Flightfax
ARMY AVIATION RISK-MANAGEMENT INFORMATION
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Sometimes the Envelope Pushes Back

Flightfax

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James E. Simmons

Brigadier General, US Army
Commanding

DASAF's CORNER

from the Director of Army Safety

The Basics of Accident Prevention

Executing our missions in support of Operation Enduring Freedom requires a high state of readiness that, in turn, makes it even more imperative that we not allow accidents to degrade our ability to accomplish those missions.

Every day we expose our soldiers to hazards in uncertain and complex operational and training environments. Increased mission optempo, leader inexperience, constant changes with personnel resource issues in terms of time, equipment, etc., are all present. None of these elements alone is the inherent cause of accidents. However, when left uncontrolled, seemingly low-risk hazards can collectively raise risk to an unacceptable level. The cumulative effect of these risks may create breakdowns in leadership, discipline, training, and standards, which in turn can quickly set the accident chain of events in motion.

In fact, an analysis of FY02 Class A accidents reveals that breakdowns in discipline, leadership, training, and standards were the main contributing causes of these accidents. Data also supports that, in many cases, the accident didn't just happen on the day of the helicopter crash or the tank rollover. Sometimes the sequence of events that culminated in the accident started days, weeks, and even months before—and not always at the accident unit level.

If we understand what is causing our accidents, the logical follow-on question is, "How do we prevent them?" The preventive answer doesn't lie in the development of some new program with a catchy slogan. The answer lies in what I call "the basics." As I've stated many times, my personal belief is that *"Units that participate in tough, well-disciplined training—with technically and tactically competent leaders present—have significantly fewer accidents."*

Today, I'm more convinced than ever that leadership (theater, corps, division, brigade, battalion, and company) involvement while executing aggressive, realistic training and real-world missions—combined with effective risk management and strict enforcement of discipline and adherence to standards—are the primary tools that can prevent accidents and save lives.

Our great Army is built on a tradition of discipline and clearly defined standards. Good leaders who are responsible and accountable have no trouble enforcing either. Risk management is the bedrock of our safety culture. Good leaders not only enforce discipline and standards, they understand and apply risk management effectively—and they ensure the soldiers in their command can do so as well.

Risk management is the tool that helps us identify hazards and reduce risks to our soldiers, thus allowing us to successfully operate in high-risk environments with minimal

losses. For maximum effectiveness, it has to be a closed-loop, cyclic five-step process: identify hazards, assess hazards, make the right risk decisions, put controls in place, and supervise. The process must start with planning and continue throughout execution and the after-action reviews.

As an Army, we are fully engaged in prosecuting this war on terrorism and, at the same time, continuing to transform our Army into a more agile, lethal, and deployable force. Recently signed by the Secretary of the Army and Chief of Staff of the Army, the Army Safety Strategic Plan **(http://safety.army.mil/StrategicPlan2002.pdf)** is our roadmap for ensuring that, in conjunction with transforming our Army, we are safely transforming our Army by fully integrating risk management and safety into each of the 14 lines of operation within the Army Transformation Campaign Plan.

Today, I'm more convinced than ever that leadership (theater, corps, division, brigade, battalion, and company) involvement while executing aggressive, realistic training and real-world missions—combined with effective risk management and strict enforcement of discipline and adherence to standards—are the primary tools that can prevent accidents and save lives.

From the Army strategic level to the individual level, risk management is the accepted process for preventing accidents. On the individual level, I challenge all of you—every soldier and civilian alike—to make a renewed personal commitment to thoroughly understand and practice risk management until it becomes intuitive. Risk management is probably the most important five-step process that any of us will ever learn. Embrace it and practice applying the entire process in everything you do, both on and off duty. The more you practice risk management, the easier it becomes.

Risk management is a solid accident prevention program. It affords us the capability to conduct those tough, realistic training missions that replicate combat conditions while minimizing losses due to accidents. It is incumbent upon each of us to apply the process to all that we do and execute every mission to the risk management standard—an informed decision at the appropriate level.

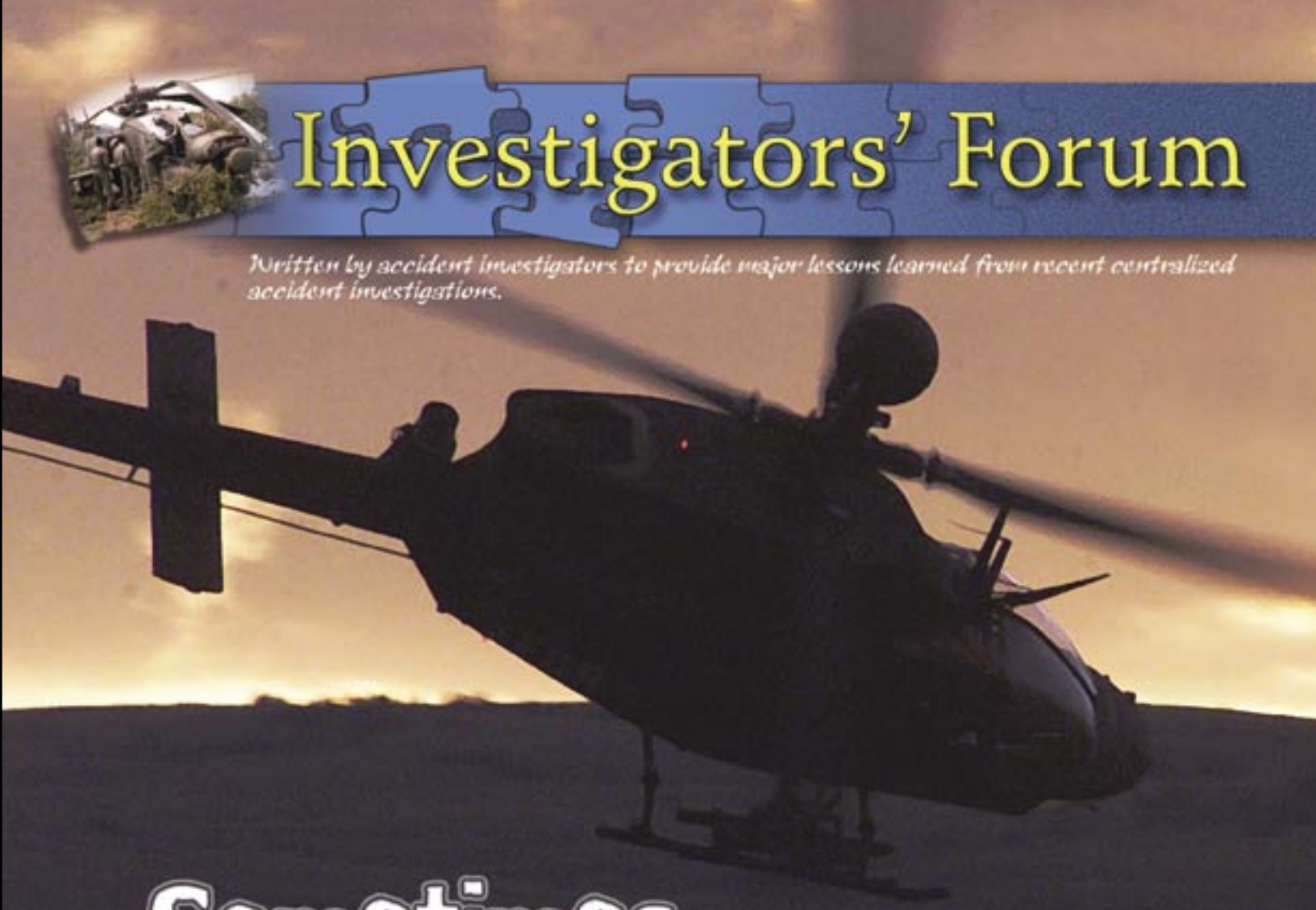
I recognize that there is some concern that junior officers and NCOs lack experience in the application of risk management. We are currently working with TRADOC to ensure we have embedded risk management education from pre-commissioning through the Division Commander's Course, and to make certain that we have embedded appropriate levels of risk management education and training in NCOES from PLDC through the Sergeants Major Academy.

If you need help in the form of risk management training at the unit or MACOM level in integrating risk management into operational plans to execute the objectives within the Army Safety Strategic Plan, the Safety Center team is standing by to assist. Contact our risk management mobile training team at DSN 558-9854/3790 (334-255-9854/3790) or our Army Safety Strategic Plan coordination team at DSN 558-3367 (334-255-3367).

Any failure to manage risks at either the strategic, operational, tactical, or individual level could well result in a much higher price than we are willing to pay. The payoff of doing it right will be accidents avoided and lives saved.

Train Hard, Be Safe!

James E. Simmons



Investigators' Forum

Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

Sometimes the Envelope Pushes Back

There I was 10,000 feet, upside down, Air Medals dangling in my face…. Many of us have used this line as we begin a story about one of our flying experiences. Our stories of "daring do" are intended to relate our proficiency and ability to deal with the circumstances that we have encountered in flight or our plain dumb luck in getting out of a bad situation. Unfortunately, many of those circumstances are created by the pilots themselves, though few would admit it. This story is of one such circumstance where the crew of an OH-58D Kiowa Warrior put themselves in a bad situation several times and on the last time of the flight, it caught them.

The air cavalry troop was executing a situational training exercise (STX) lane in support of a ground force of Bradley fighting vehicles and Abrams tanks. There were three Kiowa Warriors supporting the ground platoon in a movement to contact. As the exercise progressed, the Warriors began to rotate through the forward arming and refueling point (FARP) with the air mission commander (AMC) rotating through second of the three aircraft. As he returned to the maneuver box to continue the mission, the third aircraft headed for the FARP, and the ground force was rolling through the OPFOR. The observer controllers called ENDEX shortly afterward. The after-action report (AAR) location was announced and the small ground force executed a hasty decontamination exercise before moving out.

The two Warriors in the maneuver box began a sweep of the area to ensure all the ground vehicles were moving. The AMC decided to follow the line of armored vehicles to the AAR site because the coordinates given in the past had not always correlated to where the AAR was actually held.

He began to fly down the line of vehicles opposite their route of march. When he reached the last vehicle, he began a right turn to follow behind it. He later described the turn as not very steep and his copilot said it was "nothing special." In the middle of the turn, the aircraft began to lose altitude.

The pilot on the controls quickly leveled the aircraft and attempted to arrest the rate of descent. The tell-tale bells, whistles, and bongs of low rotor RPM, engine overtemp, and control augmentation failure all followed quickly. The pilot raised the nose and attempted to cushion the aircraft, but it landed hard, dipped its nose and tumbled prior to coming to rest upside down.

The crew exited the aircraft through the broken windscreens and brushed themselves off. They determined that other than bruises and small cuts on their shins, they were virtually unhurt. The aircraft, however, was a total loss. Everyone who looked at it couldn't believe that the two crewmembers walked away. It had all the makings of another "There I was" story.

When investigators from the Safety Center and the Directorate of Evaluation and Standardization arrived, they anticipated a lengthy investigation into an engine problem. All the technical experts were called in and the recording devices on the aircraft were immediately shipped for download. The aircraft was recovered to the airfield and a complete analysis of the engine was begun.

When this analysis was complete, no significant mechanical defects could be found in the engine. The onboard devices also indicated that there had been no faults in the engine. The board was at a loss to explain what had been described by the crew as an engine failure. Then the data transfer module (DTM) download arrived and a clearer picture developed. The data from the DTM revealed that the engine was operating as designed throughout the accident. The problem was

DTM depiction of flight conditions.

that the engine was not capable of the power requirements placed on it by the aircrew. I will explain this in the next few paragraphs.

The DTM revealed that the "nothing special" right-hand turn was in fact a 180-degree, 65-degree angle of bank turn at an altitude of less than 125 feet above ground level (AGL). This angle of bank was coupled with an airspeed reduction to less than 20 knots due to the turn being an uncoordinated maneuver. Lastly, in the middle of the turn, the aircraft was in a tailwind condition.

All of these things contributed to the aircraft experiencing a rapid sink rate in the middle of the turn. The rate of descent was determined by the board to have exceeded 2000 feet per minute for 1.13 seconds. It was during this side slip that the pilot in command began to level the aircraft and apply collective.

When he made the collective input, he went from a very low power setting to a very high power setting in less than one second. The engine "spooled up" but was unable to provide the power required by the maneuver and rotor RPM dropped. Thus, the bells and whistles the crew associated with an engine failure.

This crew had demonstrated the aerodynamic principle that an aircraft in a 60-degree angle of bank requires twice as much power to maintain altitude as an aircraft in straight and level flight. We all know that the OH-58D doesn't have that much power. The aircraft was going to descend in the turn, allowing the airspeed to drop below 20 made it happen quicker, and the engine and rotor system could not save the crew from the mistake.

The most important learning point from this accident concerns the margin for error that the crew allowed themselves. The DTM data showed two previous turns that exceeded 60 degrees and three others that exceeded 55 degrees. Obviously, there was no accident at the end of those turns.

The primary difference in the previous turns and the one that led to the accident was that airspeed dropped off significantly in the final turn because the crew failed to account for a 20 knot wind and they allowed their airspeed to drop as the turn began. That's all it took to make the difference between "flying aggressively" and creating a Class A accident. Numerous accidents over the last 12 months include aircrews that were pushing the envelope in tactical training or routine flights. They weren't necessarily violating limitations or regulations, but put themselves in situations that they couldn't recover from. In this case, no one was seriously hurt. In others, that hasn't been the case.

So the next time you're thinking about "yanking" it around a little harder than necessary, just remember—sometimes the envelope pushes back! ■

—Aviation Systems and Accident Investigation Division, DSN 558-9552 (334-255-9552)

"We're INADVERTENT IMC!"

Few phrases elicit as much instant anxiety to Army rotary-wing aviators as do those three words. Regardless of the aviator's status—master aviator, instructor pilot, instrument flight examiner, commander, or newbie—accidentally bumping into a cloud presents many problems not typically encountered during a planned instrument flight rules (IFR) flight. An analysis of inadvertent IMC-related accidents provides some insight into the significance of these accidents.

From January 1974 through August 2002, the Army experienced 60 Class A through Class C rotary-wing accidents involving inadvertent instrument meteorological condition (IMC). Of these 60 accidents, 54 (90 percent) were Class A's. In the last 8 years, the Army has experienced 10 rotary-wing inadvertent IMC accidents. The aircraft involved were four AH-64s, three OH-58s, one UH-1, one UH-60, and one MH-47. All but two occurred at night.

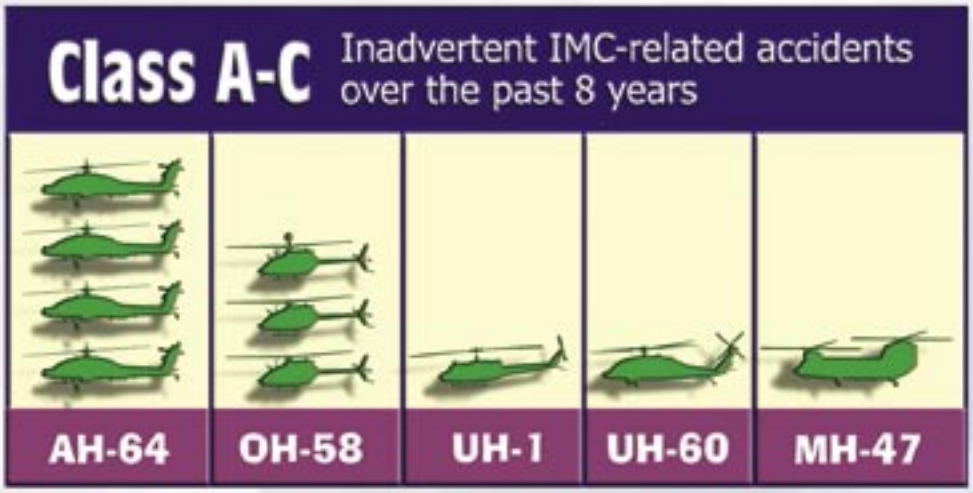
The seriousness of the outcome of these accidents serves to make aviators all the more anxious when encountering these conditions.

Prevention measures/techniques

What can be done to eliminate this type of accident? The solution probably requires action at several levels—individual aviator, instructor pilot/instrument flight examiner, and commander.

Individual aviators should—

- Maintain "very good" instrument flight proficiency instead of minimal proficiency.
- Practice instrument flight until they are very confident in their abilities.
- Be familiar with and practice local inadvertent IMC procedures. Commit to memory altitudes, headings for procedures, ATC frequencies, and NAVAID frequencies and identifiers. Back it up with an approach plate.
- Realize when accomplishing the hazard assessments that combinations of hazards may increase risk beyond the sum of individual hazards.
- Avoid routes over areas of low contrast and definition, particularly at night.
- *Not continue flight purely on aided-flight visibility during night-aided flight with either NVGs or night vision systems. During any given flight, periodically evaluate unaided visibility (look under the tubes or the system). If restrictions to visibility deteriorate below the required minimums, make a weather decision; don't just continue.*
- Maintain situational awareness while in flight, particularly regarding flight visibility and ceilings. Be willing to turn around when the weather begins to deteriorate.
- Be willing to land the aircraft and wait the weather out if turning around doesn't resolve the problem.
- Not push the weather in mountainous terrain. There is no guarantee the weather on



the other side of a pass will improve.

■ Have NAVAIDs tuned to navigation radios as opposed to commercial radios.

■ Never attempt to reestablish VMC if you bump into a cloud. Commit to IMC! This is probably the most important recovery measure/technique. You have been trained to accomplish a recovery. Execute!

Instructors/instrument flight examiners should—

■ Conduct instrument training in the aircraft at night. This forces good cockpit organization and eliminates peripheral visual cues that may help aviators retain orientation with other than the flight instruments.

■ Initiate instrument renewals using inadvertent IMC scenarios, particularly in observation and attack aircraft.

■ Require proficiency in full approaches, as well as vectors to final.

■ Exercise the local inadvertent IMC procedures. Aviators and controllers get the benefit of the training.

■ Make instrument evaluations challenging but realistic. Promote aviator confidence. The old "instrument checkrides from hell" aren't very useful in developing aviator confidence.

■ Teach aviators and nonrated crewmembers to make flight-visibility estimates; for example, what is the difference between ½-mile and 1-mile visibility?

■ Reinforce good crew coordination and crew interaction.

Commanders should—

■ Require aviators to fly hooded training scenarios at night.

■ Ensure their unit aviators don't push the weather. Ensure aviators know the weather limits and have a plan for what to do if they encounter inclement weather.

■ Ensure the unit risk management process includes considerations for the type of IMC recovery procedures available.

■ Include instrument training as part of training scenarios when possible. That is, at the end of a unit METL training session, plan to have some or all aircraft recover with an instrument approach.

■ Never send aircraft out on "weather checks."

■ Require crews to brief specific responsibilities when weather is marginal.

■ Establish procedures for multi-ship operations in reduced visibility conditions.

■ Not demean aviators who identify weather below minimums.

■ Evaluate aviator experience. Does the local weather criteria match the experience level of the unit's crewmembers? If it doesn't, consider increasing ceiling and visibility requirements for all night missions.

■ Be a good example. If you push weather, you set the standard for every other aviator to also take chances with the weather.

■ Maintain "very good" instrument proficiency instead of minimal proficiency. Commanders who are technically competent are looked at differently than those who are only marginally competent.

As previously stated, the majority of the inadvertent IMC accidents occurred at night. Over the years, the amount of night/night vision devices as a percentage of our total flying hour program has increased and continues to rise. As night operations increase, we as an aviation community must continually do all we can to reduce these deadly and costly accidents.

Think of inadvertent IMC as a "come as you are party." We are either proficient and prepared—or we aren't. All of us know if we are ready or not. Don't wait until you're inside a cloud to promise yourself (or a higher being) that you will practice more inadvertent IMC if only you could get out of *this* predicament. ■

Editor's note: The material presented in this article is just a start. Many other aviators have experienced inadvertent IMC that did not result in an accident. If you have experiences, ideas, or training methods that have proven beneficial, send them to Commander, U.S. Army Safety Center, ATTN: *Flightfax*, Fort Rucker, AL 36362-5363, fax DSN 558-3003 (334-255-3003), or E-mail them to **flightfax@safetycenter.army.mil**. We'll work those ideas into another article in *Flightfax*.

—Robert A. Brooks, Operations Division, USASC, DSN 558-9860 (334-255-9860), robert.brooks@safetycenter.army.mil

Surviving a Crash... and Confronting the Cold

Imagine being so cold that you can't feel your fingertips or your toes. Imagine a night so dark, so wet, and so cold that it takes two people to operate a simple jacket zipper. If you can imagine all of that, then you have only a glimmer of understanding of what it was like for an AH-64 crew on a snowy night after they crashed into the side of a mountain. Despite the fact that this accident occurred several years ago, the hazards never change and the lessons learned from this incident are many.

It was a routine night recon into the mountains, and the accident crew was Chalk 3 in a flight of four AH-64s flying in staggered-right formation. They had been airborne for 32 minutes when they encountered unforecasted snowshowers. The air mission commander announced that he was starting a 180-degree left turn to return to station. As Chalk 3 turned left to exit the weather, it crashed at the top of a 7,000-foot mountain.

Their story

The following is an account by CW4 Franklin C. Harrison and CW2 Daniel R. Smee of what happened after the crash and the crewmembers' actions until they were rescued more than 2½ very cold hours later. At the time of this incident, the crew was assigned to Company A, 2d Battalion, 229th Aviation Regiment, Fort Rucker, AL.

CW4 Harrison, PC:

"I'm alive" was my first thought when the aircraft stopped rocking from side to side. I tried to call Dan, my front-seat pilot. No answer. During the crash sequence, his helmet mike cord had come unplugged. He was trying to call me, I was trying to call him, and neither of us could hear the other. Obviously, some very unpleasant thoughts about each other's condition flashed through our minds in those first few seconds.

I immediately shut down the engines. As I was exiting the aircraft, I saw Dan. When the aircraft had started vibrating and rocking from side to side, Dan had ducked down as low as he could in the seat to avoid any rotor blades that might come through the cockpit. He could hear the fuel escaping from the ruptured auxiliary tank that had been mounted on the right wing, and he climbed out through the opening where his left canopy had been broken away.

Much relieved to see each other, we quickly moved about 25 feet away from the aircraft and did a quick appraisal of our physical condition. I thought I had broken my left arm on the armor seat during the impact. However, on examination we found that it wasn't broken, just banged up pretty good. Dan

had a small cut on his right cheek and scratches on his right arm. All in all, we were in great shape considering what had just happened.

Assessing the situation

I was told when I started flying helicopters that "if it's not on you at the time of a crash, chances are you won't get it out of the aircraft." We were lucky. There was no postcrash fire, and we were able to return to the aircraft and retrieve our Gore-Tex® parkas and sleeping bags from the wreckage.

By then it was snowing very hard on the mountaintop and the wind was blowing at 20 knots or more. We heard an aircraft circling to our south clear of the snowshower. It was our lead aircraft—the company commander. I attempted to contact them on my PRC-90 survival radio to let them know we were down safe, but the aircraft was destroyed. I got no reply, so I changed over to the beacon mode. Still no reply.

We assessed our situation and realized that due to the weather conditions on the mountain, it was going to be difficult for a rescue aircraft to get to us. Knowing that we would not be rescued where we were until hours later when the weather cleared, we decided to climb down to the valley floor about 700 feet below to improve our chances of being picked up sooner. We did a quick inventory of what we had and decided to take our sleeping bags and wear our survival vests under our Gore-Tex® parkas. I had two flashlights and Dan had one. I was wearing my Nomex gloves; Dan had a pair of inserts he could pull on over his Nomex gloves.

Descending the mountain

Prior to flight school, Dan had been an Army Ranger School instructor with extensive mountain training. He led out. I felt that if anyone could get us down that mountain, he was the guy who could do it.

As we started down, the going was very slow due to the steepness of the terrain. It was still snowing, and we were soon soaking wet. As we moved, Dan would throw his sleeping bag down the path about 20 feet and I would keep my flashlight on his path. He would stop, I would throw my sleeping bag down to him, and he would keep his light on me until I caught up with him. We knew that just one misstep could mean a broken ankle or worse, and then it might be all over.

The cold was really starting to take its toll on me by the time we reached the halfway point. I could no longer feel my fingertips or toes. I would take my wet gloves off, wring the water out of them, place my hands inside my parka until the feeling returned, and then I would put my gloves back on.

No turning back

At each stop, we would try both of our PRC-90s. We still got no reply. Then we came to a dropoff of about 25 feet. It was like a kick in the chest. I just didn't think we could make it back up the mountain, and it looked like we couldn't continue down. The terrain was too steep to even allow us to set up our sleeping bags.

Things were looking pretty grim. Just as I was thinking that I was going to die on that mountain after surviving the crash, Dan casually asked if I had ever seen the movie "Alive" in which the survivors of an airplane crash had been forced to resort to cannibalism to survive. That got me moving!

Dan surveyed our location and found that if we moved laterally about 15 feet, we could hang from a ledge and drop only 7 feet and continue down. Before we had a chance to talk ourselves out of it, Dan's sleeping bag was over the edge. We were committed. Dan reached his bag with no problems, and then it was my turn. I threw my bag to Dan and started. It took only a couple of minutes, but it seemed more like an hour. I was physically drained. Fortunately, the terrain shallowed out and we wandered into a small streambed and followed it to the valley floor.

It had been 2 hours since we started down. It was still snowing, the wind was still blowing as hard as ever, and we were soaking wet and cold. This was it; we weren't going any further. We would set up camp and wait for rescue.

For want of a fire

Our first priority was to get a fire going. As Dan surveyed the area for possible landing sites for rescue aircraft, I gathered sagebrush to build a fire. We knew we had matches in our vests because the vests had been inspected before our deployment. The problem was locating them and getting them out of the vests. My hands were so cold it took both of us to operate the zipper on my parka. Using paper I had torn from my kneeboard, we

tried every match in both vests—none ignited. Next, we tried the emergency fire starter kit; it ignited, but the wood and paper were too wet to burn. Next Dan tried the magnesium fire starter, using his survival knife to shave it and to strike the sparker—too windy.

About that time, I would have given a hefty price for a cigarette lighter. Bad timing; I had stopped smoking just 3 months before.

A welcomed flash of light

Lucky for us, an Air Force UH-60 search-and-rescue bird had seen the flash from our attempt to start a fire and headed our way. When we heard the aircraft, we called them and asked them to flash their landing light twice if they could hear our emergency transmission. They responded with two flashes of light that were about the prettiest sight we had ever seen. We used my two flashlights to mark our position. By the time we were extracted, it had been more than 2½ hours since our aircraft went down—2½ of the coldest and wettest hours we had ever known.

Lessons learned

In retrospect, I know we made the right decision when we decided to move down the mountain. The crew of the rescue aircraft (and this crew was trained and prepared for mountain rescue operation) told us that they had twice tried to make it to the top of the mountain to find us, but were forced to turn back due to the low ceilings and snow. It was during their third attempt that they had spotted the spark as we were trying to light a fire.

In addition to learning the benefit of doing everything possible to enhance your chances of being rescued, we also learned the importance of—

- Having a thorough understanding of the weather. What you get in the weather briefing may not be what you encounter.
- Preflighting your survival vest and knowing the location of all components. It's hard to find them in the dark.
- Taking the right equipment (food, water, clothes) with you when operating in adverse environmental conditions so that if you end up on the ground for whatever reason—crash or precautionary landing—you can survive.
- Preparing for the environment you are operating in. It may be hot when you depart, but it can get awfully cold in mountainous terrain at night.
- Coordinating with your ATC personnel to test your survival radios at some distance, not just in the bench test set. Following the accident, we checked 10 of our unit's survival radios and all 10 were good only for a 1-mile range.
- Having good batteries and carrying spares for your flashlight and liplight. During those first few minutes following the crash, the liplight on our helmets was the only source of light we had to help us find our flashlights, parkas, and sleeping bags stored in the cargo bay.
- Testing the matches in your survival kit.
- Making sure your copilot is a mountain ranger instructor—you might need those skills before you get back to station.

CW3 Smee, PI:

When I realized we were going to crash, my immediate thought was very simple: the ORT (optical relay tube) is going to cause pain. I was right. During the crash sequence, my head was thrown forward and that was where I elected to keep it until the engines wound down and the blades were finished beating themselves to death. The ORT hurt, but I thanked God for giving McDonnell Douglas the talent to make the AH-64 a crashworthy machine. That was my religious experience during the crash.

You can only imagine the jumble of simultaneous thoughts racing through my mind. Because of this "chicken" position I was in, my ICS cord had come undone and I was unable to communicate with Frank.

Since Frank and I had crewed together for just short of a month, we had been working together on our communication and our teamwork, even during our spare time. Frank is an experienced aviator with nearly 7,900 rotary-wing hours. I was new to the unit and still learning stateside flying, having been previously stationed in Germany. In my opinion, I couldn't have had a better teacher than Frank. Yet with all the mission planning and all the rehearsals, there I was crawling out through a huge hole where the canopy used to be of what just moments before was a perfectly good aircraft.

Assessing the situation

As I was climbing out of the aircraft, I saw the glow of Frank's liplight and I knew he was at least conscious. My adrenaline was pumping like crazy. I walked

around the aircraft and saw Frank's door open and out he climbed. We walked away from the aircraft and assessed our physical damage. Outside of a couple of scratches and bumps, we were basically intact.

We could hear an aircraft circling to the south and tried to reach them on our PRC-90s, but were unable to establish voice communication. Frank went to beacon. Still no luck.

We were fortunate to have brought our Gore-Tex® parkas and our sleeping bags with us because we knew how cold it could get in the desert at night. We gathered our gear and secured our helmets and kneeboards along with the rest of our gear in our bags and placed them away from the aircraft because we knew the accident board was going to need them. Still unable to raise voice with the other aircraft, we then decided to proceed down the hill.

Descending the mountain

The climb down was interesting to say the least. I had been in snow before, but never on top of a mountain in the middle of the night. I knew that this was going to be good. Our objective was to make our way down to where the weather was better and the terrain conducive to safe rescue. For an "old guy," Frank surprised me: he really didn't have any serious problems keeping up on the descent. The going was slow and the distance down to the next drop was hard to judge due to the darkness and the snow.

We would drop our sleeping bags from one level to the next and use them as a reference to judge distance. Slow, but it worked extremely well.

In my survival training, I had never had a hard time starting a fire when needed. Not now. First the radio hadn't worked, although we had just checked it a few days prior, and now the matches in our survival vests were inop. Our luck seemed to be running kind of thin.

For want of a fire

When we reached a streambed, we followed it to the valley floor and then we decided to build a fire and wait there for someone to pick us up. The weather was still bad, and we were not sure if it would permit a pickup that night or not.

In my survival training, I had never had a hard time starting a fire when needed. Not now. First the radio hadn't worked, although we had just checked it a few days prior, and now the matches in our survival vests were inop. Our luck seemed to be running kind of thin.

Magnesium fire starter was the next weapon of choice. My fingers were pretty cold from the climb down, and we were both wet to the bone. A fire was sure going to feel good, just as soon as I could get one going. Well, the magnesium didn't work either. No matter how hard we tried to build a windbreak, the wind was too strong for it to contain the shavings.

A spark of light

Finally, our luck began to change: an Air Force search-and-rescue aircraft had seen sparks of the firestarter and was able to visually home in on our position. When we heard them, we were able to establish contact with them for pickup, although we still didn't have two-way communication.

Lessons learned

These events took place in a period of 2½ hours; 2½ long, miserable hours and plenty of time to think about pre-mission planning and the importance of it. If we had not brought our parkas and our sleeping bags, it is very likely that we could have been cold-weather casualties to some degree. As it turned out, the search-and-rescue aircraft had made two previous attempts to reach the crash scene and had been forced to turn back. On their third attempt, they had spotted the spark of light as we were desperately trying to get a fire started.

Frank and I both have a better appreciation for the survival vest than we did before the accident. I know that if I'm going to have to wear it, I'm going to ensure that things work as advertised. Regardless of current inspection dates and the presence of matches and other required items, if they don't work or you don't know how to use them, they can't be of much help to you when you really need them. From now on, I'll check *everything*. ■

—Reprint from Flightfax

Aviation Maintenance in the Cold

Army Aviation missions don't change just because the weather does; however operating in cold weather can present many challenges. As a maintenance officer, I can tell you that winter's cold weather can have adverse effects on the aircraft you fly.

It's a time-consuming, patience-tasking job to keep aircraft flying when temperatures plummet and snow, wind, and ice attack. That's why top-notch preventive maintenance on your aircraft is critical in cold weather.

Start maintenance procedures by moving the aircraft inside a hangar or maintenance shelter. Use an approved, ventilated ground heater to warm your shelter. Don't forget to identify and assess any fire hazards associated with operating a ground heater. If you can't move the aircraft inside and you're faced with extended maintenance problems, limit your exposure to the elements.

Electronic systems

Unless you're in subfreezing temperatures for a long period of time, nickel-cadmium batteries will do their job well in cold weather without too much effort on your part. However, every cold start shortens the life of batteries. So, bring batteries indoors or insulate them using heater blankets approved for your aircraft when operation in subfreezing temperatures is expected.

If that's not possible, turn on the landing lights, searchlight, or other equipment for 30 seconds before an engine start. It's always a good idea to use an auxiliary power unit (APU) with the heat on, allowing the black boxes to warm up before hitting them with a power surge. After all, it takes you and me standing around the stove drinking a few cups of coffee to get started. Just remember, give those systems that electric cup of java before asking them to perform.

Mechanical systems

The systems are now up and running and ready to go, right? Wrong! We have done the right thing with our electronic systems; however, what about the mechanical systems?

Mechanical and hydraulic controls become sluggish in cold weather. Transmissions and gearboxes are lubricated by either oil or grease. Both of these lubricants can be affected by temperature, and in cold weather they tend to thicken. We know that thicker fluid means higher pressure on seals. In maintenance lingo, that means lots of blown seals. Simple actions such as wiping down exposed hydraulic pistons and thorough pre-heating of the aircraft help alleviate problems associated with extreme cold weather.

Hydraulic fluid leaks are amplified as the temperature plummets. Hydraulic cylinders and actuators may leak fluid because O-rings, seals, and gaskets are less pliable and become deformed at lower temperatures.

Fuel

Water in fuel can turn to ice that will block fuel lines, filters, and valves. Keep fuel tanks topped off. The gap between the top of the tank and the fuel is full of cold moist air, which causes condensation that drips into your fuel. When taking fuel samples, drain enough fuel to get rid of all the water.

When refueling an aircraft in subzero temperatures, always check the fuel level while outside the hangar. When a full aircraft is moved inside the hangar, the fuel level rises

with the higher temperature. Opening the filler cap inside the hangar could result in a fuel spill to clean up.

The colder the temperature, the drier the air. And the drier the air, the more static electricity becomes a hazard. Be extra careful during refueling. Static can result from the aircraft moving through the air or by brushing frost or snow off the aircraft. Fuel flowing through the filler neck can also generate a spark that ignites fuel.

Aircraft must be grounded. Make sure the aircraft and tanker are bonded together and the nozzle is bonded to the aircraft before removing the cap. When you're freezing while refueling, you might be tempted to neglect a ground. Don't! Follow all grounding procedures; do not take shortcuts.

If you're not using a closed circuit fueling nozzle, put the regular nozzle in all the way. That will keep static down and lessen the chance for a fuel spill. Use extra care if you have to refuel or take fuel out of an aircraft. Spilled fuel can cause instant frostbite.

Tires

Air pressure drops with the temperature, so check your aircraft's tire pressure often. Tires frozen to the ground can be freed with an approved liquid deicer. Move the aircraft immediately to keep tires from freezing again as the slush formed by the deicer refreezes.

Crewmembers

Finally, let's talk about our most important resource: people. When units move from a warm environment to a much colder one, it is important that all personnel carefully review manuals to ensure specific adjustments for the new environment are made (see CTA 50-900 for additional equipment requirements).

Getting soldiers to work in cold climates is a challenge, and it's also a very big responsibility. Take an active role in caring for your soldiers. Small things like having hot coffee and soup available go a long way. Make sure soldiers are dressed for the environment. Poly-pro may be okay for walking around for short periods of time, but for extended periods, it isn't the correct PPE for launching an aircraft or working on a vehicle.

Bottom Line

Operating and maintaining aircraft in cold weather can be physically demanding and hazardous. Regardless of winter's adverse environmental conditions, Army Aviation must continue its mission to defend our Nations' interests around the world. To do so safely requires each one of us taking cold weather training seriously and applying risk management effectively. ■

—CW4 Todd Toth, Risk Management Integration Division, DSN 558-9579 (334-255-9579), todd.toth@safetycenter.army.mil

Better to Stay on the Ground!

So, what is a cold anyway? A familiar scenario: you wake up with a nasty tickle in the back of your throat, and the beginnings of a sniffle. As the day progresses, the tickle becomes an ache, and suddenly your back hurts, you feel flushed, you have a ripper of a headache, and your sinuses are full of cement. You have a cold, and inevitably you will be grounded until you get better.

So, what actually IS a cold? Here are some questions that pop up from time-to-time that may help in understanding just why you feel so bad, why the doctor can't do a great deal to make the damn thing go away, and why you can't fly.

What is a cold?

A cold (or upper respiratory tract infection, aka URI) is a self-limiting viral infection of your upper airways; this includes your throat, nasal passages, sinuses, and larynx. Classically, colds are characterized by inflammation of these passages, with excess sputum production, increased nasal discharge, cough, painful throat, watery eyes, and headaches. Also, you may experience aching muscles and joints, fevers and chills—these symptoms are secondary to your body's fight against the virus.

What causes a cold?

Colds are caused by a number of different viruses. Up to half of all colds are caused by different strains of a virus called rhinovirus. Viruses are not alive like bacteria are, they are small packages of either DNA or RNA, and need to get into living cells, and then use that cell's machinery to reproduce. Some of the cold symptoms come from your body trying to fight off the infection, and some from the damage the viruses do to the cells when they reproduce.

How did I catch a cold?

Cold viruses tend to be fairly robust and can survive in the water droplets produced when you breathe, sneeze and cough, as well as lurking on taps, basins, crockery, etc. They can be transmitted by inhalation, direct contact through kissing, exchanging eating utensils and cigarettes, or by touching contaminated household surfaces. There is usually an incubation period of several days before you will start to show the classical symptoms of a cold.

How come I got a cold, but the fellow sitting next to me at work didn't?

The fellow sitting next to you may not have been exposed to the virus, depending on how well the air circulates around your work space, or whether you partook of any of the things mentioned above! The other possibility is that he is immune to the virus. That is, his body already possesses the defenses to fight the virus off before it gets a toehold.

What happens is this: as you are exposed to a virus, the body mounts an 'immune response' with antibodies being produced to assist in tagging the virus for destruction by the body's natural defenses. Each new virus the body is exposed to will result in a different type of antibody being formed. Once the host has been infected with a particular virus, the next time around the body is far more efficient at reproducing the antibodies required to fight off the invader. Therefore, you won't necessarily get sick, or as sick as someone who has never been exposed to that particular strain before.

Why isn't there a cure for my cold?

Because colds can be caused by any one of hundreds of viruses; there is no single

agent that will work against all, or indeed any, of them. In fact, there are only a handful of effective antiviral drugs in existence, and they are targeted against very different viruses to the ones that cause colds.

But, isn't there a vaccination for colds?

There is a vaccination against influenza, but this is different from the garden-variety 'cold' again. Many people, when they get a nasty cold, will call it the flu, when in reality it is just one of those usual cold viruses doing a particularly good job. On the other hand, influenza is a serious, systemic viral infection caused by variations of one of two viruses: Influenza A and Influenza B. Because the virus is potentially so severe (the epidemic after the First World War killed between 20 and 40 million people worldwide), a vaccination is developed on an annual basis to cover the latest strains of these viruses. The vaccine does NOT protect you against the cold viruses that people casually call the flu.

Why don't antibiotics work?

Antibiotics only act against bacteria, and either kill or stop the growth of bacteria. However, because viruses aren't really alive, all we can do is try to stop them from replicating—this is much harder to do! When you have a simple cold, antibiotics will not aid in your recovery. Indeed, they may work against you, by creating resistance in your body's existing bacteria population against the antibiotic you've been given. When you are prescribed antibiotics, it will be to treat a 'super-infection'; that is, a bacterial infection that has taken advantage of your lowered defenses to attack while you have a cold. They won't decrease the duration of a viral infection.

How long am I going to be sick?

That depends on a variety of factors: how healthy you are normally, what your nutritional state is like, whether you exercise heavily, and whether you are a smoker. Generally, a cold will take up to two weeks to resolve, sometimes longer if sinuses are involved. Things that may prolong your illness include inadequate rest, smoking, heavy exercise, and poor diet.

How should I treat my cold?

First, you should never self-medicate; but if you have to, treat colds with rest, plenty of water, and medication to relieve the symptoms. Such medications include Tylenol® or aspirin, which will relieve aches and pains, and take the edge off any fevers you are experiencing. Medications containing pseudo-ephedrine (Sudafed®) will help stuffy noses and sinuses by decreasing swelling in the lining of the nose and sinuses. Gargles such as Listerine® or Chloreseptic® may reduce sore throat pain.

Importantly, none of these medications will reduce the duration of your cold—no medication your doctor can give you will. To give you the best chance, stop smoking if you usually smoke, don't engage in any heavy exercise or sport, and maintain a balanced diet.

Also remember if you have to self-medicate, follow the approved over-the-counter medications guide in the July 2002 *Flightfax*. If you take anything else, you are grounded until cleared by a flight surgeon or an Aeromedical physician assistant!

I can still perform the Valsalva maneuver—why can't I fly?

You may be able to clear your ears, but a patent Valsalva will not clear your sinuses, which will be swollen and congested with mucus when you have a cold. As you descend from even low altitudes, you will risk a sinus 'squeeze', with resultant severe cheek, eye or forehead pain, and possibly a bloody nose. Even if your sinuses are not congested, the physiological changes that occur when your body is fighting off a viral infection will leave you more vulnerable to fatigue, hypoxia, overload, disorientation and distraction. Better to stay on the ground! ■

Editor's note: If you want to know more about colds or any other issue of aircrew health, contact your friendly medical officer.

—Adapted from Touchdown Safety Magazine

NEWS & notes

Health experts say West Nile Virus preventable

Health officials at Wilford Hall Medical Center maintain people should not panic about the West Nile Virus, says Air Force Print News. "You can get it only from mosquito bites," said Maj. Cynthia Thomas, communicable disease and epidemiology element chief for the 59th Medical Wing here. "The main way to prevent it is to prevent bites." If wearing long sleeves and pants in the summer heat is not practical, experts recommend using insect repellents containing the chemical DEET. Adults should use repellents with no more than 35 percent DEET, and children should use repellents with less than 10 percent DEET.

Mosquitoes are most active at sundown and sunrise, so people should wear repellent, cover up, or head inside during these times. Large items like birdbaths and old tires are popular breeding areas; however, mosquitoes also use areas that people often overlook, like pet dishes, children's toys, and even bottle caps.

People do not usually get sick from the virus, even in areas that have confirmed cases. Only about 20 percent of people bitten by mosquitoes with West Nile Virus develop any signs of infection, said Thomas. Typical symptoms include fever, headache, skin rash, and swollen glands. Most symptoms last less than a week. Less than 1 percent of people infected experience serious health problems. Signs of more serious illness include neck stiffness, high fever, headaches, muscle weakness and changes in behavior. People should contact their primary care doctor if they develop these symptoms and recall a recent mosquito bite.

For more information on West Nile Virus, visit the Centers for Disease Control and Prevention web site: **http://www.cdc.gov** or the U.S. Army Center for Health Promotion and Preventive Medicine web site: **http://chppm-www.apgea.army.mil.** ■

—Military Report, September 10, 2002 Issue

AAFES halts sale of products with Ephedra

Stars and Stripes reports that the Army and Air Force Exchange Service (AAFES) recently began pulling all supplements containing the natural stimulant ephedra from store shelves due to recent concerns from major commands within the military community.

Last spring, a soldier at Fort Hood, Texas, died during physical training from an apparent heart attack. According to a base memo, the soldier was likely taking a nutritional supplement containing a combination of ephedra and caffeine. Another Fort Hood soldier on a similar supplement was recently treated in the emergency room for a heat-related injury during physical training.

Ephedra's safety is widely debated. Ephedra is also known as ma huang and is a natural herb that is supposed to give the body an energy boost by speeding up metabolism, depressing appetite, and increasing heart rate—leading to weight loss. However, use is not without risk. Ephedra has been shown to be associated with cardiac arrhythmias, increased risk of heat injury, muscle breakdown, strokes, and heart attacks. Ephedra can also interact with common decongestants like Sudafed® and may interfere with high blood pressure medications. ■

Clarification

We have received several inquiries regarding the article, "VFR or VMC? Let's Be Clear About What We Mean!" in the July 2002 issue. It has been brought to our attention that due to the FAA's definition of VMC which refers to meteorological conditions expressed in terms of visibility, distance from clouds, and ceiling equal to or better than specified minima, the term "visual conditions" would have been the appropriate term to contrast with VFR in the context of the article, not VMC.

Still, VMC and VFR are not synonymous. VFR are the rules and VMC are the conditions a pilot must operate in to comply with the rules. The rules define the conditions. Special thanks to Mr. John Travers and CW4 Dennis Elliot for the clarification. ■

ACCIDENT BRIEFS

Information based on preliminary reports of aircraft accidents

AH-64

A model

■ **Class A:** Acft was on a single-ship night VFR training flight. Following departure from an Army airfield where they had been conducting closed traffic pattern training, the crew of the acft failed to relay any further position reports. Overdue aircraft procedures were initiated, and following an intensive ground and air search effort, the wreckage was located 42 hours later. Both crewmembers sustained fatal injuries. Investigation continues.

■ **Class A:** Acft was one of a flight of four conducting a night deliberate attack mission. Moments after occupying their attack-by-fire position, the aircraft began an uncontrollable spin to the right. The PC on the flight controls reduced the collective to slow the spin and execute an immediate forced landing. The aircraft impacted the ground upright on sloping terrain at the edge of a tree line bordering an open field. The aircraft was destroyed and the crew sustained minor injuries.

■ **Class A:** Acft crashed while serving as escort for a MEDEVAC mission and was destroyed. Crew sustained minor injuries. Investigation continues.

CH-47

D model

■ **Class C:** Pilot on the controls executed an abrupt maneuver to avoid an obstacle in their flight path resulting in a suspected overtorque.

EH-60

■ **Class C (Damage):** Two acft collided at approx. 300 feet AGL during IERW training. One acft had just taken off for closed traffic flight; the second had been on "short final" for landing when the crew announced their intention to conduct a "go-around." The tail rotor of the acft that had just taken off contacted the undercarriage of the second acft. Both acft were landed w/o further incident. One crew was using ANVIS-6 NVGs. Damage estimated to be within class C parameters.

MH-6

■ **Class C:** Post-flight inspection following a night live-fire exercise revealed MRB and windshield damage as a result of impact from spent shell casings. ANVIS-6s were in use.

MH-60

L model

■ **Class A:** This flight-related accident occurred when a USN passenger fell from a USA acft while at an approx. 50-ft. hover during the conduct of a FRIES infiltration exercise. The soldier sustained a sprained ankle upon contact with the ground. The USN will lead the joint-service accident investigation; the USA will provide technical representatives and a USASC advisor.

OH-58

DI model

■ **Class A:** Acft had just completed a hot refuel and was circling the field site following takeoff, when it was observed to enter a progressive nose-up attitude until the fuselage inverted in flight. The acft entered the trees vertically prior to ground impact in an inverted, left-side low attitude. Both pilots/crewmembers sustained fatal injuries. Investigation continues.

DR model

■ **Class A (Damage):** Crew experienced FADEC failure to the manual mode. The decision was made to continue flight to nearest airfield. After approximately seven minutes of flight in manual mode, the crew experienced a complete loss of engine power. Both crewmembers survived the acft's impact with the ground and were evacuated to the local medical facility for evaluation. The acft was destroyed. Investigation continues.

■ **Class C:** Acft experienced engine overspeed during approach in tail wind conditions. Engine replacement required.

■ **Class C:** While performing manual throttle operations at altitude, the acft experienced NP/NR overspeed to 125%. FADEC was re-engaged and a precautionary landing was executed w/o further incident.

UH-60

A model

■ **Class C:** Acft attempted to land on uneven terrain during a MEDEVAC pick-up. Post-flight inspection revealed several holes/tears in the undercarriage. NVGs were in use.

L model

■ **Class A (Damage):** Acft crashed following aborted landing approach in dust conditions. All crewmembers and passengers sustained injuries. Investigation continues.

■ **Class C:** Acft was taxiing to VIP pad for drop-off of PAX and contacted a parked civilian acft while negotiating a right turn. Damage to Army acft consisted of two destroyed tail rotor blades and two MRB tip caps. Civilian acft requires sheet metal work to tail section. ECOD total: $120,000.

C-23

■ **Class C:** Upon landing, acft's nose gear collapsed.

Note: For more information on selected accident briefs, call DSN 558-9552 (334-255-9552). Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

IN MEMORIAM

ARMY PERSONNEL KILLED AT THE PENTAGON
11 SEPTEMBER 2001

Spc. Craig Amundson
MSgt. (Ret.) Max Beilke
Carrie Blagburn
Lt. Col. Canfield D. Boone
Donna Bowen
SFC Jose Orlando Calderon-Olmedo
Angelene Carter
Sharon Carver
John J. Chada
Ada M. Davis
Lt. Col. Jerry D. Dickerson
Amelia V. Fields
Gerald Fisher
Cortez Ghee
Brenda C. Gibson
Ronald F. Golinski
Diane Hale-McKinzy
Carolyn B. Halmon
Sheila Hein
Maj. Wallace Cole Hogan Jr.
Jimmie Holley
Peggie Hurt
Lt. Col. Stephen Neil Hyland Jr.
Sgt. Maj. Lacey B. Ivory
Lt. Col. Dennis M. Johnson
Brenda Kegler
David W. Laychak
Samantha Lightbourn-Allen
Maj. Stephen V. Long
Terence Lynch
Teresa M. Martin
Ada L. Mason
Lt. Col. Dean E. Mattson
Lt. Gen. Timothy J. Maude
Robert J. Maxwell
Molly McKenzie
Maj. Ronald D. Milam
Odessa V. Morris
Ted H. Moy
Diana B. Padro
Capt. Clifford L. Patterson
Scott Powell
Deborah A. Ramsaur
Rhonda S. Rasmussen
Martha M. Reszke
Cecelia E. Richard
Edward V. Rowenhorst
Judy Rowlett
Robert Russell
Chief Warrant Officer William R. Ruth
Marjorie C. Salamone
Lt. Col. David M. Scales
Janice Scott
Michael L. Selves
Maria H. Serva
Antoinette M. Sherman
Don Simmons
Cheryle D. Sincock
Lt. Col. (Ret.) Gary F. Smith
Patricia J. Statz
Edna L. Stephens
Sgt. Maj. Larry L. Strickland
Maj. Kip P. Taylor
Sandra C. Taylor
Sgt. Tamara C. Thurman
Willie Q. Troy
Lt. Col. Karen J. Wagner
Spc. Chin Sun Pak-Wells
Meta L. Waller
SSgt. Maudlyn A. White
Sandra L. White
Ernest Willcher
Maj. Dwayne Williams
Edmond Young
Lisa L. Young