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Managing risks in 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.

The cold of winter can make it difficult to perform routine, simple tasks even though you are fully prepared to face the risks associated with operating in adverse conditions. If you aren't prepared or if you fail to identify and control the hazards, exposure to extreme cold for even a few hours can become a struggle for survival.

If your unit hasn't already begun maintenance, flying, and personal survival cold-weather operations refresher training, begin now. Don't let the first shower of snowflakes catch you unprepared.

Surviving a crash . . . and confronting the cold

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, Company A, 2d Battalion, 229th Aviation Regiment, Fort Rucker, AL, of what happened after the crash and the crewmembers' actions until they were rescued more than 2½ very **cold** hours later.

CW4 Harrison:

"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 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 in 1968 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 better 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 it might be all over.

The cold was really starting to take its toll on me by the time we got to 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, 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 farther. 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 operations) 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.

Things were looking pretty grim...

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.

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.

CW2 Smee:

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.

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 firestarter 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*. □

It can't work if it isn't turned on

Safe flight begins on the ground. The time invested in properly preparing the cockpit for flight could end up being the best investment you ever made. Give it your full attention; otherwise, you might miss something that could kill you.

In a recent UH-60 accident, the results of poor cockpit preparation led to tragedy when the crew could not identify the problem in time to take corrective action.

The accident

The weather was marginal at best with the freezing level in the clouds, but the crew elected to complete the second leg of a VIP mission under instrument flight rules. After the aircraft entered the clouds in a right turn to a newly assigned heading, the airspeed indicator showed that the airspeed was steadily decreasing. This confused the pilot because he had no other cockpit indications of any malfunctions.

As was revealed by the cockpit voice recorder, the PC wasn't offering any assistance. And the pilot remained confused because he had very limited partial panel training. He became channelized on the airspeed indicator to the exclusion of the other instruments—no cross check of the instruments.

Within 2 minutes of the crew noting the decreasing airspeed, the aircraft was in an uncontrolled dive. As the aircraft emerged from the clouds, the crew overcontrolled the cyclic in an effort to level off. The main rotor struck the tail rotor drive shaft and then severed the tail boom. The aircraft plummeted to the ground, killing all the occupants and crewmembers.

What happened

The airspeed was steadily decreasing because both pitot tubes were icing over. The crew had failed to turn on the pitot heater system before takeoff or before entering the freezing conditions in the clouds. While this error did not directly cause the accident, it did begin the chain of events that led to the confusion in the cockpit and ultimately to the crash.

As the aircraft continued to slow down, the pilot increased power and pushed the nose over to increase airspeed. The radar track indicated an increase in ground speed and level attitude. Remember that the pilot had channelized his attention on the airspeed indicator and the PC was not offering assistance. The crew was not cross checking the instruments because they had limited experience in flying partial panel under actual or simulated weather conditions.

With the pitot tubes continuing to ice over, further restricting the airflow through them, the stabilator continued to program down as it was designed to do. But the crew did not notice that the stabilator position indicator was programming down. There were no malfunction indications in the cockpit except that the airspeed indicator was showing that the aircraft was slowing down.

The crew could have recovered the aircraft before it reached the point where aerodynamics took over (at 130 knots airspeed with the stabilator down 10 degrees, the aircraft will pitch violently down into an unrecoverable dive) if they had recognized that the stabilator was programming down, zeroed it out with the "pinky switch," and then continued flight under partial panel conditions.

Lessons learned

A simple reminder: if the pitot heater system isn't turned on, it can't prevent the pitot tubes from icing over if icing conditions are encountered. All anti-ice systems and the pitot heater must be turned on prior to entering visible moisture at ambient temperatures of +4°C or less. If conditions conducive to icing are encountered, turn on all anti-ice equipment and the pitot heater immediately. Make sure the cockpit is set up properly before entering instrument meteorological conditions (IMC) as well as on those marginal VFR days when the possibility for inadvertent IMC exists. As a rule of thumb, if you have the slightest chance of entering icing conditions, turn on the anti-ice systems. It doesn't cost you anything in terms of fuel or engine performance. When in doubt, turn it on.

All pilots should be able to recognize the effects of icing on the pitot system and be able to recover the aircraft. A good cross check of the instruments and commitment to partial panel procedures will get you on the ground safely.

UH-60 pilots have a unique problem to contend with in this situation: the stabilator. The stabilator gets airspeed data from the pitot tubes. UH-60 pilots must also remember that the pitot system directly affects the performance of a very large control surface. As long as one pitot tube is working, the airspeed data sent to the stabilator will be correct. Additionally, if there is a malfunction within the pitot heater system, master caution and segment lights will illuminate in the cockpit. This is worth practicing or experiencing in the simulator. Remember that the pitot heater system can't work if it isn't turned on.

—MAJ Richard Young was a member of the USASC Aviation Branch at the time he wrote this article. He has since been reassigned to Korea

(Photo credit: Aviation Detachment, Fort Greely)

On 5 August 1994, BG Thomas W. Garrett, Director of Army Safety (fourth from left, front row), presented to MAJ James A. Bell, commander, U.S. Army Garrison Aviation Detachment "Grizzly Flight" a safety award for more than 20,000 accident-free flight hours during the last 30 years.

"Grizzly Flight" celebrates 30 years of safety excellence

On 22 June 1942, the Army Air Corps established Station 17, Alaska Wing, Air Transport Command, Big Delta Alaska to provide an intermediate rest/refuel point for lend-lease aircraft being transferred to Russian control during World War II. On 1 May 1947, the War Department transferred the post to the Department of the Army and designated it as the Arctic Training Center.

On 6 August 1955, the post was redesignated Fort Greely in honor of Major General Adolphus Washington Greely, arctic explorer, Medal of Honor recipient, and founder of the Alaska Communications System. The airfield was redesignated Allen Army Airfield on 30 May 1965 in honor of LTC Robert L. Allen, Chief of the Aviation Division of the Arctic Test Center.

Located 110 miles east of Fairbanks and about 350 miles northeast of Anchorage, Fort Greely is unknown to most people unless they have been here to train. Today, Fort Greely is home to the Cold Regions Test Center (CRTC), which has a cold-weather chamber capable of producing temperatures as low as -60°F; Northern Warfare Training Center (NWTC); and various support units. It is synonymous with cold-weather operations/testing and is home to the U.S. Army Garrison Aviation Detachment "Grizzly Flight."

"Grizzly Flight" mission

The aviation detachment provides Fort Greely, CRTC, NWTC, the Arctic Support Brigade, and the 1st Brigade 6th Infantry Division Light with general aviation support. Support also extends to transient DOD units conducting arctic training; POL operations are conducted on a 24-hour basis.

The unit flies a variety of support missions that challenges even the most experienced aviators. Support of the Alaska Fish and Game Department with wildlife surveys, cold-weather testing of the OH-58D and AH-64, VIP transport, high-altitude glacier operations, paradrops, search and rescue, and slingload operations are just a few examples. Detachment personnel also help in

cold-weather testing of aviation-related equipment such as the electrically heated handwear.

Survival requirements

If you are flying into the "Last Frontier," a state twice the size of Texas, you must be prepared for the worst. Flight following is mandatory but difficult because of the largely unpopulated areas. An aircraft accident during any season of the year is an immediate survival situation.

People who have trained in Alaska know that normal operations in an arctic environment are difficult to say the least. Survival is a strong motivational factor in such an unforgiving environment. Therefore, ALSE operations are critically important to all crewmembers.

Survival kits are specifically tailored to summer and winter operations. They must be carried on board aircraft for all passengers as well as crewmembers. Kits include such items as mosquito nets, rations, shovels, ice-cutting tools, fishing gear, an arctic-survival tent, compressed sleeping bags, and 5 gallons of water. In winter, an average of 70 pounds of survival gear is carried for each crewmember.

Training

Unit members often attend the Air Force "Cool School" at Eielson AFB near Fairbanks, where arctic survival skills are taught by experts. The course focuses on immediate and improvised arctic shelters, aircraft signaling techniques, sustenance, firebuilding, and the maintenance of normal body temperature. Building snowcaves, trapping techniques, as well as numerous other survival skills are put to the test—a hands-on experience that challenges the will to survive in a harsh arctic environment.

The unit routinely practices mountain flying and high-altitude glacier operations in terrain ranging from 2,000 to 13,000 feet. The standardization officer schedules one crew each week for a Situational Training Exercise (STX).

STXs are designed to allow for crewmember rotation and require the flight crew to perform various types of training scenarios in different aircraft conditions. STXs are also designed to enhance pilots' confidence in their decision-making abilities while increasing their flying proficiency and improving their technique. Knowledge of aircraft performance capabilities, human factors, and weather phenomena is essential to the successful completion of each STX. At the end of the STX, crewmembers debrief and share lessons learned from their experiences during informal feedback sessions.

Safety oriented

In this unit, the emphasis is always on safety—ground as well as aviation. Safety **must be** the primary concern in all that the unit does and is factored into all mission-related tasks. For example—

■ The wind chill beneath a CH-47 in a 0°F temperature can be as much as 50°F below zero. Exposed skin can experience instant frostbite. Cold-weather injuries are not tolerated because they can be prevented with proper countermeasures and supervision.

■ POL operations in the dry arctic can produce disastrous results and expose personnel to extremely harmful conditions. Incorrect grounding of an aircraft in POL can produce static electricity that can ignite fuel and burn an aircraft to the ground in a matter of minutes. To prevent such disasters, hot refueling is prohibited when temperatures are below -18°C.

■ The unit safety officer and first sergeant recently developed a new risk-assessment worksheet (similar to the one used by aircrewmembers) for unit drivers. A 120-mile drive to Fort Wainwright in January with temperatures of -30°F requires the same kind of careful planning and hazard identification and control that flying requires. As another preventive measure, the safety officer also inspects POVs quarterly for essential survival equipment.

Meticulous attention to detail is imperative, and safety is a 24-hour-a-day state of mind. It is the firm belief of the collective leadership in the unit that if young soldiers are taught safety first and mission second in peacetime, the unnecessary loss of life will be reduced during war. Safety (risk management) must be instilled initially through repetition until it becomes instinctive and intuitive.

The safety record

The unending professionalism and dedication of assigned aviators and support personnel, present and past, has established a standard of safety unparalleled by any other active Army aviation unit. Although the detachment is small (3 UH-1H aircraft and 25 personnel assigned), "Grizzly Flight" takes extreme pride in all it does. Considering the harsh arctic winter environment with temperatures of -40°F and winds in excess of 80 miles per hour and the seasonal changes in summer with temperatures up to 90°F, it is remarkable that this detachment currently holds the record for the longest period of flying without an accident in the United Sates Army: 30 years of accident-free flying.

Command involvement in continuously evaluating the status of safety programs and countermeasures as well as the experience level of assigned personnel and a safety-first attitude by all members of "Grizzly Flight" have helped achieve this remarkable safety record.

Esprit de corps and morale are high in the unit. No one wants to be the one who brings this outstanding safety record to an end. With continued emphasis by the command and soldiers alike, that won't happen; safety will remain the trademark of "Grizzly Flight" for many years to come.

—CW3 Robert A. Plomski, Safety Officer, U.S. Army Garrison Aviation Detachment "Grizzly Flight," Fort Greely, 907-873-4170/4171 or FAX 873-4723

ALSE alert: CARC paint on flight helmets

Yes, it is true: chemical agent resistant coating (CARC) is infiltrating the ALSE shops. Flight helmet manufacturers are required to paint new flight helmets with CARC. And in the SPH-4 helmet manual (TM 10-8415-204-12&P, change 5) and SPH-4B helmet manual (TM 1-8415-215-12&P), CARC is also listed as the paint for touching up and repainting flight helmets.

Why use CARC paint?

The Department of the Army requires that equipment used in combat be painted with CARC. It's a durable coating that won't absorb chemical or biological agents, is easily decontaminated with soap and water, and is free of the toxic chemicals chromate and lead.

What is CARC?

What's so new and strange about CARC? Not much. CARC is actually just polyurethane paint. The only thing new is that when the Army decided to use it, they called it CARC. Polyurethane has been around for several years in the civilian world. It's used on cars, trucks, airplanes, bridges, and on equipment where a durable coating is desired.

CARC comes in two quantities: quart (NSN 8010-01-146-2650) and gallon (NSN 8010-01-055-2319) containers. Both are two-part kits. The first part is the main component, and the second part is a hardening agent. The hardening agent chemically reacts with the main component during the curing process and results in a hard, durable paint.

What is dangerous about CARC?

It seems that when CARC is mentioned, people react as if they had been given the death penalty. While the potential health hazards of handling CARC are very real, one time that CARC is **not** a health hazard is when it is on a flight helmet and cured.

The hazards exist mainly during application (mixing and painting) and when dried CARC is burned during welding or when paint is stripped with fire. (We hope there are no ALSE personnel stripping paint from helmets with fire.) Inhaling dust from sanding CARC is also a no-no. Eating CARC, wet or dry, is also not recommended.

The chemical Diisocynate, is part of the hardening agent and is why users must take precautions when applying, sanding, or burning CARC. Diisocynate fumes are odorless and can cause serious lung and throat disorders such as coughing and shortness of breath if the individual is overexposed. Inhaled spray droplets or small quantities of CARC in a person's mouth or on an open wound could result in liver and blood protein abnormalities and nervous system disorders.

Sounds pretty serious, doesn't it? Each person's tolerance level to such chemicals is different. Those with low-tolerance levels will find themselves coughing and wheezing after inhaling only a small quantity of fumes. Some of the chemicals in the paint can be absorbed through a person's skin and cause reddening, swelling, itching, and rashes.

That's the short version of the potential hazards of using CARC/polyurethane paint. The bottom line is to understand when CARC is a hazard and how to protect yourself from those hazards.

What protective measures do I need?

Required protection varies, depending on the amount of exposure. For example, brush or roller painting two or three helmets outdoors would be low exposure; spray painting large quantities of equipment in a room or building would be high exposure. Low exposure may only require protective gloves and a face shield, while high exposure may require an airline-type overpressure respirator, protective gloves, face shield, protective clothing, and an exhaust fan in the work area.

In all cases, ALSE personnel are ***strongly*** advised to talk to the local Industrial Hygienist who supports their unit. He or she can tell you the specifics on what protection is required for the job you are doing.

If individuals are required to wear a respirator, it must be properly fitted and they must first have a medical evaluation to be sure they are physically capable of working while wearing a respirator.

What options do ALSE personnel have?

Most ALSE shops are not required to paint more than two or three helmets a week. One option is to work order the helmets to a support paint shop (direct support, general support, or post engineers) or borrow protective equipment and a paint booth and do the work yourself. Our recommendation is to brush or roller paint flight helmets outside of buildings. This method presents the least hassle for the ALSE person.

For more information

CARC is not the monster it's sometimes made out to be. But if you fail to identify the potential hazards and take the necessary precautions or control measures, it can be hazardous to your health. If you have questions or doubts about handling CARC, remember that your local industrial hygienist is a good source of information on the how-tos of avoiding excessive exposure.

For more information refer to the U.S. Army Environmental Hygiene Agency publication TG No. 144, TB 43-0242: CARC Spot Painting and the Army Safety Center pamphlet *Chemical Agent Resistant Coating*.

POCs: CW5 Daniel W. Medina, Operations and Investigations Division, DSN 558-9857 (205-255-9857) or MAJ Robert Pipkin, USASC Industrial Hygienist, DSN 558-3261 (205-255-3261)

Broken Wing award

The Broken Wing award is given in recognition of aircrewmembers who demonstrate a high degree of professional skill while actually recovering an aircraft from an in-flight failure or malfunction necessitating an emergency landing. Requirements for the award are spelled out in AR 672-74: Army Accident Prevention Awards Program.

■ **WO1 Robert Burnett, 1st Battalion (Attack), 2d Aviation Regiment, Aviation Brigade, 2d Infantry Division, APO AP 96257-04890.** About 45 minutes into the AH-1 mission, WO1 Burnett was in a narrow draw with steep ridges on three sides of the aircraft. The aircraft was at a stationary out-of-ground-effect hover, 200 feet above the floor of the draw with 80-percent torque applied. While the crew was performing unmasking procedures, the aircraft suddenly experienced a series of loud, sharp reports, severe vibrations, a rapid left yaw, decreasing engine and rotor RPM, and a significant loss of altitude. Rapidly assessing the situation as a catastrophic compressor stall and realizing that no landing areas were immediately available below and to the front of the aircraft, WO1 Burnett immediately reduced collective and executed a 90-degree descending right turn, matching his descent profile with the terrain. The aircraft vibrations continued to worsen as the engine compressor blades caused severe internal damage to the engine, resulting in a partial loss of engine power. As he cleared the draw, WO1 Burnett saw that the only available landing area was a small freshly plowed field at his 9 o'clock position. As he continued the turn to land into the wind, his copilot/gunner warned him of a set of wires obstructing the flight path. WO1 Burnett immediately executed a 45-degree left turn, avoided the wires, and using all available collective to cushion the landing, completed the landing with no damage to the aircraft.

■ **CW3 Thomas Michael Manhart, B Troop, 6th Squadron, 6th Cavalry, 11th Aviation Brigade, APO AE 09140.** During OGE hover, the AH-64 primary hydraulic bypass caution and master caution lights illuminated. CW3 Manhart returned the aircraft to the airfield. As the crew was preparing to initiate normal aircraft shutdown procedures, the main rotor system began an uncommanded left lateral roll. The collective was full down, and the cyclic was in the neutral position. Reacting immediately, CW3 Manhart applied right cyclic control to arrest the roll, which it did not do. When the right main landing gear began to rise off the ground and it was apparent that the main rotor system was going to contact the ground, CW3 Manhart applied collective pitch. The aircraft ascended to about 20 feet AGL. CW3 Manhart continued applying right cyclic until the backup control system activated and cyclic control was regained. CW3 Manhart then landed the aircraft and performed a normal shutdown. By quickly and appropriately reacting to a nonstandard emergency, CW3 Manhart prevented injury to personnel in the vicinity of the aircraft and catastrophic damage to his aircraft and other aircraft parked nearby.

■ **CW3 Kenneth T. Shannon, 229th Aviation Group (Attack) (Airborne), Fort Bragg.** Just before leveling and rolling the AH-64 out of a climbing right turn to the north, CW3 Shannon heard a loud pop. He immediately tried to trim the aircraft into straight and level flight but was unable to control the yaw. CW3 Shannon asked the general officer who was occupying the front seat during the orientation flight if his feet were resting on the antitorque pedals. The general responded that he was clear of all controls. CW3 Shannon determined that the tail rotor was fixed at a climb power setting. He declared an emergency and flew the aircraft back to the airfield where he made a successful roll-on landing at about 90 knots. Inspection revealed that the left transmission panel had peeled back in flight and an interior support structure of the panel had lodged against the tail rotor bell crank and locked it in position.

Airfield snow-removal and ice-control plans

Paragraph 2-10C of AR 420-72: Surfaced Areas, Bridges, Railroad Track and Associated Appurtenances, dated 28 March 1992, requires that all installations where snow and ice accumulate prepare snow-removal and ice-control plans. The Office of the Assistant Chief of Staff for Installation Management issued a message in December 1993 establishing a requirement that snow-removal and ice-control plans at installations that have airfields include applicable guidance contained in Federal Aviation Administration Advisory Circular (AC) 150/5200-30A: Airport Winter Safety and Operations, dated 1 October 1991. This additional requirement will be included in the next revision of AR 420-72.

Local airfield commanders and managers may obtain free copies of the FAA AC by sending a written request to U.S. Department of Transportation, General Services Section, M-443.2, Washington, DC 20590. Copies of AC 00-2.6: Advisory Circular Checklist are also available. This AC provides a listing and status of all ACs and certain other FAA publications.

POCs: Mr. Stan Nickell, Office of the Assistant Chief of Staff for Installation Management, DSN 345-0172 (703-345-0172) or FAX 345-0197; SFC John M. Morthole, USASC Aviation Branch, DSN 558-2119 (205-255-2119/3262)

Reminder: wear only authorized cold-weather clothing

Information from the field indicates that individuals who operate Army aviation aircraft and tracked vehicles have been seen wearing the polypropylene drawers and undershirt from the extended cold weather clothing system (ECWCS). The polypropylene material in the extended cold weather drawers and undershirt has a low melting point and does not have the temperature-resistant and flame-retardant characteristics of the Nomex fabric. When exposed to heat, the polypropylene material could melt to the individual's skin, causing severe burns.

The polypropylene drawers and undershirt should be worn with the items of the ECWCS only while individuals are engaged in outside activities and are not, repeat not, operating Army aviation equipment or tracked vehicles.

Authorized clothing

Individuals who operate Army aviation equipment or tracked vehicles and require some type of thermal undergarment should wear items that are made only of cotton, wool, or a cotton-wool blend. When operating Army aviation equipment, individuals whose primary duty is flying are authorized to wear only the clothing items that are listed in CTA 50-900: Common Table of Allowances for Clothing and Individual Equipment and chapters 3 and 22 of TM 10-8400-201-23: General Repair Procedures for Clothing, dated 7 May 1990. The only clothing items authorized for wear by operators of any type of tactical tracked vehicle are those listed in the CTA 50-900 and chapter 3 of TM 10-8400-201-23.

These clothing items authorized in CTA 50-900 and TM 10-8400-201-23 contain Nomex, a synthetic fabric that is high-temperature resistant and inherently flame retardant with no hot-melt point or drip characteristics. The fabric is lightweight and will not support combustion, but it is not fireproof and will begin to char at 700 to 800 degrees Fahrenheit.

—Adapted from Safety-of-Use Message (SOUM), SOUM-ATCOM-94-005, 291842Z Apr 94. POC: Mr. Steven Manos, Aviation and Troop Command, DSN 693-3980 (314-263-3980)

ALSE advisory message (94-02) Availability of PRC-90 series survival radios

PM ALSE has been contacted by a number of units asking about the availability of PRC-90 series radios. Units report that they have turned their inoperative radio(s) in to the supply system but have not received a replacement radio.

When units inquire about their PRC-90 radio(s), they are being told that there are no PRC-90 radios available. PM ALSE has recently learned that PRC-90 series radios are being held up in the depot due to a lack of funds by CECOM to release the radio(s).

In order for CECOM to release PRC-90 radio(s), units must prepare a memorandum that includes the following information:

- Name of organization requesting the radio(s)
- Number of radio(s) ordered
- Organization DODACC
- Organization UIC
- Organization telephone number: DSN and commercial
- Organization FAX number and E-mail address if available

The memorandum will also need to include justification for CECOM to fund the release of the PRC-90 radio(s). Reference to AR 95-3: Aviation General Provisions, Training, Standardization, and Resource Management, paragraph 7-6c and all applicable unit mission requirements for PRC-90 series radios should be included in the memorandum.

The completed memorandum with all required information should be forwarded to Commander, USA CECOM, Directorate of Materiel Management, ATTN: AMSEL-LC-MME, Fort Monmouth, NJ 07703-5000. Item manager is Hugh Garretson or Brenda Eichorn, FAX DSN 992-2850.

POC: SSG Stan Marmuziewicz, Office of the PM ALSE, Aviation and Troop Command, DSN 693-3573 (314-263-3573) or FAX 693-9078

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class B

H series - Aircraft was Chalk 2 in flight of three en route to NTC when Chalk 3 noted that Chalk 2 was producing smoke. During precautionary landing, Chalk 2 landed hard and sustained major damage. Suspect engine failed.

UH-1 Class C

H series - During postflight inspection, crew found deep creases located about 20 inches from ends of main rotor blades.

UH-60 Class C

A series - After refueling at field site and while circling to land from 80 feet AGL to confined area with known dust, pilot on controls in left seat selected landing reference point and initiated shallow to normal angle of approach. As dust cloud developed, tail wheel contacted ground and continued to roll forward about 22 feet before fuselage wheels contacted ground. Aircraft came to full stop after rolling another 11 feet. As dust settled, crew chief who was sitting on right side of aircraft noted and told pilots that main rotor blades were contacting tree on left side. PC took controls and repositioned aircraft about 3 feet to the right. Postflight inspection revealed damage to all four main rotor tip caps.

A series - While taxiing out of parking, aircraft struck a parked UH-1. All main rotor tip caps of UH-60 and tail rotor and FM antenna of UH-1 sustained damaged.

L series - During multiship landing, aircraft's main rotor blades struck unidentified object. None of the four crewmembers or passenger noticed the contact while landing or departing the LZ. During postflight inspection, crew did not find damage to main rotor blades; crew chief found damage during 10-hour inspection.

L series - Following maintenance, crew started APU and engines without incident. Power control levers remained at idle while PC programmed points into GPS. Six other aircraft were parked in same vicinity at idle. About 10 minutes later, crew advanced power control levers to fly. After 3 to 5 minutes at 100 percent, crew heard loud bang. Pilot felt cyclic move forward and left about half an inch. Crew performed emergency shutdown. As rotor system coasted down, crew discovered FOD damage on leading edge of black main rotor blade.

UH-60 Class D

L series - As aircraft picked up M119 Howitzer, crew chief saw that sling leg was entangled on gun. Load stabilized with muzzle pointed to ground. PC lowered load to ground, and it came to rest in upright position. Crew released load and landed without further incident.

Attack

AH-1 Class C

F series - During approach, 20mm gun contacted ground and broke off aircraft. PC reacted to impact and applied aft cyclic. Because of shift in CG and loss of 20mm gun, tail stinger contacted ground. PC regained control of aircraft, repositioned off runway about 100 feet, and completed landing and shutdown without further incident.

AH-1 Class E

F series - Aircraft landed adjacent to OH-58A that was operating at engine idle. AH-1 rotorwash blew right-side pilot door out of OH-58 pilot's hand. Door did not strike anything else and except for the hinges was undamaged.

F series - During hover check with 80 percent torque applied, aircraft had insufficient left pedal to complete 360-degree turn. Crew completed landing without further incident. Maintenance found tail rotor control tube was rubbing against guide grommet.

Cargo

CH-47 Class A

D series - During day VFR cross-country training mission, crew was performing unauthorized NOE terrain flight when aircraft struck wires at about 50 feet over river and crashed. Four fatalities.

CH-47 Class B

D series - During night slingload operation, crew dropped M198 Howitzer.

CH-47 Class E

D series - After repositioning aircraft for tandem hookup of three blivets of JP-8, forward hookup was conducted with one person attaching sling to hook and another person on ground with grounding rod. After attaching forward sling, flight engineer gave command to move forward to get aft hook over blivet for hookup. Because hookup person was standing on ground in front of blivets, aircraft was approximately 1 to 2 feet above load. Upon moving forward, aircraft settled about 1 to 2 feet and struck blivet with hook. Crew released load and returned to parking. About 60 gallons of fuel leaked from blivet before hole was plugged and blivet defueled.

D series - While in cruise flight, PC attempted to open map. Map was drawn out of left pilot's vent window, striking and breaking HF antenna.

Observation

OH-6 Class A

J series - After completion of firing during aerial gunnery, pilot initiated right turn away from target. Aircraft continued in right descending turn and impacted ground, followed by immediate explosion/fire. One fatality.

OH-6 Class C

A series - During engine runup, PC was performing checks as AO read checklist. AO called for "throttle full open." PC rolled throttle full open and noted N2 was in green arc. PC then called for next item on checklist. Neither crewmember checked to see where RPM peaked. About 15 to 30 seconds later, crew noticed N2 was between 106 and 107 percent. N2 RPM beep switch had been checked during daily and was left at full beep. Engine overspeed necessitated changing engine.

J series - During firing of M134 7.62mm machine guns, barrel clamp bolt came out, allowing flash suppressor and barrel clamp to come off. Aircraft sustained damage as bullets struck and ricocheted off barrel clamp.

OH-58 Class C

A series - Aircraft experienced low rotor RPM, and crew executed precautionary landing in area being cleared of trees. Upon arriving to retrieve aircraft, maintenance test pilot raised engine RPM to 103 percent and lifted aircraft for relocation to more suitable position for further maintenance inspection. Main rotor blades clipped 3-inch-diameter tree. Both blades sustained significant damage and WSPS was forced through bottom of chin bubble.

OH-58 Class D

C series - During termination with power autorotation, IP failed to notice pilot

had not rolled throttle back on. IP attempted recovery by simultaneously increasing throttle and collective during landing. Torque spiked to 110 percent during maneuver.

OH-58 Class E

D series - While hovering for takeoff, crew noticed smoke but did not smell any smoke in cockpit. PC landed aircraft and could not find any fire. As crew was returning aircraft to parking, crew again saw smoke. Postflight inspection revealed that transformer rectifier unit (TRU) cooling fan bearing had frozen, causing TRU to overheat and warp top cover.

Messages

■ Safety-of-flight operational message concerning flight maneuver prohibition for OH-58D and improved OH-58D aircraft (OH-58-94-04, 201815Z July 94). Summary: Investigation of recent engine flameouts which initially centered on overhauled engines and/or fuel controls revealed higher than expected fuel pump bypass pressures during certain engine operations. This high bypass pressure situation affected the fuel control, causing interrupted fuel supply to the engine fuel nozzle and resultant engine flameout. Investigation of affected pumps found that the bypass pressures were beyond calibration tolerances as a result of surface damage to the pump jet inducer nozzle. Use of drill bits as gauges during inspection of the inducer jet orifice is considered the probable cause for the damage to the nozzle. Steps have been taken to require the use of precision gauge pins during overhaul/repair of the fuel pump and to provide instruction for mandatory documentation of fuel pump bypass pressure. The purpose of this message is to provide inspection and reporting instructions for suspect engine fuel pumps and a plan to replace them with serviceable pumps, and to rescind the limitations imposed by SOF messages OH-58-94-02 and- 03. Contact: Mr. Lyell Myers, DSN 693-2258/2085 (314-263-2258/2085).

■ Aviation safety action informational message concerning Hydra 70 rocket firing from Army helicopters (GEN-94-ASAM-09, 081653Z Aug 94). Summary: Reports from the field indicate that specific Hydra 70 rocket motor exhaust debris from certain production lots are causing damage to Army helicopters. The damage consists of large dents in the skin (up to 7 inches long and half an inch deep) and sometimes holes (up to half an inch in diameter). This damage can occur to stabilators/elevators, skin, and tail rotors. The purpose of this message is to inform aviation units of the suspension of Hydra 70 rockets referenced in this message by AMCCOM. Contact: Mr. Jim Wilkins, DSN 693-2285/2085 (314-263-2285/2085).

■ Aviation safety action informational message concerning maintenance expenditure limits for Army aircraft and TM 1-1500-328-23, 28 February 1991, aeronautical equipment maintenance policies and procedures (GEN-94-ASAM-10, 091730Z Aug 94). Summary: GEN-93-ASAM-13 required all requests for disposition or waiver of deteriorated, damaged, or destroyed aircraft to be forwarded to AMSAT-I-MDM. This address is in error. All requests for disposition of damaged, destroyed, or deteriorated aircraft should be sent to USAATCOM, ATTN: AMSAT-I-SB. TM 1-1500-328-23 does not contain procedures for an AVIM unit to be approved to perform depot-level repair of an item. These procedures and other corrections are identified in this message. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

FOR MORE INFORMATION ON SELECTED ACCIDENT BRIEFS, CALL DSN 558-2119 (205-255-2119).

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—POC: MS. SHARREL FOREHAND, MEDIA MANAGEMENT AND PRODUCTION, DSN 558-2062/3014 (205-255-2062/3014)

In this issue:

- *Surviving a crash . . . and confronting the cold*
- *It can't work if it isn't turned on*
- *"Grizzly Flight" celebrates 30 years of safety excellence*
- *ALSE alert: CARC paint on flight helmets*
- *Airfield snow-removal and ice-control plans*
- *Reminder: wear only authorized cold-weather clothing*
- *ALSE advisory message (94-02) Availability of PRC-90 series survival radios*

Class A Accidents *through August*

		Class A Flight Accidents		Army Military Fatalities	
		93	94	93	94
1ST QTR	October	6	2	2	0
	November	2	3	6	0
	December	0	2	0	2
2D QTR	January	1	1	0	2
	February	5	2	8	0
	March	1	0	5	0
3D QTR	April	4	5	0	2
	May	1	1	1	0
	June	0	0	0	0
4TH QTR	July	0	5	0	5
	August	1	1	0	0
	September	2		0	
	TOTAL	23	22	22	11

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