crew knew this before they took off. However, it was common practice to fly to the passes regardless of the forecasts, because they were often inaccurate. The crew just continued to push on in deteriorating weather and delayed making the decision to turn around until it was too late. The IP realized after the crash that since he felt strongly enough about the weather to take over the controls, he should have turned around immediately.

The unit commander, who was onboard the aircraft, allowed the flight to continue even though weather began to deteriorate 20 miles east of the crash site. The commander was uncomfortable about the situation, as were the other crewmembers, who knew the pass contained numerous high-tension cables. Yet, no one voiced his anxiety.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 12-18 July

Utility helicopters

UH-1 Class B mishap

H series - Engine failed during flight, and aircraft landed hard. Both main rotor blades hit tail boom. Preliminary report indicates that variable inlet guide vane failed and went through engine. 8547

UH-1 Class D mishaps

H series - During final approach to pinnacle pad, copilot allowed aircraft to develop excessive vertical rate of descent. Aircraft landed hard, damaging cross tube assembly.

H series - Aircraft hit and cut wire during descent to NOE altitude. Bottom of aircraft was damaged.

UH-1 Class E mishaps

H series - Crew smelled smoke during hover. Caused by shorted-out rheostat.

H series - Hydraulic caution light came on. Caused by failure of pressure switch.

H series - IP heard loud bang from engine compartment. Caused by failure of engine gas producer section.

H series - Binding was noted in antitorque pedals. Caused by faulty magnetic brake.

H series - Right fuel boost pump light came on and circuit breaker popped. Wire on fuel boost pump was broken and grounding out against frame.

H series - Top transmission cowling was seen to be unsecure during hover.

M series - No. 2 hydraulic light came on. Caused by ruptured hose.

Attack helicopters

AH-1 Class C mishap

S series - Aircraft developed severe vibration while in dive. Postflight inspection revealed that leading edge abrasion strip was missing from main rotor blade. Rotating controls had come in contact with transmission cowling sometime during the emergency.

AH-1 Class D mishaps

G series - Aircraft hit tree during hover, damaging main rotor blades.

S series - Pilot allowed aircraft to drift too close to tree during hover. Main rotor blades hit tree limb.

AH-1 Class E mishaps

S series - Transmission oil pressure gauge dropped to zero during landing. Caused by faulty oil pressure transducer.

S series - Copilot noted stiffness in pedals. Caused by failure of tail rotor magnetic brake.

S series - Aircraft shuddered and developed medium frequency vibration. Caused by frozen engine oil cooler turbine bearing.

Observation

OH-58 Class D mishaps

C series - Seagull entered rotor system and was impelled through right front windscreen. Pilot landed with bird stuck in windscreen.

A series - Aircraft rocked backwards during landing from a hover on a front to rear slope. Pylon mount assembly was damaged.

OH-58 Class E mishaps

A series - Engine-out light, rpm light, and low rpm audio activated. Cannon plug to rpm box had a broken wire and was worn.

C series - D.C. generator light came on. Caused by sheared starter generator shaft.

Training helicopters

TH-55 Class D mishaps

A series - Student pilot was making an autorotation with turn. IP was following him through on the controls. Aircraft fell through after cushioning pitch was applied at 3 feet and landed hard, bending aft crossbeam and breaking landing light.

A series - Student pilot applied too much right pedal during hover. When IP corrected with left pedal application, pedal broke at the torque tube. Aircraft began spinning to right and nose pitched up. IP asked student to apply left pedal with his controls to stop the spin. Student did not recognize that he could correct the condition. IP applied forward cyclic to prevent tail stinger from striking the ground and chopped the throttle. Aircraft landed hard with slight yaw to right. Right rear oleo strut broke and aft crossbeam was bent. Pedal failure was caused by fatigue cracks originating from rivet hole in the mount.

Cargo helicopters

CH-47 Class E mishaps

C series - Crew smelled smoke and transmission oil pressure maxed at 100 psi plus in all positions. Caused by failure of pressure selector switch.

D series - No. 1 engine torquemeter read 40 percent higher than No. 2 engine torquemeter with N1s matched. Caused by failure of No. 1 engine torque kit.

C series - Crew chief noted severe hydraulic leak from aft transmission

area. Caused by failure of preformed packing.

A series - After engine shutdown, crew chief saw hydraulic fluid leaking from utility cooling area. Caused by failure of hydraulic cooling fan motor.

CH-54 Class E mishap

A series - Hoist oil pressure light came on. Caused by ruptured hoist oil line.

Fixed wing

OV-1 Class A mishap

C series - While aircraft was in the traffic pattern at 400 to 500 feet agl, IP gave pilot simulated engine failure of the No. 1 engine. As pilot started the emergency procedure, he felt the aircraft slowing down. IP took control and advanced No. 1 engine throttle all the way. Engine feathered and aircraft started to roll to the left. As aircraft reached 20 to 30 degrees, IP told pilot to eject. After pilot ejected, IP ejected. Pilot was not injured, but IP was killed because his parachute did not deploy fully before impact. 8548

OV-1 Class D mishap

B series - Hatch popped open during takeoff. Crew did not ensure hatch was locked.

OV-1 Class E mishaps

D series - Aircraft veered to left during takeoff roll. Caused by failure of power steering unit.

D series - Right main gear indicated unsafe. Visual check by ground personnel indicated that gear appeared to be down and locked. Aircraft was landed without incident. Caused by faulty wheel and flap indicator.

U-21 Class C mishap

H series - IP initiated simulated engine failure during climbout. Pilot feathered incorrect prop, resulting in engine overtorque.

U-21 Class E mishaps

A series - IP saw fluid coming from No. 2 nacelle during takeoff. Oil cap was not seated correctly.

A series - Fuel began siphoning from right nacelle tank during flight. Caused by deteriorated fuel cap O-ring.

C-12 Class D mishap

C series - Pilot applied excessive braking after touchdown. Right main gear tires were destroyed.

Maintenance

UH-1 Class E mishaps

H series - Crew smelled fuel fumes during flight. Caused by loose main fuel crossover line.

H series - Master caution and hydraulic lights came on. Caused by loose cannon plug on hydraulic pressure switch.

H series - Pilot's and copilot's airspeed indicators did not work during takeoff. Insect had laid eggs in pitot tube line, clogging line. Maintenance personnel had not installed pitot tube cover after last flight.

AH-1 Class E mishap

S series - Airspeed indicator stuck at 30 knots and then would not go above 50 knots. Static air leak was caused by incorrect installation after pitot static check performed before flight.

OH-58 Class D mishap

A series - Rotorwash from landing UH-60 blew unsecured forward transmission cowling from parked OH-58. OH-58 was parked too close to helipad by maintenance personnel. Crew chief had unfastened all dzus fasteners on cowling to do a maintenance inspection. Crew chief did not anticipate the effects of UH-60 rotorwash on unsecured cowling.

OH-58 Class E mishaps

A series - High d.c. amperage reading was caused by voltage regulator being set too high.

A series - Engine oil pressure exceeded normal operating limits during runup. Oil pressure regulator valve was adjusted incorrectly

CH-47 Class E mishap

C series - Rotor rpm varied 10 rpm during descent. When power was increased, N1 and TTIT increased, but No. 2 engine torque remained at 20 percent. Bleed band was out of adjustment.

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0			
	September	4	3			
	Total for Year	39	35*	Total to Date	**42**	**28**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Mishap briefs

OV-1 Class E mishap

D series - No. 1 engine had compressor stalls at cruise power. Inlet guide vane actuator was out of adjustment.

C-12 Class E mishap

C series - Power was advanced to above high idle position and condition levers were placed to low idle position. No. 1 engine went to minimum fuel flow, and power lever could not be brought back to idle position. Inspection revealed that No. 1 fuel control actuating lever forward rod end connector nut, washer, and rod had come off. When maintenance personnel replaced rod end connector, they did not install cotter pin. Inspectors did not notice that cotter pin was missing nor did crew who preflighted the aircraft.

Safety messages

• Safety-of-flight technical message concerning one-time and recurring inspections of U-8 engine mounts (U-8-85-04, 172300Z Jul 85). Summary: Extensive cracks were found in the engine mounts of a U-8. The cracks were located in the top two struts which extend from the firewall attachment points diagonally forward and inward to the intersection at the engine mount ring. This message establishes a recurring inspection every 50 flight hours on the engine mount structure of all U-8 (Excalibur conversion) aircraft. Contact: Lyell Myers, AUTOVON 693-3300, commercial 314-263-3300.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Nomex neglect is a no-no

Aircrewmembers, don't neglect your Nomex clothing—especially the gloves. They suffer more wear and tear than most other Nomex garments simply because they're always where the action is. Dirt, grease, grime, hydraulic fluid—you name it and your gloves get in it. Grease, oil, and hydraulic fluid, in particular, will destroy their flame-resistant properties.

Hand-launder your gloves like it says in TM 10-8400-202-13 by putting them on and washing them with soap and warm water just as if you were washing your hands. Rinse with more warm water, then remove them and **squeeze** the water out. Don't wring or twist 'em. Machine washing is OK, too.

Drip-dry 'em or toss 'em in the dryer with other garments. Then stretch them back into shape.

Use saddle soap, NSN 7930-00-170-5467, to keep the leather palms from getting hard, crusty, or brittle. **Never** use petroleum base lubricant on them!

Take care of your gloves and they'll take care of your hands. ■

—from PS

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Report on third quarter FY 85 aircraft accidents

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Eight Class A aircraft mishaps occurred during the third quarter of this fiscal year. One of these mishaps resulted in three fatalities. Another mishap, a midair between an Army UH-1 and a civilian airplane, resulted in the death of the civilian pilot. These eight mishaps, together with the 29 recorded during the first half, bring the total to 37 Class A mishaps and 27 fatalities for the first three quarters of this fiscal year.

The Class A accident rate at the end of the first three quarters was 3.24, higher than the year-end rate for the past 2 years.

Seven of the eight accidents involved rotary wing aircraft. Materiel was a factor in five of the eight accidents, while human error was a factor in four of the accidents this quarter.

One of the human-error accidents was the midair collision between the UH-1 and a civilian airplane. The helicopter was flying about 700 feet above the ground when the copilot on the controls saw the shadow of an airplane on the ground. He then looked around the door post and saw the airplane approximately 45 degrees to the right front at the same altitude. The pilot took control and put the UH-1 into a steep left, descending turn. The airplane went into a steep right bank. As the UH-1 crew lost sight of the airplane, they felt their helicopter vibrate. The UH-1 landed hard, with no injuries. The pilot of the civilian airplane was killed when his aircraft crashed. The right wing had been chopped off by the helicopter's main rotor blades.

Human error was involved in one of the materiel failure accidents. The test pilot of an OV-1 made an incorrect response to an engine power loss. The pilot and crew chief ejected successfully before the aircraft crashed.

Two AH-1 human-error accidents are still under investigation.

Materiel failure

The three fatalities this quarter occurred in a UH-60 accident which was caused by a fatigue fracture of a main rotor blade spindle. The helicopter began to break apart during a training mission, crashed, and burned.

An OH-58 pilot was hovering about 200 feet above trees when his engine failed. A power-off landing was made into the trees. The helicopter was destroyed and a passenger was seriously injured.

As a UH-1 crew was making a maximum performance takeoff from a confined area, the engine low rpm audio and light activated. With engine N2 and rotor rpm decreasing, the switch was placed in the emergency governor position. There was no response from the engine, and the UH-1 descended into trees. The aircraft came to rest in a swampy area, with injuries to all four occupants.

Materiel-related factors were involved in 35 percent of the Class A mishaps for the first three quarters of fiscal 85. This is a 25-percent increase over FY 84. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 19-25 July

Utility helicopters

UH-1 Class A mishap

V series - As aircraft was on NOE training mission, rotor blades hit rocks on hill. Pilot lost control, and aircraft crashed. The three crewmembers were injured. 8549

UH-1 Class D mishaps

H series - Loud bang was heard and aircraft yawed left. Two compressor blades were damaged by foreign object ingestion.

H series - Crew chief saw wires ahead. Pilot told copilot to stop to confirm wire location. Loud bang and shudder followed. Aircraft lost altitude. Pilot took control, rolled off throttle, and rotated. Aircraft turned approximately 230 degrees before coming to stop. Postflight inspection revealed failure of No. 3 tail rotor hanger bearing.

V series - Pilot noticed egt at 630 degrees C. during approach for landing. Caused by excessive heat to N1 turbine nozzle vane.

UH-1 Class E mishaps

H series - Pilot felt feedback in cyclic controls. Caused by failure of left cyclic servo cylinder.

H series - Severe airframe vibrations and engine surges were noted during flight. Caused by defective fuel control.

H series - Transmission oil temperature fluctuated up to 140 degrees C. Caused by failure of thermo valve.

H series - Feedback was felt in collective pitch, and popping sound was heard. Caused by failure of mast bearing.

V series - Crew chief saw fuel draining from fuselage during runup. Caused by failure of preformed packing in fuel control servo filter.

UH-60 Class D mishaps

A series - Severe vibrations were felt in airframe. Failure of No. 2 viscous dampner caused failure of bearing and damage to tail rotor drive shafts.

A series - Storage compartment door was lost during flight. Door latches appeared to have worked loose.

UH-60 Class E mishap

A series - Stabilator failed during takeoff. Failure of lateral accelerometer gave bad signal to stabilator amplifiers.

Cargo helicopters

CH-47 Class A mishap

D series - Aircraft was being repositioned from hot refueling pad to parking area. As pilot was bringing engines from ground detent to flight detent, severe vibrations were felt from aft area of aircraft. Flight engineer, standing outside aircraft, told pilot that droop stop block had just been thrown from aircraft and had landed several feet from it. Pilot told personnel to exit aircraft. As blades slowed, two aft rotor blades penetrated fuselage, resulting in extensive damage to aircraft. Caused by copilot misadjusting directional control pedals and inducing droop stop pounding. 8550

CH-47 Class E mishaps

C series - Flight engineer saw hydraulic fluid leaking from utility hydraulic pressure filter. Caused by failure of elbow tube and packing.

D series - Crew saw smoke coming from instrument panel during runup. Caused by failure of transmission oil pressure selector switch.

D series - No. 1 engine oil pressure increased to 110 psi. Caused by defective oil pressure transmitter.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	1-7 August	**1**	**1**
	September	4	3			
	Total for Year	39	35*	Total to Date	**43**	**29**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Attack helicopters

AH-1 Class E mishaps

S series - Crew heard strange noise from main rotor system during takeoff. Bonding had separated from erosion strip about 8 inches from white blade tip.

S series - High frequency vibration in pedals was caused by failure of oil cooler fan bearing.

S series - Master caution, rectifier, and alternator lights came on. Alternator shaft was sheared and quill assembly bearing failed.

Observation helicopters

OH-6 Class E mishap

A series - Crew smelled hot oil fumes, and drops of oil started coming into cabin. Aircraft doors had been removed. Postflight inspection revealed that seal had become cocked, allowing oil to escape around main rotor drive shaft.

OH-58 Class D mishaps

A series - During a battle drill, copilot in left seat was hovering at 3 to 4 knots along a ridgeline. Pilot was observing enemy activity on right side of aircraft. Copilot diverted his attention to right side, and tail rotor blades hit trees to left of aircraft.

C series - During engine start, pilot set throttle by placing it to abort side of idle detent. IP failed to see the mistake. As N1 passed through 12 percent, TOT rose to 940 degrees C. for less than 2 seconds. IP pressed idle release and rolled off throttle. Combustion liner sustained heat damage.

Training helicopters

TH-55 Class D mishap

A series - IP was flying and talking student pilot through an autorotation. On late downwind, student was given the controls to perform the maneuver. Everything appeared normal before and during deceleration. When student applied initial pitch, she also applied left pedal, causing aircraft to yaw left. IP could not recover the heading because of student's left pedal pressure. Aircraft turned 180 degrees. IP tried to keep tail rotor off the ground with forward cyclic and applied remaining pitch. Aircraft landed hard, hitting tail rotor and sliding off the lane.

Fixed wing

C-7 Class E mishap

A series - No. 2 engine rpm dropped from 2000 to 1400 and returned to 2000. Low fuel pressure light came on and fuel pressure gauge indicated zero. Caused by failure of fuel pump.

U-8 Class C mishap

F series - Both engines failed during flight. Aircraft was landed in corn field, with damage to nose wheel gear doors and left inboard wing.

C-12 Class D mishap

C series - During final approach, pilot had difficulty maintaining heading and attitude because of severe turbulence. While trying to maintain heading and attitude, pilot flew aircraft through a thunderstorm cell. Hail damaged radar cone, vertical stabilizer fairing, and VHF antenna.

C-12 Class E mishap

A series - Left bleed air fail light came on. Caused by hole in bleed air line.

U-21 Class A mishap

A series - Pilot reported that left fuel boost pump failed in flight. Pilot switched to manual crossfeed and fuel pressure returned to normal. Ten minutes later, fuel pressure gauges fluctuated. Aircraft then yawed to right and right engine boost pump failed. Pilot ditched aircraft in the sea. The three crewmembers were rescued by a nearby cruise ship. 8551

U-21 Class E mishaps

G series - No. 1 engine oil pressure and torque fluctuated. Caused by failure of engine-driven boost pump garlock seal.

A series - Fuel was seen siphoning from right nacelle fuel cap. Cap was installed incorrectly during preflight.

A series - Right landing gear down light did not come on when gear handle was placed down. Caused by failure of toggle switch.

OV-1 Class E mishap

D series - No. 2 engine failed during takeoff. Inspection revealed that fuel control shaft to accessory gearbox had sheared, causing stoppage of fuel flow to engine.

Maintenance

UH-1 Class C mishap

V series - Aircraft vibrated during low-level flight. Compressor blades were damaged. Variable inlet guide vane actuator rod was out of rig.

UH-1 Class E mishaps

H series - Master caution and hydraulic lights came on, and controls stiffened. Caused by chafed hydraulic line to servo.

H series - Fire light came on during landing. Fire detection wiring harness was rubbing against oil line.

H series - When crew preflighted aircraft, there was no ignition switch installed and no writeup in logbook.

Mishap briefs

AH-1 Class D mishap

S series - Maintenance test pilot had completed maintenance checks at flight idle and began to roll throttle on when TT strap housing assembly broke off. Rpm was going through 5000 when aircraft began to vibrate severely. Pilot rolled throttle to flight idle and shut down without further damage. Suspect improper maintenance procedures.

CH-47 Class E mishap

C series - Flight engineer felt excessive vibrations from vicinity of No. 8 drive shaft. Inspection revealed failure of hanger bearing because of insufficient lubrication.

OV-1 Class E mishaps

D series - No. 1 engine propeller rpm bled off to 1500 during takeoff roll. Prop control was out of adjustment.

D series - Right main landing gear would not retract after takeoff. Strut was overserviced.

Safety messages

• Safety-of-flight maintenance mandatory message concerning one-time inspection for right cyclic control stick cracks (OH-58-85-02, 232200Z Jul 85). Summary: This message provides detailed instructions for an inspection of the OH-58 right cyclic control stick for cracks. Contact: Richard Smith, AUTOVON 693-1689, commercial 314-263-1689.

• Safety-of-flight maintenance mandatory message concerning one-time and recurring inspections of all K747 main rotor blade erosion guards installed on AH-1S aircraft (AH-1-85-04, 222359Z Jul 85). Summary: A recent Class A mishap occurred when an erosion guard separated from a K747 blade during flight. The failure was attributed to water getting under the erosion guard through an undetected separation between the erosion guard and blade near the inboard root end and then progressing outboard until cohesive failure occurred. Contact: Jack Hepler, AUTOVON 693-1687, commercial 314-263-1687.

• Safety-of-flight technical message concerning one-time inspection of AH-64 drive shaft couplings for proper assembly (AH-64A-85-03, 182200Z Jul 85). Summary: An improperly installed engine nose gearbox fan coupling was discovered on an undelivered AH-64. This installation cannot be observed without a mirror and flashlight. A check of all similar couplings for improper installation is prudent. Contact: Howard Johnson, AUTOVON 693-3300, commercial 314-263-3300.

• Safety-of-flight technical message concerning one-time inspection of UH-60 tail rotor drive shaft bearings (UH-60A-85-23, 252320Z Jul 85). Summary: Bearings have failed because of lack of lubrication during manufacture. Bearings with less than 100 hours of operating time will be removed from service. Other bearings will remain installed pending test results. Contact: Roman Chomskis, AUTOVON 693-1840, commercial 314-263-1840.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

Aircraft accident review

UH-1 crashes when engine fails from fuel exhaustion

Synopsis

As a UH-1H was returning to home base at night, headwinds became stronger than anticipated. The engine stopped as a result of fuel exhaustion. The Huey landed hard 200 meters from the approach end of the runway.

History of flight

A UH-1, with a pilot and copilot as the crew, flew from its home base to another airfield to deliver some parts needed to repair two AH-1s. The copilot was an AH-1 maintenance officer.

When repairs were begun on the AH-1s, it was discovered that one of the parts needed was not there. To expedite the repairs, it was decided that the UH-1 would return to home base that night, get the needed part, and fly back the next morning. The copilot of the UH-1 needed to stay to work on the AH-1s, so one of the AH-1 pilots took his place as copilot of the UH-1.

Because winds at the selected flight level were considered adverse, the flight plan was filed from the airfield to an airport along the route, where the aircraft would be refueled. The UH-1 had been refueled at the airfield, but the pilot did not visually check the fuel level and did not know how much fuel had been required. One of the AH-1 pilots had used his commercial credit card and pocketed the receipt.

After the first 30 minutes of flight, a fuel consumption check indicated a 500-pound-per-hour rate of consumption. Another check 1 hour into the flight indicated a 475-pound-per-hour rate of consumption. About 45 to 50 nautical miles from the airport, with 420 pounds of fuel indicated on the fuel quantity gauge, the computed fuel consumption rate (475 pounds per hour) was rounded up to 480 pounds per hour or 8 pounds per minute. With an assumed ground speed of 90 knots per hour, the crew estimated they could make the airport with 23 minutes of fuel remaining. To be safe, they increased airspeed to maximum range (approximately 115 knots airspeed/39 pounds torque).

The flight was continued until the crew sighted the airport. They descended about 500 feet and then reported low fuel. Several minutes later, the low fuel warning light came on. The fuel gauge indicated 180 pounds at that time. About 2 minutes later, the right fuel boost pump light came on, and the crew requested landing clearance to the approach end of a runway.

The engine then stopped, and the pilot began an autorotation. About 200 feet above the ground, engine power was restored for no longer than 30 seconds and forward flight was attempted. The engine stopped again at 150 feet, and the autorotation was continued to the ground. The UH-1 landed tail low, spreading the gear, and then rebounded to an extreme nose-low attitude. One main rotor blade hit the ground, and the other main rotor blade severed the tail boom. The crew was not injured.

Crew experience

The 25-year-old pilot had more than 400 rotary wing flight hours, with more than 300 in the UH-1H. The 31-year-old copilot had more than 450 rotary wing flight hours, with more than 100 in the UH-1H.

Commentary

Two hours and 17 minutes into the flight and 1 nautical mile from destination, the engine failed as a result of fuel

Accident review

exhaustion. At engine failure, the fuel quantity gauge indicated 140 pounds of fuel remaining. The gauge was adjusted incorrectly and two fuel transmitters exceeded allowable tolerance limits, allowing the crew to believe that their destination could be reached.

No cause could be found for the out-of-tolerance conditions found in the fuel system. The system does not require servicing except as faults are found during normal operation. Calibration of the system is required only during depot rebuild, and the fuel quantity gauge does not require bench calibration before installation. Therefore, errors could exist from installation.

The only preflight check that could alert the crew to a potential problem is to ensure visually that tanks are full and to crosscheck the fuel quantity gauge for a proper indication. This check, however, would not be conclusive. Fuel transmitter problems could still result in nonlinear errors during the fuel burn and possibly an inaccurate fuel consumption computation.

Although materiel malfunction directly contributed to this accident, the crew used poor judgment in continuing a cross-country flight without calculating actual ground speed. Adverse winds were forecast for the entire flight route, with planned time en route to be 1 hour and 45 minutes. After takeoff, two fuel consumption checks were made and fuel burnout times calculated. However, no attempt was made to verify the planned ground speed in flight. Therefore, the crew did not know that actual winds aloft were 22 knots greater than forecast, and they were unaware that their estimated time en route had increased to 2 hours and 20 minutes. Had the crew known this, they would have selected an alternate refueling point. As it was, the crew did not realize that fuel was critical until they were about 50 nautical miles north of their destination, a point at which their best decision was to continue to the airport. ■

Quick thinking saves airplane

Quick thinking and emergency procedures by an instructor pilot are credited with saving an Army aircraft when one of its engines failed shortly after takeoff.

Joseph H. Powell, an instructor pilot at Fort Rucker, and his student, Captain Robert G. Pyper, were flying a training mission in an OV-1 Mohawk. Powell was demonstrating a normal takeoff. At an altitude between 50 and 100 feet, he experienced the "swimming in glue syndrome." He had lost the No. 2 engine.

The first thing Powell noticed was the aircraft yawed to the right. The instrument panel warning lights lit up like a Christmas tree. Powell said it took him 2 or 3 seconds to begin corrective actions. There wasn't enough runway to land on, so he decided to fly the Mohawk away. He ultimately flew 5 miles before he had enough speed and altitude to turn back to the airport.

"As I progressed through the emergency procedures to the point where the flaps were supposed to come up, I realized the airspeed was much too slow, so I left them extended. If the flaps had been retracted, we would have lost directional control of the airplane and would have had to eject " Powell said.

He directed Pyper to jettison the wing tanks, which were partly responsible for the slow speed. "When Pyper dropped the tanks onto the runway, the tower told us we had lost a wing tank, and I radioed back that I hoped we had lost both of them," Powell said.

Powell's actions began to show and he was finally able to get the aircraft up to 400 feet above ground level. He lowered the nose and retracted the flaps, attaining a safe single-engine climb speed, about 124 knots.

"After reaching that speed, we were able to start a good positive climb, then turn crosswind and take it back to the airport for landing. The only damage we had was to the tanks we had jettisoned," Powell said.

Pyper, an Army aviator with more than 600 flight hours, said, "Under most circumstances, a pilot might at least have lost the aircraft, but Powell showed his skill under trying circumstances and I'm certainly glad he had the controls."

Powell, combining his military flying and working with a contractor, has accumulated more than 4,250 flight hours. About 1,450 of those hours have been in the Mohawk. ■

—Al Endicott
Fort Rucker Public Affairs Office

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 26 July-1 August

Utility helicopters

UH-1 Class E mishaps

H series - Crew chief saw fuel seeping from internal auxiliary tank during flight. Caused by failure of O-ring on auxiliary tank fitting.

H series - Inspection after landing revealed that IR suppressor plate for oil cooler duct was hanging by one bolt from the lower fuselage. The front two bolts were missing and the aft left bolt was ripped from the fuselage. Indications are that the front bolts vibrated loose.

H series - While on the ground at flat pitch and 6000 rpm, pilot inadvertently placed governor in emergency mode, resulting in engine and rotor overspeed for 1½ seconds.

H series - Transmission oil pressure light came on during hover. Caused by blown transmission oil filter gasket.

H series - Master caution and hydraulic lights came on. Caused by failure of hydraulic pressure switch.

H series - N1 tachometer dropped to zero. Caused by failure of tachometer gauge.

UH-60 Class E mishaps

A series - No. 1 engine oil pressure dropped to 20 psi. Caused by failure of oil pressure transmitter.

A series - Low-pitched whining sound was heard. Postflight inspection revealed No. 2 high speed shaft was leaking oil. Suspect failure of gearbox caused out-of-balance condition and seal failure.

Attack helicopters

AH-1 Class E mishaps

S series - Vibrations were felt throughout airframe during descent. Roll and yaw SCAS began to oscillate. Caused by failure of SCAS actuator.

S series - Starter would not engage engine. Caused by sheared shaft on starter/generator.

Cargo helicopters

CH-47 Class E mishaps

A series - During descent, pilot noticed static beep failure on No. 2 engine. Caused by malfunction of N2 control box.

C series - No. 1 engine oil temperature rose above 150 degrees C. Caused by failure of oil temperature bulb.

C series - Forward speed trim actuator did not retract from extended position during approach. Caused by failure of speed trim actuator motor.

C series - No. 1 engine transmission oil pressure dropped below 20 psi during hover. Caused by failure of transmission pressure transmitter.

D series - During engine start, No. 2 engine accelerated to flight when condition lever was moved to ground. As engine accelerated past flight idle N1 speed, condition lever was moved from ground to stop with no engine response. Engine accelerated to an N1 speed of 80 percent and stabilized. Caused by failure of N1 control box.

Observation helicopters

OH-6 Class D mishap

A series - Crew heard loud bang during flight and landed. Seat cushion had flown out of aircraft and dented tail rotor blade.

OH-58 Class C mishap

A series - During engine start, pilot noticed early rise of TOT. TOT rose about 927 degrees for about 8 seconds. Pilot did not anticipate hot start and did not shut fuel off quickly enough.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	1-14 Aug	**1**	**1**
	September	4	3			
	Total for Year	39	35*	Total to Date	**43**	**29**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Mishap briefs

OH-58 Class D mishaps

A series - Postflight inspection revealed that lower wire strike protection system breakaway tip was missing.

A series - Left windshield was broken by flying piece of metal from a 155mm round. Pilot assumed that the range was cold because other pilots had been told it was cold 10 minutes earlier.

OH-58 Class E mishap

A series - Pilot felt binding during runup and engine quit. Caused by failure of fuel control.

Fixed wing

C-12 Class E mishap

D series - Strong fumes filled cockpit during flight. Caused by failure of forward vent blower motor.

OV-1 Class E mishap

D series - When power was applied, No. 2 propeller rpm increased to 1780 for 2 seconds. Caused by malfunction of prop control.

Maintenance

UH-1 Class E mishap

H series - Engine rpm fluctuated and aircraft yawed. VIGV actuator was out of rig.

AH-1 Class E mishaps

S series - Master caution and transmission oil hot lights came on. Suspect that during inspection for a leak in the fuel cell vent hose, maintenance personnel inadvertently disconnected quick disconnect on transmission oil line from cooler.

S series - Aircraft yawed 15 degrees left, N2 dropped to 5800 rpm, and engine noise decreased. Postflight inspection revealed a washer inside the fuel control metering section directly in front of the inlet port. This caused a reduction in fuel flow to the engine.

OH-58 Class D mishap

A series - Pilot noticed poor VHF radio performance during flight. Antenna wire came off vertical fin and connector struck tail rotor blade leading edge. VHF antenna coaxial cable was too long, allowing connector to reach tail rotor blade area.

U-8 Class E mishap

F series - Nose gear indicated unsafe during landing. Down-lock spring was unconnected.

T-42 Class E mishap

A series - Control yoke would not rotate beyond the centered 12 o'clock position during takeoff. Aircraft was being operated under night instrument conditions. Visual contact with runway environment was attained at 800 feet agl and successful landing was made. Failure to adequately secure wiring harness caused harness to fall into flight controls during rotation.

Safety messages

- Safety-of-flight technical message concerning supplement to inspection of UH-60 tail rotor drive shaft bearings (UH-60A-85-24, 020200Z Aug 85). Summary: This message provides direction for aircraft being held on the ground pending bearing test results. Contact: Jasper Spears, AUTOVON 693-1840, commercial 314-263-1840.
- Maintenance information message concerning change in flyable storage engine runup requirements (powerplants) (MIM-GEN-85-MEM-03, 011530Z Aug 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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". . . all I saw was a single strand of wire"

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OH-58 pilot: "I looked up in time to see two wires come toward the windscreen and I saw them go up above us. I'm not sure where they hit. Then I felt a severe vibration in the aircraft . . . The next thing I saw were the trees, and we hit the trees. . . ."

OH-58 copilot: "We were going down the valley. Then all I saw was a single strand of wire across my front. We couldn't have been 10 or 15 yards away from it. The wires blended in perfectly. I pulled in pitch and honked it back a little to try to gain some altitude quickly to get over them. We heard a big thud, and something grabbed the helicopter and it started shuddering real bad and started to go left. I saw the trees coming and I knew we were going to hit hard. . ."

These pilots were flying at NOE altitude over a ridgeline into a valley when their helicopter hit three powerlines. The wires passed under the rotor blades and over the upper cutter of the wire strike protection system. The end of one of the wires wrapped around the mast and severed the pitch change links.

OH-58 pilot: "I was going to climb to what we thought was terrain flight for NVGs. I don't remember if I shouted 'Wires!' or who. I remember the word 'wires,' but I don't remember hearing it. I think I just more or less felt it. I saw a pole right out the left door. I got a glimpse of it and I thought maybe we're barely over them. That was it. The next instant, I was on the ground. . . ."

This pilot was flying 50 feet above the ground when his OH-58 hit the top two cables of a powerline. The first cable hit the airframe forward of the windshield and entered the cockpit. The second cable was cut by the bottom wire cutter.

These aviators lived to tell their story. A great many have not. Forty-two crewmembers and passengers have been killed and 83 more injured in wire strike accidents in the past 10½ years. These accidents cost more than $25 million. More OH-58s (31) were involved in Class A, B, and C wire strike accidents than any other aircraft,

"... all I saw was a wire"

followed closely by UH-1s (see table 1).

The wire strike protection system installed on Army aircraft has proven to be effective in reducing the number of aircraft lost to wire strikes. However, this system is not a cure-all for wire strikes. Both of the OH-58s involved in these accidents were equipped with wire strike protection systems. When wires do not invade the area which the system is designed to protect, the system is not challenged. So the causes of wire strikes must be eliminated.

Wire strike accidents are caused by, among other things, pushing on in weather because of a desire to get to destination, no hazard maps, wires not marked on hazard maps, unauthorized low-level flight, overconfidence in ability to see wires, deviation from NOE route, and unauthorized high-speed maneuvers. It is rare that an in-flight materiel-related emergency results in a wire strike.

Most wire strikes happen during cruise flight at altitudes below 50 feet agl, although some have occurred above 150 feet. Slower airspeed not only makes wire detection and avoidance easier but also reduces the severity of injuries and aircraft damage if wires are hit.

It is virtually impossible to locate all wires by an aerial reconnaissance over unfamiliar terrain. Even though wires may not be seen, their presence should be expected along roads and railroad tracks; between hills, poles, structures; and between poles and structures. Even when only a single pole in open country is spotted, wires may be present.

The position of the sun, types of wires, time of day, and existing atmospheric conditions can drastically affect the crew's ability to detect wires. A change in one or more of these variables can be a deciding factor as to whether wires can be readily spotted, seen with difficulty, or not seen at all. Even large powerlines suspended from a tower can be virtually impossible to see on a clear day if other adverse environmental conditions exist.

The possibility of a wire strike is greatest when lack of crew coordination diverts the pilot's attention from visually searching for wires. The more crewmembers actively engaged in spotting wire hazards on any given flight, the less the risk of a wire strike.

Wire strikes have declined over the years, but they are still costing us lives and dollars. Wire strikes can be prevented through team effort. The team includes the following people:

- The commander must continually enforce SOPs dealing with flight discipline. Breaches of flight discipline must meet with positive command

TABLE 1.—Class A, B, And C Wire Strikes

Year	Total	Type Aircraft				Injuries		Cost
		UH-1	OH-58	AH-1	Other	Inj	Fat	
1975	6	4	1	1	0	10	8	$ 1,706,234
1976	6	2	3	1	0	7	3	1,348,299
1977	9	3	5	0	1	8	5	4,817,745
1978	10	3	6	0	1	2	7	2,299,102
1979	5	3	2	0	0	3	4	1,605,285
1980	6	3	1	1	1	15	4	2,830,447
1981	7	0	6	1	0	7	1	624,360
1982	6	3	1	0	2	16	4	3,914,819
1983	4	2	1	0	1	5	0	1,148,804
1984	9	1	2	2	4	3	3	1,699,897
1985*	6	2	3	1	0	7	3	3,049,549
Total	74	26	31	7	10	83	42	$25,044,541

*1st half

action. Unit operating procedures for the 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.

• The operations officer must schedule aircrews who are compatible and who have attained the desired state of training as weighed against the complexity of the mission. The operations officer must provide hazard maps and brief aviators on wire hazards.

• The unit aviation safety officer must contribute to a wire avoidance climate in the unit by promoting prevention awareness in safety meetings; by closely monitoring flight crew scheduling, briefings/debriefings, posting, use of, and availability of wire hazard maps; and, in coordination with or in the absence of a flight surgeon, by being aware of the psychological/physiological state of the aviators in the unit.

• Unit instructor pilots must practice, teach, and reinforce wire strike prevention criteria and commonsense rules for detecting wires. IPs must place emphasis on slowing down when poor visibility conditions (flying into sun, rain, etc.) are encountered and stopping to reorient when disoriented.

• 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.

• The aviator must, as the "final authority," consistently and successfully combat the temptation to take shortcuts that may lead to a wire strike. 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 mishaps, but the final responsibility still belongs to the people in the cockpit.

Seven steps for wire strike prevention

1. Make certain unit SOPs cover terrain flight and clearly establish safe procedures for the types of missions to be flown.

2. Ensure that pilots adhere to established procedures, and commanders must take immediate and positive action regarding **any** violation of flight discipline.

3. Make certain that thorough wire hazard and obstacle briefings are conducted before every terrain flight mission.

4. Mark wires in the areas where you normally operate.

5. Avoid contour flight unless required by the mission. Contour is the terrain flight mode where most wire strikes occur.

6. Ensure maximum crew coordination in searching for and calling out wires during terrain flights.

7. Above all else, go slow when you go low. ■

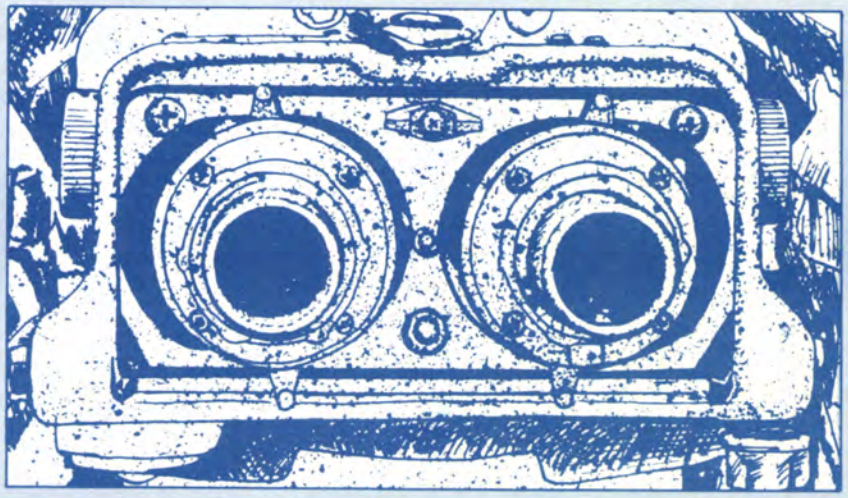
Notice to all aviators who wear corrective lenses and use night vision goggles

The U.S. Army Aeromedical Research Laboratory has studied the impact resistance of various materials used for prescription lenses. The standard issue lenses for aviators are made from specially treated glass. Studies show that these glass lenses are not nearly as impact-resistant as those made of a material called polycarbonate.

Approximately 3 months ago, aviation personnel were notified by TWX and also a statement in **Flightfax** that if they wore corrective lenses and flew with modified night vision goggles, they should contact their local eye clinic or flight surgeon to order the new polycarbonate lenses. This is a research project and is restricted at this time to active Army personnel who wear single-vision (no bifocal) lenses. They are only available in clear color, and each eligible individual will receive one pair.

If you qualify for this program, you are **strongly urged** to have your current glass lenses replaced. If you are in a command position, you should ensure that your flight personnel are made aware of this program and encouraged to participate.

Information about this program has been made available to all eye clinics and flight surgeons. However, should you have any questions you may contact Dr. John Crosley at the U.S. Army Aeromedical Research Laboratory, P.O. Box 577, Fort Rucker, AL 36362-5000, or call AUTOVON 558-6824. ■



Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 2-8 August

Attack helicopters

AH-1 Class A mishap

S series - Pilot, demonstrating aircraft capabilities, was making diving maneuvers and pulling out close to the ground. On the third dive, pilot misjudged clearance and aircraft hit the ground left side low. Pilot momentarily brought aircraft to stabilized hover. Aircraft spun to right and made three or four revolutions before crashing inverted. Pilot was killed and passenger was seriously injured. 8552

AH-1 Class E mishaps

S series - HIT check was plus 33. Particle separator was partially clogged by sand, dirt, and grass. Aircraft had been operating in a desert environment.

S series - Aircraft, equipped with multiple integrated laser engagement system (MILES), was at a hover in firing position. IP was viewing target through TSU and told pilot to begin egress procedures. Pilot tried to untangle MILES audio cabling from collective. Torque increased to 110 percent before movement could be stopped. IP took control and landed.

Utility helicopters

UH-1 Class D mishap

H series - As aircraft was landing to a pinnacle, windshear was encountered at 30 feet agl. Power was applied until full left pedal and a 15-degree sideslip to the right had developed. Power was approximately 40 psi torque and engine rpm was 6600. Go-around was attempted. Aircraft was put into a 5-degree nose-high decelerative attitude and right yaw developed. As aircraft slowed, right yaw and rate of descent increased. Concerned that added power would cause a further increase in right yaw at touchdown and that reduction of collective would result in a hard landing, pilot rolled off throttle and autorotated. This corrected the yaw to 5 degrees left and stopped the excessive rate of descent. Aircraft touched down on large rocks, damaging skid tubes.

UH-1 Class E mishaps

H series - Pilot noticed uncommanded control feedback in cyclic. Caused by failure of servo cylinder.

H series - Crew felt high frequency vibration in pedals and floor of aircraft. Caused by failure of No. 3 tail rotor drive shaft hanger bearing.

H series - Engine quit during runup. Caused by defective fuel cutoff valve.

H series - Engine oil light came on. Caused by defective thermostatic valve.

H series - Tail rotor chip detector light came on. Caused by wear metal from 90-degree gearbox.

UH-60 Class E mishap

A series - Several caution lights came on during flight. Caused by failure of master caution panel.

Cargo helicopters

CH-47 Class D mishaps

C series - Aircraft was landing at LZ. Ramp was left level with the cabin floor because rear wheels of a jeep were on the ramp. Blowing dust obscured the pilot's sight of the touchdown point. As aircraft touched down, it rolled forward about 2 feet, and aft landing gear went into a small ditch. Bottom of ramp was damaged.

C series - Weather deteriorated

FY 85 Class A Mishap Countdown

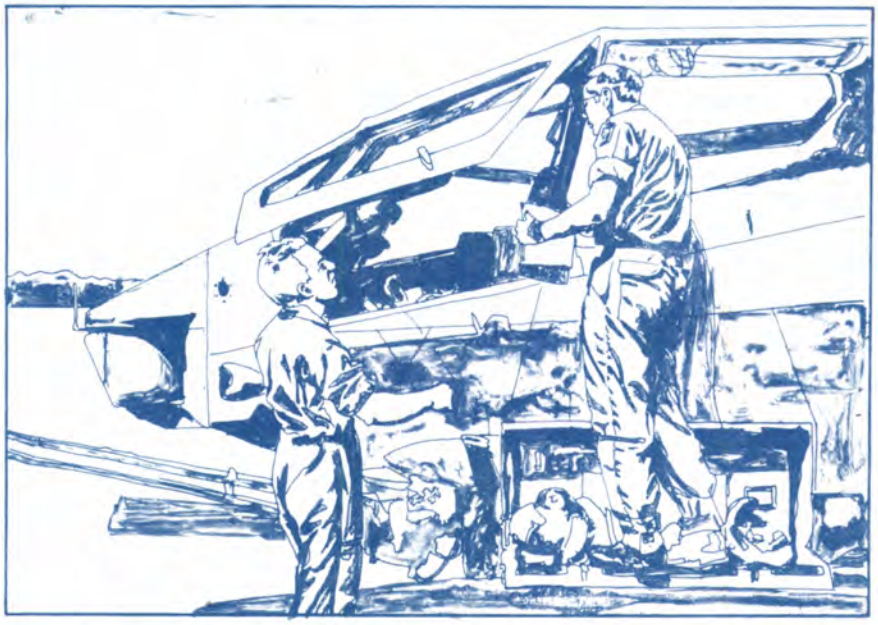
		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	1-21 Aug	**1**	**1**
	September	4	3			
	Total for Year	39	35*	Total to Date	**43**	**29**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Mishap briefs

during flight. Pilot could not return to takeoff site or continue mission. As pilot made his approach to an open field, he noticed tall ferns and grass. Aircraft landed on two small stumps, which punched holes in sheetmetal.

B series - As aircraft was being run up, fuel leak was found on No. 2 engine. Test pilot told flight engineer to see where the leak was coming from. Flight engineer climbed to engine work platform and opened bottom engine cowling. He could not find the source of the leak, unplugged his helmet from the intercom, and climbed up side of aircraft. Engines were off line, but APU was running and blades were coasting down. Slow-turning blade struck flight engineer on the shoulder and knocked him from aircraft. Fatigue at the end of a 10-hour workday may have been a contributing factor.



CH-47 Class E mishaps

C series - Hydraulic fluid was seen leaking from hydraulic system reducer. Caused by failure of preformed packing.

B series - No. 2 flight boost gauge fluctuated and cyclic pulsated left to right in the roll axis. Caused by failure of flight boost transducer.

D series - After aircraft was lifted to a hover, aft longitudinal control trim would not retract in automatic or manual mode. Caused by failure of linear actuator.

Observation helicopters

OH-6 Class D mishap

A series - Daily inspection revealed damage to main rotor blades. Suspect damage occurred during landing.

OH-6 Class E mishap

A series - N1 would not increase above 72 percent during autorotation. Suspect governor failure.

OH-58 Class D mishap

C series - As aircraft was flying in light turbulence, pilot's armor side panel swung open. Panel nut plates were damaged when panel hit stops.

OH-58 Class E mishap

C series - Transmission oil pressure rose to 105 psi during flight. Caused by failure of oil pressure transducer.

Fixed wing

U-21 Class E mishap

A series - Landing gear was electrically extended, but right main gear light did not illuminate. Caused by broken wire beneath gear.

C-12 Class E mishap

D series - Cabin temperature rose rapidly to 90 degrees, and smoke was noted in cabin. Caused by failure of cabin temperature controller.

Maintenance

UH-1 Class D mishap

H series - After jumpers exited, aircraft had a compressor stall at 10,000 feet. Compressor stall was caused by erosion and minor FOD. Maintenance personnel failed to keep particle separator discharge tube clear.

AH-1 Class E mishaps

S series - Vibration was felt through antitorque pedals and seat during runup. Turret was bumping against the stop. Maintenance personnel had not entered in logbook that drive assembly azimuth rate unit had been removed from turret and that circuit breaker should be out to prevent turret from bumping the stop.

S series - Radios were not operational during runup. When radio access panel was removed, it was discovered that radios were not installed. Removal of radios was not entered in logbook.

S series - On preflight inspection, pilot found that transmission fluid level was low. He told crew chief to fill transmission. When he rechecked transmission, he noted the red color of the fluid and asked crew chief to check can. Crew chief had used hydraulic fluid instead of transmission fluid.

Safety messages

• Safety-of-flight technical message concerning one-time inspection for missing cotter pins at F.S. 275 bellcrank (AH-64-85-04, 081500Z Aug 85). Summary: Before delivery, two production aircraft were found to be missing a cotter pin on the tail rotor bellcrank at F.S. 275. This message requires an inspection for proper installation of cotter pins. Contact: Howard Johnson, AUTOVON 693-3300, commercial 314-263-3300.

For more information on selected mishap briefs, call AUTOVON 558-4198/4200.

A few words on the word "safety"

I'm sure all of you assume the word "safety" was derived from the Middle English (ME) and Middle French (MF) word "sauvette." Unfortunately, this is incorrect. I have it on good authority from an **old** flight safety officer that **he** actually coined the word. He related that he designed the word, letter by letter, from words that described safety. I'd like to share his knowledge with you.

S—the letter "S" stands for "sense," that is, COMMON SENSE. The point being that the majority of safety is just the exercise of common sense. As you may have heard, the problem with common sense is sometimes it's not so common. Be on your guard.

A—the letter "A" stands for ATTITUDE. A safe individual has a positive and professional attitude on the importance of safety in the organization. This attitude is analogous to the old phrase "Think Safety." The letter "A" also stands for ASSUME. (That is, don't assume anything.) Safety involves a conservative mental process of not assuming. You know the old adage—assuming too much, when not balanced with good judgment, will make an ASS (out of) U (and) ME.

F—the letter "F" stands for FITNESS, both mental and physical. You have to be mentally and physically fit and satisfy those basic physiological needs before you can place the proper emphasis and attention on safety.

The letter "F" also stands for FORESIGHT, the ability to look ahead and foresee what could go wrong and what action would be required to make the evolution as safe as possible. (Remember Murphy's law.)

The letter "F" also stands for FAMILIARITY. Safety is being familiar with and knowing the equipment and procedures required in doing your work.

E—the letter "E" stands for EDUCATION. People should be educated to the importance of safety on the job. Safety is a portion of the daily routine; it is by no means separate and distinct. It goes hand-in-hand with a professional approach.

T—the letter "T" stands for TALK. Safety is a matter of talking and communicating. An absence of free and open communications in an organization on both a vertical and horizontal basis will spell disaster in the area of safety.

The letter "T" also stands for "take the time to do it right." You know the old adage, "we never have the time to do it right the first time, but we always have the time to do it right again a second time." You cannot overemphasize the importance in the area of safety in taking the time to plan and review the procedures before taking on a job.

Y—the letter "Y" stands for YOU. Safety is the collective effort of **all** individuals in an organization toward a common goal. The contribution or lack of contribution of each individual in the area of safety will show in the final count.

When you think safety, think of the words that it came from and are crucial to a safe and productive work environment; namely—common sense, attitude, not assuming anything, fitness, foresight, familiarity, education, talking, taking the time to do it right (the first time) and most important, you. ■

—from Approach
Cdr. Tom Johnson, USCG

U.S. ARMY SAFETY CENTER

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Terence M. Henry
Colonel, Aviation
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Report of Army Aircraft Mishaps

Followups

Additional information on mishap briefs previously published

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Utility helicopters

UH-1 Class A mishap in 7 Nov 84 issue (8503) □ UH-1V pilot was on the final leg of a night MAST mission. He departed VFR from his intermediate stop en route to his destination which he knew to be below IFR published approach minimums. Arriving at destination, the pilot initiated an instrument approach which terminated in a missed approach when the runway environment could not be seen. The pilot then requested a second approach because he could see the runway lights as he flew directly over the airfield. During the second approach, the pilot elected to descend below decision height when the approach lights and the runway were not clearly visible. Airspeed deteriorated, and the UH-1 hit the ground in a near-level attitude. The three occupants were injured.

UH-1 Class A mishap in 30 Jan 85 issue (8516) □ Aircraft was on tactical training mission. Copilot, occupying the left seat, created a dynamic rollover condition during a slope landing. The right skid hit a soft dirt mound, and the helicopter rolled over on its right side. The pilot did not clear or ensure the copilot cleared the aircraft of obstacles before attempting the slope landing.

UH-1 Class B mishap in 13 Mar 85 issue (8521) □ Engine failed during NOE flight. IP autorotated to an open field, and the aircraft came to rest upright, with damage to the tail boom, landing gear, main rotor blades, and underside. Engine failure was caused by failure of the gas producer wheel lockring tabs. This allowed the gas-producing wheels to operate in an out-of-balance and out-of-alignment condition which resulted in complete failure of the power turbine section. The IP correctly identified the emergency and properly performed emergency tasks. The height and velocity of the aircraft at the time of engine failure were the controlling forces which resulted in aircraft damage.

Observation helicopters

OH-58 Class A mishap in 21 Nov 84 issue (8507) □ OH-58 was the lead aircraft in a flight of four returning to their home field. About 1 minute after takeoff from a field location, the OH-58 pilot, wearing night vision goggles, began a left 360-degree turn. Airspeed and altitude were lost during the turn. The aircraft hit the top two cables of a powerline. The copilot had become preoccupied with the radios and did not communicate navigational data and

(continued on back page)

8507

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 9-15 August

Utility helicopters

UH-1 Class E mishaps

H series - Aircraft yawed left during flight. Caused by defective engine fuel control.

H series - Master caution light came on, and engine oil pressure gauge dropped to zero, then went back to normal. Five minutes later, inverter light came on. Caused by failure of main inverter.

H series - Master caution and left boost pump lights came on during hover. Sand or dirt had clogged ejector pump, causing loss of pressure.

H series - Transmission oil pressure gauge fluctuated during hover. Caused by malfunction of oil pressure transducer.

H series - Tail rotor chip detector light came on. Ninety-degree gearbox was replaced.

Attack helicopters

AH-1 Class D mishap

S series - Postflight inspection revealed right wing pylon fairing (forward) was missing. The forward fairing is attached to the pylon with four dzus fasteners. Outboard wing fairing was broken, indicating two inner dzus fasteners became loose during the flight and caused forward fairing to swing to the right and break the two outboard dzus fasteners. Two maneuvers may have caused the separation by vibrating the two inboard dzus fasteners loose. An OGE hover was performed at 1,500 feet agl. Winds aloft were about 15 to 20 knots at 160 degrees. Before settling into a good zero airspeed hover, the aircraft entered a condition similar to settling with power. As aircraft decelerated out of translational lift, it entered a descent momentarily and vibrated. This vibration, coupled with the airflow rising under the wing, may have caused the fasteners to become loose. During a "g" loading check maneuver, aircraft was placed in a 20-degree dive. Airspeed was 75 knots with 60 percent torque applied. As airspeed reached 130 knots, pilot induced a positive "g" load by applying aft cyclic while turning right. During the climbing right turn, pilot noticed a slight bump or jolt in the flight controls and airframe. All indications were normal. Pilot thought it was the SCAS reacting to the wind or turbulence.

AH-1 Class E mishaps

S series - Aircraft was in NOE flight following an OH-58. Visual contact with the OH-58 was lost after cresting a hill. Aircraft was accelerated downslope while pilots searched for the OH-58. Pilots applied aft cyclic and collective pitch to miss a tree. Torque stabilized briefly at 60 psi and N2 bled off about 400 rpm. Postflight inspection revealed no damage.

S series - Master caution and engine chip detector lights came on. Suspect internal engine failure.

S series - Aircraft yawed left and right during hover. Caused by defective SCAS amplifier.

Cargo helicopters

CH-47 Class B mishap

D series - During refueling operation,

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	1-28 Aug	**2**	**1**
	September	4	3			
	Total for Year	39	35*	Total to Date	**44**	**29**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

left cell overfilled. Ballooning effect caused structural damage to aircraft. Suspect malfunction of hot refueling nozzle. 8553

CH-47/Class E mishaps

D series - Flight engineer saw fuel venting overboard from vicinity of refueling station. Caused by failure of disk valve in pressure refueling receptacle to fully seat.

C series - IP was demonstrating single-engine flight. No. 2 engine condition lever was placed to ground position. When lever was returned to flight position, engine did not respond. Caused by malfunction in engine quadrant assembly.

C series - Smoke and sparks were seen coming from No. 1 engine during landing. Caused by failure of generator.

Observation helicopters

OH-58 Class C mishap

A series - Crew was conducting standard autorotation training. All parameters of the maneuver were normal through the point of deceleration. Student pilot maintained deceleration attitude through initial pitch pull, which was higher than normal, and did not level aircraft before touchdown. IP failed to take corrective action before the heels of the skids hit the lane surface. Low rotor rpm condition caused one main rotor blade to flex down, severing tail boom and tail rotor drive shaft. Aft portion of severed tail boom then fell to the ground, causing extensive damage to tail rotor assembly.

OH-58 Class D mishaps

C series - Unit trainer (UT) was demonstrating ITO. As aircraft approached 500 feet agl, UT experienced violent control feedback in cyclic, pedals, and collective. Torque gauge fluctuated rapidly. UT returned to heliport and landed. Checklist had hit and damaged tail rotor blades. Location of checklist before takeoff is uncertain. UT apparently failed to secure checklist.

A series - IP was demonstrating autorotation. After autorotation was entered, rotor rpm was in the high green and increasing. Pitch application was made and rpm stabilized in the mid green. When deceleration was initiated, IP checked rpm and it was steady at mid to high green. IP then checked outside for position. When he glanced back at tachometer, rpm was 400. Pitch was applied to bring rpm to mid green. Autorotation was completed without further incident. Higher than normal density altitude contributed to high rotor rpm.

OH-58 Class E mishaps

C series - During hydraulics check, hydraulic pressure was not restored after hydraulic boost switch was returned to "on" position. Caused by failure of hydraulic axial pump.

A series - Binding was felt in cyclic in the forward position during takeoff. Caused by defective magnetic brake assembly.

A series - Before takeoff, fuel gauge indicated 425 pounds. On downwind departure, fuel gauge indicated 200 pounds. Caused by malfunction of fuel gauge.

Fixed wing

U-21 Class E mishap

D series - Flaps froze in intermediate position while being lowered from approach position. Caused by failure of flap motor.

C-7 Class E mishaps

A series - Loud bang was heard during flight, and white smoke was seen coming from No. 2 engine. Cylinder head had split between plug hole.

A series - Right engine low fuel pressure light came on. Caused by failure of fuel pressure switch.

C-12 Class E mishaps

C series - Flap switch was moved to full down position on final approach. Flaps would not move from previously set 40 percent position. Caused by stuck microswitch on cockpit flap lever.

A series - No. 2 fire pull handle light came on during descent for landing. Caused by defective flame detector.

OV-1 Class E mishaps

D series - No. 2 generator failed in flight. Caused by faulty voltage regulator.

D series - Hydraulic fluid started leaking onto floor on copilot's side of aircraft during taxi. Caused by defective windshield wiper motor on pilot's windscreen.

Maintenance

OH-58 Class D mishap

A series - Left rear passenger door blew off during landing. Maintenance personnel used a substitute door sealant which caused undue pressure on door hinges by interfering with proper door closure.

UH-1 Class D mishap

H series - Crew was told by radio that they had a cowling open. Postflight inspection revealed left engine cowling had come open and caused 2-inch tear in tailpipe fairing cowling. Engine cowling latches were out of adjustment.

UH-1 Class E mishaps

H series - Transmission temperature gauge indicated 120 degrees C. during hover. Caused by loose cannon plug.

H series - Engine began running rough during landing. Variable inlet guide vanes and bleed band were adjusted incorrectly. Suspect maintenance personnel failed to follow proper procedures after adjustment of fuel control.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Followups

instrument readings to the pilot.

OH-58 Class A mishap in 6 Feb 85 issue (8518) ☐ As pilot was on the final leg of a service mission, he heard a bang, followed by a slight left yaw and silence from the engine. As the pilot made a left turn to an open area, smoke and fumes entered the cockpit. The pilot made a successful autorotation to a snow-covered field. A fire in the engine area subsequently destroyed the aircraft. The cluster helical torque gear of the power train failed because of fatigue. As a result, the power train was allowed to overspeed to such an extent that the third stage power turbine rotor disintegrated, causing the engine to be torn into two pieces, rupturing fuel and oil lines. The ruptured lines sprayed oil and fuel on the engine, causing a fire. Of the gears currently in the system, one is marked with suffix E. This was an E gear. The suffix E gear has been identified as being involved in four other mishaps of this type.

OH-58 Class A mishap in 27 Mar 85 issue (8527) ☐ Power loss occurred as aircraft was in a right turn about 200 feet above the ground. The pilot continued the right turn, increased collective pitch, and tried to find a landing area. He continued to add collective pitch and, just before impact, applied aft cyclic to decelerate. Aircraft hit tail low at 40 knots forward speed and came to rest on its right side. No cause could be found for the power loss; however, it was concluded that there was a power loss. The pilot did not follow written emergency procedures. In response to an engine underspeed and loss of rotor rpm, he increased collective pitch when the correct course of action was to initiate an autorotation in accordance with the operator's manual. By not lowering the collective, the pilot continued to bleed off rotor rpm, resulting in impact with the ground.

OH-58 Class A mishap in 3 Apr 85 issue (8528) ☐ While preparing to hover to a parking area, OH-58 pilot made a left pedal turn which placed the aircraft in a downwind condition. The wind lifted the tail and caused uncommanded yaw movements which the pilot misinterpreted as loss of tail rotor effectiveness. The pilot applied forward cyclic in an attempt to fly out of the condition. This further lowered the nose. The main rotor blade hit the runway and control was lost. This mishap was caused by the pilot's inattention to existing wind conditions and inadequate command supervision. The pilot was inadequately trained and improperly designated as a pilot-in-command.

OH-58 Class A mishap in 3 Apr 85 issue (8529) ☐ Aircraft was on short final to landing. While moving forward at a hover flight speed, the pilot placed the tail of the aircraft into a known wind estimated to be 25 to 30 knots. This placed the tail rotor into the region that tends to cause the aircraft to make uncommanded left or right turns toward the relative wind. The pilot was aware of the parameters conducive to loss of tail rotor effectiveness but did not react in time to prevent the aircraft from entering that condition and crashing. ■

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Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

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Report of Army Aircraft Mishaps

He had gotten away with it before

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The stage was set for an accident long before the pilot got into the cockpit that night. On other missions, the pilot had gotten weather reports forecasting IFR and marginal conditions. He had gotten lots of reports like that. But he had continued into the deteriorating weather and had always made it. He had chanced it, and the weather had not been as bad as forecast.

The night before the accident, the pilot had flown a similar mission and landed at the same airfield with the tower reporting IFR conditions. He had broken through a fog layer at 150 feet, 50 feet below decision height, and landed. He had made it again.

On the night of the accident, the pilot, with a copilot and aidman, flew the UH-1 to a nearby hospital, picked up a heart patient and nurse, and transported them to a medical center about 200 miles away. On the return flight, the pilot started seeing some low, scattered clouds. He got a weather report saying that his intermediate stop (the hospital) was clear with 7 miles visibility and his destination (home field) was something less than 1,000 feet with fog and one-quarter-mile visibility. He wasn't really concerned. The clouds appeared to be thin. He could see lights through the layer.

The intermediate stop was still clear when the helicopter arrived at 3 o'clock in the morning. The pilot hadn't used half of his fuel when he landed at the hospital and dropped off the nurse. He was told before he landed that his destination was partial obscuration to obscured—100-foot ceiling to partial overcast.

After dropping the nurse and her equipment, the pilot took off for his home field a few miles away. He planned to check the weather and try an approach. If he could not land, he would return to the hospital. He was told the weather was partial obscuration, 100-foot ceiling, and RVR was 1,000, which is below minimums. The forecast for the intermediate stop was okay and the pilot thought it was ridiculous not to try an approach and, if necessary, a missed approach. He could see the ground all the time until he got closer to destination.

The pilot elected to try to shoot an approach, seeing no harm in doing this approach. His auxiliary fuel had run out on the way to destination, and he had about 1,200 pounds remaining in the fuel tank. The pilot received vectors for an approach. The controller made him fully aware that he was going below minimums. He elected to go ahead and

He had gotten away with it before

try it because he had so much doubt about the weather he had been given.

The pilot could see the rabbit lights at the missed approach point. He didn't have the threshold lights in sight, so he did a missed approach. As he was initiating the missed approach, the copilot looked to the left, saw the runway lights, and told the pilot the lights were visible. The pilot decided to go around and try again. While being vectored for downwind, the pilot was told that the intermediate stop had gone to 200 and a quarter and would probably go to zero/zero before he could get back there.

The crew got a report from one of the hangars that they couldn't see the helicopters from their hangar. The pilot decided to try one more approach and do it at a slower airspeed. He had 800 pounds of fuel left as he lined up for final. He did the approach and the same thing happened again. The runway lights were out to the left.

As the pilot started to do a missed approach, the copilot saw the runway lights. The pilot told the copilot to keep the lights in sight. The pilot slowed down to try to get some visual references outside. He couldn't see anything, so he decided to make another missed approach.

He pulled in power and did not compensate correctly with antitorque pedals.He looked at his airspeed and saw it dropping below 40 knots. The next thing the crew knew, the helicopter had hit the ground and rolled onto its right side.

After the crash, the pilot tried to call the tower on his survival radio. After two unsuccessful attempts, the pilot discarded the radio and tried to use his strobe light, which was inoperative. He then tried to use the radio in the helicopter. He was unable to connect his helmet to the cord jack in the darkness and could not locate his flashlight in the aircraft. The tower operator heard an emergency transmission on guard from the aircraft, but received no response when he tried to call back on guard. The operator heard a short sweep on an emergency locator transmitter and dispatched a crash truck to the approach end of the runway.

The crew could hear the crash truck driving up and down the runway. Because of the heavy fog and near zero visibility, rescue personnel could not find the helicopter or see the landing light of the helicopter which was shining up at an angle toward the tower. Seeing that the crash truck was not able to find them, the pilot ran about one-half mile to a hangar. The tower was called, and the crash truck picked up the pilot at the hangar. The pilot directed the truck to the accident site. They arrived at the site 23 minutes after the crash.

Accident behavior pattern

This accident is a classic example of an aviator who developed a behavior pattern in flying that led him to repeatedly take unnecessary risks and willingly and knowingly violate established procedures.

Following cancellation of his IFR clearance and landing at the hospital, the pilot left the hospital VFR when his destination was below IFR filing minima and forecast to remain so for the next 2 hours. There was no urgency to return to home station. The pilot could have remained at the hospital.

After arriving at his destination, the pilot did two approaches and missed approaches when weather was below that required for the procedure he requested. During the second approach, the pilot descended below decision height when neither the landing area nor the approach lights were clearly visible to him.

This accident was caused by a violation of procedures. This is the type of high-risk aviator behavior which is accounting for one-third of the human error problem in Army aviation today. Aviators who lack the self-discipline to follow the rules must change their behavior or be taken out of the cockpit.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	August	**2**	**1**
	September	4	3	1-4 Sep	**0**	**0**
	Total for Year	39	35*	Total to Date	**44**	**29**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 16-22 August

Utility helicopters

UH-1 Class C mishaps

H series - Engine oil pressure fluctuated during hover. Aircraft then had severe compressor stall, and smoke was seen coming from rear of aircraft. Engine assembly, bulkheads, and engine deck were damaged by heat.

H series - Transmission oil pressure dropped to zero, followed by illumination of master caution and transmission oil pressure lights. Transmission oil filter gasket had failed. Seven quarts of oil were lost, requiring replacement of main transmission, mast, and oil cooler.

UH-1 Class D mishaps

H series - Postflight inspection revealed top dzus fastener screw on vertical fin drive shaft cover was missing. Closer inspection of tail rotor blade revealed large dent in leading edge of blade. Suspect fastener came off and was struck by blade. Test pilot is certain fastener was secure before flight.

H series - Top from ammo can to M-60 door gun came off and hit synchronized elevator. Top was secured correctly to bottom of ammo can by steel cable. Handle to which cable was attached apparently broke or separated.

UH-1 Class E mishaps

H series - Rpm limit light came on. Caused by sheared rotor tachometer generator shaft.

H series - Aircraft yawed right and left during flight. Caused by defective fuel control.

UH-60 Class C mishap

A series - Aircraft taxied too close to rear of parked UH-60. Main rotor blades hit tail rotor blades of parked aircraft.

UH-60 Class E mishaps

A series - No. 1 engine torque increased and No. 2 engine torque decreased. Caused by failure of No. 2 engine electrical control unit.

A series - Master caution, boost off, and No. 2 reservoir low lights came on. Caused by malfunction of logic module inside ring relay.

Attack helicopters

AH-1 Class C mishaps

S series - Main rotor blade was swung 90 degrees for engine crank, but main rotor tiedown was not removed. Engine was advanced to flight idle. Crew chief heard whistling noise and told pilot to shut down. Tail rotor blades, transmission, and gearboxes were damaged.

S series - Master caution and transmission oil temperature lights came on during ground run. Before shutdown was completed, engine and transmission oil temperatures exceeded red lines. Caused by oil cooler turbine fan seizure.

AH-1 Class D mishap

S series - Refueler inserted CCR nozzle with such force that the rivets around filler cap retaining ring were torn loose.

AH-1 Class E mishaps

S series - At 5-foot hover, copilot's torque gauge read 71 percent and pilot's torque gauge read 62 percent. Caused by faulty torque transducer.

S series - Transmission oil pressure dropped to zero. Caused by faulty pressure transducer.

S series - During hover checks, tgt increased to 875 degrees and stabilized. Caused by faulty solenoid valve.

AH-64 Class E mishap

A series - Crew smelled fuel during landing. Caused by malfunction of pressure relief valve.

Observation helicopters

OH-6 Class C mishap

A series - IP was demonstrating autorotation, terminating with power. During pitch pull to stop at a hover, IP realized that power had not been reapplied. Hard landing resulted in loss of tail boom and main rotor damage.

OH-6 Class E mishaps

A series - Engine oil pressure and oil temperature gauges indicated zero during hover. Caused by failure of circuit breaker.

A series - Postflight inspection revealed bonding separation of abrasion strip on tail rotor blade from the

most inboard point following the contour of the abrasion strip outboard. The bonding completely separated for 4 inches and was cracked for an additional 5 inches. The unit submitted an EIR on the problem.

OH-58 Class E mishaps

A series - Bird hit pilot's windscreen as aircraft was flying at 80 knots. Aircraft was not damaged.

C series - Aircraft was No. 3 in a formation of three. On takeoff, copilot allowed aircraft to settle in downwash of two lead aircraft. Copilot pulled in collective to stop descent, and torque reached 102 percent. Pilot took controls and landed without further incident.

A series - Loud noise was heard from rotor system during flight. Main rotor blade end cap separated from blade because of bonding failure.

Cargo helicopters

CH-47 Class E mishaps

D series - No. 1 engine accelerated rapidly to 105 percent during approach. As No. 1 engine condition lever was brought to intermediate position, No. 2 engine accelerated rapidly to 111 percent. Caused by failure of beep control box.

A series - Transmission pressure gauge indicated 100 pounds in all positions. Caused by malfunction of selector switch.

Fixed wing

C-12 Class C mishap

C series - Aircraft was hit by lightning while flying in IMC at 25,000 feet. Engine overspeed governor, No. 1 propeller nose case, and left elevator were damaged.

C-12 Class E mishaps

C series - Crew detected acrid odor after takeoff. When gear handle was lowered for landing, nothing happened. Gear was extended manually. Caused by failure of landing gear motor.

D series - As throttles were advanced for takeoff power, pilot noted maximum power of 68 percent on No. 2 engine. High pressure bleed valve failed open and internal diaphragm deteriorated.

U-21 Class E mishaps

A series - No. 1 engine would not produce minimum power for takeoff at 31 degrees C. Caused by defective bleed air valve assembly.

A series - Fuel was seen siphoning from left nacelle cap during flight. Fuel cap locking ring was bent during refueling operation.

Maintenance

UH-1 Class D mishap

H series - Passenger dropped canteen while exiting aircraft. Crew chief picked up canteen and threw it from aircraft. Canteen was drawn into rotor system, hitting and damaging main rotor blade.

UH-1 Class E mishaps

V series - Master caution and hydraulic lights came on. Caused by incorrect installation of preformed packing on hydraulic valve collective servo.

H series - Master caution and hydraulic lights came on. Caused by chafed hydraulic line from pressure switch.

OH-58 Class D mishap

A series - Tail rotor blade leading edge was dented. VHF coaxial connector was not secure and cable was too long.

C-7 Class E mishap

A series - Excessive oil leak on left engine was seen during pretakeoff check. Oil line to firewall was installed incorrectly during engine change the previous day.

U-8 Class D mishap

F series - Gear handle was moved to retract position after liftoff. Gear began cycling up but stopped about halfway. Gear was pumped down and aircraft landed. Landing gear motor output drive, gear spur, and clutch assembly sheared because of excessive side loading caused by misaligned gearbox housing bracket.

Safety messages

- CH-47 maintenance information message concerning oil sampling interval (MIM-CH-47-85-MEM-06, 222005Z Aug 85). T55-L-712 engine oil sampling interval is every 25 hours on the CH-47C.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

U.S. ARMY SAFETY CENTER

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Terence M. Henry
Colonel, Aviation
Commander, Army Safety Center

Recap of AVSCOM messages

Following is a list of AIG 8881 addressed messages transmitted by AVSCOM (AMSAV-M) from 1 April through 30 June 1985.

UH-1-85-03 Safety-of-flight technical message concerning recurring inspection and lubrication of swashplate bearing

UH-1-85-04 Safety-of-flight technical message concerning one-time inspection of all UH-1D/H/V and EH-1 series aircraft for chem fab left and right elevator assemblies

UH-1-85-05 Safety-of-flight technical message concerning one-time inspection of all UH-1/TAH-1/AH-1 series aircraft for defective tension torsion straps

UH-60-85-07 Safety-of-flight emergency message concerning immediate grounding and inspection of flight controls

UH-60A-85-08 Safety-of-flight supplement to previously released emergency message on immediate grounding and inspection of flight controls

UH-60A-85-09 Safety-of-flight emergency message concerning immediate grounding of UH-60/EH-60 series aircraft

UH-60A-85-10 Safety-of-flight technical message concerning one-time inspection on six references due to immediate grounding

UH-60A-85-11 Safety-of-flight maintenance mandatory message on one-time inspection of main rotor spindles

UH-60A-85-12 Safety-of-flight maintenance mandatory message on one-time and repetitive inspection

UH-60A-85-13 Safety-of-flight technical message concerning one-time inspection and modified flyable storage procedures

UH-60A-85-14 Safety-of-flight maintenance mandatory message on one-time records inspection of main rotor shaft

UH-60A-85-15 Safety-of-flight maintenance mandatory message on one-time records inspection of main rotor hub

UH-60-A-85-16 Safety-of-flight maintenance mandatory message concerning correction to one-time records inspection of main rotor hub

UH-60A-85-17 Safety-of-flight maintenance mandatory message on engine output shaft

UH-60A-85-18 Safety-of-flight technical message on requirements for ungrounding

UH-60A-85-19 Safety-of-flight maintenance mandatory message concerning correction to one-time records inspection of main rotor shaft

UH-60A-85-20 Safety-of-flight maintenance mandatory message on main rotor spindle retirement life change

OH-58-85-01 Safety-of-flight technical message on recurring inspection and replacement of main rotor pitch link assemblies

CH-47-85-02 Safety-of-flight emergency message concerning immediate grounding of CH-47D aircraft

CH-47-85-03 Safety-of-flight maintenance mandatory message concerning change in allowance rotor head operating time on CH-47C/D aircraft with fiberglass rotor blades

CH-47-85-04 Safety-of-flight maintenance mandatory message on CH-47D short-term storage procedures

CH-47-85-05 Safety-of-flight technical message on one-time inspection of flare dispensing switches in CH-47C aircraft with M-130 installation

CH-47-85-06 Safety-of-flight maintenance mandatory message concerning forward and aft transmission inspection

CH-47-85-07 Safety-of-flight technical message concerning one-time inspection of pitch link connecting bolts

CH-47-85-08 Safety-of-flight technical message concerning ungrounding authorization requirements

CH-54-85-02 Safety-of-flight technical message concerning one-time and repetitive inspection of CH-54B helicopters for defective main rotor blades

CH-54B-85-03 Safety-of-flight technical message on one-time inspection of CH-54B main gearbox chip detector accessory for correct installation

CH-54-85-04 Safety-of-flight maintenance mandatory message concerning one-time inspection of CH-54A bracket, rotor hub torque tube assembly

AH-64A-85-01 Safety-of-flight maintenance mandatory message concerning one-time and repetitive inspections on T700-GE-700/-701 engines

AH-64-85-02 Safety-of-flight message concerning one-time inspection and correction of backup control system

AH-1-85-03 Safety-of-flight technical message concerning one-time inspection of all UH-1C/M/H/V, EH-1, and TH-1/TAH-1/AH-1 series aircraft for defective tension torsion straps

U-8-85-02 Safety-of-flight technical message concerning one-time inspection for the installation of stall strips

U-8-85-03 Safety-of-flight technical message concerning one-time inspection for the installation of stall strips

C-12-85-01 Safety-of-flight technical message concerning one-time inspection for the installation of stall strips

U-21-85-01 Safety-of-flight technical message concerning one-time inspection for the installation of stall strips

T-42-85-01 Safety-of-flight technical message concerning one-time inspection for the installation of stall strips

Addressees requiring copies of messages should contact their higher headquarters. ■

FY 86 USASC aviation safety courses

Two specialized DA-level aviation safety training courses will be presented at the Army Safety Center during FY 86.

The Aviation Safety Officer Course (ASOC) is a 6-week course. The objective of this course is to provide education and training in the techniques of managing an effective safety program as it applies to aviation accident prevention. Upon successful completion of the ASOC, the appropriate Additional Skill Identifier (ASI 1S: commissioned officer) or Special Qualification Identifier (SQI Suffix B: warrant officer) will be awarded.

Personnel eligible to attend the ASOC include Army aviators assigned, or selected for assignment, to ASO/FST positions; Civil Service Army flight instructors; contract civilian Army flight instructors; installation command safety directors or their assistants, where such installations have Army aircraft assigned; other military personnel as approved by the Deputy Chief of Staff for Operations; and foreign military training sponsored allied students as approved by the Security Assistance Training Field Activity, Army Training and Doctrine Command.

Proficiency in basic algebra and trigonometry is required. High school level physics or equivalent is mandatory. A review of these subjects prior to attendance is advisable. A minimum of 3 years of experience in aviation units is required.

The Chief, Aviation Management Branch, Professional Development Division, Office of Personnel Management Directorate, MILPERCEN, manages the quota allocation for Active Army personnel. The Chief, National Guard Bureau, Army Aviation Division, Aberdeen Proving Ground, Maryland, manages quota allocations for National Guard personnel. The Commander, U.S. Army Forces Command, Education and Training Support Division, ODCSOPS, Fort McPherson, Georgia, handles the U.S. Army Reserve quotas. Quotas are allocated to each of the above by the U.S. Army Safety Center.

ASOC course schedule

Class	Start	Close
86-1	6 Jan 86	14 Feb 86
86-2	24 Feb 86	4 Apr 86
86-3	14 Apr 86	23 May 86
86-4	2 Jun 86	11 Jul 86
86-5	21 Jul 86	29 Aug 86

The Aviation Accident Prevention Course for NCO (AAPC-NCO) is a 2-week course. The objective of this course is to train noncommissioned officers and DA civilians in the techniques of supervising Army aircraft mishap prevention programs from the standpoint of the firstline supervisor. Graduates will be able to identify and control hazards primarily in the aircraft maintenance and operations areas. Active Army and Reserve component enlisted personnel in grades E6 and above in aviation-related MOS (67 series, 68K, and 93P), performing at firstline supervisory level in Army aviation units and staffs; DA civilians GS-5 through GS-9; and U.S. Army wage grade maintenance supervisors may attend. No previous formal safety training is required.

The AAPC-NCO is an Additional Skill Identifier producing course which awards ASI A2 to those enlisted servicemembers holding an MOS in the 67 series or MOS 68K/93P who successfully complete the academic requirements and participate in the aviation mishap prevention survey.

AAPC-NCO course schedule

Class	Start	Close
86-1	7 Apr 86	18 Apr 86
86-2	16 Jun 86	27 Jun 86
86-3	4 Aug 86	15 Aug 86

Point of contact at the Safety Center is Ms. Fran Souders, AUTOVON 558-4479/3164. ■

DEPARTMENT OF THE ARMY
United States
Army Safety Center
Fort Rucker, Alabama 36362-5363

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Flightfax®
Report of Army Aircraft Mishaps

Wrenchturners need rest, too

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Some aviation soldiers believe they are not vulnerable to the weaknesses of ordinary man. Unfortunately, this mental programming cannot be passed down to the biological level of the human body. All individuals need rest. Without adequate rest, our physical and mental behavior will be altered significantly.

Army Regulation 95-1 requires commanders to design a crew rest program tailored to their unit missions and include it in their SOPs. Aircraft mechanics, aircraft armament personnel, and other personnel who perform maintenance functions on aircraft are not classified as aircrewmembers and, therefore, do not fall under the provisions of these SOPs. But the lives of aircrews and passengers depend on these personnel. These highly skilled people must be given the opportunity for adequate rest.

How much rest is needed? Research indicates that this varies from individual to individual but seems to range from about 6 to 8 hours per day, with older persons generally requiring more than younger people. The human body operates on an internal clock called the diurnal cycle (day-night cycle). People, plants, and animals tend to maintain a 23- to 25-hour diurnal rhythm. When we upset this rhythm, particularly by going without sleep, task performance is degraded. Simply put, sleep loss decreases mental alertness.

It is interesting to note that most task errors are those of omission rather than commission. This means that an aviator may fail to see a set of wires in his flight path or an aircraft mechanic could overlook a critical step during a maintenance procedure.

Sleep loss is cumulative, and recovery time varies. Following is the approximate time of recovery for various extended sleep loss periods.

Deprivation hours	Recovery hours
48	12
72	24
96	120

The recovery hours represent a period of time on a "normal" sleep cycle.

Quality as well as quantity of rest is important. Desert heat and arctic cold, for example, test the limits of human tolerance and exposure. Physical workloads, sustained operations, and rapid deployment across time zones cause fatigue, unclear thinking, and poor decisionmaking. Exposure to noise, fumes, and vibration create stress that affects the rest cycle.

Maintaining an adequately rested aviation soldier in sustained operations will require some nontraditional thinking on the part of aviation leaders, considering that fatigue and stress are the expected byproducts of operating on the air-land battlefield. Here are several suggested countermeasures.

- Learn to recognize the symptoms of inadequate rest; namely, vacant stare, pale skin, postural instability, slowness of response, lapses in attention, inability to grasp directions, and unclear speech.
- Ensure everyone gets a minimum of 4 hours of sleep every 24 hours.
- Assign work shifts so fresh individuals are kept on the job. Minimum performance abilities can be sustained with a work schedule consisting of 4 hours on and 4 hours off.
- If only a little sleep is possible and there is an option when it can be

(continued on back page)

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 23-29 August

Utility helicopters

UH-1 Class E mishaps

H series - Crew tried to start aircraft with main rotor blades tied down. IP, pilot, and crew chief were wearing night vision goggles. Start was aborted at 42 percent N1.

H series - After governor switch was returned to auto position, N2 rpm would only increase to 6400. Caused by defective linear actuator.

H series - Tail rotor pedals began to motor and binding was felt during hover. Caused by defective tail rotor servo cylinder.

H series - Tail rotor chip detector light came on. Caused by failure of 90-degree gearbox.

H series - Main transmission oil light came on. Caused by defective thermostatic switch.

H series - Engine oil temperature climbed to 120 degrees C. Deice valve stuck in open position.

UH-60 Class D mishaps

A series - Stabilator hit the ground as aircraft was landing on sloping terrain.

A series - As aircraft was hovering, downwash blew tree limb down. Limb rose up into rotor blade. Tip cap of blade was cracked.

UH-60 Class E mishap

A series - Several caution lights came on and aircraft jerked slightly. Postflight inspection revealed total loss of No. 2 hydraulic fluid through pitch trim assembly. Caused by excessive pressure from pilot assist module.

Attack helicopters

AH-1 Class E mishaps

S series - Engine oil temperature rose during flight. Caused by failure of engine oil fan bearing.

S series - Engine oil pressure rose to 40 psi during runup and then began to fall. Caused by failure of oil pressure transducer.

Cargo helicopters

CH-47 Class E mishaps

B series - Temperature gauge rose to 150 degrees C. during flight. Caused by failure of oil temperature bulb.

D series - Binding was felt in thrust lever. Caused by malfunction of electromechanical actuator.

Observation helicopters

OH-58 Class A mishap

A series - Engine failed while aircraft was flying 400 feet above the ground. Pilot tried to autorotate to small clearing in heavily wooded mountainous area. As aircraft was descending, both main rotor blades hit two trees. Control was lost and aircraft crashed. 8554

OH-58 Class D mishap

A series - Postflight inspection revealed that tail skid assembly was missing. Retaining bolt had worked loose during flight.

OH-58 Class E mishaps

A series - Master caution and fuel boost lights came on during hover. Caused by failure of fuel boost pump.

C series - Transmission oil pressure gauge exceeded 100 psi during flight. Caused by failure of oil pressure transducer.

Fixed wing

U-21 Class E mishap

A series - Vibrations were felt in

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
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	May	4	3	May	**5**	**0**
	June	5	5	June	**1**	**0**
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	August	2	0	August	**2**	**1**
	September	4	3	1-11 Sep	**0**	**0**
	Total for Year	39	35*	Total to Date	**44**	**29**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

control yoke. Left outboard flap was seen to be fluttering. Left inboard flap would not retract after completion of slow flight. Caused by stripped actuator drive shaft.

C-12 Class C mishap

A series - Postflight inspection revealed damage to propeller blade. Suspect FOD during takeoff or landing.

C-12 Class D mishap

C series - Air conditioning condenser blower unit exploded during runup. The force generated by the explosion damaged the nose compartment bulkhead.

OV-1 Class E mishap

D series - Pilot noted erratic airspeed indications during takeoff. Foreign object was causing partial blockage of static port.

Maintenance

OH-58 Class E mishap

A series - Pilot smelled fuel during takeoff. One end of metal elbow to fuel shutoff valve was loose and leaking fuel.

UH-1 Class D mishap

H series - Postflight maintenance inspection revealed two holes in tail rotor drive shaft cover, defaced bolt heads on drive shaft clamp, and defaced rivet heads on one drive shaft segment. Damage was caused by foreign object. FOD inspection after tail rotor drive shaft maintenance was not adequate.

UH-1 Class E mishap

H series - Crew chief saw oil puddle under aircraft during hot refueling operation. Wiring bundle chafed against transmission oil line, causing line to leak.

Safety messages

- Maintenance information message concerning UH-60 rod end clevis (MIM-UH-60-MEM-04, 271430Z Aug 85).
- Maintenance information message concerning UH-60A anti-flap assembly (MIM-UH-60A-MEM-85-05, 221935Z Aug 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Did you know ?

Almost any collision with the ground could be viewed as a "premature descent." But that expression is usually reserved, in official language, to describe collisions with the terrain surrounding an instrument approach. This type of accident, often serious or fatal, can be due to instrument malfunction; but in most cases it has been traced to pilot errors.

These errors include failure to select the correct NAVAID; use of the wrong approach plates; unauthorized night approaches; failure to observe altitude "penalties" adjusted for instrument outages or ground facility closure, etc. Another possible problem may be a basic misunderstanding of the pilot's responsibility in maintaining the appropriate altitude during an instrument approach.

This responsibility is defined in the **Airman's Information Manual,** paragraph 370, sections a and b; and in FAR 91.116 and 91.119. The crux of the matter is as follows:

When operating on an unpublished route (radar vectored or otherwise), maintain your last assigned or approved altitude until established on a published segment or route of the instrument approach procedure which contains a minimum altitude.

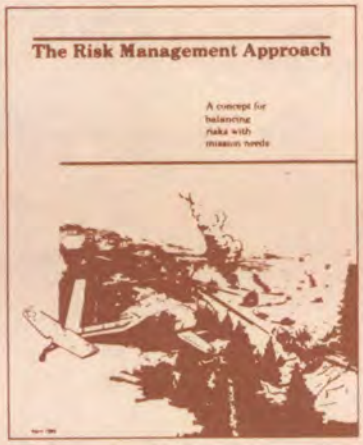
If ATC issues a clearance for the approach before the aircraft is established on a published segment, the controller is expected to assign an altitude to be maintained until that point is reached. This may simply be the current aircraft altitude. Some pilots have mistakenly assumed that being cleared for the approach by ATC authorizes them to initiate a descent at will. That is INCORRECT—an invitation to disaster. ■

—from FAA General Aviation News

Risk management pamphlet for unit commanders

As the aviation mission has become increasingly more demanding, the overall level of risk inherent in that mission has risen. This overall increase in level of risks puts greater demands on commanders—risk managers—to first minimize the risks inherent in an operation and secondly, to reconcile inherent risks with essential mission needs.

A pamphlet outlining a risk management concept which was applied while accomplishing the most demanding high-risk aviation mission in the Army is available. You can get the pamphlet entitled "The Risk Management Approach" by writing Commander, U.S. Army Safety Center, ATTN: PESC-M, Fort Rucker, Alabama 36362-5363, or calling AUTOVON 558-2062, commercial 205-255-2062. ■



Wrenchturners need rest, too

obtained, it should be between 0300 and 0600 since loss of sleep during these hours is particularly detrimental.

• Where possible, rotate the tasks that individuals have to perform. The novelty of a new task increases performance.

• If possible, assign more than one individual to a job. They can work as a team, keep each other awake, and doublecheck the work for accuracy.

• In bivouac, ensure the physical layout of the field site supports troop rest by locating sleep areas as far as possible from quality of rest detractors.

• Require noise discipline in designated rest areas. Loud radios and noisy card games can keep nonparticipants from getting adequate rest.

• Ensure a proper diet is maintained and plenty of drinking water is provided. Water deserves special attention. It can increase energy and endurance, regulate the body's temperature, and bring about a feeling of well-being. Yet, few of us drink as much water as we should. There is a close relationship between water consumption and fatigue.

Thirst is not a good indicator of the body's need for water. You must, in general, drink more liquid than your thirst calls for. Exactly how much water should you drink? Generally speaking, the average individual loses at least two cups of water daily through the respiratory process. Another two cups are lost through perspiration, even when no significant amount of physical work is carried on, and the intestines and kidneys together expel about six cups during the day. This totals 10 cups, not counting loss through perspiration during extreme physical exertion. During extreme physical exertion, as much as 28 cups can be lost daily.

Now consider where the body gets (or should get) its fluids. Let's look at some of our most popular beverages. Coffee, whether caffeinated or not, cannot replace the water you need. Coffee actually causes the body to lose more water than it gains. Carbonated drinks, composed of water, sugar, and artificial colorings, possess very little nutritional value. Sugar can complicate the absorption of water. Alcohol acts to eliminate water rather than absorb it. If an individual feels thirsty, he is already a quart low and dehydration becomes a potential problem. Even the early stages of dehydration can lead to impaired judgment. Fatigue through dehydration must be realized and treated. Drink more water and reduce fatigue.

Supervisors take needless risks when they ignore the effects of fatigue. Needless risks often result in needless accidents, and accidents undermine the Army's mission—success in combat.

References

Terry, Wayne G., Captain, and Terry, Debra L., Captain, "Because You Fly," **Combat Crew,** September 1984.

Thompson, Henry L., Major, "Sleep Loss and Its Effects in Combat," **Military Review,** September 1983. ■

—Major Kenneth O. Boley
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U.S. ARMY SAFETY CENTER

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Report of Army Aircraft Mishaps

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Fatal distraction

A 4-act play
Running time: less than 1 minute
Characters: pilot, copilot, platoon leader, unit operations personnel

Act 1: Setting the stage

A flight of four helicopters (three OH-58s and one AH-1) is positioned in a dispersal area following 3½ hours of night training. The flight is released by the unit commander to return to the airfield. The platoon leader tells one of the OH-58 pilots to lead the flight to the airfield.

Act 2: The flight

The flight leader, wearing night vision goggles, takes off from the dispersal area, intending to accelerate and climb to 200 feet agl. No altitude for the flight is briefed, but the standard recovery altitude to the airfield is 200 feet, which is why the flight leader chooses that altitude. The other crews intend to "follow the leader."

Almost immediately after the flight leader takes off and begins a climbing acceleration, the platoon leader calls and tells him to slow down so the rest of the flight can close on him. The pilot of the lead OH-58 makes a left turn to establish visual contact with the rest of the flight. During the turn, the aircraft loses some altitude and airspeed. After completing 180 degrees of turn, the pilot notes that the flight is closing on him. He continues the turn through 360 degrees, telling the copilot to clear him from the rest of the flight. He then adds power to resume the accelerating climb.

About the same time, unit operations begins trying to call the platoon leader to determine the status of the flight. The platoon leader doesn't answer the calls, so the copilot of the lead aircraft answers. The pilot expects the copilot to simply acknowledge the call and tell operations they are returning to the airfield. Instead, the copilot begins acting as a radio relay between unit operations and the platoon leader when he is supposed to be navigating and monitoring instruments for his aircraft.

The pilot, knowing there are hazards in the area, becomes concerned and annoyed that the copilot's attention is on the radio and not on navigating. The pilot's VHF radio, the radio currently in use, has no side tone. The pilot is concentrating on detecting a break in the conversation so he can tell the copilot to stop talking and start navigating.

Fatal distraction

Act 3: The accident

Deciding to check his heading and airspeed, the pilot adjusts the left vision tube of his night vision goggles to see inside the cockpit. As he is adjusting the focus, he sees powerlines and a pole out his left door. He thinks he will just clear the lines and makes no attempt to miss them.

The OH-58 hits the wires and yaws left 60 degrees. One of the wires fractures the upper nose fairing and is forced underneath the center wire guide. The wire continues to slide upward on the outside of the windscreen side posts. As the aircraft is in a left roll, the retreating rotor blade hits the wire. The bottom wire cutter cuts the second wire as the aircraft continues to the ground. The copilot is killed, and the pilot is seriously injured.

Act 4: The factors

The stage for this accident was actually set when the pilot's attention was diverted from his plan to climb to 200 feet by the call to wait for the flight. During the turn, the pilot lost altitude and airspeed. Radio distraction then became a critical ingredient. Because of the radio conversation, the pilot's concentration was not really outside the aircraft until impact with the wires.

The estimated duration of the flight was less than 1 minute. Since the pilot was receiving no navigational data or instrument readings from the copilot, he transitioned from a slightly descending left turn to an accelerating climb by feel. He thought he was climbing, when, in fact, he was in an essentially level acceleration.

Epilogue

When crewmembers are involved in critical maneuvers, such as night vision goggle takeoffs and landings, disruptions should be strictly limited except in emergency situations. It is critically important that crewmembers concentrate on terrain and obstacle avoidance during NOE flight. Procedures should be established that lead aircraft would defer outside radio traffic to other aircraft in the flight so navigation is not interrupted. ■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**4**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	August	**2**	**1**
	September	4	3	1-18 Sep	**2**	**2**
	Total for Year	39	35*	Total to Date	**45**	**31**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 30 August-5 September

Utility helicopters

UH-1 Class D mishap

H series - Main rotor blade hit tree branch during takeoff. Tip cap was damaged.

UH-1 Class E mishaps

H series - Engine tachometer failed during flight. Caused by defective tachometer generator.

H series - Transmission oil pressure fluctuated and dropped to zero. Caused by broken wire on pressure transmitter.

H series - Collective pitch and pedals locked while crew was practicing hydraulic-off maneuvers. Caused by faulty tail rotor control servo.

H series - Fuel quantity indicated 1050 pounds after 1 hour and 25 minutes of flight. Caused by faulty fuel gauge.

UH-60 Class D mishaps

A series - During engine runup, aircraft rotorwash blew an unsecured hand cart into tail boom of another aircraft. Crew did not ensure parking area was clear before running up engine. Crew chief of another aircraft had left the cart unsecured.

A series - As aircraft was hovering, operations called pilot and told him that ground personnel heard loud whining sound from right side of aircraft. Inspection revealed FOD to first-stage engine compressor. Cause unknown pending teardown analysis.

Attack helicopters

AH-1 Class E mishaps

S series - Transmission oil bypass light came on. Caused by failure of pressure switch.

S series - Sudden roll SCAS input was felt in right quadrant during takeoff to hover. Caused by failure of transducer control for roll SCAS.

AH-64 Class E mishap

A series - Utility hydraulic bypass light came on during taxi. Caused by failure of pressure switch.

Cargo helicopters

CH-47 Class D mishaps

C series - As winch was being used to load 1,800-pound piece of cargo, pulley underneath floor came loose. Pulley and sheet metal surrounding it were damaged.

B series - Aircraft was in level flight at 200 feet agl. Slingload became unstable and hit aircraft in the ramp area. Pilot jettisoned slingload and landed.

CH-47 Class E mishaps

C series - No. 1 engine failed during approach for landing. Caused by failure of engine fuel control.

C series - No. 2 hydraulic boost and SAS-off lights came on. Caused by failure of hydraulic line.

D series - Master caution and No. 2 rectifier-off lights came on. Failure of generator control unit and broken wire to No. 2 rectifier caused loss of rectifier function redundance.

C series - When power was reduced for approach, No. 1 engine torque decreased, rotor decreased, and N1 dropped. Caused by failure of control box.

C series - Engine torque split on static side on No. 2 engine during takeoff. Caused by failure of N2 actuator.

CH-54 Class E mishap

A series - During flight control check, pilot noticed he could only raise collective about 5 inches with or without AFCS servo switch on. Nut failed to maintain self-locking feature and backed off, allowing collective bias to become loose.

Observation helicopters

OH-6 Class E mishap

A series - Crew chief saw smoke coming from battery compartment during landing. Caused by overheated battery.

OH-58 Class D mishap

A series - As AH-1 hovered down taxiway, left passenger door of parked OH-58 was blown off. Crew was on top of aircraft doing preventive maintenance daily inspection. Crew chief did not close door in time.

OH-58 Class E mishaps

A series - Master caution and fuel boost lights came on. Wire on fuel boost pump had vibrated loose.

A series - When generator switch was placed in on position during runup, generator caution light remained on. Caused by failure of starter generator.

A series - Pilot and passengers smelled something burning during flight. Loose wire was found near landing light.

Training helicopters

TH-55 Class D mishap

A series - Aft crossbeam broke during termination of standard autorotation. Caused by fatigue.

Fixed wing

U-21 Class E mishaps

D series - Landing gear would not retract on takeoff. Landing gear circuit breaker was pulled during maintenance and was not reset on preflight or runup.

A series - Flaps would not extend from full up position. Caused by failure of flap motor.

C-12 Class E mishap

C series - Flaps would not retract from landing position during after-landing check. Caused by blown left split flap fuse.

OV-1 Class E mishap

D series - Pilot received unsafe left main gear indication. Caused by defective gear indication gauge.

Maintenance

UH-1 Class E mishaps

H series - Loud squealing sound was heard from transmission area. Master caution and hydraulic pressure lights came on, and pilot felt cyclic feedback. Caused by chafed left IR valve return hose.

V series - Master caution light came on, and feedback in cyclic was felt. Caused by chafed hydraulic pressure line.

CH-47 Class E mishap

B series - No. 2 engine dropped off line with high egt. Two locking pins on main engine harness cannon plug were broken. Cannon plug may not have been secured properly.

OH-58 Class D mishaps

A series - Rpm audio activated during flight. Pilot lowered collective pitch and glanced at the rotor and N2 gauge. Rotor was in the green arc, but N2 was decaying and stabilized at 50 to 53 percent. Altitude was approximately 550 feet agl at onset of emergency. Autorotation was made to open field. As skids touched down on the soft, sandy soil, they sank into the ground. Aircraft skidded about 10 feet. Deceleration caused aircraft to rock up onto nose and then back to the skids. This caused main rotor blades to flex down and cut through tail rotor drive shaft and cover. Loss of power was caused by separation of PC tube where it connects to overspeed governor. Cause of the break appears to be overtorque of retaining nut.

A series - Preflight inspection revealed hole in fuselage on lower right side. Yellow paint surrounded the hole. Maintenance stand probably punctured aircraft skin.

OH-58 Class E mishap

A series - On postflight, pilot noticed excessive fuel on engine deck. Fuel leak was found at the finger-tightened main fuel line. Caused by incorrect maintenance and inspection during installation of engine 12½ hours before.

U-21 Class E mishap

H series - Oil was seen coming from engine nacelle vent during flight. Oil cap was not installed correctly by crew chief after sample was taken. Pilots had finished preflight and did not know oil sample had been taken.

Safety messages

- Safety-of-flight maintenance mandatory message concerning one-time inspection of all UH-1D/H/V and EH-1 aircraft for collective lever assemblies with serial numbers EA 001 through EA 196 (UH-1-85-07, 031800Z Sep 85). Summary: After delivery to the government of a lot of 196 collective lever assemblies, it was determined that the flashing was not satisfactorily removed to meet quality assurance and engineering standards. Stress risers can occur in the lever if not properly machined. This message also advises that serviceable collective levers have an unlimited fatigue life. Contact: CPT Al Yeske, AUTOVON 693-3300, commercial 314-263-3300.
- OH-6 maintenance information message concerning installation of wire cutter blades in wire strike protection system (MIM-OH-6A-85-MEM-01, 071701Z Sep 85).
- OH-58 maintenance information message concerning installation of wire cutter blades in wire strike protection system (MIM-OH-58-85-MEM-02, 071702Z Sep 85).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Stacom

Standardization Communication

Facts about STACOM

Some confusion still exists about the use of STACOM. The following questions and answers should clear up the confusion.

• Are STACOM files required? Yes, because AR 385-95, par. 2-17h, requires that aviation safety publications libraries be maintained by all aviation units. One of the items in these libraries should be current issues of **Flightfax,** normally, as a minimum, copies of the previous 12 months, which includes STACOM.

• Are STACOMs regulatory? No, they are published in **Flightfax** as informative articles. However, STACOMs do serve as a responsive means to disseminate up-to-date information to aviation personnel, allowing correction of deficiencies and misunderstandings regarding Army aviation programs and publications. Messages and letters do not reach as many personnel. Commanders should declare STACOM the official source of guidance until changes are made to the respective regulations.

• Does the aviation library have to contain all the STACOMs published? No, it should contain, as a minimum, those found in the last 12 issues of **Flightfax.**

Most of the recent questions regarding STACOM are the result of STACOM No. 108, 16 January 1985, dealing with UH-1 performance planning. The contents of that STACOM will be incorporated into the next change to the UH-1 ATM. In the future, those STACOMs that have information which will be incorporated into regulatory publications will contain the target date for printing of the official change to the publication.

A previous article on the origin and concept of STACOM was published 28 March 1984 in STACOM No. 100. This article will be republished again in October this year.

Checklists

STACOM 107, dated 21 November 1984, containing the article, "Checklists, Here We Go Again," is still current. Two recent Class C mishaps were found to be caused by improper preflight/thru-flight procedures because checklists were not properly used. The result was $100,382 damage to two AH-1 helicopters. The new abbreviated checklists are being looked at by DES and certain units will be testing a new card stock checklist that is in somewhat more detail. Results should be available for the December Aviation Commanders Conference. Remember: Proper planning prevents poor performance. Be professional—use your aircraft checklist.

AR 95-1

Be on the lookout for AR 95-1: Army Aviation: General Provisions and Flight Regulations. This new updated version will include Change 4 and should be fielded by the time this is printed. The effective date is 22 August 1985.

New FM 1-104

There is a new FM 1-104: Forward Arming and Refueling Points (FARP), dated 31 July 1985. Have you received your copy yet? Proper use of FARPs enables the unit commander to apply continuous pressure on the enemy by reducing turnaround times and by increasing loiter times. A well-planned operation is a **safe** operation. ■

STACOM 111 18 Sep 1985

Prepared by the Directorate of Evaluation and Standardization, USAAVNC, Fort Rucker, AL 36362-5000, 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.

TURNER E. GRIMSLEY
LTC(P), Aviation
Director, DES

Shortfax

Field-conducted aircraft accident investigation

Officers appointed as presidents of aircraft accident investigation boards should become very familiar with the contents of DA Pam 385-95: Aircraft Accident Investigation and Reporting.

Numerous field reports received at the Safety Center contain findings which are not substantiated by analysis and recommendations which are not supported in the findings. Caution should be exercised when formulating recommendations so as not to use accident investigations as a forum to "grind a personal axe." Be factual, be comprehensive. A useful, quality report will be the result. ■

EIR/QDR initiation

Equipment Improvement Recommendation (EIR) and Quality Deficiency Report (QDR) submissions are an important part of aviation accident prevention. Units should ensure that the Army Safety Center (PESC-SPA) is an information addressee on all Category I EIRs. Also, when a materiel failure warrants the submission of a preliminary report of aircraft mishap (PRAM), block 14b of the PRAM should indicate the EIR/QDR number.

Many units take advantage of the Corpus Christi Army Depot (CCAD) engine "hotline" to resolve maintenance problems. Often a CCAD team is dispatched to assist in onsite correction of the problem. Whether an assistance team is dispatched or not, units are not relieved of the responsibility of submitting an EIR/QDR on the failed part/components or problem areas. ■

PRAM information

Units submitting PRAMS on AH-1 aircraft are requested to indicate the type rotor blades (K747 or B540) installed on the mishap aircraft in block 16g of the PRAM. If the aircraft has K747 blades, specify the series; i.e., -205, -209, -303, etc. ■

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Flightfax
Report of Army Aircraft Mishaps

Report of fourth quarter FY 84 Class A mishaps

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Eight Class A aircraft mishaps occurred during the fourth quarter of fiscal year 84 compared to 15 for the fourth quarter of FY 83. Four of the eight mishaps resulted in eight fatalities—six Army personnel and two civilian observers. Four of the eight involved human error. Following are synopses of the human error mishaps.

• After participating in a civil disaster drill, the crews of two UH-1s took off from the airfield in a loose trail formation. They flew for about 3 miles before turning back toward the airfield. With both pilots flying from the right seats, the aircraft formed up in a side-by-side formation to fly past a picnic area. As the aircraft were flying about 25 feet agl and 90 to 100 knots, the main rotor blades made contact, causing both aircraft to partially break up and crash.

Cause: Pilots misjudged rotor clearance.

Result: Two fatalities, seven major injuries, eight minor injuries, and two destroyed aircraft at a cost of more than $2 million.

• A UH-1 was the No. 2 aircraft in a flight of four. The flight had landed and was hovering to a parking area. The copilot, who was flying the UH-1, applied aft cyclic to the stop because of a right quartering tailwind and rotor-wash from the No. 3 aircraft. Concerned about getting too close to the No. 1 aircraft, the copilot applied abrupt and excessive collective to get away from the flight. The UH-1 climbed about 50 feet, entered a nose-low attitude, and rotated 270 degrees to the right. The pilot-in-command got on the controls, briefly stabilized the aircraft, and then got off the controls. Descent continued and the aircraft hit the ground nose low and rolled 90 degrees to the left.

This UH-1 crashed after a midair collision with another UH-1. Both aircraft were destroyed and two people were killed.

Cause: Copilot, who was inexperienced and overconfident in his ability, lost his composure. Pilot-in-command did not take and keep control. He was overconfident in the copilot and was reluctant to take the controls because he was accustomed to flying with experienced pilots.

Result: Two minor injuries and a destroyed aircraft at a cost of more than $900,000.

• An OH-58 was the No. 2 aircraft in a flight of two on a mountain navigational training flight. The aircraft went into a nose-low, left bank and crashed through trees. Evidence indicates the engine was turning at impact.

Cause: The crew flew the aircraft into the hillside, but the reason for this is unknown.

Result: Two fatalities and a destroyed aircraft at a cost of more than $850,000.

• An OH-6 was involved in a state-authorized search for escaped prisoners. Two law enforcement officers were on board the aircraft. As the OH-6 was flying at low altitudes and variable airspeeds, it hit two wires. The transmission and rotor were torn from the aircraft, and the airframe crashed.

Cause: Pilot was flying too low and did not see wires in time to miss them.

Result: Three fatalities and a destroyed aircraft at a cost of almost $500,000.

Total Class A aircraft mishaps for FY 84 was 38, with 37 fatalities, including two non-Army fatalities in one accident. Approximately 70 percent of the Class A mishaps involved human error, with about 50 percent involving pilot error only.■

Recap of AVSCOM messages

Following is a list of AIG 8881 addressed messages transmitted by AVSCOM (AMSAV-M) from 1 July through 30 September 1984.

UH-1-84-06 Safety-of-flight emergency message concerning immediate grounding of all series UH-1 aircraft (except C and M).

UH-1-84-07 Safety-of-flight maintenance mandatory message giving supplemental inspection criteria for pitch change link clevis.

UH-1-84-08 Safety-of-flight emergency message grounding all thin wall mast UH-1s.

OH-6A-84-04 Safety-of-flight technical message concerning preflight inspection of OH-6 series and FMS/commercial derivative aircraft with metal type tail rotor blades installed.

OH-6A-84-05 Safety-of-flight technical message supplemental to previously released message.

OH-6A-84-06 and OH-58-84-01 Safety-of-flight maintenance mandatory message concerning one-time inspection of the anti-icing valve poppet screw on all T63-A-5A/700 and T63-A-720 gas turbine engines.

UH-60A-84-11 Safety-of-flight maintenance mandatory message concerning inspection of longitudinal/lateral link assemblies for cracked bearing inner race.

UH-60A-84-12 Safety-of-flight maintenance mandatory message concerning one-time inspection of main rotor spindle assembly pitch control arm attaching bolts.

CH-47-84-11 Safety-of-flight technical message to direct installation of steel flight control tubes on CH-47 aircraft within a required suspense time.

OV-1-84-04 Safety-of-flight technical message concerning inspection of bracket for cracks.

UH-60A-84-10 Safety-of-flight maintenance mandatory message concerning one-time inspection of tail cone canted hinge bulkhead radius blocks.

UH-1-84-09 Safety-of-flight maintenance mandatory message concerning daily inspection of pitch change link clevis.

OH-6A-84-07 Safety-of-flight technical message concerning one-time inspection of H-6 series helicopters for suspected defective engine power-out warning control units.

GEN-84-03 Safety-of-flight operational message concerning the ALQ-144 IR jammer installed on certain AH-1S (MC), AH-1T, UH-1N, EH-1H, and UH-60 aircraft.

OV-1-84-03 Safety-of-flight technical message concerning inspection of main landing gear torque arms.

Addressees requiring copies of messages should contact their higher headquarters. ■

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	1-24 Oct	**3**	**0**
	November	3	3			
	December		0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**3**	**0**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

New audiovisual productions catalog

The Department of Defense has issued a catalog of audiovisual productions in the following four volumes:

- DoD 5040.2-C-1 Army Productions
- DoD 5040.2-C-2 Navy and Marine Corps Productions
- DoD 5040.2-C-3 Air Force and Miscellaneous DoD Productions
- DoD 5040.2-C-4 DoD Productions Cleared for Public Release

The catalog is effective immediately and is mandatory for use by all DoD components. DoD components may obtain copies of the catalog through their publications channels. Other federal agencies may obtain copies from Naval Publications and Forms Center, Code 301, 5801 Tabor Avenue, Philadelphia, PA 19120.

The Safety Center will no longer distribute a catalog of Army, Navy, Air Force, and Coast Guard safety films. Please do not request copies of the DoD catalog from the Safety Center, as we do not have them. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 5-11 October

Utility helicopters

UH-1 Class E mishaps

H series - Transmission oil pressure light came on. Caused by broken pressure switch.

H series - Cargo door began sliding open during flight. Crew did not insure door was fully closed and latched.

H series - Oil pressure fluctuated shortly after takeoff. Caused by failure of No. 2 bearing pack.

H series - Low rpm audio and light activated on approach. Caused by failure of N_2 tachometer generator.

H series - Controls became stiff, and master caution and hydraulic pressure lights came on. Caused by failure of hydraulic line.

H series - During runup, passenger with a soft cap on approached aircraft. Cap blew off and entered rotor disk.

H series - IP noticed N_1 tachometer at zero percent during climb. Caused by broken shaft on tachometer generator.

UH-60 Class D mishap

Aircraft was sitting on the ground. Rappel rope was caught on belay master's rucksack. Rappel master flipped rope off rucksack and rope went through main rotor system, damaging rotor blade.

UH-60 Class E mishap

Main module chip light came on during hover. Caused by defective module.

Attack helicopters

AH-1 Class C mishap

S series - Engine oil bypass light came on. Aircraft was not over suitable landing area and was flown about 1 minute before landing. Engine oil temperature reached 140 degrees. Engine was changed. Caused by failure of engine oil cooler drain valve.

AH-1 Class D mishap

S series - During hover for takeoff, 20mm cannon depressed full down and hit runway. Gun mount support was cracked.

AH-1 Class E mishaps

S series - N_2 and rotor tachometer needle did not split during simulated forced landing. IP took control, climbed, and reduced throttle to flight idle. Needles did not split. Rotor rpm decreased to 87 percent. Caused by failure of sprag clutch.

S series - Airspeed decreased during simulated forced landing. Large insect had plugged pitot tube during flight.

S series - Engine oil temperature rose during flight. Caused by failure of pressure transmitter.

G series - Squealing sound was heard from behind pilot's seat during takeoff. Piece of plastic had chipped off and fallen into blower.

Cargo helicopters

CH-47 Class D mishap

B series - Aircraft was landed when crew chief told pilot there was a fire in the aft transmission area. Failure of No. 8 drive shaft hanger bearing caused lord mounts to break and drive shaft to become scored.

CH-47 Class E mishap

C series - No. 2 engine N_1 gauge dropped to zero. Caused by failure of tachometer generator.

Observation helicopters

OH-58 Class C mishap

A series - As No. 1 aircraft was inbound for landing at airfield, crew saw No. 2 aircraft closing at one-quarter mile. Crew of No. 1 took evasive action by abrupt aft cyclic and felt thump in airframe. Crew then saw that left skid was missing. No. 1 aircraft was landed with damage to skid, cross tubes, and fairings. Crew of No. 2 aircraft did not see No. 1 or realize they had been involved in a midair until No. 1 crew announced during Mayday call that skid had been cut off by another aircraft. Crew of No. 2 had felt a bump just before the Mayday call. No. 2 aircraft was landed with damage to main rotor blade skin.

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

OH-58 Class E mishaps

C series - Master caution and transmission chip detector lights came on. Caused by failure of transmission.

C series - Transmission oil pressure light came on. Caused by failure of transmission pressure switch.

Fixed wing

U-21 Class E mishap

H series - While taxiing down runway for takeoff, IP noticed nose wheel steering was erratic, requiring left rudder and right power to taxi straight. Aircraft was brought to a stop. When power was applied to clear the runway, right brake would not release and nose turned 20 to 30 degrees to the right. Caused by failure of right brake assembly.

C-12 Class D mishap

A series - When gear handle was placed in up position, transit light remained on. Gear would not fully retract because of broken teeth in right gear actuator.

Maintenance

AH-1 Class E mishaps

S series - Engine oil pressure dropped, oil temperature rose, and oil bypass light came on. Caused by loose T fitting at torquemeter transducers.

S series - Aircraft began porpoising, followed by pitch channel hardover. Nose dropped 10 to 15 degrees. Pitch card was out of balance.

OH-58 Class E mishap

C series - Master caution and generator lights came on. Caused by loose wire between generator and voltage regulator.

CH-47 Class E mishap

C series - No. 1 engine N_1, torque, and egt fluctuated during flight. Main wiring bundle cannon plug on engine was dirty and wires were chafed.

Messages received

• Safety-of-flight technical message concerning one-time inspection of CH-54A/B helicopters for defective MS21251 brass turnbuckles (CH-54-84-02, 102055Z Oct 84). Summary: Certain brass turnbuckles manufactured during the 1973-1982 timeframe are defective. The defect was caused by misalignment of the thread tapping tool with the bore and resulted in incomplete, distorted threads or double threading. In-service use of defective turnbuckles and testing of discrepant parts indicate that the normal working loads do not fail defective turnbuckles. However, as a precautionary measure, they are to be removed from service because an abnormal load application could cause failure. Contact: Robert High, AUTOVON 693-1639, commercial 314-263-1639.

• Safety-of-flight technical message concerning inspection of CH-47A/B/C aft transmission upper housing (CH-47-84-12, 102105Z Oct 84). Summary: Some aft transmissions have, in the past, experienced fatigue cracks in the upper housing lug area and have been rejected and replaced by the user through normal visual discovery of the crack usually evidenced as an oil leak. A recent investigation has determined the need for increased inspection procedures to assure that cracks are found before any probability of failure. Contact: L. Dwight Brown, AUTOVON 693-1418, commercial 314-263-1418.

• Maintenance information message concerning flight with UH-60 pilot's and copilot's doors removed (MIM-UH-60A-MEM-84-07, 121630Z Oct 84).

• Maintenance information message concerning securing of UH-60 main rotor pitch control rod assemblies during air transport aboard a C-5A Galaxy (MIM-UH-60A-MEM-84-08, 121930Z Oct 84).

• Maintenance information message concerning UH-60 maintenance crane and blade clamp device (MIM-UH-60A-MEM-84-10, 121925Z Oct 84).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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Flightfax
Report of Army Aircraft Mishaps

A lesson from the past

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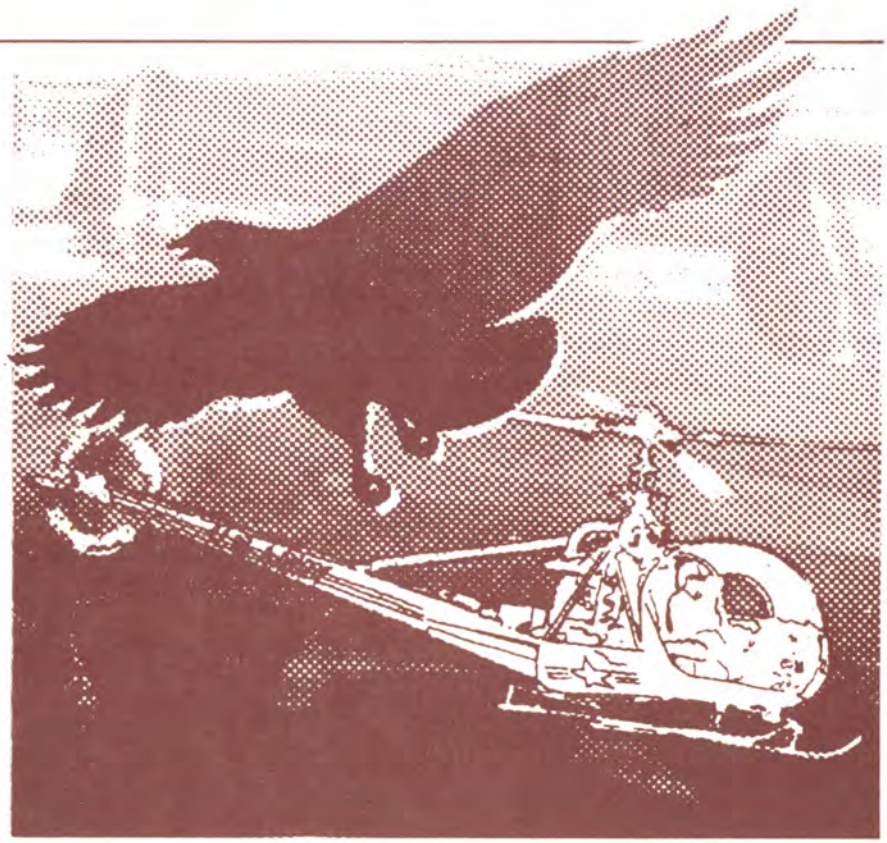

This article was written by Gerard M. Bruggink. At the time of his retirement, Mr. Bruggink was deputy director, Bureau of Accident Investigation, National Transportation Safety Board, Washington, DC. He is also a former air safety investigator with the Army Safety Center.

A recent **Flightfax** article on bird strike hazards brought to mind an accident in the dim past, involving an OH-23 (Hiller). The helicopter disappeared on a local flight in a southeastern state. Despite an intensive search, the wreckage was not found until 53 days later when a hunter stumbled on it. The condition of the remains of the pilot and his passenger suggested that the crash itself had been survivable, at least for the pilot.

The accident

Early in the investigation one of the working theories was that a real or perceived aircraft problem had prompted the pilot to make an emergency landing. However, a thorough examination of the engine and all aircraft systems failed to reveal a reason for the pilot's actions. Finally, when the shattered main rotor blades were reassembled on a hangar floor, it was discovered that the leading edge of one of the blades had a heavy but smooth indentation. The covering of the wooden airfoil behind this dent showed several scratch marks in chord-wise direction. Subsequent laboratory analysis of this blade section proved that a bird had struck and damaged the blade.

The bird strike probably occurred while the pilot was following the right-of-way of powerlines in a heavily wooded, swampy area. Although the helicopter was not disabled, vibrations or other effects may have convinced the pilot—who had very limited OH-23 experience—to land immediately. There was just enough clearance on either side of the powerlines to accommodate the main rotor. However, the prevailing crosswind at the time may have brought the aircraft too close to the tree line. Both blade tips struck trees 50 feet above the ground while the main rotor disk was in level attitude with a slight aft tilt.

Following the disintegration of the main rotor, the helicopter turned to the right, continued sideways, and came to a stop against two trees, about 200 feet beyond the initial tree strikes. One tree struck the forward cockpit enclosure; the other the tail boom. The center fuselage, including the engine and fuel tank, were undamaged. There was no fire. The accident occurred in daylight VFR conditions.

Pilots of the same unit started searching for the missing helicopter as soon as it was declared overdue. The right-of-way of the powerline in question was searched the same afternoon but the olive-drab and partially submerged wreckage was concealed in the undergrowth at the edge of the forest.

A lesson from the past

Survival aspects

Although badly injured—including a broken leg that kept him from moving to the nearby open area—the pilot was resourceful in using the few available means to draw attention. He reversed his flight jacket so that the orange lining was on the outside. The canvas first aid kit was found near the wreckage with its contents partially burned in the opened kit. This may have been the only method to start a smoke-producing fire in the water-logged area. Additional evidence at the scene showed that the pilot did all he could to help himself in the grim emergency.

The chances of timely rescue would have been infinitely greater had the pilot possessed a simple signaling device, such as a pen-type flare gun, when he heard the aircraft searching for him. Unfortunately, the life-saving potential of signaling devices is too often associated with operations in the so-called remote corners of the world. The fact of the matter is that, within 10 to 15 minutes flying time from most Army installations in CONUS, an aircraft can literally disappear, unwitnessed, in wooded or rugged terrain.

Conclusions

This accident remains a tragic reminder that timely rescue and survival after being forced down may depend solely on the emergency equipment the pilots—or other occupants—carry on their person. Elaborate survival gear makes no contribution to eventual survival when it burns up with the aircraft or when it cannot be reached due to disabling injuries. Under these circumstances, the last recourse is what can be reached in one's pocket. This should include at least these four fundamental items: pen-type flare gun, whistle, pocket knife, and matches or a lighter (nonsmokers, note).

With regard to the air search for an aircraft downed in a heavily wooded area, it should be reiterated that, in the absence of smoke, the only observable clues may be scorched foliage or fresh breaks in treetops and branches.

Accident investigators should be aware that a bird strike does not have to disable a helicopter to induce the crew to make an emergency landing. The outcome of such a landing depends on the perceived urgency of the situation, the suitability of the terrain, and crew experience. Thus, in case of an accident without survivors or reliable witnesses, the possibility of a bird strike as an initiating or principal factor must always be taken into account. The only available guidance in that regard is a frequency of the reported bird strikes on certain helicopter components in U.S. Army operations. The involvement of these components is listed in decreasing order of frequency. The percentages do not add up to 100 since about 20 percent of the bird strike reports do not identify the impact points.

1.	Cockpit/cabin enclosure	(51%)
2.	Main rotor	(20%)
3.	Tail rotor and vertical tail	(3%)
4.	Mast controls	(3%)
5.	Engine intake	(2%)
6.	Stabilizer and stub wings	(2%)

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3			
	December		0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**3**	**0**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 12-18 October

Observation helicopters

OH-58 Class D mishaps

C series - Aircraft was sitting on the ground at flight idle. Pilot left aircraft to meet with the pilot of an AH-1 and did not secure his door. Another AH-1 hovered to the rear of the OH-58. Rotorwash caused door to be forced open and broke the door off at the hinges.

A series - When right rear seat passenger got out of aircraft, he did not secure his seatbelt. Aircraft was flown with belt banging against airframe. Skin near lower fuel port was punctured.

OH-58 Class E mishaps

A series - As aircraft was operating NOE, wire strike protection system cut a double strand of wire. Wire was not seen until it was hit.

A series - Binding was felt in cyclic control. Caused by defective magnetic brake.

A series - Transmission oil hot light came on. Caused by dirt in oil cooler radiator and hole in line to oil cooler.

A series - N2 tachometer fluctuated during hover for takeoff. Caused by failure of tachometer generator.

A series - Hydraulic boost light came on. Caused by failure of pressure relief valve.

Utility helicopters

UH-1 Class D mishaps

H series - Aircraft was No. 3 in a flight of five on short final to a dusty pickup zone. The No. 2 aircraft passed to the left of the signal panel and its rotorwash picked up the unsecured panel. Panel flew above No. 3 aircraft and down through main rotor system while aircraft was hovering. Main rotor blade was punctured by grommet on panel marker.

H series - Aircraft landed in grassy confined area. Left skid was bent when it was set down on a rock.

UH-1 Class E mishaps

H series - N2 tachometer fluctuated. Caused by failure of tachometer generator.

V series - Fuel odor was smelled during fuel transfer from auxiliary tanks to main tanks. Failure of O-ring in quick disconnect caused fuel leakage.

H series - Crew heard loud bang and aircraft yawed left. Third- and fifth-stage compressor blades and actuator assembly were replaced.

H series - Unusual noise was heard from main rotor. Caused by separation of skin near blade tip.

UH-60 Class D mishaps

As slingload was being hooked up, aircraft started to lose tail rotor control and made two 360-degree turns. Load was released. Tail wheel hit the load, damaging the strut. Tail rotor quadrant spring assembly failed to function as designed, resulting in loss of tail rotor control.

After stabilizing Howitzer at 10-foot hover, pilot told copilot to stand by to release the load. Copilot misunderstood and disengaged the load. Gun was damaged when it hit the ground.

UH-60 Class E mishaps

No. 2 reservoir low, boost servo off, and SAS off caution lights came on. After aircraft was landed, hydraulic fluid was found on cabin roof area. Caused by failure of thermal relief valve in pitch trim assembly.

No. 2 engine lost torque indication during flight. Caused by failure of anti-ice valve.

Fixed wing

C-12 Class D mishap

C series - Aircraft was taxiing between parked aircraft on left side and row of hangars on right side. Pilot in left seat was taxiing and watching the left wing. Copilot in right seat was watching right wing. Copilot told pilot too late to move left, and right wing tip hit hangar door.

RV-1 Class E mishaps

D series - No. 2 hydraulic pressure indicator dropped to 2000 psi. Caused by failure of hydraulic pump seal at bottom of pump halves.

D series - When landing gear was lowered, left main gear indicated unsafe and in-transit lights came on in gear handle. Tower personnel indicated gear appeared to be down. Aircraft was landed without incident. Caused by failure of gear microswitch.

U-21 Class E mishaps

A series - Severe vibrations were felt when flaps were extended beyond 70 percent. Caused by failure of flap actuator.

A series - No. 2 secondary low pitch light came on, No. 2 engine torque

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

increased, and No. 2 prop rpm decreased. Caused by failure of secondary low pitch stop switch.

Attack helicopters

AH-1 Class C mishap

S series - Main rotor blades hit tree during hover. Both blades were damaged.

AH-1 Class E mishaps

S series - Oil was seen coming from ECU duct during flight. Caused by broken ECU seal.

S series - Engine oil pressure dropped. Caused by shorted-out cannon plug wire.

Cargo helicopters

CH-47 Class E mishaps

C series - No. 2 engine oil pressure dropped below normal. Caused by broken transmitter cannon plug fitting.

C series - Master caution and No. 2 engine chip detector lights came on. Retaining nut for electrical connection on chip detector had backed off.

Maintenance

UH-60 Class D mishap

Tail rotor quadrant caution light came on, followed by complete loss of tail rotor effectiveness. Aircraft began uncommanded right turn. Aircraft continued to rotate until No. 1 engine power reduced. Tail wheel locking pin was broken during landing. Tail rotor control cable was incorrectly installed around forward bellcrank.

AH-1 Class E mishaps

S series - Copilot saw transmission fluid leaking from oil cooler area during shutdown. Crew chief did not install O-ring and jam nut on drain valve in oil cooler compartment during replacement. Valve rotated loose during flight and transmission fluid leaked out.

G series - Master caution and No. 1 hydraulic lights came on. Caused by chafed hydraulic line.

OH-58 Class E mishap

A series - Transmission oil hot light came on. Residue of windshield installation was found against impedance panel.

U-21 Class E mishap

A series - No. 1 engine would not respond when power lever was moved during taxi. Engine power lever arm was not torqued correctly. Attaching bolt did not have a washer behind the nut. This allowed nut to tighten against bolt shaft rather than the power lever arm.

Messages received

• Safety-of-flight technical message concerning one-time inspection of OV-1/RV-1 aircraft for defective MS21251 brass turnbuckles (OV-1-84-05, 161950Z Oct 84). Summary: Certain brass turnbuckles manufactured during the 1973-1982 timeframe are defective. The defect was caused by misalignment of the thread tapping tool with the bore and resulted in incomplete, distorted threads or double threading. In-service use of defective turnbuckles and testing of discrepant parts indicate that the normal working loads do not fail defective turnbuckles. However, as a precautionary measure, they are to be removed from service because an abnormal load application could cause failure. Contact: Jim Mitchell, AUTOVON 693-1639, commercial 314-263-1639.

• Five other safety-of-flight messages were issued concerning inspection of aircraft for defective MS21251 brass turnbuckles. These messages are UV-18-84-01, 162005Z Oct 84; U-9-84-01, 161955Z Oct 84; C-12-84-01, 162015Z Oct 84; U-21-84-02, 162000Z Oct 84; and U-21-84-03, 162000Z Oct 84.

• UH-60 maintenance information message concerning change to the powertrain manual, damage limits to main rotor pitch control rod and damper bearings (UH-60A-MEM-84-09, 151700Z Oct 84).

• Maintenance information message concerning ALQ-144 IR jammer maintenance update (MIM-GEN-MEM-84-06, 021130Z Oct 84).

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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Report of Army Aircraft Mishaps

Aircraft accident review

Failure to document removal of nuts and cotter pins

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Synopsis

The UH-1H was on a maintenance test flight. Witnesses heard unusual noises coming from the aircraft shortly before it crashed through trees. The test pilot and mechanic were killed.

History of flight

The UH-1 was scheduled for a test flight following completion of a swashplate change, hanger bearing repack, and overspeed governor replacement, and a binding cyclic writeup. A compass swing and a fuel control response check were also due. No discrepancies with the aircraft or the logbook were noted during the preflight inspection.

The tower released the Huey to the maintenance test flight area 5 miles northeast of the airfield. A few minutes after the pilot received takeoff clearance, witnesses saw the aircraft at a low altitude and heard unusual noises coming from the aircraft. About 10 kilometers from the end of the runway, the main rotor assembly separated from the mast and began making contact in the vicinity of the tail boom, vertical fin, and synchronized elevators, finally severing the tail boom assembly. Control of the helicopter was lost at this point, and it began a free-fall descent through trees. The fuselage hit the ground with an estimated 74 Gs of force in a tail-low attitude, killing the test pilot and mechanic.

Crew experience

The 38-year-old test pilot had almost 4,500 rotary wing flight hours, with almost 3,500 in the UH-1H.

Commentary

The aircraft was flown with unsecured bolts attaching the cyclic control tubes to the lower linkage of the fore and aft and lateral hydraulic servo cylinder assemblies. These bolts worked loose, resulting in a flight control disconnect and loss of control over the main rotor system. The complete main rotor system then separated and the aircraft crashed.

The UH-1 initially entered maintenance about 2 months earlier for replacement of the swashplate. However, it was concluded that an open writeup identifying the binding cyclic control is what eventually resulted in disconnecting the control tubes from the hydraulic servo lever assembly. An analysis of maintenance historical records of other aircraft revealed that similar cyclic control writeups resulted in troubleshooting procedures which involved disconnecting flight controls to identify the source of the problem. The proper writeups documenting the disconnect of the flight controls had been made for these aircraft. The historical maintenance records of the aircraft involved in this accident did not contain any writeup on any maintenance form documenting the disconnect of flight controls, as required by TM 38-750. It could not be determined who disconnected the control tubes.

When properly installed, the bolts which worked loose are secured with self-locking, castellated nuts and safetied with cotter pins. Tests revealed that had the bolts been in place at the time of impact, some visible damage would have occurred to both the control tube and the hydraulic servo lever assembly. There was no apparent damage to either component.

It was concluded that the nuts and cotter pins were removed from the bolts on the cyclic servos during troubleshooting procedures conducted to isolate the cause of the binding cyclic. No entry was made on the aircraft's maintenance records and, in all probability, the nuts and cotter pins were never replaced. The access panels were reinstalled with only the unsecured bolts providing the connection between the control tube and the hydraulic servo lever assembly. ■

Followups

Additional information on mishap briefs previously published

Utility helicopters

UH-1 Class B mishap in 22 Feb 84 issue (8422) ☐ Pilot, wearing night vision goggles, had taken off from a pickup zone when he noticed a small fire near the area he had just left. Pilot decided to land and extinguish the fire. He did not land in the approved pickup zone but selected a road intersection closer to the fire, an area for which a daylight reconnaissance had not been made. During the landing, tail rotor blades hit a road sign, causing loss of antitorque control. Pilot then did not follow the prescribed emergency procedure. Rather than close the throttle and make a hovering autorotation, pilot rapidly reduced collective pitch, resulting in increased rate of descent. Aircraft landed hard.

UH-1 Class B mishap in 2 Nov 83 issue (8405) ☐ As UH-1 was being landed to sloping terrain, right skid touched down lightly. As left skid was being lowered, aircraft began to slide left. Student pilot made abrupt left cyclic movement, causing aircraft to bounce on left skid. Student pilot then corrected with right cyclic and collective, and simultaneously IP added additional right cyclic and collective. Aircraft rolled over and came to rest on right side. IP did not adequately guard the controls, allowing the student pilot to place the aircraft in an attitude from which the IP could not recover.

UH-60 Class B mishap in 9 Nov 83 issue (8408) ☐ Maintenance personnel misaligned the front rollers of the main rotor pylon forward sliding cover. Cover came off and hit tail rotor paddles, causing severe imbalance condition in tail rotor system. Imbalance condition led to complete separation of tail rotor gearbox and blades as aircraft was slowed to land. Aircraft spun to right and hit the ground in nose-low attitude. The design of the cover causes it to appear to be properly secured when it is not. When the cover was removed the night before the mishap, the required recordkeeping entry was not made and a technical inspection was not accomplished.

UH-60 Class B mishap in 11 Jan 84 issue (8415) ☐ During descent to field landing site at night, pilot in left seat had the controls and was looking to the right front of the aircraft in an attempt to locate the landing site marker lights. Copilot warned pilot to watch his closure rate. Pilot increased collective pitch, but aircraft descended and hit the tops of two trees. Pilot continued the approach to a controlled landing.

Observation helicopters

OH-58 Class A mishap in 25 Jan 84 issue (8416) ☐ Pilot took off into the wind from a confined area. Climbing to about 100 feet above the ground, pilot began a steep right turn. Turn could not be stopped and aircraft crashed. Pilot operated aircraft in a flight environment known to be conducive to loss of tail rotor effectiveness and then used an incorrect emergency procedure.

OH-58 Class B mishap in 16 Nov 83 issue (8412) ☐ Downgraded to Class C. Crew heard low rpm audio and saw N_2 and rotor rpm dropping. IP lowered collective and started a right turn toward a forced landing area. When collective was lowered, engine and rotor indications returned to normal. Altitude was lost during right turn and increase in power was applied to avoid obstacles. N_2 and rotor rpm again decayed, resulting in near vertical rate of descent. Aircraft landed hard, slid along the roadway, and hit a metal sign.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	1-7 Nov	**0**	**0**
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**3**	**0**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 19-25 October

Utility helicopters

UH-1 Class A mishap

V series - Medevac crew was on night mission. When crew returned to their home field, fog required an instrument approach. First approach was missed, so pilot decided to attempt another one. Aircraft descended below landing minimums and crashed near approach end of runway. Medic was seriously injured, and pilot and copilot sustained minor injuries. 8503

UH-1 Class D mishap

H series - As aircraft was on final approach, bird hit and broke lower right chin bubble.

UH-1 Class E mishaps

H series - Feedback was felt in cyclic control, and loud whine was heard from transmission area. Caused by failure of check valve.

H series - Master caution light came on and controls became stiff. Caused by failure of hydraulic line.

H series - Loud squeal was heard, and hydraulic pressure light came on. Feedback was felt in cyclic. Caused by failure of collective servo cylinder.

H series - N_1 fluctuated rapidly during descent. Caused by failure of tachometer generator.

H series - Engine oil temperature rose during flight. Caused by failure of thermal bypass valve.

H series - Transmission oil pressure light came on during final approach. Caused by failure of pressure relief valve.

UH-60 Class D mishap

As load was picked up, aircraft started to lose tail rotor control and made two 360-degree turns. Load was released. Tail wheel strut was damaged when tail wheel hit the load. Failure of tail rotor quadrant spring assembly caused loss of tail rotor control.

UH-60 Class E mishaps

Unusual control inputs were felt as aircraft was brought to a hover. Antiflap stop was stuck in place.

No. 2 hydraulic reservoir low light and SAS off light came on during approach. Caused by failure of thermal relief valve on pitch trim assembly.

Cargo helicopters

CH-47 Class E mishaps

C series - Master caution, No. 2 SAS, and No. 2 hydraulic boost lights came on. Failure of yaw SAS link seal allowed loss of hydraulic fluid.

C series - No. 2 engine began smoking during runup. Oil leak was caused by failure of packing in oil line fitting.

A series - No. 2 engine failed during flight. Caused by internal failure of accessory gearbox.

Fixed wing

C-12 Class E mishaps

A series - Crew smelled strong electrical odor after takeoff. Caused by failure of ambient air shutoff valve.

A series - Smoke and toxic odor entered cabin. Caused by failure of vent blower motor brushes.

U-21 Class D mishap

A series - Flaps were inadvertently placed full down at approximately 145 knots.

OV-1 Class E mishaps

D series - No. 1 and No. 2 hydraulic pressure indicators dropped to 0 psi. Flap actuator hydraulic line fitting backed off at hydraulic actuator.

D series - Pilot saw oil seeping from No. 1 engine propeller spinner during climbout. Caused by failure of propeller seal.

D series - No. 2 engine developed compressor stall each time power lever was moved forward from 50 percent torque. Caused by failure of inlet guide vane actuator.

Attack helicopters

AH-1 Class D mishap

S series - Aircraft was trail in a flight of five. During climbout, formation made a left bank and pilot allowed aircraft to fall below formation alignment. IP noticed torque increasing through 60 psi and took corrective action to reduce power. Transient torque of 62 psi was reached before power reduction.

AH-1 Class E mishaps

R series - Fuel pressure indicated 0 psi during runup for maintenance test flight. While test pilot's attention was on

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

troubleshooting the fuel pressure, engine oil pressure decreased to 63 psi and temperature increased toward 130 degrees. When test pilot noticed the engine oil trouble, he secured the engine. Fuel pressure problem was caused by faulty transmitter. Oil pressure and temperature problem was caused by failure of oil cooler fan due to seized bearings.

S series - Master caution and No. 2 hydraulic pressure lights came on. Caused by defective hydraulic pressure switch.

S series - Engine oil pressure indicated zero during approach. Caused by defective oil pressure transducer.

Observation helicopters

OH-58 Class E mishaps

A series - Master caution and fuel boost lights came on. Caused by failure of fuel pump.

C series - Master caution and transmission chip detector light came on. Caused by broken electrical wire.

Maintenance

UH-1 Class E mishaps

H series - Master caution and transmission oil pressure oil lights came on, followed by loss of oil pressure. Quick disconnect was not secured on transmission filter side.

H series - Master caution light came on. Crew chief had washed aircraft and allowed water to get into voltage regulator for standby generator.

UH-60 Class E mishap

Tail rotor pedals jerked and tail rotor quadrant caution light came on. Caused by incorrect routing of tail rotor cables.

OH-58 Class E mishap

C series - Torquemeter fluctuated during takeoff and engine failed shortly afterward. Air sensing lines to fuel control were loose.

C-7 Class D mishap

During maintenance operational check, mechanic taxied aircraft into the wind but failed to center nose wheel before runup. Brakes did not hold and aircraft began to move, causing nose wheel to turn further right. Strut assembly, torque knee, and nose wheel steering actuator were damaged.

Messages received

• Safety-of-flight maintenance mandatory message concerning special inspection of all UH-1 main rotor blades (except C/M models) for skin delamination (UH-1-84-10, 241540Z Oct 84). Summary: Reports of skin separation at the bond line between the spar and afterbody skin on UH-1 metal main rotor blades continue. Separations occur at the top, bottom, or both and generally within the outboard 4 feet. While no catastrophic accidents have occurred, severe vibrations and control problems can result depending on the length of the separation. Separations occur due to voids in the bond line caused by corrosion. When the void progresses along the edge of the skin, air flow may allow air under the skin, causing the skin to raise and increasing the bond separation. The inspection specified by this message is an interim procedure and will only be required until the new nondestructive inspection technique is developed and implemented. Contact: Ken Luber, AUTOVON 693-1683, commercial 314-263-1683.

• Maintenance information message concerning OH-58A and C pylon support installation (MIM-OH-58-84-MEM-05, 231430Z Oct 84). There are errors in figure 23 of TM 55-1520-228-23P and figure 2-35 of TM 55-1520-228-23 concerning the washers to be used under the bolt heads when installing the pylon support link assemblies to the fitting assemblies. The correct washers to be used are specified in this message.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Correction to publication number

In the 10 October issue, we said that FM 55-412 would be changed to 1-5412. The new number is 1-512, **not** 1-5412. ■

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Report of Army Aircraft Mishaps

Thurman emphasizes safety to Aviation Officers Advanced Course graduates

Safety was a major point of emphasis when General Maxwell R. Thurman, Vice Chief of Staff Army, addressed the first class of officers to graduate from the Aviation Officers Advanced Course at the U.S. Army Aviation Center, Fort Rucker, on 24 October 1984.

The VCSA briefly recapped for his audience the history of Army aviation from the time 75 years ago when Wilbur and Orville Wright conducted the first military aviation flight. The Wright brothers were given an order to provide the United States Army with one airplane, two pilots, the necessary spare parts, and two crewmen to repair the aircraft.

LTG James M. Gavin wrote in an article entitled "Cavalry, and I Don't Mean Horses," published in Harper's magazine more than 30 years ago, of the potential of the helicopter and air assault tactics on the modern battlefield. As G3, DCSOPS, General Gavin was able to lay some of the early groundwork for this new type of cavalry.

General Thurman spoke of other pioneers who in 21 years of Army aviation brought the air mobile concept into being, developed air assault tactics and doctrine, participated in the research and development of aircraft, and became the first leaders of air cavalry units forged in the crucible of Vietnam.

"You must be the most professional and professionally demanding branch in the Army. Your responsibilities on the modern battlefield—in fighting the Airland battle—far exceed those duties that aviators have shouldered in the past," General Thurman told the graduates.

"Part of the professionalism for which you must strive is in aviation safety. Aviation safety has two important aspects: flight safety and reliable maintenance. No branch operates in a more dangerous environment . . . and there is no branch in the service in which the lives of its officers are more in the hands of the soldiers, the crew chief and aviation mechanic, than the Aviation Branch." Paraphrasing a statement by a journalist in Southeast Asia, General Thurman added, "Planes have wings and want to fly; a helicopter has ten thousand parts trying to tear themselves apart."

"Kick the tire. Light the fire. First one off is lead. We'll brief on guard. That's an old saying in the Air Force about aviation procedures. That was a 'seat of the pants' kind of flying operation in an environment where equipment was cheaper, flying was less dangerous, and the world in which we and our adversaries lived was much more forgiving. Those days are gone forever—if they were ever here at all for Army aviators," General Thurman warned.

He compared the position of the Advanced Course graduates to that of earlier aviation pioneers. "Your challenge is integration of Army aviation into the heavy forces. You will have the chance to develop the tactics and procedures, the standards and values, and to establish the enduring traditions of the Aviation Branch." At the same time that there is the onrush of equipment to the heavy side, the VCSA emphasized that attention will still be given to insure that the United States Army has the world's best light forces.

General Thurman told his audience that they must be not only aviators but the most technically and tactically competent of all the Army's leaders. "Technically you must know more about the mechanics of flight and flying than those whom you will lead. . . . You must also be tactically competent, able to plan and execute support of an Armored brigade in a 30km deep counterattack, using M1/M2/M3 with multiple launch rocket systems in support."

Aviation accident reports are among the significant events on which the VCSA is briefed every day. Invariably, investigations show all too many of these accidents are the result of pilot error—usually because a pilot was flying beyond his own capabilities or outside the safety envelope of his aircraft.

"Aviation flying hours will increase up to 40 percent in the next 2 years. You officers of the first advanced class will be going into the force at a time when flying hours will be as high as 2.4 million. You understand that the more you fly, the more risk there is associated with it. We need your very best efforts on safety," General Thurman emphasized.

General Thurman related some of the things he was asked when as the DCSPER he was the Army's chief safety officer. One of them was to let units remove the seats from the Black Hawk so that the aircraft could carry 23 troops. His answer was a resounding "No!" "That aircraft was designed with seats that would be crashworthy so that people riding in them might live if there was an accident. If we had wanted an aircraft to hold 23 people without seats, we would have designed it that way."

Similarly, people have asked why a pilot-in-command must fly the aircraft from the pilot station. "Because it was

Thurman emphasizes safety

designed to be flown from the pilot's station—that's why."

"Everybody doing their own thing is simply not in the cards, so get your head straight and those of your subordinates straight about what your obligations are on the way the equipment is designed to operate."

The VCSA added, "Last December, when I took stock of the first quarter FY 84 accident data, I directed a standdown for a day for aviation safety. I asked people, 'Is one day out of the training program too much for aviation safety?' Of course it's not and when you take command of whatever unit you get, remember rule number 14—'When in charge, take charge.' That means you can stand down your unit anytime you choose to in order to have an aviation safety day so that it can be rammed home to every single member of your organization what your standards are in aviation safety."

Accountability from people who give mission briefings is another Thurman initiative. He directed the Army Safety Center to report to him the names of individuals who briefed each Class A aviation mishap. (Class A mishaps involve a fatality, $500,000 in damages, or a destroyed aircraft.)

"The final point is we must hold ourselves accountable. . . . You must not permit yourselves the luxury of not holding people accountable. You must do that; it's part of your job as an officer and it's part of my job as an officer. You understand that no one has an inherent right to fly an aircraft. I repeat, **no one has an inherent right to fly an aircraft.** They have to demonstrate their competency to fly it. Bear that in mind, and that's true in any job we have in the United States Army. I ask your support in that. . . . We can't do otherwise. Equipment is expensive, but most important of all is the loss of life. That is the greatest price of all."

General Thurman concluded, "Equally important to being technically and tactically competent is developing your skill and potential as leaders. You must care for your soldiers. Today's Army has dynamite kids—whom you will lead—and dynamite equipment—which you will fly. But never forget the soldier and his sacrifices and aspirations." ■

FY 85 Class A Mishap Countdown

	Month	FY 84 Class A Mishaps	FY 84 Army Fatalities	Month	FY 85 Class A Mishaps	FY 85 Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	1-14 Nov	**2**	**1**
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**5**	**1**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Eleven receive Broken Wing Award

Eleven aviators received the Broken Wing Award from July through September 1984.

CW2 Richard E. Armbruster
D Company, 82d Combat Aviation Battalion,
82d Airborne Division,
Fort Bragg

CW4 Billy C. Carver
55th Aviation Company,
APO San Francisco 96301

CW3 Tholan F. Crosby
Corpus Christi Army Depot,
Corpus Christi, Texas

CW3 William H. Dixon
205th Aviation Company,
APO New York 09185

CW3 Arthur J. Doyle
15th Medical Detachment,
APO New York 09114

CW4 Frederick G. Funk
5th Special Forces Group,
Fort Bragg

WO1 Jeffrey D. McDonald
Company C, 501st Aviation Battalion,
APO New York 09140

CW2 John D. Phillips
C Company, 229th Attack Helicopter Battalion,
101st Airborne Division,
Fort Campbell

CW2 Kenneth A. Robillard
14th Company, Fort Rucker

CW2 Grover W. Tyner
Hq Btry, US Army Field Artillery Center and Fort Sill,
Fort Sill

Captain Jeffrey N. Williams
A Company, 503d Aviation Battalion,
APO New York 09165 ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 26 October-1 November

Utility helicopters

UH-1 Class D mishaps

H series - Aircraft was at 750 feet agl during climbout when bird hit top of pilot's windshield. Windshield was cracked.

H series - Copilot and crew chief preflighted aircraft in the dark and did not remove intake cover. Pilot did not notice that cover was on and attempted to start engine. Engine air inlet caution light came on, and engine was immediately shut down. Intake baffle bent down on main drive shaft, scoring aft drive shaft boot.

H series - During final approach to beanbag-lighted inverted Y, aircraft was allowed to maintain an excessive rate of descent in a tail-low attitude, causing tail skid and landing gear to hit the ground. Cross tube, skid tube, tail skid, and drive shaft were damaged.

H series - During takeoff from refueling site, shudder and vibration were felt in tail rotor pedals. Aircraft was landed and crew chief discovered vertical fin drive shaft tunnel cover was open. Cover was secured and aircraft returned to home field. Postflight inspection revealed scoring to No. 4 tail rotor drive shaft and drive shaft covers.

UH-1 Class E mishaps

H series - Pilot felt feedback in cyclic, and master caution and hydraulic lights came on. Caused by deteriorated O-ring in right cyclic irreversible valve upper bolt.

H series - Muffled explosion-type noise was heard during hover. Caused by failure of fuel control.

H series - Stiff collective was caused by failure of right cyclic irreversible valve.

UH-60 Class B mishap

Aircraft was slingloading a jeep at night. During flight to LZ, aircraft entered fog bank over gently rising terrain. As crew was transitioning to instrument flight, slingload began to oscillate. Crew could not see the gently rising terrain and taller trees, and slingload hit the trees, pulling aircraft low enough to cause main rotor and stabilator damage. Crew chief immediately released the jeep, allowing an altitude increase. Aircraft was flown back to airfield and landed without further incident. The jeep was destroyed. 8504

UH-60 Class E mishaps

No. 2 engine rpm and torque dropped during flight. Caused by malfunction of electrical cable cannon plug.

Stabilator audio and master caution light activated. Auto reset would not function. Caused by failure of lateral accelerometer.

Attack helicopters

AH-1 Class C mishap

S series - As pilot was making right 60-degree turn, aircraft descended into trees. Pilot regained control and landed in open field. Main rotor blade, ADS sensor and boom, and rocket pod were damaged.

AH-1 Class E mishaps

S series - Master caution and fuel boost pump lights came on. Caused by failure of two pressure switches and one relay.

S series - Excessive force was required to move collective up or down during hover. Caused by corroded collective jackshaft.

S series - Both airspeed indicators were inoperative during takeoff. Pitot static line behind pilot's seat became brittle and cracked because of heat and direct sunlight.

S series - Radios lost all side tones and ICS during hover. Rain leaking off canopy on ICS box caused box to short out.

S series - Pilot felt control feedback through cyclic along the longitudinal axis. Caused by malfunction of pitch SCAS actuator.

Cargo helicopters

CH-47 Class E mishap

C series - Smoke filled cabin after aircraft was hot refueled. No. 1 flight boost pump drive shaft sheared after pump seized internally.

Observation helicopters

OH-58 Class E mishaps

A series - Loud popping noises were heard during touchdown. Compressor discharge tube seal rings failed, resulting in compressor stall.

A series - Transmission oil pressure light came on. Caused by failure of oil pressure switch.

U.S. ARMY SAFETY CENTER

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JOSEPH R. KOEHLER
Colonel, Aviation
Commander, Army Safety Center

Mishap briefs

Fixed wing

U-21 Class B mishap

A series - As aircraft was on takeoff roll, accelerating through 70 knots, pilots saw three deer crossing the runway. Because it was dark, pilots did not see the deer until they were illuminated by the aircraft landing lights. Nose gear assembly hit one deer, gear broke and folded, and aircraft nose dropped. Props began to strike runway surface about 80 feet from impact and continued until aircraft came to rest 1,400 feet from point of impact. 8505

OV-1 Class E mishap

D series - No. 1 engine egt rose to 800° C. during landing. Caused by failure of engine.

Maintenance

AH-1 Class E mishaps

S series - Master caution and chip detector lights came on. Incorrect installation of 42-degree gearbox cover caused cover to chafe chip detector wire.

S series - Crew chief saw that strainer for No. 3 and 4 bearing pack was leaking during runup. Caused by loose bearing pack return line.

S series - N_1, N_2, and torque fluctuated during hover. Bleed band was out of adjustment.

OH-58 Class E mishaps

A series - High frequency vibration was felt in antitorque pedals. Tail rotor was out of balance.

C series - Slight binding was felt when collective was lowered. Caused by dirty friction collar.

OV-1 Class E mishap

D series - Pilot put landing gear handle in up position after takeoff. Gear position indicator showed right main gear down. Gear handle was recycled four times and gear failed to completely retract. Right main gear strut was overserviced.

Messages received

• Safety-of-flight maintenance mandatory message concerning one-time inspection of UH-60 aircraft for defective tail rotor control cable MS21251 brass turnbuckles (UH-60A-84-13, 301500Z Oct 84). Summary: This turnbuckle is used in the aft fuselage directional control system on UH-60 series aircraft. These aircraft will be inspected for defective turnbuckles. Contact: Robert Lawyer, AUTOVON 693-3300, commercial 314-263-3300.

• Safety-of-flight technical message concerning one-time inspection of UH-60 tail rotor control cables (UH-60A-84-14, 301515Z Oct 84). Summary: Several tail rotor cable failures have resulted from two problem areas: misrouting of the cables around the cable guard pins adjacent to the forward overhead pulleys and misrouting of the right cable over a stabilator amplifier mounting bolt, subsequent to pylon fold sequence. UH-60 aircraft will be inspected to insure that their tail rotor control cables are routed correctly and have appropriate tension. Contact: Lyell Myers, AUTOVON 693-3300, commercial 314-263-3300.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

On the new format

By now, you've probably noticed a change in the format of **Flightfax.** Because of current budget restraints imposed on DA periodicals, this change to a report format was necessary to continue weekly publication of **Flightfax** and retain timely distribution by first class mail.

As a weekly Report of Army Aircraft Mishaps, **Flightfax** will continue to carry indepth reviews of Class A and B accidents, current mishap briefs, safety-of-flight information, reports on seasonal hazards, and STACOM. When space permits, we will drop in short articles on specific safety problems. Safety Center articles on general aviation topics will continue to be published monthly in the **U.S. Army Aviation Digest.**

To those who have called and written, we appreciate your interest and concern about **Flightfax.** We will continue to try to give you the information you need to make your job safer. ■

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United States
Army Safety Center
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Flightfax®
Report of Army Aircraft Mishaps

Aircraft accident review

Single-pilot medevac mission

Synopsis

A UH-1V pilot was on a night aeromedical evacuation mission. As the helicopter was approaching a field pickup site, it entered a heavy rainstorm. The pilot became spatially disoriented, and the aircraft crashed.

History of flight

Two UH-1 helicopters were providing aeromedical evacuation (medevac) coverage for units on annual tank gunnery training. Near the end of the training period, one of the helicopters was sent back to home base because of decreased training activities of the supported units. The medevac crew that remained consisted of a pilot (the unit operations officer), the unit IP, a crew chief, and a medical technician.

The training often continued into the early morning hours, so the operations officer telephoned the commander of his aviation unit and suggested they be allowed to fly single-pilot missions. The commander approved. This arrangement would allow the two pilots to alternate tours of duty and allow some time away from the standby duty at the airfield.

By 1100 one morning, the surface winds in the area were exceeding the UH-1V operating limitations, so the pilot secured the aircraft and released his crew to return to the barracks. The pilot continued to monitor the winds and reported his operational status every 90 minutes.

That night, the pilot was notified of an accident and the need to evacuate five badly burned soldiers. The pilot checked the weather and was told that it was marginal but within aircraft operational limitations. He called the crew chief and told him they had a mission. By the time the pilot had removed the aircraft covers and untied the rotor blades, the crew chief had arrived.

The UH-1V took off from the airfield, with the pilot in the right seat and the crew chief in the left seat. The pilot planned to use medics from the supported unit at the accident site to provide care to the injured while en route to the medical facility.

About 10 minutes after takeoff, the pilot reported to range control that he had the lights on the range at the pickup point in sight. He overflew the site generally from west to east at 70 knots indicated airspeed and 1,000 feet above the ground before starting a right descending turn for a "teardrop" approach to the area, with the final approach being on a 250-degree heading into the wind. As the aircraft searchlight began to pick up the trees, the crew chief told the pilot they were moving sideways. The pilot confirmed that they had experienced a wind change to the north and started a right climbing missed approach.

At this point, the aircraft entered a heavy rainstorm and the pilot was blinded by a light outside the cockpit. The light was later determined to have been the searchlight which was being diffused or reflected by the heavy rain. The pilot was unable to read his instruments because of the loss of his night vision and the low instrument light setting he was using. Control was lost, and the aircraft rotor system struck 60- to 70-foot trees. The pilot applied power and the helicopter flew approximately 1,000 feet and reentered the trees, traveling backward in a steep, uncontrolled descent.

After the aircraft came to rest on its left side, the pilot extracted himself and the crew chief from the wreckage. Both sustained major injuries. A rescue party reached the crash site about 3½ hours

Accident review

later. Injured personnel from the ground accident were evacuated by ambulance shortly after the aircraft crash.

Crew experience

The 28-year-old pilot had almost 500 rotary wing hours, with more than 300 in the UH-1V.

Commentary

The decision by the commander to allow single-pilot medevac missions was based on information related to him by his operations officer (the pilot of the crashed aircraft). By approving single-pilot operation, the commander reduced his support capability, because AR 95-1 requires two pilots in instrument weather conditions. Also, common practice dictates that an entire crew, including a medic, is needed for any medevac mission regardless of weather conditions.

The operations officer told the commander that the unit they were supporting was training on a 24-hour basis instead of a 16-hour basis as they had understood. The commander was also told that the crew could not stay on duty at the airfield on a 24-hour basis because there were no bathing or sleeping facilities. It was later discovered that, although it would have been a hardship, the crew could have stayed on standby status at the airfield.

There should have been two aircraft and crews in support of the mission. However, when the commander was informed of the changes in training hours only 3 days remained before the end of the exercise, and he decided he could not field another aircraft and crew.

On the afternoon of the accident, the operations officer told the supported brigade S-3 that he would have to terminate medevac coverage because of adverse weather conditions. The S-3 would not allow him to do so. The S-3's rationale was that the crew could continue to stand by and, if a mission was received, the pilots could check weather at that time and make the decision whether or not to fly. The S-3 was under the impression that an entire crew would be used if they were requested to fly.

The pilot and his copilot, who was also the unit IP, should not have agreed to fly single-pilot missions with the weather conditions that were prevalent. The copilot, although on main post, should have been standing by ready to perform his duties.

When the mission was received, the pilot, after checking the weather and finding it marginal, made the decision to attempt the rescue alone, using the crew chief as an observer. This decision was based on the severity of injuries and the number of soldiers waiting to be evacuated. He felt that the copilot, who had been released from duty, would not be ready or able to fly.

Once airborne and on final approach to the pickup zone, the pilot found himself in a heavy rainshower. His immediate reaction should have been to execute vertical helicopter instrument recovery procedures; however, he did not. With the searchlight reflecting off the rain, the pilot became disoriented and lost control of the aircraft. ■

Reminder on mission briefer requirement

Block 9e of the Preliminary Report of Aircraft Mishap (PRAM) requires information on the person who briefed the mission. This information is required on all Class A, B, and C mishaps and is provided to the Vice Chief of Staff Army. Reference U.S. Army Safety Center messages 29 Nov 83 and 1 Dec 83, the name, rank/grade, and duty position of the person who briefed the aircrew on the parameters of the mission should be included in block 9e. If the mission briefer cannot be identified, give the name and rank of the unit commander.

When mission briefer information is not included in the basic PRAM, a supplemental PRAM with data on the mission briefer is required. No telephone calls can be accepted. ■

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	1-21 Nov	**4**	**3**
	December	0	0			
2nd Qtr	January	4	0			
	February	4	4			
	March	3	1			
3rd Qtr	April	1	3			
	May	4	3			
	June	4	5			
4th Qtr	July	2	3			
	August	2	0			
	September	4	3			
	Total for Year	38	35*	Total to Date	**7**	**3**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 2-8 November

Utility helicopters

UH-1 Class A mishap

H series - While at 150 feet agl and out-of-ground-effect (OGE) hover, crew noticed low rpm warning light and simultaneous loss of rotor rpm. IP took controls and completed OGE hovering autorotation. Aircraft landed hard, causing extensive airframe and rotor damage. 8506

UH-1 Class D mishap

H series - Duck hit and broke chin bubble as aircraft was flying at 800 feet.

UH-1 Class E mishaps

H series - Engine oil temperature rose and oil pressure dropped during takeoff. Caused by malfunction of engine oil cooling fan.

H series - Transmission oil hot light came on and crew smelled hot metal. Caused by failure of flow control thermostat.

H series - Engine air inlet light came on. Caused by malfunction of pressure switch.

H series - Crew noticed vertical vibration during flight. Skin separated from main rotor blade.

UH-60 Class D mishap

A series - Windshield wiper switch was left on during runup. When APU generator was turned on, electrical surge caused windshield wiper motor to short out.

Attack helicopters

AH-1 Class D mishap

S series - Student pilot was performing high-speed, low-level autorotation. Everything was normal until 4 to 5 feet off the ground, when student pulled all remaining collective pitch. Aircraft touched down rough on skid heels with low rotor rpm, resulting in pylon rock.

AH-1 Class E mishaps

S series - Both airspeed indicators were inoperative during takeoff. Caused by broken pitot static line behind pilot's seat.

S series - No. 2 hydraulic light came on. Caused by failure of hydraulic pressure switch.

S series - Engine oil pressure dropped to 30 psi. Caused by failure of pressure transducer.

Cargo helicopters

CH-47 Class D mishap

D series - Cabin emergency escape panel separated from aircraft during flight. Panel was not recovered.

CH-47 Class E mishap

C series - Cooling fan developed leak during flight and began spraying hydraulic fluid.

Observation helicopters

OH-58 Class A mishap

C series - Aircraft hit wires during night vision goggles training mission and crashed. One crewmember was killed and one critically injured. 8507

OH-58 Class D mishap

A series - Pilot saw wires during low-level flight and tried to fly under them. Pilot heard noise but did not think he had hit the wires. When aircraft was landed, damage was found to main rotor blade, horizontal stabilizer, and pitch change link. Pilot was flying too fast for the low altitude, and wires were not marked on pilot's map.

OH-58 Class E mishaps

A series - Aircraft entered unforecast ground fog during takeoff. Pilot initiated instrument recovery procedures and climbed to VMC. Mission was aborted.

A series - Hydraulic light came on during hover. Caused by malfunction of hydraulic pump.

OH-6 Class D mishap

A series - Main rotor blades hit wire during hover at field site. Both blades were damaged.

OH-6 Class E mishap

A series - IP retarded throttle to engine idle to simulate forced landing. Student responded with excessive forward cyclic, causing rotor overspeed. IP did not increase collective pitch in time to prevent overspeed.

Fixed wing

U-21 Class D mishap

D series - Loud noise was heard from vicinity of No. 2 engine as aircraft was taxiing to hangar. Inspection revealed foreign object damage to No. 2 propeller. Concrete ramp had broken up at joints, allowing loose particles to be picked up by moving propeller blades.

U-21 Class E mishap

G series - Flap switch was placed in approach position. Flaps started down slowly and stopped at approximately 27 percent instead of at the approach position of 35 percent. Flap motor circuit breaker popped out. Caused by burned-out flap actuator motor.

T-42 Class D mishap

A series - Left engine exploded during flight. Engine cowlings were damaged by engine debris. Fire started on outboard side of engine. Copilot closed fuel selector to engine. Fire then extinguished itself. Aircraft was landed with no further damage.

Maintenance

UH-1 Class E mishaps

H series - When copilot retracted landing light with pink light filter, motor burned out. Filter was incorrectly attached. A larger screw than required was installed, keeping landing light from being fully retracted.

(continued on back page)

Stacom

Standardization Communication

Checklists. Here we go again!

In 1969, Army aviation began enforcing a regulation that requires the use of checklists from preflight to shutdown. The idea for using standardized procedures when operating an aircraft was not new in 1969, but it was the first time the Army had adopted the policy of reading items from standardized checklists.

Since 1969, checklists have increased in volume to the point where aviators have suggested that they are overly complex, contain unnecessary checks, list too many emergency steps that require memorization, and require too much time to be accomplished. Other factors indicate that revisions can be made that will have a positive impact on their overall effectiveness.

• In 1981-82, the U.S. Army Aviation Research and Development Command was involved in a Department of the Army directed effort to determine how Army helicopter operations can be changed to reduce fuel consumption. The final report shows that significant fuel savings can be realized by changing starting and runup procedures without any compromise to flight safety.

• An Artillery officer recently commented to an Army aviator that it seemed strange that Army aviators train one way in peacetime, then when the balloon goes up, standing operating procedures are cast aside in order for Army aircraft to respond rapidly to combat operations. His point was that the Artillery trains today as it will fight tomorrow. Are Army flight procedures relevant to tomorrow's battlefield? LTG Julius W. Becton, Jr., summed it up at the 1982 Aviation Policy Committee meeting with the brief statement, "Train as we fight."

• Army aviators are training in mission-oriented protection posture equipment. During some tests of aircraft preflight and runup, it was determined that aviators became incapacitated after extended periods in MOPP gear. If the time the aviator spends on the ground prior to becoming airborne can be reduced, more time can be spent accomplishing flight tasks.

• For years we have made some systems checks, because we had the time and capability. Now the question is asked, "Are all the checks we make necessary for safe flight?" All of these issues were considered when work began this past year to revise all helicopter and airplane checklists.

• The recently distributed UH-1H/V checklist is a prime example of how changes are being made to respond to problems identified above.

• Imagine yourself entering the right side of a UH-1H cockpit. Upon discovering that someone had run the pedals all the way to the short stop, you move them to a position that is comfortable to you. Similarly, you make adjustments to the seat. You do all of this because you recognize the need to do it and not in response to a checklist. Had you picked up a checklist first, a few seconds would have been required to read and respond to the step "Seat and pedals - adjust." Then you would have put the checklist down while you made the adjustments. Putting the checklist down, picking it up again, and finding the correct step on which to begin again consumes more time. The time might seem trivial, but when combined with all of the other similar time-consuming checks, a significant amount can be saved by their elimination. By now you've guessed that the step "Seat and pedals - adjust" is deleted.

• The flow pattern of the old checklist was another time consumer. The pilot began the cockpit check at the flight controls, moved to the center console, then overhead, down to the instrument panel, then again to the center console and finally back to the flight controls. The new sequence begins overhead and moves through the instrument panel and center console to the flight controls. One objection expressed to this sequence was that the battery switch would be turned on before checking fuel switches OFF. If the old or new checklist were followed, the fuel switch would not be a factor because it is checked OFF during the **before exterior check.**

• When the UH-1H checklist appeared in 1979, it was obvious that some thought had been given to reducing steps that required reading and responding. An example is the checklist step that reads: "Overhead switches and circuit breakers - set as required." In the dash 10, there is a step-by-step explanation of how the

switches should be set. There is no intent that the pilot repeat from memory each switch position from the dash 10; yet, some aviators insist that each item on the overhead panel be called out. This is but one example of how mission response is unnecessarily delayed. If the pilot looks at the overhead panel and only moves three switches (not calling out any switches or positions), the checklist step, "Overhead switches and circuit breakers - set," has been accomplished. Furthermore, a considerable amount of time can be saved by visually checking switch positions rather than making the callouts and physically touching each switch. Some of the lettered sub-steps under an asterisk numbered step also have asterisks. This means that only they, and not the other steps, must be checked in flight. The new checklist treats the center console the same as the overhead console: "Console switches - set."

• A completely new thru-flight checklist is included in the performance section of the -CL that provides an even quicker response. It is a consolidation of all the asterisked items on the "N" pages of the checklist. In addition to the normal thru-flight checks, it may be used for combat/tactical training when authorized by the commander.

• There is no requirement in the new checklist to decrease the rpm switch for 10 seconds prior to the first start of the day or at any other time. The rationale is that in the past 5 years, the GOV switch has not been decreased on thru flights; then, there is no reason to decrease on the first start.

• You will also note that **pitot heat, bleed air, AC voltmeter, inverter, DC voltmeter,** and **generator** checks are no longer accomplished during engine runup. They are checked during shutdown only. It is mandatory that engine temperatures be stablilized for 2 minutes prior to shutdown; therefore, these checks can be performed without extending engine run-time. The crew on a morning flight must rely on the systems being checked on the last flight the previous day. Since the spare inverter is checked on shutdown, only the main inverter is used from start to shutdown on all flights. This prevents time-consuming switching from spare to main during runup.

• Another check that has been eliminated during runup is the hydraulic system. The previous check of the hydraulic system told the pilot that the hydraulic switch worked; it turned the system off and on. The normal mode of flight is with the hydraulic switch on and the only time it is required to be turned off is in the event of a hydraulic failure. Normal flight control responses prior to flight indicate that the hydraulic system functions properly; so—why check to see that it is disabled by the switch? None of the in-flight failures that have ever occurred, including pilot-initiated "hydraulics-off," could be detected prior to flight by the hydraulic system check we have been using.

• Finally, the step requiring a check of force trim is gone. That does not mean that a force-trim check is not made. Consider this. If the force trim is engaged with the switch in the ON position during start and runup and it releases when the pilot uses either switch to deactivate it before hovering, a check of the system has been made. Therefore, a checklist step is not necessary to accomplish the task.

• The new UPDATE operator's manual (-10) contains the amplified checklist in chapters 8 and 9. The -CL can only be used with this version of the -10.

These major changes are brought about for three valid reasons: responsiveness to combat needs, flight crew MOPP requirements, and fuel conservation. While these necessary improvements are warranted, the importance and requirement for use of the aircrew and maintenance checklists in accordance with AR 95-1 must continue to be enforced. If the new checklists are used as they are intended, anticipated improvements in efficiency will be realized. ■

Aircrew information reading file

AR 95-1, paragraph 3-2, requires the establishment of an aircrew information reading file per TC 1-134. Since TC 1-134 is no longer in effect, a future change to AR 95-1 will read IAW Commanders Guide, Aircrew Training Manual. ■

Aviators Annual Proficiency and Readiness Test evaluations

Reference "Thurman Sends" message, March 1984, paragraph 8b, note 2. AAPART: To be qualified to perform pilot-in-command duties from both pilot and copilot seats, PICs will take their AAPART evaluation in both seats. This does not mean that the PIC will take a complete AAPART evaluation in each seat. The PIC will complete as a minimum those mandatory AAPART tasks (base and commander selected tasks). The evaluator will, as a minimum, insure the PIC completes enough tasks in each seat to satisfactorily demonstrate proficiency. ■

STACOM 107 21 Nov 1984
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TURNER E. GRIMSLEY
LTC(P), Aviation
Director, DES

Mishap briefs

V series - Hydraulics went off and master caution and hydraulic lights came on. Hydraulic line was chafed against throttle control tube.

UH-60 Class E mishap

A series - Copilot's cyclic stick developed lateral and vertical play during flight. Postflight inspection revealed that the cyclic mounting bolt to the cyclic assembly was not the correct size.

CH-47 Class E mishap

C series - Engine torque needles split during takeoff. Caused by improperly rigged fuel control.

Messages received

• Safety-of-use message concerning static discharge probe (SOU-GEN-MEM-84-03, 021815Z Nov 84). Summary: Failure to use or misuse of the static discharge probe has been the cause of injuries to personnel performing aerial recovery operations. There is an electrical shock hazard potential when attaching loads to the recovery aircraft cargo hook. Users are reminded to strictly adhere to proper probe usage procedures. Contact: David Branham, AUTOVON 693-1107, commercial 314-263-1107.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

Updated field manuals available soon

An updated set of field manuals, FM 25-1 through FM 25-4, will be introduced in the first quarter of FY 85. These field manuals provide techniques, principles, and procedures for training and training management in all combat arms, combat support, and combat service support units, both active and reserve component. The manuals are the basis for all Army training and training management.

FM 25-1, **Training**, covers the philosophy and principles of training. It is for leaders at all levels. FM 25-2, **Unit Training Management,** provides the Army training management process. It is for battalion and above commanders and staffs. FM 25-3, **Training in Units**, provides the "how to" for the conduct of training. It is for leaders at battalion level and below, first-line trainers. FM 25-4, **How to Conduct Training Exercises,** describes the conduct and use of training exercises to sustain skills. It is primarily for commanders and staffs at battalion level and above.

These manuals are significant doctrinal contributions. Be sure to update your DA Form 12A (by checking block No. 159, Techniques of Military Instruction) or write the U.S. Army Publications Center in Baltimore, Maryland, to obtain copies. ■

U.S. ARMY SAFETY CENTER

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Flightfax
Report of Army Aircraft Mishaps

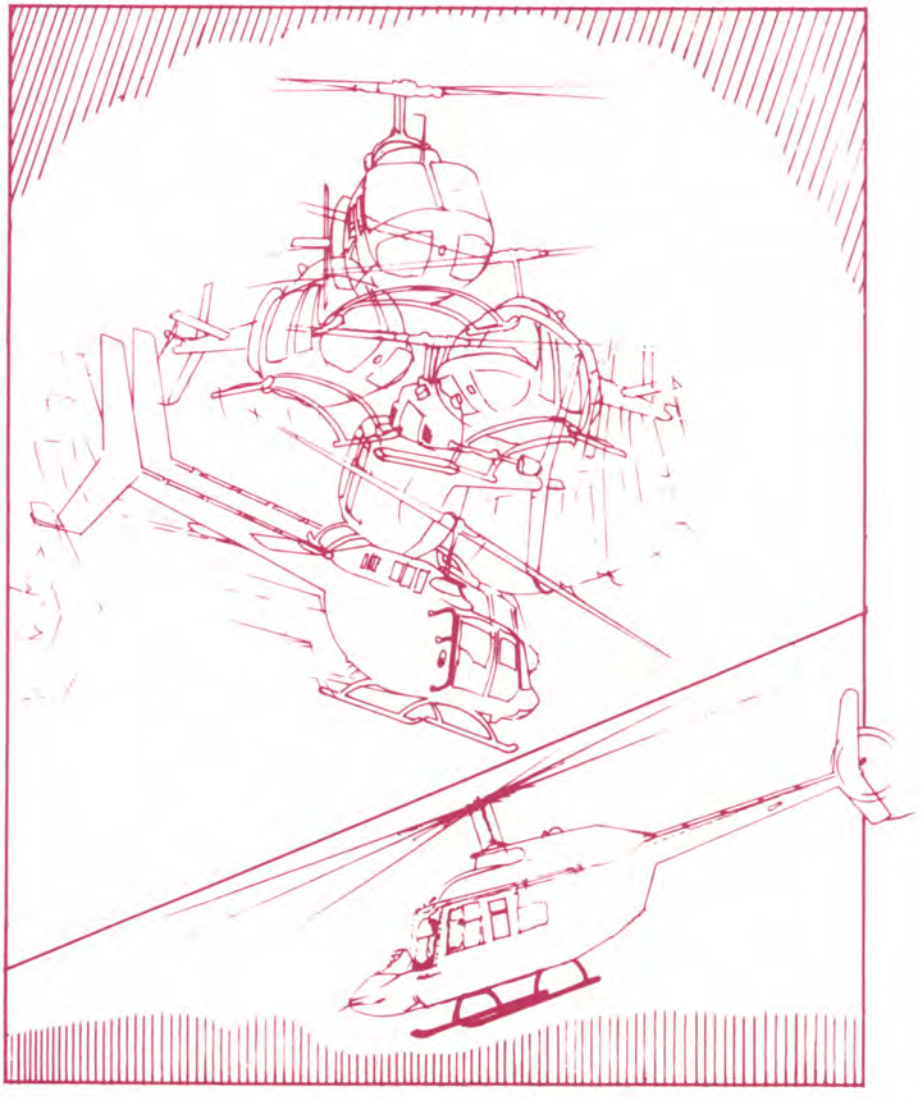
Loss of tail rotor effectiveness . . . when it is and when it isn't

Case 1 - when it is

The mission called for the OH-58C to contact some ground reconnaissance troops and then fly two passengers to an airfield. After the ground troops were located, the pilot flew east of his intended landing area at about 200 feet agl and 80 knots. He then made a high recon and a 360-degree left turn to begin his approach into the wind, estimated by the pilot to be 20 to 30 knots. As the helicopter approached the intended landing area, the pilot determined that the landing site was unsuitable. About 10 to 15 feet above the ground and with minimal forward ground speed, the pilot began a left turn to land at another site to his right rear.

After completing about 150 degrees of the turn, the aircraft began to shudder and started rotating to the right. The pilot tried to stop the rotation with left pedal application. The rotation could not be stopped, and the aircraft spun to the right four times. The first two spins were slow, but with the pilot's cyclic input, the spins became more elliptical and exaggerated. The aircraft was also descending.

Although the pilot considered an autorotation, he felt he was too low and might be over a sand dune. The aircraft continued to lose altitude and, with each rotation, the spin increased in rate. Because the aircraft was in a nose-low attitude, the pilot applied aft cyclic. This action, with the right rotation of the aircraft, caused the aircraft to move abruptly rearward in a level position and hit a sand dune. The left skid was sheared from the aircraft as the fuselage continued rearward. The main rotor blade hit the ground, and the aircraft came to rest on its right side. After the crew and passengers exited, the aircraft caught fire and was destroyed.



The pilot sustained a leg injury. The copilot and passengers were not injured.

Not all uncommanded movements of an aircraft are the result of loss of tail rotor effectiveness (LTE), as evidenced by the following case.

Loss of tail rotor effectiveness . . .

Case 2 - when it isn't

The OH-58A pilot had completed his mission and requested an approach to an airfield holding apron adjacent to his parking area. The request was approved, and the pilot was told to approach straight in to a runway, landing to the holding apron. The pilot was also told that the winds were 330 degrees at 11 knots, gusting to 18 knots. This gave the pilot a right quartering tailwind on his approach to the runway.

The pilot accepted the approach and terminated at a 4-foot hover over the apron. He was cleared to taxi and began a left pedal turn. A gust of wind lifted the tail of the aircraft. Misinterpreting the movement as loss of tail rotor effectiveness, the pilot applied forward cyclic in an attempt to fly out of the condition. This input, along with the already nose-low attitude of the aircraft, caused the main rotor blades to hit the runway about the same time as the skid toes.

The blade and skid contact brought the nose of the aircraft back up, and the pilot lowered collective and rolled the throttle off, attempting a hovering autorotation. This action resulted in a hard landing on the heels of the skids. The blades flexed down and hit the tail boom. The tail boom and rotor system components separated from the aircraft. The pilot was not injured.

This OH-58 did not encounter LTE. Two eyewitnesses who were familiar with aircraft operations said the main rotor blades hit the ground while the aircraft was hovering. Physical evidence on the concrete ramp surface established that the blades first hit the ground to the left front of the aircraft. There was no evidence of aircraft rotation common with LTE. This was further substantiated by the collapse of the aft cross tubes and minimal ground scars caused by the fuselage hitting the ramp.

The pilot in case 1 knew he was in an LTE situation, and he knew the correct emergency procedures. He was just hesitant about following them all the way.

When the pilot decided his selected landing site was unsuitable, he placed the tail of the aircraft into a strong wind instead of making a go-around or terminating at a hover. Once the pilot made the turn and faced downwind, the aircraft was placed within the area identified in figure 8-4 of the operator's manual as weathercock stability. It appears that the pilot was late in trying to stop the uncommanded turn and that the yaw rate increased to a point that the pilot found himself in an LTE condition.

Lack of knowledge of emergency procedures and inadequate unit training caused the pilot to think he was in an LTE situation.

Of the several options available to the pilot, he picked the worst possible one. He **did** follow the procedures in the operator's manual and tried to regain airspeed by lowering the aircraft nose and adding full left pedal. However, once he determined recovery was not possible, he leveled the aircraft but elected not to enter autorotation as outlined in the operator's manual. By eliminating this option, he denied himself the opportunity to diminish or cease the severe spins and increase the chance of a successful landing.

The pilot's reason for not entering autorotation was his close proximity to sand dunes. The worst possible thing that could have happened had he entered an autorotation and fell off a sand dune is exactly what did happen.

Lack of knowledge of emergency procedures and inadequate unit training caused the pilot in case 2 to think he was in an LTE situation when he was not. Eight months before this accident, the pilot failed a no-notice evaluation. His knowledge of aircraft limitations and preflight and emergency procedures was unsatisfactory. Suspension of pilot duties and additional academic training were recommended. Two days later, the pilot took an oral examination again with the unit IP. He received a satisfactory rating and was requalified as a pilot in the OH-58, with no documented training.

Four days before the accident, the pilot took a no-notice evaluation ride with a different unit IP. He received an overall satisfactory rating but was noted to be weak in the area of memorized emergency procedure items and with all aircraft performance limitations. He did not receive additional training to correct these weaknesses.

Three days after the accident, the pilot received unsatisfactory grades in all areas of an oral examination, plus unsatisfactory on aircraft preflight. The areas failed during the oral exam were the same areas the pilot had demonstrated a weakness in on prior checkrides.

OH-58 pilots should be totally familiar with the effects of wind on the aircraft, with the characteristics associated with the onset of LTE, and with the emergency procedures stipulated in the operator's manual. But familiarity alone is not enough. The procedures must be followed to the letter.

A new videotape on tail rotor effectiveness has been released to the field. The title is "Loss of Tail Rotor Effectiveness—What Is It?" It was released under TVT 46-127 and SAVPIN 701651. The tape gives the definition of loss of tail rotor effectiveness, causes, and actions to take to avoid accidents. It describes in detail the actions which occur when the pilot encounters weathercocking, vortex ring, and disc vortex situations. Using a model helicopter, all three of these dangerous situations which can cause a decrease in tail rotor thrust are demonstrated.

This tape should be available through your local Training and Audiovisual Support Center. It should be viewed by all OH-58 pilots. ■

Selected aircraft mishap briefs

Information based on preliminary reports of aircraft mishaps received 6-12 September

Utility helicopters

UH-1 Class D mishap

H series - Dzus fastener dislodged,hit tail rotor blade, and then hit vertical fin.

UH-1 Class E mishaps

M series - No. 2 hydraulic pressure light came on. Caused by failure of hydraulic pressure switch.

V series - Engine oil pressure decreased during flight. Caused by failure of oil pressure transmitter.

H series - Transmission oil pressure fluctuated. Caused by defective pressure gauge.

H series - Crew smelled something burning and then saw smoke in cockpit. Master caution and transmission oil pressure lights came on during landing. Caused by ruptured transmission oil line.

Attack helicopters

AH-1 Class D mishap

S series - Loud banging noise was heard from oil cooler compartment. Upper bearing of turbine blower failed. Retaining nut and washer came off shaft and damaged fan blades.

AH-1 Class E mishaps

S series - Engine decelerated during hot refueling operation. N1 dropped to zero, tgt decreased, and N2 dropped to zero. Fuel was contaminated with water.

S series - Pilot noticed 1:1 vibration during flight. Aircraft had just been flown through a rainshower. Postflight inspection revealed 4-inch square of rubber missing from leading edge of main rotor blade.

AH-64 Class E mishaps

A series - Oil pressure accessory pump light came on. Caused by failure of pressure switch.

A series - Main transmission chip detector light came on. Fuzz was found on chip detector.

Cargo helicopters

CH-47 Class E mishaps

C series - Loud bang was heard following drop in rotor rpm. No. 2 engine N1 speed dropped below 40 percent and PTIT indicated 1,000 degrees. Engine was shut down and aircraft landed. Inspection revealed metal shavings in tail cone and oil in engine inlet. Compressor section would not turn.

C series - No. 1 engine failed during approach for landing. Caused by failure of fuel control.

Observation helicopters

OH-6 Class C mishap

A series - Pilot heard engine-out audio during descent for landing. Aircraft landed hard on downslope in open field, rolled right, and came to rest upright. Tail section and main rotor blades were destroyed. Landing gear and fuselage were also damaged. Cause of engine failure unknown pending investigation.

OH-6 Class E mishaps

A series - Pilot heard loud bang after touchdown. Inspection revealed main rotor blade tiedown behind aircraft. Suspect rope went through tail rotor. Caused by failure to ensure security of blade tiedown in back of aircraft. Doors of aircraft were removed.

A series - Engine oil bypass light came on. Flared end of oil line failed at base, causing oil loss.

FY 85 Class A Mishap Countdown

		FY 84			FY 85	
	Month	Class A Mishaps	Army Fatalities	Month	Class A Mishaps	Army Fatalities
1st Qtr	October	7	10	October	**3**	**0**
	November	3	3	November	**4**	**3**
	December	0	0	December	**5**	**5**
2nd Qtr	January	4	0	January	**5**	**0**
	February	4	4	February	**3**	**2**
	March	3	1	March	**9**	**14**
3rd Qtr	April	1	3	April	**2**	**3**
	May	4	3	May	**4**	**0**
	June	5	5	June	**1**	**0**
4th Qtr	July	2	3	July	**5**	**1**
	August	2	0	August	**2**	**1**
	September	4	3	1-25 Sep	**2**	**2**
	Total for Year	39	35*	Total to Date	**45**	**31**

*Army personnel only. Total number of fatalities in Army aircraft flight accidents was 37.

Mishap briefs

OH-58 Class E mishaps

A series - Torque indicated 54 psi during hover check. When pilot made power changes, torque did not move from 54 psi. Caused by crimped oil line on torque gauge.

C series - Pilot felt cyclic feedback during takeoff. Caused by failure of hydraulic pump.

Fixed wing

OV-1 Class E mishaps

D series - No. 2 engine fire handle light came on during climb. Single-engine landing was made. Caused by failure of deicer generator.

D series - Fuel pump light came on during approach. Caused by failure of aft boost pump.

C-12 Class D mishap

D series - As aircraft was landing, approximately 30 pigeons flew up from left side of runway. Several pigeons hit and dented left outboard flap panel.

C-12 Class E mishaps

C series - Nose wheel gear light did not give safe indication. Tower personnel indicated gear appeared to be down. Aircraft was landed without incident. Caused by failure of nose gear down-lock switch.

C series - As pilot advanced power for takeoff, No. 1 engine would not develop full power. Caused by failure of high pressure bleed valve.

D series - Right bleed air fail light came on. Rivet had blown out of bleed air fail sense line forward of pressure bulkhead.

Maintenance

UH-1 Class E mishap

H series - Fuel filter light came on during takeoff. Wire at fuel filter cannon plug was stripped too far, causing short.

CH-47 Class E mishap

C series - No. 2 hydraulic boost light came on, and hydraulic pressure dropped to zero. Hydraulic rigid line was installed under combining transmission without antichafing tape. Line was rubbing phenolic block and failed at that location.

OH-58 Class E mishap

C series - Antitorque pedals stuck in full or near-full left position during takeoff. Running landing was made. Suspect maintenance personnel failed to install spacer, self-locking nut, and cotter pin to bolt.

Safety messages

• Safety-of-flight technical message concerning one-time inspection of AH-1 K747 main rotor blades (AH-1-85-05, 1110500Z Sep 85). Summary: An early production K747 rotor blade, returned to the factory for rework, was found to have a defect in the aluminum root fitting. The problem has been isolated to a particular lot of material from which the part was produced. Serial numbers of the blades with root fittings made from the suspect lot have been identified. This message directs an inventory of all stocks and all installed K747 rotor blades and removal of suspect blades from use until root fittings can be replaced.

For more information on selected mishap briefs, call AUTOVON 558-4198/4202.

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