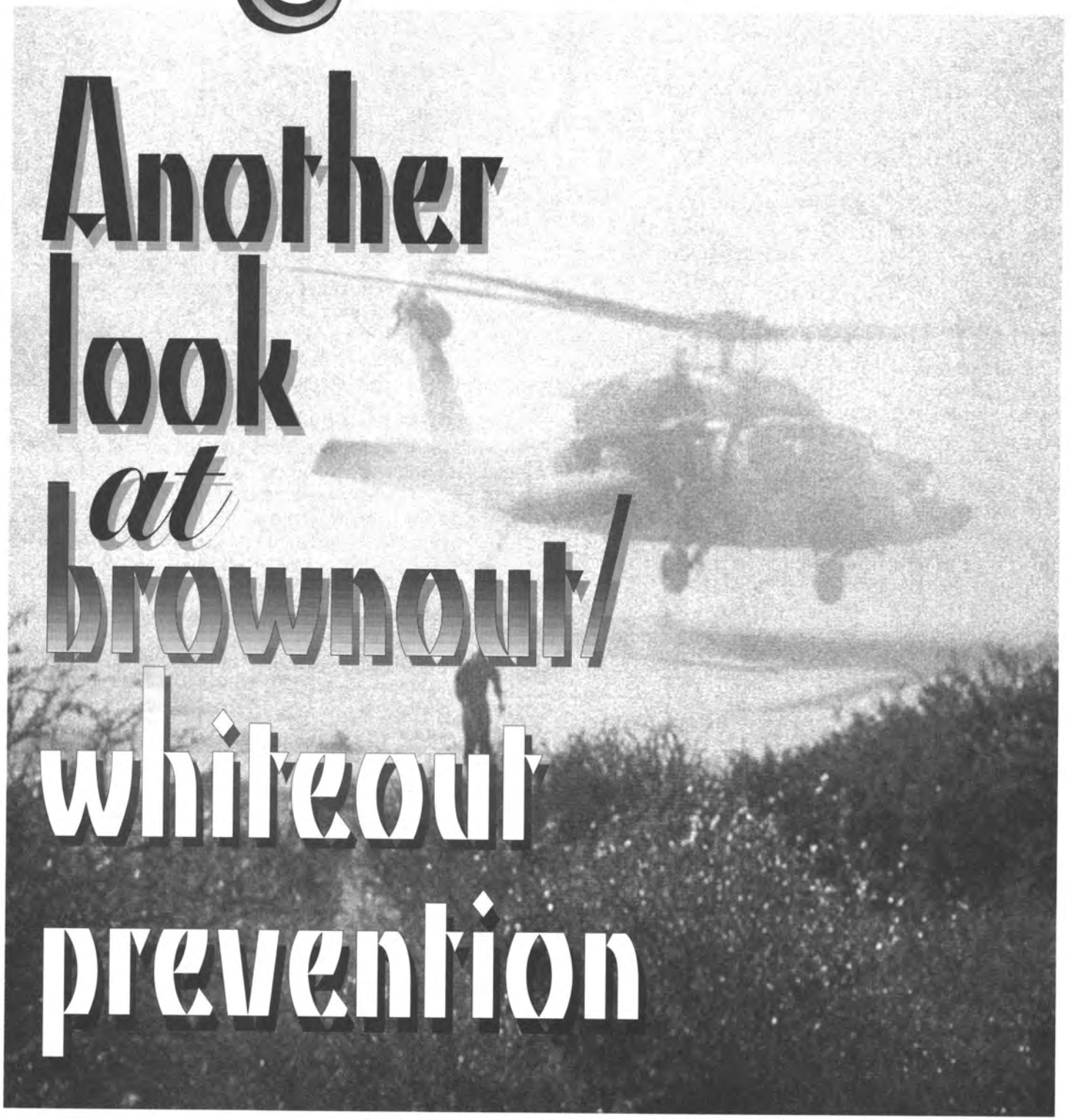
FlightFax

REPORT of ARMY AIRCRAFT ACCIDENTS

April 1995 ◆ Vol 23 ◆ No 7



Another look *at* brownout/whiteout prevention

Property of U.S. Army Aviation Technical Library
Fort Rucker, AL 36362-5163

Operating in limited-visibility conditions caused by blowing snow or dust can be challenging, risky, and potentially destructive. In this issue of FlightFax, one commander shares his unit's search for safer brownout/whiteout operating techniques and provides a sample of their new blowing dust/snow SOP in the hope that others may find his unit's experience and new techniques helpful.

Desert operations revisited: a success story

The January 1994 issue of *FlightFax* featured an article entitled "Brownout/Whiteout Prevention Techniques" by LTC William A. Tucker and MAJ Richard Young of the Army Safety Center. As a battalion commander who had suffered one Class C and a few Class D and E accidents and incidents at the National Training Center in August 1993, I had a vested interest in whatever the authors had to say. The desert had not been very good to me, and despite my experiences as a brigade XO during Desert Storm with an accident-free brigade, I needed advice, guidance, and some good ideas.

Tips and techniques provided

The authors offered just that, including some rather obvious points to consider. Reviewing flight manuals and other sources on techniques and tips for brownout conditions is one thing; anticipating and planning for such conditions is another. And we had done all of that prior to our rotation to the NTC in August of 1993. Clearly there was more to this.

LTC Tucker and MAJ Young also offered advice on takeoffs, landings, taxiing, and crew coordination. Many of their ideas seemed logical and easy to grasp, but our experiences as an air assault battalion at the NTC provided some contradictory evidence.

For instance, the authors recommended 30 seconds to 1 minute separation on takeoffs and landings "to allow the previous aircraft's dust to dissipate during multiship operations." Our multiship operations typically included more than 20 mission UH-60s in serials of 5 or 6 aircraft. While a 1-minute separation time would give our ground tactical commanders the ability to mass combat power on an LZ or objective, we found that without a stiff breeze (over 15 knots), the dust clouds would not dissipate unless we had 2- to 5-minute separations. Under NVGs (our normal mission profile) and with zero illumination conditions, vast dense clouds sat on our previous landing sites and back in our PZs.

Perhaps the greatest area of discussion among my leadership was the part of the article where the authors mentioned two landing techniques: roll-on and a "high hover over your intended landing point, and then slowly hover straight down." The roll-on proved disastrous in my August 1993 NTC rotation, because no matter how we tried to beat the dust cloud following us to the ground, we seemed to bump into ruts, fighting positions, brush, or rocks with our forward roll. The high-hover technique seemed unthinkable in the conditions we encountered where huge clouds stirred up by our rotor vortices grew all around any aircraft attempting to hover for any brief period.

Searching for new techniques

What then were the techniques I needed to train my crews that would ensure maximum safety, minimum damage, and still allow me to rapidly build combat power on the LZ?

I called the authors and told them that I had convened a panel composed of my standardization instructor pilot (SP), instructor pilots (IPs), unit trainers (UTs), and flight leads and had given them the task of analyzing our past rotation's mission profiles, accident reports, after action reviews, and interviews with crewmembers. I wanted an exhaustive reconstruction of events, conditions, and mission analysis. The result would be the drafting of a new dust/snow SOP for brigade and division review. With the wholehearted support of the brigade and division safety offices, we began our self-examination.

Results of the analysis

Clearly, the accident reviews pointed to similar circumstances encountered by my crews: multiship formations, arriving at PZs or LZs and finding an incredible amount of residual dust that would not dissipate, and attempts to "outrun" the dust cloud formed by the landing aircraft, which often resulted in aircraft slamming into objects on the ground, damaging sheet metal, landing/searchlights, or MILES gear.

My SP summed up the thoughts of the reviewers: "We think that our forward momentum is the cause of most of

our problems. If we can find a way to land with little, or better yet, zero forward ground roll, we'll probably see a tremendous reduction in incidents." Additionally, we formed a consensus on several other issues—

- Multiship formations need greater separation by either time or distance, requiring our infantry brothers to "rethink" their ground tactical plans.
- PZ/LZ reconnaissance by flight leads is crucial to determining suitability and the "on-scene" conditions.
- PZs must allow for greater physical separation between aircraft on the ground to prevent these locations from becoming totally browned out.
- Slingload operations at night under NVGs are high-risk and should be considered only as a last resort.
- Day slingloads are a challenge and can be detrimental to engine health over the long run, but they are doable.

The new draft SOP was completed over the cold, wet winter months at Fort Campbell. During this period, no suitable dusty or snowy conditions existed in the local flying area where we might attempt to validate our findings.

A training opportunity

In March 1994, we were alerted to provide a company of Black Hawks to go to the NTC to support the famous digitized rotation of the 24th Aviation Brigade. Here was our opportunity to see if the new techniques would work.

In addition to this unforeseen training opportunity, we would also benefit from a more extensive environmental train-up period than previously offered. Once we arrived and completed our mandatory safety classes, the NTC was going to give us almost 1 week of desert flight operations "in the box." Never before, in my experience, has a unit been given the chance to train in the area of operations they would be "fighting" in. We would make the most of this opportunity.

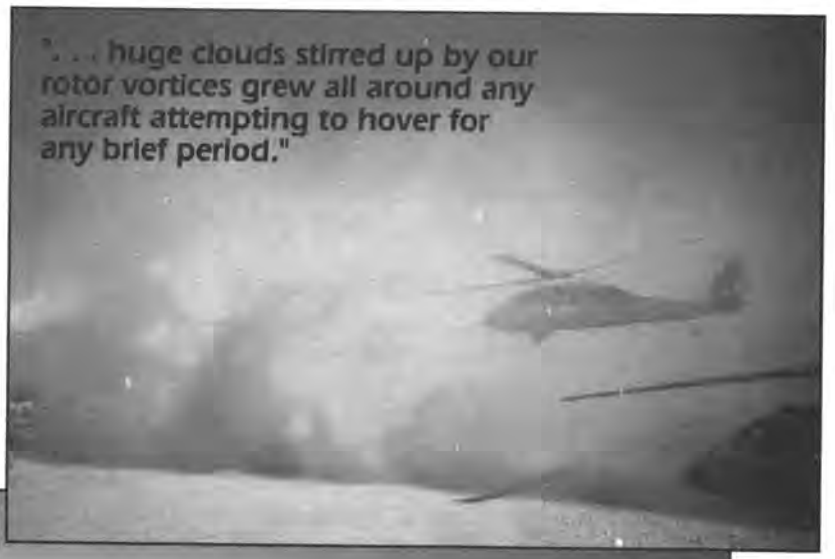
Our philosophy was the same as that established during Operation Desert Storm—crawl, walk, run. My "task force" was composed of crews from both of my line companies. An IP first trained the UTs and flight leads for each company. They, in turn, trained other PCs and crew chiefs. After a week, even the doubters had been won over.

What was the new technique?

The "desert think tank" had come to the conclusion that there should be a way to land in a desert/dust environment that, in all but the most severe conditions, will allow the crew to maintain visual contact with the ground. It must also preclude forward momentum to avoid "going bump in the night."

In theory, what they agreed upon was a modified "steep" approach to a preselected (by the PC) touchdown point. The vertical descent should delay the cloud buildup, while the slower forward airspeed would still allow time for the aircraft to proceed in front of the cloud.

In practice, what actually happened was that the dust cloud would advance forward, with the crew chief calling its position: "tail, cargo door, gunner's window." Then if the pilot's patience held up, we found that the cloud continued past the cockpit and left the crew with a fairly unobscured view of the landing point. If the crew felt uncomfortable, they merely executed a go-around and returned to another location. Many hours of practice led to confidence, skill, and zero incidents.



". . . huge clouds stirred up by our rotor vortices grew all around any aircraft attempting to hover for any brief period."

The rotation was an unqualified success. We flew missions of every type and under a wide variety of conditions. All of the crews came back to Fort Campbell with rave reviews of our new technique. As the weather improved in the late spring of 1994, we were able to go out to our local training area and find some truly challenging dusty landing areas. The rest of the crews in the battalion got trained on the new technique by our desert-experienced crews. The objective was our next battalion rotation, 94-09, which would be the first-ever Air Assault rotation at NTC.

NTC rotation 94-09

We flew six brigade and battalion air assaults, typically employing 24 mission UH-60As/Ls, 3 UH-60 spares, a DART/SAR aircraft, a command and control console bird, 3 EH-60s, 3 UH-60V medevac aircraft, and 8 CH-47Ds. The battalion had zero accidents or incidents and caused the chief of the operations group to say that rotation 94-09 was the safest aviation rotation ever at the NTC.

Keys to success

Our success hinged on the following three key factors.

■ Breaking the mindset that forward roll was the answer to overcoming the dust clouds. Unless you fly and work in a flat, almost featureless desert, forward roll will ultimately do you more harm than good. There are just too many random things to bump into—day or night.

■ Being very critical in the selection of PZs and LZs. PZs should always be reconned for every type of aircraft that will use them; for example, CH-47s present a different challenge than an OH-58. LZ selection should include a recon if possible. If that is not possible, a map recon for slope, vegetation, or surface composition should be performed.

■ Training up as crews—day, night, NVG, and then NVG-in-formation modes. I cannot overemphasize the importance of this. The confidence building and team building that goes on through such a process is invaluable. You can tell your crew what it will be like, or you can go through it together, collectively analyzing the risks, techniques, and lessons learned along the way. When you have completed numerous repetitions of landing in increasingly tougher conditions, the shared knowledge and expertise is a combat multiplier.

I am proud of the accomplishments of some very fine soldiers who conceived the techniques, trained others to do them properly, and who refused to accept the results of the previous year as "the cost of doing business at NTC." Clearly these aviators relished the challenge and thoroughly enjoyed proving what proud professionals everywhere in Army aviation know—you can always find a way to do difficult things with less risk through good training.

POC: LTC Marshall T. Hillard, Commander, 4th Battalion, 101st Aviation Regiment, Fort Campbell, DSN 635-4015/3189 (502-798-4015/3189)

Sample blowing dust/blowing snow SOP

Editor's note: The following is a copy of the SOP that was developed by the 4-101 Aviation Regiment (Assault). The techniques described in this SOP are not official Army doctrine; they are provided for your information, consideration, or possible adaptation for use within your unit.

Appendix 1: Blowing Dust/Snow SOP to Annex F: Standardization of Task Force 4-101 Tactical SOP

1. **REFERENCES.**
   a. AR 95-Series
   b. FM 1-202.
   c. FM 1-203.
   d. FM 1-230.
   e. FM 1-301.
   f. FM 1-400.
   g. TC 1-202.
   h. TC 1-204.
   i. TC 1-212.

2. **MISSION AND CONTINUATION TRAINING.**

a. During RL progression training, unit trainers and evaluators will demonstrate flight techniques to be used when brownout/whiteout conditions are encountered. Tasks to be demonstrated include:

(1) Hovering flight.
(2) Ground taxi.
(3) VMC takeoff.
(4) VMC approach.
(5) IIMC procedures.

b. If crews have not operated in a dust/snow environment in the past 90 days, they should perform a day rehearsal (flight), when possible, prior to conducting a multiship, NVG mission.

3. **TRAINING FOR DEPLOYMENT.**

a. Before deployment to a dust/snow environment, all crews will receive academic training on how to perform dust landings and takeoffs. All crews should as a minimum review the ATM tasks listed above (paragraph 2a). The following academic instruction will be scheduled:

(1) D/N/NVG flight techniques for blowing dust/snow conditions.

(2) Multihelicopter operations in blowing dust/snow conditions.

(3) Use of landing/searchlight and position lights in blowing dust/snow conditions.

(4) Areas where blowing dust/snow can be expected to occur.

(5) Techniques for attempting to dissipate effects of blowing dust/snow before takeoff.

b. After deployment to a dust/snow environment and before performing missions, all crews will perform environmental training. Environmental training should be completed in four phases:

(1) *Phase one: standardization flight*. All IPs and UTs should conduct a standardization flight during day conditions. The purpose of the standardization flight is to ensure that all trainers are teaching the same snow/dust landing techniques. Single-ship and multiship operations should be conducted. It is not necessary for all trainers to fly with one IP. Ideally, two or more aircraft are used for the standardization flight. Then after each multiship landing, landing techniques can be critiqued. If an IP or UT has not flown in a dust/snow environment in the previous 12 months, an NVG standardization flight should also be conducted.

(2) *Phase two: individual training*. As a minimum, all crewmembers who have not flown in a dust/snow environment in the previous 12 months will fly with an IP or UT during day and NVG conditions. The IP or UT will demonstrate the different landing techniques for dust/snow conditions.

(3) *Phase three: collective training, single-ship*. All crewmembers will conduct dust/snow landings under first day and then NVG conditions. Crewmembers should fly with the crewmembers they are planning to fly missions with. The purpose of this flight is to allow crewmembers to work together and to build **confidence** in their landing techniques prior to conducting air assault operations.

(4) *Phase four: collective training, multiship*. All crewmembers should conduct multiship dust/snow landings under first day and then NVG conditions.

c. These phases can be completed simultaneously. Some crewmembers may be performing phase one and two on one day, while others are performing phase three and four.

d. Crew chiefs and pilots should be trained simultaneously. Crew chiefs will be instructed to:

(1) Advise pilots of the relative position of the dust/snow cloud during approach, landing, and ground taxi operations.

(2) Assist in identifying hazards and avoiding obstacles in blowing dust/snow conditions.

(3) Assist pilots in recognizing and controlling drift if engulfed in the dust/snow cloud before landing or during takeoff.

(4) Advise pilots of the thickness of the dust cloud.

4. **FLIGHT TASKS**. A description of how to perform flight tasks:

a. *Before takeoff*: Align aircraft with desired takeoff heading if possible. Set the attitude indicator for takeoff if the aircraft is on level terrain. Crews should exercise caution when performing a takeoff in snow, because the

wheels may be frozen to the ground. If snow is only a few inches thick, apply sufficient pitch to blow away loose snow but not enough to lift the helicopter. This should reduce the amount of snow blown up during actual takeoff. In a dusty environment, power applications should be minimized before takeoff.

b. *Takeoff*: Determine points for ground track, place cyclic in neutral position and smoothly increase collective and maintain heading with pedals. A near-vertical ascent will be required until clear of the snow/dust cloud. Continue to increase collective to obtain power necessary to clear obstacles without exceeding aircraft limitations. Maintain takeoff heading with pedals and takeoff attitude with cyclic. Blowing snow/dust may increase and ground references may be lost. If this happens, transition to flight instruments and continue climb as in ATM task 1075 (ITO). Once clear of snow/dust cloud, adjust torque, attitude, and airspeed as necessary to achieve normal or desired rate of climb.

c. *Hover*: Hovering may not be possible in a dusty/snowy environment. Hovering should only be attempted when snow/dust is minimum. When picking up to a hover, attempt to blow loose snow/dust away by smoothly increasing collective until aircraft is light on wheels. Once snow/dust cloud has dissipated, apply pressure and counterpressure on pedals to ensure aircraft is free to ascend. While maintaining heading with pedals, coordinate cyclic for a vertical ascent to a higher than normal hover height (20 to 25 feet). Aircraft should be flown at a higher than normal hover height and taxied at a taxi speed that is slightly faster than ETL. A snow/dust environment provides little contrast or reference points. To avoid spatial disorientation, maintain proper visual scan techniques. If visual references are lost, apply sufficient power for ITO. If takeoff is not feasible, attempt to maneuver the aircraft forward and down to the ground to limit the possibility of sideward or rearward movement.

d. *Landing*:

(1) Roll on—touchdown ahead of dust/snow cloud. *It will be performed only at an improved landing site or when landing surface is free of obstructions*. Determine an approach angle that allows safe obstacle clearance to arrive at the intended point of landing. Adjust collective as necessary to establish and maintain the angle. Maintain entry airspeed until apparent rate of closure and ground speed appear to be increasing. Maintain ground track alignment with landing direction by maintaining aircraft in trim above 100 feet AGL and aligning the aircraft with the landing direction below 100 feet AGL. Control rate of descent at touchdown with collective. Maintain aircraft attitude and landing alignment with cyclic and heading with pedals. During the last 50 feet of the approach and touchdown, airspeed should be at or slightly above ETL as necessary to avoid the possibility of brownout/whiteout and keep the snow or dust cloud behind the cockpit. After ground contact, ensure the aircraft remains stable as collective is lowered. Maintain heading with pedals and ground track with cyclic. Apply brakes as necessary.

(2) VMC approach to the ground (minimum forward ground roll). *It will be performed to an unimproved landing site*. Crew must be able to see through dust/snow cloud. The approach is steeper and slightly faster than a normal VMC approach to the ground. This approach will be initiated at approximately 50 feet and at an airspeed of less than 50 knots and above ETL. The idea is to be high enough not to stir up dust/snow for the aircraft behind you and to be slow enough that you don't have to put the aircraft in a nose-high attitude. Select a landing point and then initiate an approach by reducing collective to establish a descent. Maintain proper attitude with cyclic and heading with pedals. Prior to touchdown, it is normal for the dust cloud to engulf the aircraft. However, the dust cloud will move in front of the nose and visual contact with the ground can be maintained. If visual contact with the ground is lost, initiate a go-around. After ground contact, ensure the aircraft remains stable as collective is lowered. Apply brakes immediately. Touch down with *minimum* forward ground roll.

NOTE 1: Adequate reference features and lines of contrast are required to minimize drift and reduce the possibility of brownout/whiteout. It is helpful to initiate an approach to an area where there are small shrubs or bushes.

NOTE 2: The possibility of inadvertent IMC exists during snow/dust operations and the appropriate actions should be discussed before landing. The decision to continue or perform a go-around should be made prior to descending below obstacles, entering a snow/dust cloud, or decelerating below ETL. However, if IMC is encountered prior to touchdown, inadvertent IMC procedures will be initiated immediately.

NOTE 3: The roll-on landing technique will only be attempted to an improved landing area or when the landing surface is free of obstacles.

NOTE 4: The conditions at some unimproved PZs/LZs may be such that brownout/whiteout may occur when performing the VMC approach-to-the-ground technique. If this occurs, initiate a go-around and land at an alternate

location. *Do not attempt the roll-on landing technique.* These locations will not be used for air assault operations.

NOTE 5: OGE power is required for takeoffs and landings in a snow/dust environment.

NOTE 6: Whenever possible, the aircraft should be ground taxied to keep the dust/snow cloud to a minimum.

NOTE 7: It is very important to attempt to land with a headwind or crosswind. Landing with a tailwind should be avoided.

5. **MULTISHIP.**

a. The maximum number of aircraft for dust/snow

takeoffs and landings is dependent upon environmental conditions but should not exceed six.

b. The preferred landing and takeoff formations are staggered or echelon.

c. If landing to a dirt strip and the landing site is too narrow to land staggered or echelon, the aircraft should do approaches one at a time. Trail formation landings should be avoided.

d. When coming in for landing, aircraft should stack down if possible and all should initiate the approach simultaneously. To stack down, the lead aircraft may need to initiate an approach from 75 feet in order for trail to start at 50 feet.

e. During formation landings, aircraft should land far enough apart to avoid encountering the dust from the aircraft in front of them.

6. **PZ/LZ OPERATIONS.**

a. In a dust/snow environment, PZs/LZs will be reconned if possible before conducting air assault operations. This recon should be performed in an aircraft (daytime) to determine suitability. If it is an unimproved landing area, the VMC approach-to-the-ground technique will be used by the recon aircraft. If brownout/whiteout occurs before touchdown, the area will not be used for air assault operations.

NOTE 1: At the NTC during the train-up period, commanders should recon areas to determine suitability for possible PZs/LZs.

b. Large LZs/PZs will be selected.

c. In a dust/snow environment, do not bring 15 aircraft into one PZ. Disperse the aircraft into three or four different PZs. This will minimize the dust/snow.

d. It is very important to attempt to land with a headwind or crosswind. Landing with a tailwind should be avoided.

7. **EXTERNAL LOAD OPERATIONS.**

a. Slingload operations should only be conducted in areas where visual contact with the ground is possible. Slingload operations are extremely difficult in areas where brownout/whiteout occurs.

b. Before conducting slingload operations, the PZs and LZs should be reconned in a UH-60 aircraft if at all possible (during day conditions) to determine if visual contact with the ground can be maintained.

c. Before attempting slingload operations, a dust-free recovery airfield/area will be identified and briefed.

d. All external-load operations will be briefed as high risk and will require the approval of the battalion commander.

8. **NVG CONSIDERATIONS.**

a. Surface conditions will be more difficult to judge at night. The possibility of spatial disorientation due to limited reference and contrast will increase at night. It is very helpful to do your approaches to areas where there are small shrubs or bushes. As you do your VMC approach to the ground, the shrubs provide the necessary contrast.

b. Use of the position lights and searchlights may increase contrast and reference points during landings. However, use of the searchlight or position lights may cause NVGs to shut down if a snow/dust cloud develops around the aircraft. It is normally best to leave the searchlight on and place the position lights on steady dim for approaches. If you place the position lights on steady bright, it tends to bleach out the landing environment. The searchlight provides the necessary illumination to see the landing environment and can be dimmed if necessary.

c. Air assault operations should be conducted inside the NVG window (moon angle is greater than 30 degrees with 23 percent or greater illumination) whenever possible. Outside the NVG window, there is hardly any contrast above 50 feet and it is almost impossible to see a horizon. If conducted outside the NVG window, the mission will be briefed as high risk and will require the battalion commander's approval. ❑

Quality crews . . . good decisions

Armed with a cool head, experience, and training, an extremely dangerous situation can be handled effectively.

We hear it repeatedly: approximately 80 percent of all reported accidents are attributed to *human factors*. Someone made a mistake, someone violated regulations or policies, or someone did not follow procedures as specified in the dash 10 or aircrew training manual. What we don't hear often enough are reports about those accidents that were prevented or minimized due to superior judgment and skill of the individual—the *human*—at the controls.

Until the middle of December, Army aviation enjoyed an exceptional flight safety record for the first quarter of a fiscal year. The outstanding safety record for early FY 1995 can be attributed to crewmembers who were able to correctly identify and assess hazards, accurately diagnose an emergency, analyze the situation quickly, and execute emergency procedures with learned exactness. While I know there are many others out there who deserve equal credit for outstanding performance, I am personally aware of two recent cases in which the crews deserve recognition for their performance.

■ In November 1994, Mr. Mel Strobel, a contract instrument instructor pilot was conducting instrument flight training in a UH-1 under actual instrument conditions with 2LT Mike Mora, a student pilot. Due to deteriorating weather conditions, Mr. Strobel decided to conduct the instrument approaches at Cairns Army Airfield, Fort Rucker, AL. During ATC vectoring to the final approach course, he had monitored other aircraft reports of breaking out of the clouds at 300 feet AGL and 1 mile from the airfield.

In actual weather conditions at approximately 1,500 feet AGL, 2LT Mora established the aircraft on the final approach course 3 miles from the airfield and the master caution and engine chip lights illuminated. A decision had to be made. At that moment, the aircraft entered a "sucker hole" approximately ¼-mile in diameter. Mr. Strobel saw the ground and saw a wall of clouds approach as they neared the airfield. Examining his options, he elected to initiate a circling descent to land in the only area they could see rather than continue to the airfield.

Mr. Strobel took the aircraft controls and selected his landing area based on his limited visibility. 2LT Mora performed those crew actions that allowed Mr. Strobel to concentrate on landing. As they continued their descent, the aircraft engine seized. Mr. Strobel continued his descending turn and committed to his landing area. He estimated that they had made three complete 180-degree turns during the descent to keep the ground in sight. As he approached the ground, he leveled the aircraft, flared, and cushioned, knowing he had to minimize his ground run. The aircraft landed in a soft, sandy field with minimum ground run and suffered only minimal damage due to the expert handling by the pilot.

Mr. Strobel has an extensive flight background that includes 12 years as an active-duty pilot, continued Reserve flight training, and 12 years as a contract instructor pilot for the Army. His flight experience, coupled with his level of comfort conducting instrument flight, enabled him to remain cool and collected as he evaluated the signals from the aircraft. His decision to remain in the limited "sucker hole" was a decision to play it safe rather than to try to make it to home base. Mr. Strobel's excellent decision to land immediately in the only area he could see paid off and saved the aircraft and crew.

■ An RV-1D Mohawk pilot and air intelligence specialist were conducting a mission in actual weather conditions at altitude. When their VHF radio became inoperative, LTC Richard Leyden, the pilot-in-command, elected to abort the mission, as required by the unit SOP. As they were en route to their home base and descending from altitude of 12,000 feet MSL, both engines quit.

Once LTC Leyden determined that he had no engine response, he elected not to eject as is recommended. At this point he was still in the clouds, was uncertain if he was over the ocean or near a populated area, or if he had a suitable landing area available. He continued the descent until he had visibility with the ground (about 2,000 feet AGL) and he was able to determine that he had no suitable landing area. He trimmed the aircraft level, aiming toward an area that did not appear to be populated. LTC Leyden instructed the observer to eject, and he followed as the aircraft passed through 800 feet AGL. Both crewmembers landed safely and uninjured.

Even though the aircraft was totally destroyed, no property or personnel were injured because of LTC Leyden's decisions and actions. He had 16 years as an aviator, most of them in fixed wing aircraft. Even though I'm sure he was experiencing a high degree of anxiety, LTC Leyden kept cool and made the best decision possible when he ejected from the aircraft.

These are but two examples demonstrating that Army aviation has quality aircrews who identify and assess hazards and make good risk decisions daily. When Mr. Strobel and LTC Leyden were presented with an emergency situation, they made smart decisions based on the immediate situation and their aviation experience and training. They were understandably excited but remained calm and collected and were able to perform in the professional, skillful manner required to keep a bad situation from becoming a tragedy.

—MAJ Paul E. Nagy, nagyp@rucker-safety.army.mil, DSN 558-3262 (334-255-3262)

AH-64 tail wheel locking mechanism

In a recent AH-64 Class C accident, the crew could not get the tail-wheel-unlocked light to illuminate prior to ground taxi. The pilot in the front seat directed the crew chief to visually confirm that there was no tail wheel safety pin installed. After visual confirmation that no tail wheel safety pin was installed, the crew elected to hover taxi to an adjacent parking ramp.

After landing the aircraft, the crew again attempted to get the tail wheel to unlock by applying slight pressure to the tail rotor control pedals. As the crew applied pressure, the tail wheel swiveled. However, the tail-wheel-unlocked light did not illuminate.

During postflight inspection following a maintenance test flight, the crew found damage to the tail wheel trailing arms and tail wheel locking mechanism. Maintenance inspection revealed that the interior surface of the tail wheel fork assembly bearing sleeve was excessively worn, causing the tail lock pin to stick in the locked position.

Contributing causes

Recent accumulations of ice and snow in combination with below-freezing temperatures may also have contributed to the tail wheel locking pin becoming stuck in the locked position. The moisture and ice may have accumulated inside the bearing sleeve, further restricting the movement of the tail wheel locking pin.

The pilot on the controls may have applied excessive pressure to the tail rotor control pedal when trying to unstick the tail wheel locking pin. This excessive pressure may have caused the tail wheel pin to shear.

Prevention measures

- Ensure aircrews and maintenance personnel are aware of the potential problem.
- Look for excessive wear of the tail wheel fork bearing sleeve during scheduled maintenance inspection.
- Give special attention to removal of snow and ice from the tail wheel locking mechanism during cold-weather operations.
- Be cautious when using the tail rotor control pedals to assist in unsticking a stuck tail wheel locking pin.
- Be aware that a free-swiveling tail wheel without a corresponding "tail-wheel-unlocked" light is generally indicative of a sheared tail wheel pin and further ground taxi should be minimized.

POC: MSG Alcides Santana, santanaa@rucker-safety.army.mil, DSN 558-3051 (334-255-3051)

Congratulations AAAA winners!

The Army Aviation Association of America national award recipients for 1994 are as follows:

- *Outstanding Aviation Unit of the Year (Active).* 4th Battalion, 24th Aviation Regiment, 24th Combat Aviation Brigade, Hunter Army Airfield, GA 31409-5109. Commander, LTC Jack Dibrell, Senior Noncommissioned Officer, CSM Karl Moody.
- *Outstanding Aviation Unit of the Year (ARNG).* Company G, 140th Aviation Regiment, 8010 South Airport Way, Stockton, CA 95206. Commander, MAJ Kevin Keenan, Senior Noncommissioned Officer, 1SG Charles Chaisson.
- *Outstanding Aviation Unit of the Year (USAR).* 1st Battalion, 214th Aviation Regiment, 63d Army Reserve Command, 11200 Lexinton Drive, Building 42, Armed Forces Reserve Center, Los Alamitos, CA 90700-5002. Commander, LTC Ronald Brown, Senior Noncommissioned Officer, CSM Kent Snyder.
- *Army Aviator of the Year.* CW2 Victoria Welch, 194th Maintenance Battalion, APO AP 96271.
- *Aviation Soldier of the Year.* SSG Donald L. Wilson, 3d Battalion, 25th Aviation Regiment, Fort Drum, NY 13602.
- *Army Aviation Medicine Award.* MAJ Lisa A. Black, D.O., 159th Combat Aviation Group (Airborne), Fort Bragg, NC.
- *Joseph P. Cribbins Department of the Army Civilian of the Year.* Mr. Rodney J. Schulz, Deputy Assistant Commandant, U.S. Army Aviation Logistics School, Fort Eustis, VA 23604-5414.
- *James H. McClellan Aviation Safety Award.* CW5 Gerald D. Cartier, 10th Aviation Brigade, 10th Mountain Division, Fort Drum, NY 13602.
- *Robert M. Leich Award.* 1st Battalion, 58th Aviation Regiment (Corps), 159th Combat Aviation Group, Fort Bragg, NC 28707-5000.
- *Top Chapter of the Year.* Colonial Virginia Chapter, COL Thomas E. Johnson, Chapter President, Assistant Commandant, U.S. Army Aviation Logistics School, Fort Eustis, VA 23604-5414.

Congratulations to all recipients for their significant achievements in Army aviation. ❑

Maintenance advisory message on closed circuit refueling nozzles, NSN 4930-00-204-9452 and 4930-00-117-4726

After refueling an AH-1S, the closed circuit refueling (CCR) nozzle was disconnected from the aircraft receiver and the nozzle subassembly tube, P/N CCN101-063, was expelled from the nozzle, resulting in an uncontrolled fuel discharge that soaked both the aircraft and the pilot.

Note: Although the Wiggins nozzle has not been supported by the military supply system for more than 6 years, many of these nozzles have been supported by commercially available parts and are still in service, particularly in Army National Guard units.

Inspection/correction procedures

■ During normal assembly of the nozzle, ensure the nonmetallic thread locking feature of the subassembly tube, P/N CCN101-063, is still functional—that is, some resistance should be felt during tightening.

■ If the nonmetallic locking feature is degraded and a new subassembly tube is not available, Loctite 242, NSN 8040-01-250-3969, must be applied to the threads during assembly.

Points of contact

■ Technical POC is Mr. Charles Bright, DSN 693-3888 (314-263-3888).

■ Logistical POC is Mr. Jack Shortridge, DSN 693-2618 (314-263-2618).

■ Safety POC is Mr. Jim Wilkins, DSN 693-2258 (314-263-2258).

Accident briefs

Information based on preliminary reports of aircraft accidents

Utility

UH-1 Class C

V series - On normal NOE approach to snow-covered LZ during routine authorized training flight, main rotor blades contacted small tree. Both blades sustained damage.

UH-1 Class E

H series - Prior to engine start, crew chief verbally responded to PC that aircraft was "clear." Although crew chief untied tiedown from tail boom, he did not remove it from main rotor blade. During start, PC felt unusual shaking and shut down aircraft. Main rotor tiedown had struck tail rotor and FM whip antenna.

H series - While performing HIT check, crew raised collective about 4 inches but could not lower it to flat pitch. Crew reduced throttle to idle. As RPM came back through 4400, crew was able to lower collective. Crew shut down aircraft and aborted mission. Maintenance serviced hydraulic system.

H series - During IFR flight, fire light flickered. Crew encountered VFR conditions shortly after incident. PC decided to land aircraft at uncontrolled airport. Suspect wiring problem.

H series - During NVG air assault, aircraft was at engine idle in LZ when master caution light flickered and then illuminated. PC checked segment light panel but found none illuminated, reset master caution, and shut down aircraft. Technical inspector was flown to site to inspect aircraft and found nothing. Crew ran up aircraft. Master caution light did not illuminate, and crew flew aircraft back to airfield. Master caution box then replaced.

H series - Returning to airfield after completion of TEAC and vibemeter test (all normal), MP started descent on left base for landing and N2 drooped to 6300 RPM. MP reduced collective to regain RPM. In less than 1 minute, RPM decreased to 6000. Increase/decrease switch had no effect. MP diverted and N2 decreased to 5800 RPM. MP increased airspeed to clear trees on approach end. As aircraft cleared trees, MP continued shallow approach, noticed decrease in engine noise, and saw N2/rotor needles split. MP continued to decelerate aircraft and made running landing. Aircraft slid about 700 feet down runway and then off left side into sod before coming to a stop. Postflight inspection revealed no damage to aircraft. Suspect engine failure.

H series - During hover OGE check, crew felt binding in tail rotor pedals with near full left-pedal input. Crew completed normal landing without further incident. Maintenance troubleshooting revealed that tail rotor trunion spindles were worn excessively by needle bearings, which ride against that surface.

V series - On final approach, master caution and engine chip lights illuminated. About 5 seconds later, N2 gauge oversped. Crew reduced throttle to correct overspeed. N2 gauge then indicated zero. At 50 feet AGL, engine appeared to quit completely. Crew autorotated aircraft to ground with no further damage.

V series - About 1.5 hours into flight, crew began to smell increasingly strong jet fuel odor. Master caution and auxiliary fuel-low caution lights subsequently illuminated early, after only 45 minutes of fuel transfer. Crew verified that auxiliary tank was empty, determined that fuel was leaking from auxiliary fuel system, and landed at nearest airport to investigate. Crew observed fuel dripping from tail boom of aircraft, aborted mission, and initiated fuel-containment procedures.

UH-60 Class C

A series - Crew had been flying aircraft for about 1 hour on acceptance test flight. During autorotational RPM check, nose door came open. Crew completed power recovery and landed without further damage. Inspection revealed damage to nose door, nose door strut, ice sensor, and center windshield.

L series - While aircraft was hovering in confined area on hillside, main rotor blade contacted small tree in left rear quadrant. Crew returned aircraft to home base, which was closest suitable landing area. Postflight inspection revealed damage to four main rotor blade tip caps.

UH-60 Class E

A series - During contour flight, aircraft was in right turn when main rotor blades contacted top of tree. Crew completed landing without further incident. Maintenance inspection revealed small chip on leading edge of nickel abrasion strip 2 feet inboard of tip cap on blue blade. Aircraft was released for one-time flight to airfield. Maintenance applied hysol to damaged area and released aircraft for flight.

A series - During cruise flight, No. 1 tail rotor caution light, master caution and backup pump advisory lights, and No. 2 tail rotor advisory light illuminated and tail rotor control was lost momentarily. No. 2 tail rotor servo came back on line and tail rotor control was regained. Crew landed aircraft without further incident. Maintenance could not duplicate problem and released aircraft for flight.

A series - During stabilator test on runup procedures, crew depressed stabilator test button and stabilator moved upward about 10 degrees with no accompanying stabilator caution light or audio. When crew released test button, stabilator moved back to full-down position without their pressing auto control reset. Maintenance replaced No. 2 stabilator amplifier.

L series - During IFR flight, right tank of ESSS/ERFS failed to transfer fuel. Crew aborted mission. Suspect blockage of bleed air valve in ESSS.

L series - While in formation flight, stabilator failed and would not reset. Master caution and segment lights and stabilator audio all functioned properly. Crew returned to airfield without incident. Maintenance replaced stabilator amplifier.

Attack

AH-64 Class A

A series - After refueling and departing for second sortie of pre-gunnery training, aircraft crashed in traffic pattern. Aircraft came to rest upright with all four main rotor blades destroyed, tail boom separated, and PNVS damaged. Minor injuries.

AH-64 Class E

A series - Aircraft was .5 hours into flight when pilot felt uncommanded pedal input. Crew immediately smelled burning odor and landed aircraft. Due to unstable landing surface, PC took controls and moved aircraft to improved road surface. Just prior to landing, PC felt second uncommanded pedal input but landed aircraft without further incident. Postflight inspection revealed L200 transmission panel was unsecured on forward two-thirds of panel. Panel had rubbed and shorted nose gearbox heater wiring. L200 panel had rubbed on nose gearbox shaft flex coupling with no damage, and L200 panel had come in contact with tail rotor linkage bellcrank, which caused uncommanded pedal inputs. L200 panel was bent outward by force of airflow in flight and had started chain reaction of dzus fasteners working loose due to excessive buffeting. Fiberglass structure of panel was cracked aft of transmission area access door and was creased inward on forward lower corner along line running diagonally across about 15 inches from corner. All of the forward nut plates were bent outward. This and inward crease of lower front corner is evidence that front lower dzus fastener was probably the last one to come loose. This supports the theory that the camlock fasteners were in fact locked before flight and the lower latch failed and was lost during flight. Failure of latch is believed to be caused by wear due to age and the spring coming loose. Other aircraft L200 panels were inspected and also showed degree of wear.

A series - During APU operation, crew engaged generators and received intermittent backup control system caution light. Maintenance found chafed electrical wire under B-60 access panel.

Cargo

CH-47 Class C

D series - Upon arrival at home station, crew discovered that aircraft clamshell doors had departed in flight. Suspect latch-pin failure.

D series - While taxiing to park, aircraft blade contacted blade of parked aircraft. Each aircraft sustained tip damage to one main rotor blade.

CH-47 Class D

D series - After accomplishing hover hookup, hookup team began to recover static probe grounding rod, which was about 7 feet from load. Aircrew began to lift load, and aircraft drifted right slightly. When load was lifted clear of ground, it swung right, hitting members of hookup team. One member of team suffered minor injury.

Observation

OH-58 Class E

D series - During transfer of controls while hovering for takeoff, aircraft nose pitched up, resulting in tail rotor striking taxiway. Aircraft landed hard.

Training

TH-67 Class C

Upon leveling aircraft for touchdown during controlled autorotation, pilot applied excessive collective and aircraft climbed 5 to 8 feet. Low RPM resulted in pylon whirl. Swashplate contacted cowling, mast damaged static stops, and striker plate and isolation mount were damaged.

Fixed wing

C-12 Class C

F series - While performing upper-air-work maneuvers during aviator qualification course training, IP failed and feathered left engine. When pilot recovered engine, prop failed to come out of feather and subsequent addition of power created overtorque condition. Engine must be replaced.

OV-1 Class E

D series - In cruise flight, autopilot continuously disengaged, rapidly putting aircraft into 25-degree angle of bank with aircraft trimmed for level flight. After failure of INS and compass placed in backup mode, autopilot generated wing rock of plus/minus 4 degrees. Crew disengaged autopilot and returned aircraft to base without further incident. Maintenance replaced flight controller assembly.

Messages

■ Safety-of-flight technical message concerning change to retirement life for certain main rotor blade cuffs on all EH/UH/MH-60A/L aircraft (UH-60-95-02, 131544Z Feb 95). Summary: Due to changes in the way the UH-60 is being operated, certain main rotor cuffs have a lower retirement life. The purpose of this message is to require a one-time inspection of all main rotor blade and cuff assemblies and to establish a reduction of the retirement life for the eight lug main rotor cuffs. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action operational message concerning Hydra 70 rocket motor suspension and information for all AH-64A/D, OH-58D, AH-1S/P/E/F, A/MH-6, and MH-60 series aircraft (GEN-95-ASAM-03, 142020Z Feb 95). Summary: Army Materiel Command suspended training use of the 2.75-inch Hydra 70 rockets with the MK-66 rocket motor (all mods). This message is released by ATCOM to assure affected aviation units are aware of and implement the suspension to prevent aircraft damage. The purpose of this message is to provide a listing of suspended lots of MK-66 rockets to the aviation community and to ensure units are aware of HQDA guidance in HQDA message DAMO-TR, 081802Z Dec 94, subject: Aviation Gunnery Strategy for 2.75-Inch Rockets. (See January 1995 issue of *FlightFax* for reprint of message.) Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

■ Aviation safety action maintenance mandatory message concerning main rotor stretched strap assembly Teflon removal and borescope inspection on all AH-64 series aircraft (AH-64-95-ASAM-02,

081900Z Mar 95). Summary: This ASAM addresses four strap pack problem areas—

• Depending on the failure location, it can be difficult to detect failed laminates on the main rotor strap pack using the current inspection. To facilitate performing the new 10-hour borescope inspection required by this ASAM, the excess Teflon located around the outboard and inboard shoes of each strap pack must be trimmed in accordance with TB 1-1520-238-50-03. This is to be accomplished by an OLR team.

• The inspection/repair procedures for the main rotor strap pack in TM 1-1520-238-23 dated 16 May 1994 have been superseded by this message. In addition, the requirements of TB 1-1520-238-20-52 dated 30 March 1994 and TB 1-1520-238-20-55 dated 11 April 1994 have been superseded by this message. The requirement for removal of main rotor strap pack P/N 7-311411146 (basic) is still valid.

• The 29 June 1994 issue of the interim statement of airworthiness qualification (ISAQ), AH-64A helicopter, changed the retirement interval for the main rotor strap pack from 4,500 flight hours to "on condition."

• The 16 May 1994 TM 1-1520-238-23 provides damage criteria limits for the link pin that has been determined to be inadequate.

The purpose of this message is to—

• Prepare the field units for an enhanced 10-flight-hour inspection using a flexible borescope kit. Units will be trained in the use of borescopes for this application prior to receiving borescope kits. Before the borescope inspection can be performed, the Teflon protruding out from around the inboard and outboard end must be trimmed flush. This trimming will be accomplished in compliance with TB 1-1520-238-50-03 by an OLR team.

• Provide corrections to the following TM 1-1520-238-23 inspection/repair procedures: special inspection No. 27, paragraph 5.1.3.E and paragraph 5.36.3.

• Return the retirement interval for the main rotor strap pack back to 4,500 flight hours. This change is required in order to ensure that the flight hours can be accurately tracked by ATCOM.

• Revise the damage criteria limits contained in the TM 1-1520-238-23 for the link pin, P/N 7-211411199/-3. Contact: Mr. Lyell Myers, DSN 693-2438 (314-263-2438).

■ Aviation safety action maintenance mandatory message concerning one-time inspection of wire bundle and restack of Adel clamps near bus bar, P/N 406-075-156-101 (OH-58-95-ASAM-05, 082200Z Mar 95). Summary: Field reports have indicated that several aircraft have experienced electrical short circuits between the power distribution bus bar, P/N 406-075-156-101 and a wire harness that runs parallel to the bus bar. These shorts have resulted in the loss of several aircraft systems and have caused severe damage to the wire harness. This problem has been attributed to the Adel clamp arrangement and the close proximity of the wire harness to the bus bar. The purpose of this message is to require a one-time inspection of the wire harness running parallel to the bus bar, P/N 406-075-156-101, and provide restack instructions of Adel clamps. Contact: Mr. Brad Meyer, DSN 693-2085 (314-263-2085).

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

The only way an officer can demonstrate his leadership qualities is through personal example. . . . I for one have never believed that you should ask any person to do anything that you wouldn't do yourself.

—General Louis H. Wilson

In this issue:

- Desert operations revisited: a success story
- Sample blowing dust/blowing snow SOP
- Quality crews . . . good decisions
- AH-64 tail wheel locking mechanism
- Congratulations AAAA winners!
- Maintenance advisory message on closed circuit refueling nozzles, NSN 4930-00-204-9452 and 4930-00-117-4726

Class A Accidents through March

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

U.S. ARMY SAFETY CENTER

Report of Army aircraft accidents published by the U.S. Army Safety Center, Fort Rucker, AL 36362-5363. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. Address questions about content to DSN 558-3770. Address questions about distribution to DSN 558-2062. To submit information for Flight
558-

Thom
Briga
Comn
U.S. A

60984 81800