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FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS
March 1995 ◆ Vol 23 ◆ No 6

With little or no warning, the visual cues disappear. You're in the milky white. Instantly, you feel your stomach muscles tighten: you know that flight into adverse weather conditions poses risks even for instrument-proficient pilots. Not a good time to realize your instrument flight skills are less than what they should be. But without hesitation, you transition to instruments because you also know that thinking you'll soon break through the milky white uses up precious seconds you can't afford to lose.

The next time you're tempted to press on into marginal weather, think carefully. Is the mission important enough that the potential benefits of accomplishing it outweigh the risks? If so, are you instrument proficient . . . are you confident in your abilities as an instrument-rated pilot? If you do go inadvertent IMC, you'll need INSTRUMENT FLIGHT PROFICIENCY and CONFIDENCE to get out of the clouds safely.

Inadvertent IMC

The February 1994 issue of *FlightFax* provided an analysis of inadvertent IMC-related accidents over the last 20 years.

A quick recap—

- From January 1974 through January 1994, the Army experienced 50 Class A through C rotary wing accidents involving inadvertent IMC.
- Of these 50 accidents, 40 (80 percent) were Class As.
- UH-1 and OH-58 crews experienced most of the accidents with 17 each.
- Of the 50 Class A through C accidents, 36 (72 percent) were at night.

Accidently flying into clouds continues to be a significant cause of Army flight accidents. In the last 5 years alone, IMC-related accidents have accounted for 23 fatalities and destruction of more than $20 million worth of equipment. What does all this mean to you? Flying is serious business, and if you are going to fly an aircraft when weather conditions are marginal VFR, you absolutely must be proficient and confident in your abilities as an Army aviator.

IMC accident scenario

Most IMC-related accidents tend to occur during one of three flight scenarios: aircraft encounters clouds at flight level, aircraft flies into ground fog, or aircraft flies into heavy rain. The following IMC-related accident involves an OH-58 aircraft that encountered clouds at flight level, and as too often happens, it was fatal.

The attack battalion had just completed a battalion deep attack. After the deep attack, the unit returned to a civilian airport to conduct refueling operations prior to recovering to the unit's tactical assembly area. While at the airport, weather information was updated with the forecast calling for a broken cloud layer at 1,500 feet and an overcast cloud layer at 2,500 feet with 7 miles' visibility in rain.

The unit organized into four flight groups for the return flight. The first three flights were AH-64 companies with three OH-58s making up the fourth flight. With a 5-minute separation between flights, the groups began departing at 2100. At 2130, the lead Apache company encountered weather conditions that forced it to break up momentarily. As the flight reassembled and alerted follow-on flights of the weather conditions, the lead flight encountered improving conditions and continued eastward. The improving-weather-condition information was also relayed to the remaining three flights and subsequently to the chain of command.

As the lead Apache company continued to fly eastward, they encountered a fog bank and all three Apache companies diverted to a nearby civilian airfield and terminated the mission. The OH-58 flight monitored the transmission and continued the flight. As the OH-58 flight approached the same general area where the lead Apache company had encountered the deteriorating weather and the ceiling and visibility started to decrease, the flight slowed to 60 knots. As collective was increased to climb over a ridge, the IP of the lead OH-58 was heard to announce to the flight, "I am IMC."

The aircraft was observed on radar turning toward the north at an altitude of 2,200 feet MSL, squawking 7700 emergency code. Air traffic control tracked the aircraft as it climbed to 4,000 feet MSL where it remained for approximately 5 to 10 seconds. The aircraft then entered a high rate of descent with a ground speed below 30 knots. The slow forward ground speed prevented radar tracking of the aircraft heading. As the aircraft descended in altitude, the IP transmitted in a highly stressed voice, "I have the controls." The aircraft continued its descent and impacted the ground in a nose-down, left-side-low, left-yaw attitude and disintegrated upon impact, killing both crewmembers.

Lessons learned

- *The five Cs*. Several years ago, someone established a procedure to help aviators handle those first critical seconds when an aircraft flies into IMC: **Control**, **Coordination**, **Clearance**, **Course**, and **Call**. The five Cs of IMC as the procedure is known also include those actions specified in the acronym **AHTA**: **Attitude**, **Heading**, **Torque**, and **Airspeed**. This procedure gives the pilot something to follow when confronted with inadvertent IMC.

Control

Control of the aircraft is the most important factor in recovering from unplanned flight into IMC. If you fail to make this transition, you are in serious trouble. The other four Cs depend upon the successful accomplishment of the first C, control.

Control is maintained by leveling the wings on the **Attitude** indicator; maintaining the **Heading**—turning only to avoid known obstacles; adjusting **Torque** to climb power; and adjusting the **Airspeed** to climb airspeed.

Coordination

Before a flight begins, the crew should discuss what each will do in case of unplanned entry into IMC. It should be understood that the pilot on the controls will

concentrate on flying the aircraft by referencing the instruments. The pilot not on the controls should monitor the pilot flying the aircraft and look outside the aircraft for VFR conditions and obstacles.

While we are talking about things that should be accomplished prior to flight, this is probably a good time to mention preflight and runup of the aircraft. In the OH-58 accident, the fuse in the ADF receiver was blown. It is quite possible that the fuse was blown during the crash sequence. However, if the weather is marginally VFR or less, your onboard navigational equipment just may be the difference between living and dying. Check it before you leave the ground.

Clearance Climb straight ahead to an altitude that will provide clearance over the highest obstacles along the route of flight.

Course Select the appropriate heading and turn to it. The heading you turn to will most likely be dictated by the IMC recovery procedures at your installation. The accident aircraft turned to the north although the recovery airfield was 23 nautical miles to the southeast. The most likely explanation for the pilot's behavior is that he was attempting to rejoin the other flights at the civilian airfield to the north. The frequency found displayed in the automatic direction finder (ADF) receiver was the nondirectional radio beacon frequency for the beacon at the civilian airfield. It is noteworthy that this particular civilian airfield is not listed in the DOD FLIP publication.

Call Make any required radio calls for assistance or advisory.

■ *Training*. The five Cs provide tools to assist you in coping with inadvertent IMC, but tools alone will not provide you with the confidence you need in your abilities. That confidence can come only through training.

Training to be proficient at coping with inadvertent IMC flight is probably the single most important thing you can do to ensure your survival during an IMC encounter. The intent here is not to debate the issue of currency versus proficiency. But, if you only fly the minimums in accordance with your aircrew training manual and fly the majority of your simulator and hood time during the last months of your 6-month period, you are probably current but not very proficient in instrument flying.

Instrument training should be challenging, but realistic, and it should promote aviator confidence. Your training should also reflect the kind of flying you do most of the time. As shown in the analysis of IMC-related accidents, the majority of inadvertent IMC accidents occur at night and often while NVGs are being used. If you are an NVG pilot and fly little or no instrument training in the aircraft at night, you are playing Russian roulette with your life. It's just a matter of time.

■ *Commit to IMC.* Never attempt to reestablish VMC if you bump into a cloud. You have been trained to accomplish a recovery. Execute! It is possible that the crew of the OH-58 was attempting to establish VMC at the airfield where the other flights had terminated, but that airfield was not the designated IMC recovery airfield. The cockpit of an aircraft during inadvertent IMC is no place to make last-minute changes. Rely on the old admonition of "plan the flight, and fly the plan."

Through training and practice, you can develop critical aviator skills along with the confidence that will make your encounter with inadvertent IMC the subject of your next session of hangar talk. As you become the hero of your "There I was" hangar talk with the newbies, remember how training and practice provided you with the edge for success.

—MAJ Marline J. Johnson, USASC Aviation Branch, DSN 558-9854 (334-255-9854), johnsonm@rucker-safety.army.mil

IMC video now available

A new video presentation on inadvertent IMC is now available. The presentation is based on the OH-58 accident described in this IMC article. Advance copies of the video were distributed to brigade commanders at the January 1995 Aviation Brigade Commanders Conference. You may obtain a copy by asking your local audiovisual library for—

Inadvertent IMC

TVT 20-1052 PIN 710656

Human factors in Army rotary wing accidents

Unit readiness, OPTEMPO, high-risk mission, and the high-risk aviator . . . what is their role in accidents? They are believed to be generators of human performance errors that result in Army rotary wing accidents. The effect of human performance on Army aviation is not trivial! In FY 93 and 94, at least 130 Class A through C rotary wing accidents were caused by human factors, and historically 80 percent of all Army accidents have human-factor causes.

Human-Performance Accident Study
Class A-C Rotary Wing Flight Accidents
FY93 - FY94

Accident Total	
Aircraft	Number
AH-1	10
AH-64	18
CH-47	6
H-6	8
OH-58	43
UH-1	20
UH-60	25
TOTAL	130
Class A	32
Class B	14
Class C	84

	FY93	FY94	TOTAL
Aircraft Destroyed	18	12	30
Fatalities	10	8	18
Cost in Millions	$72	$72	$144

Building a data base to study human-performance accidents

Until recently no one had accumulated a comprehensive data base of detailed, factual information about human-performance accidents. To support a study of human factors in Army rotary wing accidents, the Army Safety Center constructed the first data base to make unit, accident, person, and performance information available for detailed analyses. This data base allowed us to compare information between accident and nonaccident units. And we built an intercorrelation matrix of 167 variables and formed subject matter expert teams to interpret the results of the 27,000 correlations!

Needless to say, this was a monumental undertaking. However, this is the level of effort now required to gain ground in our battle to reduce the human factors that cause rotary wing accidents. The overall accident rate is at an all-time low, making it very hard to identify problems and trends and develop countermeasures. So we must redouble our efforts to find the root sources of human error, to "take human error out of play, off the table."

Emerging results

Analyses of the data are producing some interesting and important findings.

■ ***The 130 Class A through C human-error accidents used in this study resulted in 18 fatalities and a loss of $144 million (including 30 destroyed aircraft).*** The most frequent performance errors involved crew coordination and crewmember scanning. These errors were found in 41 percent of the accidents. It is too soon to tell if crew coordination training is effective in reducing crew coordination errors. Of the crewmembers involved in crew coordination and scanning accidents, 78 percent had not received crew coordination training. Furthermore, of all crewmembers involved in these 130 accidents, 79 percent had not received crew coordination training.

■ ***Reductions in unit readiness/resources are NOT resulting in increased accidents.*** Using unit status report data provided by Deputy Chief of Staff for Operations and Plans, we compared "accident" units with "nonaccident" units on

overall unit rating, personnel, equipment, maintenance, training, percent MOS qualified, turnover percentage, and personnel availability.

Counter to expectations, the accident units did not show any statistically significant shortfalls in readiness or resources. Unexplainably, accident units were found to have a higher training rating than nonaccident units.

■ ***Unit OPTEMPO appears unrelated to human-error accidents.*** Most accidents occurred in units reporting low to medium OPTEMPO. Using the accident unit commander's subjective assessment of OPTEMPO, 33 percent reported low and 32 percent reported medium OPTEMPO, while 29 percent reported high and 6 percent reported extremely high OPTEMPO.

■ ***Neither are a few units nor any specific unit type having a disproportionate number of accidents.*** The most accidents found for any single unit was four, and only four units had four accidents. Further, attack battalions, which represent about 33 percent of the aviation battalions, had 33 percent of the accidents and cavalry squadrons, which represent 17 percent of the aviation battalions, had 16 percent of the accidents.

■ ***High-risk aviators are still out there, but fortunately there are not many of them.*** The word is out that high-risk behavior will not be tolerated. In the study, only about 1 pilot in 20 had a previous at-fault accident. Research shows that if you have a high-risk aviator in your unit, chances are that he will be a single male under 25 years of age and will have flight standards violations, an at-fault accident, counseling for poor performance, aeromedical violations, and an administrative action/punishment. This individual will also show a low ability to recognize hazards and personal risk, and he will overestimate his own personal ability.

The Next Accident Assessment for Aviators and Leaders of Aviators are valuable tools available to help identify high-risk aviators. You may obtain copies by writing to Commander, U.S. Army Safety Center, ATTN: CSSC-PMR, Fort Rucker, AL 36362-5363 or by calling Mr. Glen Davis, Reasearch, Analysis, and Studies Branch, DSN 558-3013 (334-255-3013).

■ ***The accuracy of current mission risk-assessment procedures is questionable.*** Of the 130 accidents, 87 (67 percent) were briefed as low risk and were approved at or below company level. Only 4 percent of the accidents were assessed as high or extremely high risk. However, in attack units 72 percent of the missions were assessed as low risk and 82 percent were approved at or below company level. This is alarming in that the attack missions were typically tactical, multiship, night, aided, and NOE!

New automated mission risk assessment coming

The Safety Center is currently developing an improved mission risk-assessment method, and it is AUTOMATED! To test its accuracy, we reassessed the mission risk of 45 night, rotary wing, human-factors accidents using this automated mission risk assessment program. The reassessment was performed using only information available to the unit or crew when they performed their mission risk assessment. When we compared our results with theirs, we found that theirs had underestimated the mission risk in 78 percent of the cases. In addition, where their mission risk assessment revealed an overall average factor of 1.6, or medium risk, the Safety Center's program produced an overall average factor of 2.9 or high risk. Extremely high risk begins at factor 3.

The automated risk assessment program was also accurate in 51 percent of the cases in predicting the type of accident that actually occurred. Further refinements and field testing of the program are now underway with fielding projected for 4th quarter FY 95.

Risk Assessment Methods: Accident Unit vs Safety Center

Conclusion

The Army aviation accident rate has declined to record low levels in spite of conditions such as reduced readiness/resources and high OPTEMPO, which normally bring an increase in accidents. Furthermore, no longer are a few units, a specific unit type, or a profusion of high-risk aviators having a disproportionate number of accidents.

As a result of the human factors study, we now believe that the accuracy of current mission risk-assessment procedures is questionable. To counter this problem, the Safety Center is continuing rigorous analyses, studies, and field testing of an improved, automated mission risk assessment program that we hope will be ready for release before the end of this fiscal year.

The percentage of human-performance accidents has remained solidly entrenched at the historical level of 80 percent. If we are to gain ground in our efforts to expand beyond human error, to "take human error out of play, off the table," we must continue to develop and use improved risk-management methods and tools. Only through a concerted effort can we expect to see a decline in the historical 80 percent of Army aviation accidents caused by human factors.

—POC: Mr. Glen Davis, Research, Analysis, and Studies Branch, DSN 558-3013 (334-255-3013), davisg@rucker-emh3.army.mil

Remember the 5 "Cs" of IMC

Control Maintain control - AHTA
Attitude, Heading, Torque, Airspeed

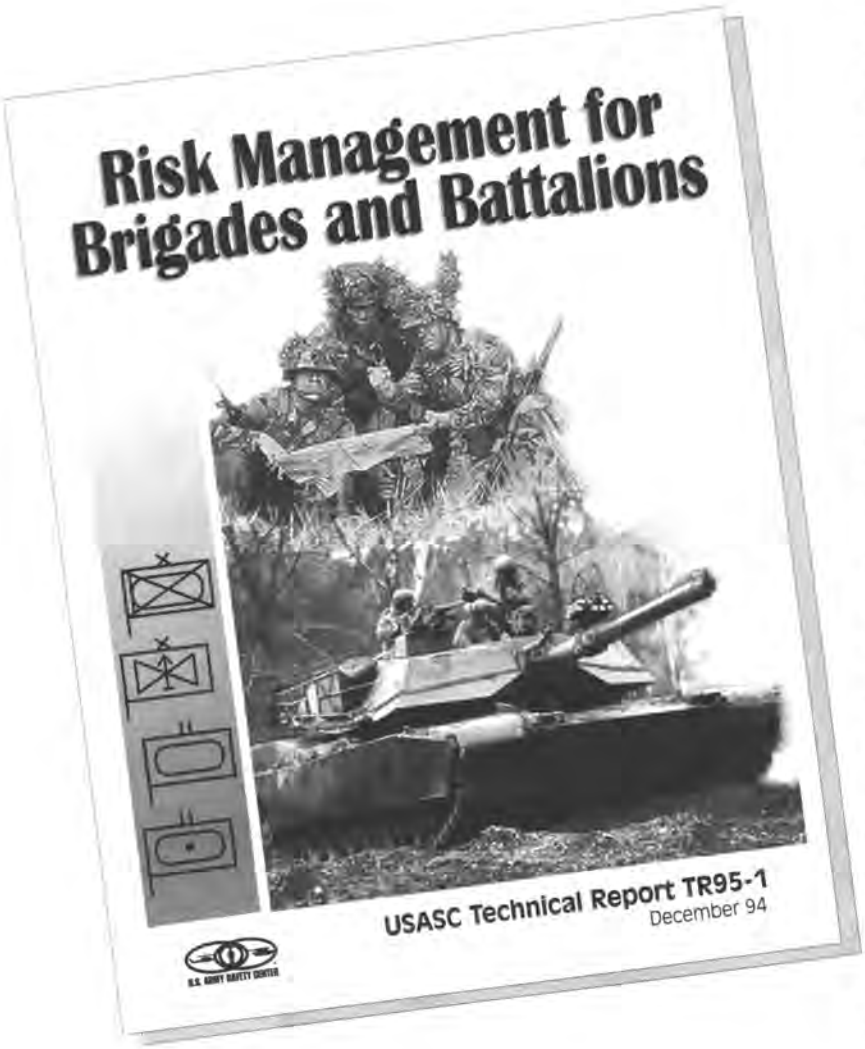
Coordination Pilot concentrates on instruments; copilot assists and looks outside

Clearance Clear highest obstacles with straight controlled climb

Course Select and turn to appropriate heading

Call Make required radio call for assistance

New risk-management report now available



Risk Management for Brigades and Battalions describes procedures and responsibilities for risk management during mission essential task list training and operations. The procedures and responsibilities reflect the roles of safety and fratricide avoidance as elements of force protection as described in FM 100-5: Operations. They also are consistent with those presented in FM 101-5: Command and Control for Commanders and Staff (final draft, August 1993), which is approved as interim doctrine. It should be noted that draft FM 101-5 places staff safety responsibilities in the S3 functional area. Also the procedures are integrated into and support phases of the training management cycle in FM 25-101: Battle Focused Training.

These procedures have been tested with three brigades and one battalion during the planning, execution, and assessment phases for rotations at the National Training Center, Joint Readiness Training Center, and Combat Maneuver Training Center. Test units achieved significant reductions in ground accident casualty rates and experienced no aircraft accidents. Finally, this report updates risk-management tactics, techniques, and procedures published in the Center for Army Lessons Learned Newsletter "Force Protection (Safety)," No. 9, December 1993.

Copies of this report were distributed to brigade commanders at the January 1995 Aviation Brigade Commanders Conference at Fort Rucker, AL.

The report can be obtained by writing to Commander, U.S. Army Safety Center, ATTN: CSSC-PMR, Fort Rucker, AL 36362-5363 or by calling Mr. Darwin S. Ricketson, Jr., Research, Analysis, and Studies Branch, DSN 558-9580 (334-255-9580).

Plan smart! Fly smart!

The Federal Aviation Administration (FAA) Southern Region has recently experienced an increase in pilot deviations (flight violations). Pilot deviations are serious matters and should be treated as such by both the Department of Defense and the FAA.

Suppose while you are flying in the National Airspace System, the air traffic controller (ATC) advises you that a flight deviation has occurred and asks you to please call by telephone to discuss the deviation when you land. Such an event strikes fear in the heart of every Army aviator, especially those who hold FAA civilian flight certificates.

Examples of recent military pilot deviations include—

- Flying 300 feet off an assigned IFR altitude.
- Flying through Class B, C, or D airspace without ATC authority.
- Flying to and landing at an airport (Class E surface area without a control tower) without ATC authority while operating under special VFR conditions.

■ Flying over an area that is protected by a temporary flight restriction without ATC authority.

Army aviators need to follow some actions and must avoid others.

■ **Information you should not provide.** First and foremost, DO NOT, repeat, DO NOT provide any FAA representative with your name and/or social security number over the radio or telephone. This also applies for all crewmembers on the flight, including crew chiefs and flight engineers. No names are to be given out.

Why? you may ask. AR 95-3: Aviation: General Provisions, Training, Standardization, and Resource Management, paragraph 2-6d states "names of crewmembers of military aircraft involved in actual or alleged violations will be treated as restricted information and not be released to the public or any agency outside the DOD except by proper authority. Any person receiving requests for names of crewmembers of Army aircraft should direct such inquiries to the Director, U.S. Army Aeronautical Services Agency (USAASA)." USAASA headquarters (MOAS-AS office) can be contacted at DSN 656-4865, FAX 656-4409 (703-806-4865, FAX 703-806-4409).

Revealing your name and/or social security number could provoke FAA enforcement procedures against you, suspending your FAA civilian flight certificate(s) for a short period of time or permanently before you have an opportunity to rebut the allegations.

■ **Information you should provide.** You may provide the FAA representative with your unit's name and address. Do not give your commander's name or telephone number. Remember that all telephonic inquiries are to be routed through USAASA. If your unit is contacted, the AR 95-3 paragraph 2-6d provision applies to whoever answers the phone. If the FAA persists in requesting crewmember names, refer them to USAASA (703-806-4865).

The purpose of these actions is not to be uncooperative or devious with the FAA. Army aviators are held accountable to their commander, not the FAA, for violations of either FAA or Army regulations. Army commanders, not the FAA, are responsible for conducting investigations and if appropriate recommending aviators for further action in accordance with paragraph 2-6 of AR 95-3, Chapter 4 of AR 600-105: Aviation Service of Rated Army Officers, and AR 15-6: Procedures for Investigating Officers and Boards of Officers.

Aviators who are performing authorized, briefed missions are not held in double jeopardy by FAA enforcement procedures and U.S. Army enforcement procedures per Federal Aviation Regulation (FAR) 13.21.

Routing of pilot deviation reports

Military pilot deviation reports and other alleged violations involving Army aircraft are forwarded from the FAA facility involved through the FAA regional headquarters to HQ USAASA. The deviation investigation report is then

forwarded to the aviator's commander through the MACOM-, ARNG-, or USAR-level chain of command. The FAA normally establishes a suspense of 90 days for the reply to be returned to the FAA regional office.

The Department of the Army regional representative (DARR) to the FAA regional headquarters is often informed by the FAA of the alleged deviation shortly after the event. The DARR informs the MACOM, ARNG, or USAR air traffic and airspace (AT&A) officer and aviation safety officer that a military pilot deviation report has been received and a formal report may be pending.

The advance warning affords the unit commander the opportunity to obtain crewmember statements and explanations while memories are still fresh and, if necessary, implement individual or unit training to correct the problem. The official FAA deviation investigation request can sometimes take a great deal of time, 6 months or more, to reach the commander.

Fly safe

The bottom line is FLY SAFE, but do not knowingly violate the FARs. FARs have the weight of public law, and violations of FARs are serious. Protect your rights as an Army aviator by—

■ Complying with AR 95-3 paragraph 2-6d and not divulging restricted personal information.

■ Informing your commander immediately if ATC informs you a flight deviation has occurred or you suspect one has occurred. Your commander should then contact the DARR in your region for further instructions. The DARR phone numbers may be found in either the Flight Information Bulletin or Table 6-1 of AR 95-2: Air Traffic Control, Airspace, Airfields, Flight Activities, and Navigational Aids.

■ Flying by the rules!

Points of contact:

■ LTC Ricky C. Smith, DARR, FAA Southern Region, Atlanta, GA, DSN 797-5481 (404-305-6916).

■ CW5 Randy Hansen, Assistant DARR, DSN 797-5481 (404-305-6915, FAX 404-305-6926).

—Adapted from DARR FAA Southern Region 3rd quarter FY 94 newsletter

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class C

H series - At 90 knots and 800 feet AGL during cruise flight, crew heard loud series of pops accompanied by left yaw. They determined that aircraft had incurred compressor stall and completed landing without further incident. Sudden stoppage maintenance inspection revealed that 45- and 90-degree gearboxes and main rotor mast require replacement.

H series - During NVD external load training mission, overtorque of 55 PSI occurred for 1.5 seconds. Crew shut down aircraft. Aircraft was released following inspection. Chips were later detected in primary and external transmission oil filters. Transmission requires replacement.

UH-60 Class A

L series - During night air assault landing, Chalk 4 of eight entered brownout conditions. Main rotor blades struck trees, and aircraft landed hard. Landing gear collapsed, and aircraft sustained possible structural damage due to broken right-side strut pylon. Main rotor blade tip caps were also damaged.

UH-60 Class C

L series - Following takeoff, left cargo door jettisoned for unknown reason and struck blue main rotor blade. Crew completed landing without further incident.

UH-60 Class D

A series - On final approach, electronic countermeasures (ECM) system failed to function properly, resulting in ECM antenna shearing off during roll-on landing. Master caution and master warning segment lights did not illuminate to warn crew that ECM antenna was in down position nor did system automatically retract antenna as it was designed to do. Maintenance is currently evaluating ECM system.

Attack

AH-1 Class C

F series - At cruise altitude about 15 minutes into cruise flight, master and No. 2 hydraulic caution lights illuminated. Crew completed emergency procedures and performed running landing at 50 knots. Both skids collapsed upon contact with ground. Aircraft came to rest upright.

S series - Postflight inspection revealed that dzus fastener had separated from vertical fin and struck tail rotor and then tail boom. Tail boom, tail rotor blades, and 42- and 90-degree gearboxes require replacement. Repair has been deemed uneconomical due to phaseout of series.

AH-1 Class E

E series - During descent for landing, IP saw unidentified object flash past main rotor disk at about the 2 o'clock position, followed by specks of unidentified debris on gunner's windshield. Postflight inspection revealed two small dents on leading edge erosion guards of both blades. Suspected bird strike.

F series - During MTF, engine oil bypass light illuminated. MP noted increasing engine oil temperature and initiated immediate approach for landing. Engine oil bypass light then extinguished, and engine oil temperature returned to normal. Engine oil bypass light illuminated again on short final, and MP completed landing without incident. Maintenance troubleshooting revealed No. 3 main bearing engine seal was leaking, causing high engine oil consumption.

F series - N2 RPM increased to 103 percent as crew increased throttle from idle. Increase-decrease switch would not reduce RPM from either pilot or gunner station. Maintenance replaced linear actuator.

AH-64 Class C

A series - During aircraft runup for MTF, No. 1 main rotor blade sustained damage. Damage was caused by survival knife that had been left on main rotor hub by armament personnel after replacing omnidirectional airspeed sensor.

A series - Flight of four AH-64s were lined up for takeoff. The PC of Chalk 4 was in back seat. Just before takeoff, his kneeboard slipped off his leg. While reaching down to pick up kneeboard, PC pushed cyclic forward, causing main rotor blades to contact PNVS turret. Upon rotor blade contact, PNVS shroud and reflective mirror shattered and germanium crystal was destroyed.

AH-64 Class E

A series - Aircraft was on short final when caution warning light illuminated "OIL PSI NGB 1." IP reduced power lever on No. 1 engine, declared an emergency to tower, and performed roll-on landing. Crew taxied aircraft into transient parking and completed normal shutdown. Postflight inspection revealed oil cap had not been secured properly.

A series - As aircraft landed from a hover, crew noticed unusual lateral oscillation. When blades were at flat pitch, oscillations stopped. Oscillation recurred when crew applied pitch. Crew shut down aircraft and aborted mission. Maintenance replaced No. 4 tail rotor drive shaft. Aircraft was vibration checked and released for flight.

A series - During runup, crew felt high-frequency vibration that stopped after about 10 seconds. After maintenance checked for hydraulic leaks and movement in gun turret, crew continued runup. When crew picked aircraft up to OGE hover, vibration returned. Crew landed aircraft and returned to parking. Maintenance found TADS inner gimbal was faulty. Maintenance replaced TADS electronic control amplifier, MOC was completed, and aircraft released for flight.

Observation

OH-58D Class E

C series - While in cruise flight, crew noticed stiffness in cyclic controls when turning. Crew completed landing without further incident. Maintenance determined that swashplate was binding around uniball and replaced swashplate assembly.

D series - During aircraft ground run at 100 percent RPM following engine rinse after completion of gunnery exercise, stability control augmentation system would not engage. Pilot checked multifunction display and found "HYD FAIL" caution message displayed. Crew shut down aircraft without further damage. Inspection revealed that transmission pump shaft had failed.

D series - During refueling operation, fuel handler connected refuel nozzle and checked by pulling to verify that nozzle was seated. When he did, the CCR receptacle broke off its hinge and fell inside fuel cell. Crew shut down aircraft without further incident.

Fixed wing

C-12 Class C

D series - During engine startup, No. 2 engine TGT indicator rose to 1,200° for 2 seconds. Crew shut down aircraft. Maintenance repaired starter relay the following day and released aircraft for return to station. Postflight inspection by BASI personnel revealed engine damage. Engine removed.

Flight related

UH-60 Class B

L series - Aircraft was lead in multiship slingload mission. Upon reaching DZ, aircraft encountered dusty conditions while coming to hover at 35 feet AGL with

slingload height of about 20 feet. Slingload (M119A1 howitzer) separated and struck ground, damaging front wheel assembly. Suspected inadvertent release.

UH-60 Class C

L series - Helocast master had soldiers exit aircraft before pilot notified him that aircraft was at proper airspeed and altitude. Several soldiers sustained injuries.

Messages

■ Safety-of-flight technical message concerning one-time and recurring visual inspection of the tail boom and related restriction on forward indicated airspeed for all OH-58D helicopters (OH-58-95-01, 161616Z Feb 95). Summary: OH-58-94-ASAM-03 required a one-time inspection and a recurring visual inspection of the tail boom in the area of the gearbox support assembly attachment for cracks. A recent quality deficiency report detailing a severe crack and indeterminate results in the ongoing investigation have warranted additional inspections and restrictions. This message supersedes the requirements of OH-58-94-ASAM-04. The purpose of this message is to require a one-time visual inspection (visually aided) of the tail boom skin in the area of the gearbox support assembly casting attachment for loose or working rivets and/or cracks in the rivet area prior to next flight with a 20-hour recurring inspection, require a visual inspection (visually unaided) of the same area every 2.5 hours, and restrict forward indicated airspeed to a maximum of 80 knots with the exception of maintenance test flights. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of cartridge-type fuel boost pump on all UH-1 series aircraft (UH-1-95-ASAM-01, 071800Z Feb 95). Summary: Several incidents have been reported on UH-1 aircraft that show the shutoff arm of the cartridge-type fuel boost pumps bent. A bent shutoff arm can restrict fuel flow to the engine fuel control. This condition is unacceptable and may result in power loss or flameout. None of these incidents have been reported on the AH-1 series aircraft. The AH-1 maintenance manual adequately addresses the possibility of bending the arm when installing the fuel boost pump. Therefore, the one-time inspection required by this message does not apply to AH-1 aircraft. Although the UH-1 maintenance manual has recently been updated to preclude this situation during installation of the boost pump, there could be pump assemblies currently installed using the old procedure that resulted in the bent arm. The purpose of this message is to require a one-time inspection of the cartridge-type boost pump shutoff arm on UH-1 series aircraft. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action informational message concerning all CH-47D, MH-47D, and MH-47E aircraft with engine transmissions utilizing Speco manufactured gears (CH-47-95-ASAM-03, 311827Z Jan 95). Summary: Two safety-of-flight messages—CH-47-91-01 (TB 1-1520-240-20-55) and CH-47-93-03 (TB 1-1520-240-20-66)—were issued to identify the unserviceable engine transmissions, P/N 145D6300-series. These SOF messages were generated by a 1991 Operation Desert Storm incident and by a 1993 Fort Meade incident involving a CH-47D engine transmission. The failures were caused by gears manufactured by Speco Corporation. Since then the gears have undergone a program of intensive inspection and changes in manufacturing processes to eliminate the cause of the problem. However, two memorandums—one from the Department of Defense Inspector General, 2 December 1994, subject: Notification of Defective Transmission Gears for the Boeing CH-47, Chinook Helicopter and the other from the 515th Military Police Detachment (CID), 3 January 1995, subject: Criminal Alert Notice—have been published. These messages are incomplete and do not contain the most current information and measures that have been put in place to solve the problem. ATCOM is continuing the technical investigation of the allegations. At this time in the investigation, there has been no indication of a safety problem with these gears. The accidents caused by the failed Speco gears—Saudi Arabia in 1991 and Fort Meade in 1993—were thoroughly investigated and appropriate corrective actions were taken. All Speco gears went through an additional nondestructive inspection following the Saudi accident. As a result, the manufacturing processes and plans were changed to eliminate the cause of the cracks—postcarburizing grinding of the damping ring grooves. The Fort Meade failure initiated in an area of a nonauthorized rework for the removal of burrs. The manufacturing plan for the gear, Boeing P/N 145D6302-2, did not have an approved procedure for deburring operation in the area of the gear that failed. This was the only part number and the only area on the gear where the deburring operation was not controlled. Changes in the manufacturing plan were addressed and all P/N 145D6302-2 gears were inspected again. The gears are used in the CH-47D, MH-47D, and MH-47E transmissions, P/N 145D6300 series. The inspections resulted in some gears being rejected. The depot maintenance work requests were revised to include more stringent inspections. There has been no recurrence of these failures in the thousands of flying hours subsequent to the inspection. The purpose of this message is to inform the user of updated information that is not reflected in the Department of Defense memo dated 2 December 1994 or in the CID memo dated 3 January 1995. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of pilot's seat web cover and copilot's seat cover assembly on all OH-58D and improved OH-58D helicopters (OH-58-95-ASAM-04, 071518Z Feb 95). Summary: The pilot's seat web cover and copilot's seat cover assembly (crew seat side supports) provide progressive deformation to absorb a portion of the "G" loads developed during a hard landing or crash. Some crew seat side supports have been improperly structurally repaired, possibly degrading crash survivability. These repairs may not conform to a Bell Helicopter Textron, Inc. authorized production-line-only repair. The purpose of this message is to provide instruction to discontinue the practice of repairing these panels and replace existing panels that have been improperly repaired. Aviation personnel should be made aware that much of the damage to this assembly is caused by using the pilot seats as steps. In addition, when the seat panel assemblies are removed for maintenance, the chance of damaging the seat side supports is greatly increased. Extra care should be taken when performing maintenance with the seat panels removed. The logistical area representatives (LARs) have been supplied with documentation on the approved Bell Helicopter Textron, Inc. one-time production-line repairs. This documentation is not to be used to effect field repairs. Its only purpose is to determine if a previous repair conforms to the authorized repair. Contact: Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

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

Posters are coming

Scarcely a day goes by that we don't receive several requests for safety posters. The problem is that with the curtailment of printing funds, we simply can't produce the full-color posters of the past. We wish we could. But we're going to try to do the next-best thing by publishing black and white posters in *FlightFax* as space permits.

This month's issue contains the first of these posters "Remember the 5 'Cs' of IMC." This poster is a reminder to aviators of a procedure that will help them during those first critical seconds after an aircraft inadvertently flies into instrument meteorological conditions. This issue also includes an article on inadvertent IMC and an announcement that an IMC video is available. Whenever possible, we will "package" a critical safety subject this way, giving you several media tools to use in increasing awareness of these problems.

The 11- x 17-inch poster in this issue should be locally reproduced on a copy machine to prevent removing the part of your *FlightFax* that is printed on the reverse side. Most units have access to a copier that can be adjusted to accommodate this size paper.

Now this is where we need your help. You know what you want to draw attention to with a poster. Maybe in your unit it's FOD, or maybe you still see people working around aircraft wearing rings, or it could be that you want to remind flight crews of the importance of their protective equipment. Write us (Commander, U.S. Army Safety Center, ATTN: CSSC-PMA (FlightFax), Bldg 4905 5th Avenue, Fort Rucker, AL 36362-5363); send us a FAX (DSN 558-9377, 334-255-9377); or give us a call (DSN 558-3770, 334-255-3770).

For they had learned that true safety was to be found in long previous training and not in eloquent exhortations uttered when they were going into action.

—Thucydides, The History of the Peloponnesian War, c. 404 B.C.

In this issue:

- Inadvertent IMC
- IMC video now available
- Human factors in Army rotary wing accidents
- IMC poster
  - Remember the 5 "Cs" of IMC
- New risk-management report now available
- Plan smart! Fly smart!
- Posters are coming

Class A Accidents through February

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

Report
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Address
558-3770. Address questions about distribution to DSN 558-2062. To submit information for FlightFax, use FAX DSN 558-9377, Ms. Jane Wise.

Thomas W. Garrett
Brigadier General, USA
Commanding General
U.S. Army Safety Center