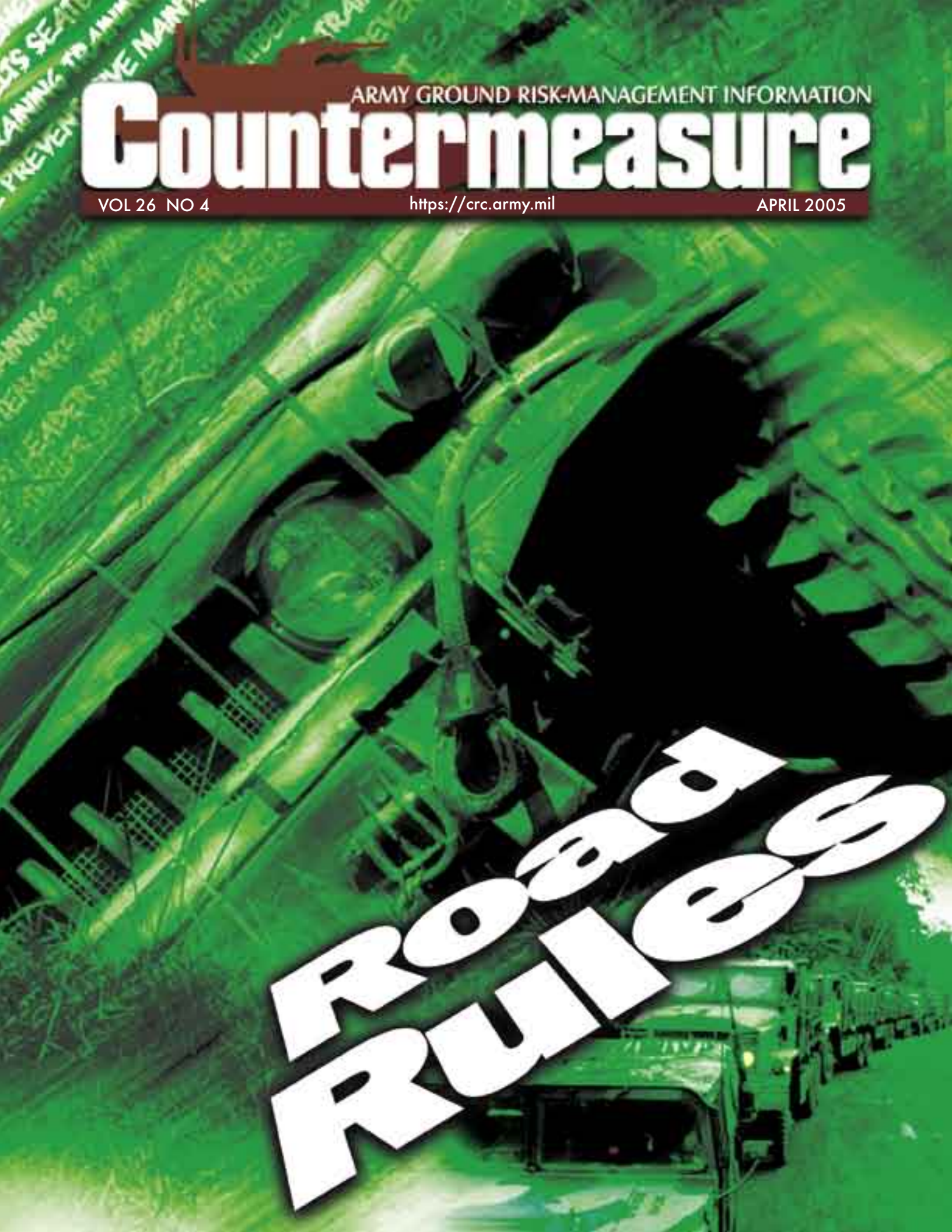
ARMY GROUND RISK-MANAGEMENT INFORMATION

Countermeasure

VOL 26 NO 4 https://crc.army.mil APRIL 2005



Road Rules

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BG Joseph A. Smith
Commander/Director of Army Safety

COL John Frketic
Deputy Commander

John Hooks
Publishing Supervisor

Julie Shelley
Managing Editor

Blake Grantham
Graphic Design

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A Cold, Wet Way to Die

LTC JOSEPH MILLER
Accident Investigator
U.S. Army Combat Readiness Center

Editor's note: The incident described here is one of the latest in a long line of accidents involving HMMWV rollovers in Iraq, specifically M1114 up-armored HMMWVs. Since the beginning of Fiscal Year 2004, 42 Soldiers have died in M1114-related accidents. Many of these HMMWVs rolled over into ditches or embankments, which often are filled with water. Soldiers are drowning in these accidents at an alarming rate. Read on for the story of two such Soldiers.

The accident sequence

The section leader of two M1114 up-armored HMMWVs established a nighttime observation post (OP) to watch over a main road in Iraq. He parked his HMMWV on a dirt road that ran perpendicular to the paved road. A small drainage ditch ran adjacent to the dirt road's right side and flowed underneath the paved road. The section leader placed the other HMMWV—the accident vehicle—approximately 70 meters behind him so that crew could provide rear security for the OP. The section's Soldiers drove in the area frequently and were very familiar with the roads and the ditch.

About 10 minutes later, a car suspected of carrying a vehicle-borne improvised explosive device (VBIED) drove by the section's position. The section leader alerted the HMMWV behind him before departing the OP and turning right on the paved road after the suspicious car. The Soldier pulling dismounted security for the other HMMWV got

in the vehicle behind the driver's seat while the gunner oriented his weapon to the rear. The driver, who was wearing ANPVS/7 night optical devices (NODs), drove down the dirt road without the vehicle's lights on. The senior occupant, however, was not wearing NODs and was busy adjusting his equipment and the radio instead of scanning outside the vehicle.

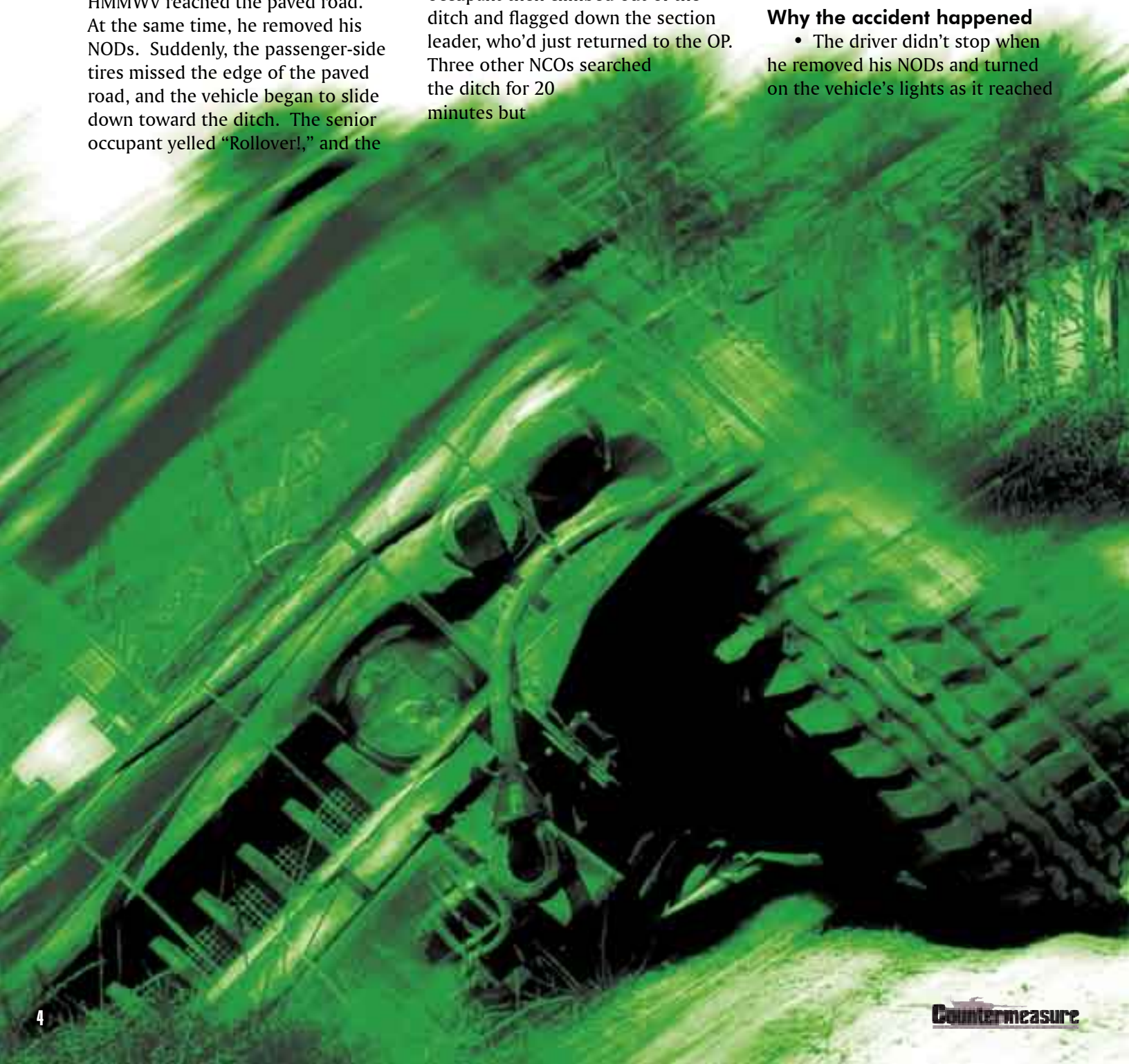
The driver turned on the lights and began to turn right as the HMMWV reached the paved road. At the same time, he removed his NODs. Suddenly, the passenger-side tires missed the edge of the paved road, and the vehicle began to slide down toward the ditch. The senior occupant yelled "Rollover!," and the gunner dropped into the vehicle. The HMMWV rolled right 10 feet before landing upside-down in 5 feet of very cold water.

The senior occupant and gunner found a small air pocket in the vehicle's right rear and opened the door after struggling with the combat lock. The driver was unconscious, so the senior occupant pulled him from the vehicle. He couldn't find the Soldier who'd been sitting behind the driver. The senior occupant then climbed out of the ditch and flagged down the section leader, who'd just returned to the OP. Three other NCOs searched the ditch for 20 minutes but couldn't find the missing Soldier. The section leader entered the vehicle and found the Soldier behind the driver's seat.

That Soldier never regained consciousness and was pronounced dead a short time later. The driver threw up water and initially was responsive, but his condition was deceiving. Sadly, he died 7 hours later from a combination of severe shock, hypothermia, and excessive water in his lungs.

Why the accident happened

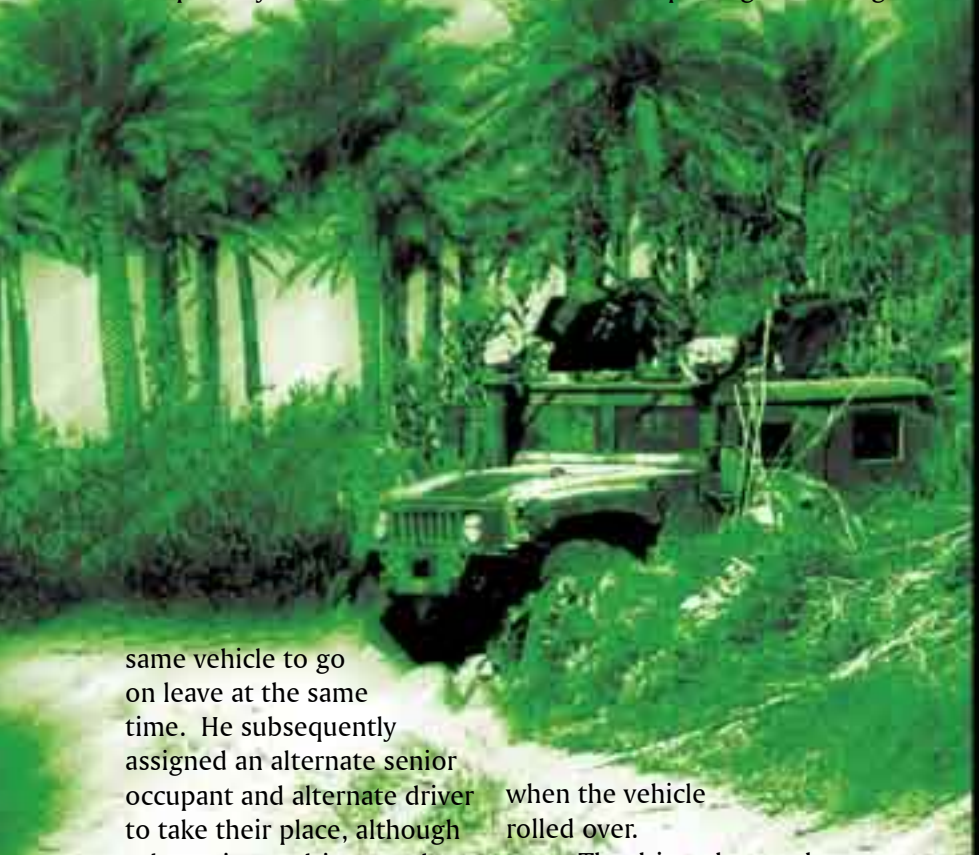
- The driver didn't stop when he removed his NODs and turned on the vehicle's lights as it reached



the paved road. Instead, he performed this transition while making the right turn. Consequently, he missed the paved road and rolled the HMMWV into the ditch.

• The senior occupant didn't correct the driver as he was removing his NODs and making the right turn. Additionally, the senior occupant wasn't wearing his own NODs or scanning the terrain for hazardous conditions.

• The NCO platoon leader allowed the senior occupant and primary driver of the same vehicle to go on leave at the same time. He subsequently assigned an alternate senior occupant and alternate driver to take their place, although other primary drivers and senior occupants were available.



Why the severity of the injuries

• M1114 up-armored HMMWV doors weigh approximately 200 pounds each. The combat lock doesn't have a quick release and is ergonomically difficult to release if the vehicle is upside-down. Additionally, the vehicle's rear compartment isn't designed to be opened quickly from inside or outside in an emergency situation.

• The Soldiers who wore their 21-pound individual body armor and 4-pound helmet didn't fasten their seatbelts. As a result, two Soldiers struggled upside-down in their seats and drowned. The seatbelts would've provided these Soldiers with a reference point once they were upside-down in the water and prevented them from impacting the ceiling when the vehicle rolled over.

• The driver drowned, although he regained consciousness and lived 7 hours after the accident. The water in the ditch was very cold, which contributed to his severe shock and hypothermia. Furthermore, aspirated fluid can cause lung conditions that are worse than they first appear. This combination of factors caused the driver's eventual death.

"THE SOLDIERS WHO WORE THEIR 21-POUND INDIVIDUAL BODY ARMOR AND 4-POUND HELMET DIDN'T FASTEN THEIR SEATBELTS. AS A RESULT, TWO SOLDIERS STRUGGLED UPSIDE-DOWN IN THEIR SEATS AND DROWNED."

Recommendations

• Commanders and leaders must consider the hazards associated with crew assignments when they conduct composite risk assessments, and develop and implement appropriate control measures.

• Senior occupants must scan for hazardous road conditions and correct drivers before an accident happens.

• Soldiers must fasten their seatbelts when riding in Army vehicles. This is especially true during combat missions, when IEDs, rocket-propelled grenades, and rollovers could cause vehicles to overturn violently. Soldiers wearing seatbelts can exit their vehicle quickly since they remain conscious while fastened in the seat.

• HMMWV rollover drills must include an exercise in evacuating the vehicle through one door.

• The Program Executive Office-Combat Service and Combat Service Support should evaluate, develop, and field alternate egress paths for M1114 up-armored HMMWVs, specifically for vehicles upside-down in water. A quick release for the combat lock on M1114 doors also should be developed.

Contact the author at (334) 255-3261, DSN 558-3261, or by e-mail at joseph.miller@safetycenter.army.mil.

Hidden

MSG PAUL GILBERT
Accident Investigator
U.S. Army Combat Readiness Center

Danger lies everywhere and takes many forms, especially in combat. Some dangers are hidden from sight, while others are hidden in plain sight. One recent, tragic accident in the Iraqi desert illustrates this point. The mission was to raid an insurgent target prior to the Iraqi elections.

The convoy's Soldiers were prepared, but also a little anxious, to begin the joint mission with Iraqi army and police elements. The Soldiers thought they'd accounted for every possibility along the way, but not long into the mission they encountered a hidden danger.

The Soldiers were familiar with the route. It had rained steadily for more than a week, and the rivers and canals along the route were swollen well above capacity. As the lead serial in the convoy passed over a culvert, disaster struck. A 25-foot-long, 7-foot-wide section along the road's shoulder suddenly collapsed. The Soldiers couldn't predict the collapse and, as such, didn't make a plan to avoid it. A Bradley Fighting Vehicle (BFV)—the last vehicle in the serial—fell 8 feet into the swift, cold water. Since the BFV was the last vehicle in that serial, no one noticed it was missing.

The two following serials saw the break in the road and avoided it, but they couldn't see their fallen comrades a short distance below. Here was another hidden danger. Why would anyone think something had happened? After all, serials two and three saw the break and successfully negotiated the hazard. There also were no vehicles from serial one in sight—a good indication the mission was proceeding as planned.

All the convoy serials arrived at the predetermined assembly area, and final mission preparations were made. The Iraqi police and army elements took their place. Chem lights were distributed as a precautionary measure to identify friendly units and prevent fratricide. It was then that the BFV was discovered missing.

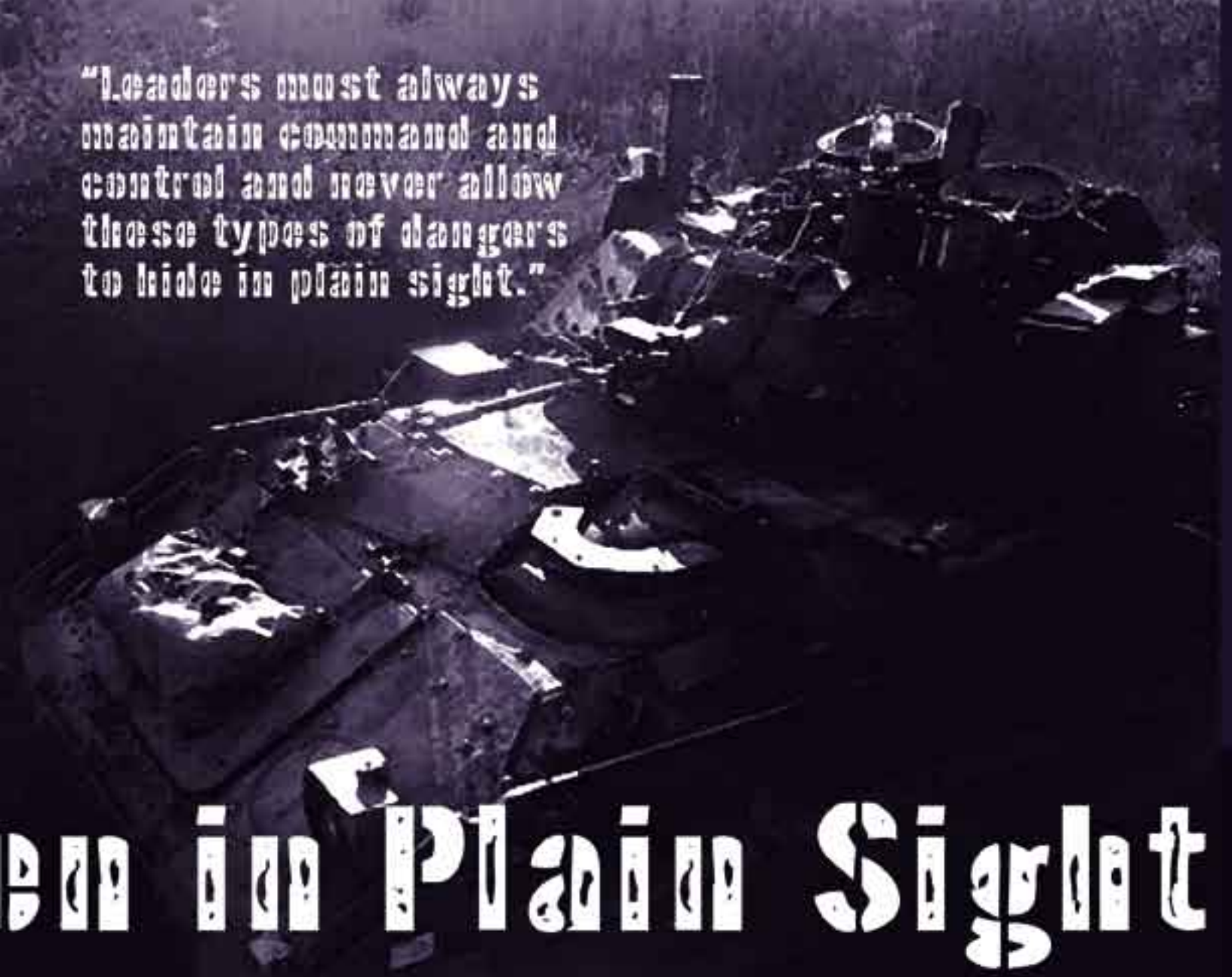
A hasty communications check yielded nothing from the BFV crew, so the frantic search began. The Soldiers decided to retrace the route, thinking and hoping the Bradley was merely lost. The BFV was discovered just 4 kilometers down the road in the water below the missing pavement. The vehicle was inverted and partially submerged.

Rescue operations began soon after the Soldiers notified the mission commander. Another BFV tried to recover the capsized vehicle and, on the third attempt, pulled it 8 feet to the canal's edge. The Soldiers struggled desperately and opened the rear door. They pulled the five crewmembers from the vehicle's rear and began lifesaving measures. Sadly, only two would be resuscitated; the other three crewmembers were pronounced dead a short time later.

Two M88 recovery vehicles hoisted the BFV from the water. The Soldiers found the driver, who was dead. The Bradley commander (BC) wasn't in the vehicle. The Soldiers thought the force of the water's current—another hidden danger—might have swept the BC away. They searched the canal's banks without finding the BC. A rescuer dove into the canal, but he couldn't find the BC. Because the water was so cold, he couldn't make a second attempt. Another Soldier volunteered to go in and found the BC, who was buried head-first in the muddy bottom. The BC was pronounced dead at the scene.

This night was filled with dangers. But, oddly enough, it wasn't the obvious hazards of the raid that killed those five Soldiers—it was the hidden dangers. The most disturbing of those dangers—a lack of accountability—was hidden in plain sight.

Accountability and responsibility are the cornerstones of Army leadership. On this mission, however, they were hidden. The mission



en in Plain Sight

commander was focused on completing the raid and didn't monitor the convoy. The platoon sergeant failed to account for the whereabouts of his Soldiers. These omissions of accountability and responsibility were basic leader failures. Both the mission commander and platoon sergeant lost sight of their standing operating procedures (SOPs), which are critical to mission success. Dangers such as the road collapsing were hidden from sight and unavoidable. The dangers of complacency and basic leadership failure, i.e., accountability and responsibility, were hidden in plain sight and entirely preventable.

What are the lessons learned from this accident? The fundamental philosophy of Army leadership is mission and Soldiers, and the guiding principles of this philosophy are accountability and responsibility. The leadership lost sight of these principles on this mission. They assumed all convoy members were present and accounted for, but they didn't make sure. They also didn't follow their unit's SOP, which spelled out convoy and reporting procedures. Leaders must always maintain command and control and never allow these types of dangers to hide in plain sight.

We always hear "mission first." But to achieve mission success, we must have adequate mission capability. A BFV and its crew together are an awesome fighting force. The loss of this crew seriously degraded mission success. The welfare of our Soldiers is entrusted to the officers and NCOs leading them. Keep accountability and responsibility in plain sight. There's no room for preventable hidden dangers in combat or at home.

Contact the author at (334) 255-9854, DSN 558-9854, or by e-mail at paul.gilbert@safetycenter.army.mil.

SAVING FOR A

DANIEL MCGLONE
CP-12 Intern

Mother Nature can be harsh, especially in the desert. Even our Army—the most mobile and powerful in the world—must bend to her power, especially during sandstorms. Sandstorms have a negative impact on personnel and equipment readiness, with visibility reduced to near zero. Any type of operation during such conditions is very dangerous. However, you can protect yourself and get the mission done, even during the worst of conditions.

Sandstorms occur frequently on the Arabian Peninsula and are most common in April. These storms are created by strong, dry winds that blow close to the desert's surface. The heat of the desert terrain causes the winds to become stronger and hotter. Throw in a cold front and tornado-like forces suddenly appear, complete with howling winds and swirling sand.

A sandstorm's leading edge creates a wall of dust that reduces visibility to near zero. Driving in Iraq is already dangerous, even in the best of conditions. The probability of an accident increases when you factor in a sandstorm and near-zero visibility.

Operating vehicles during a sandstorm is extremely difficult, so the optimum choice is to stay put on your base or in a safe place. However, if the mission must go on, drive slowly. Wear goggles with the clear or yellow-tinted lens insert to protect your eyes. If you don't have goggles, wear any type of eye protection that might be available.

Thermal imaging devices

provide vehicle and tank drivers better visibility during sandstorms. An Army News Service story in August 2003 explained the benefits of these devices to Soldiers at the beginning of the Iraq conflict. "During the infamous Iraqi sandstorms several months ago, our Army had very limited visibility," the story read. "Soldiers in Iraq discovered they still had good visibility with their individual and crew-served thermal weapons sights, even when the sandstorms obscured nearly every other optical sensor."

Communications during sandstorms are very problematic. Sometimes, the wind and "blasting noises" make communication between Soldiers—even those in the same vehicle—nearly impossible. Even so, drivers, co-drivers, and vehicle commanders must communicate with one another. Situational and environmental awareness is vital to Soldier safety during sandstorms, especially in moving vehicles. Drivers and vehicle commanders must use the scanning method while driving during these storms.

Sandstorms also present physical dangers to Soldiers. Blowing sand can make breathing difficult, and fine sand particles cause a hacking cough. Place a T-shirt or cloth over your nose and mouth to help you breathe and protect your airway. Close all vehicle vents and place sand bags or other material over any openings. Both these measures are important because sand and dust within the Persian Gulf region can carry infectious diseases. Protect your airway as much as possible.

Sandstorms are very dangerous and are not a laughing matter. Be prepared and know the proper techniques to prevent an accident and protect yourself when sandstorms strike. Keep the following tips in mind when Mother Nature decides to awe you with a sandstorm during your desert deployment.

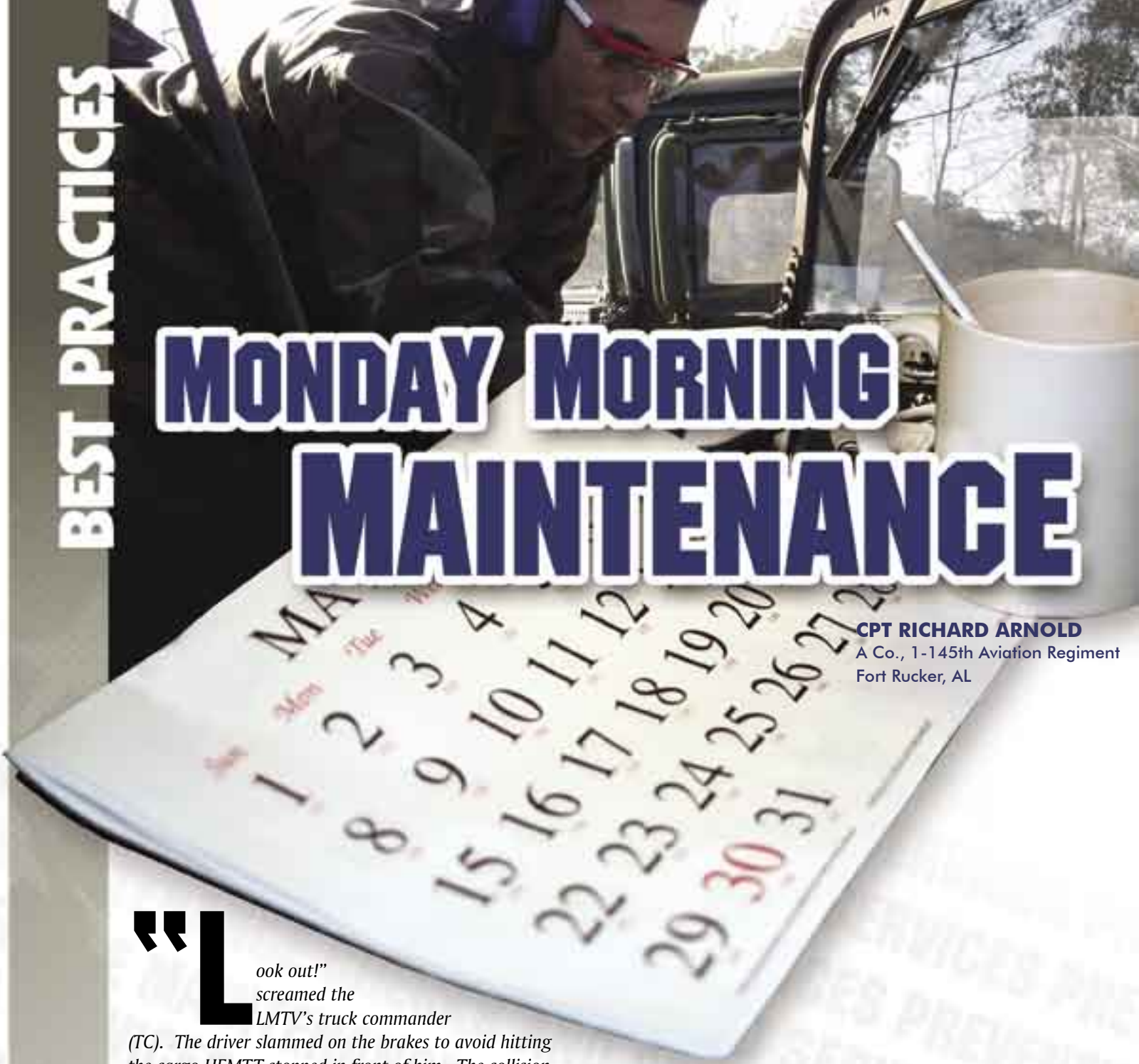
- Always wear protective eyewear.
- Protect your airway by placing a cloth over your nose and mouth.
- Close vehicle vents and cover all openings.
- Drive slowly.
- Drivers, co-drivers, and vehicle commanders must communicate with each other.
- Know your route and maintain situational awareness.
- Drive with lights on to help others see your vehicle.

A SANDY DAY

- If your vehicle breaks down, use it for protection from the storm and any enemy elements. Do not leave the vehicle to search for help; the storm will end eventually.
- Be prepared for the unexpected. Always carry a kit bag, rucksack, basic issue items, batteries, and food and water in your vehicle in case you break down or have to pull over.

For more information on sandstorms, visit **www.sandstormsiniraq.com**, **www.mycamouflage.co.uk/survivalDesert.asp**, or **www.geology.wisc.edu/course/g115/projects03/bnysenbaum/sandstorms.htm**. Have a safe deployment, and we'll see you back home!

Contact the author by e-mail at daniel.mcglone@us.army.mil.



MONDAY MORNING MAINTENANCE

CPT RICHARD ARNOLD
A Co., 1-145th Aviation Regiment
Fort Rucker, AL

"Look out!" screamed the LMTV's truck commander (TC). The driver slammed on the brakes to avoid hitting the cargo HEMTT stopped in front of him. The collision, however, was unavoidable—the LMTV was traveling at the 30-mph catch-up speed in a blinding, unexpected dust storm. The vehicle had pulled over because of a loose cargo strap and fallen behind the lead vehicles just before the dust storm hit.

As the LMTV crashed into the cargo HEMTT, the defective driver's seatbelt gave way and the driver impacted the front windshield. He lay slumped over the steering wheel, unconscious and bleeding from a head wound. The young TC, a second lieutenant, could not believe an accident had happened with him in command. "How can everything go wrong so quickly?" he screamed as he started performing first aid.

The previous scenario is a true story—it just hasn't happened *yet*. What went wrong? How did this accident happen? Just like any other accident, several factors came into play. These factors can be small in scope, but when they meet quickly, the results can be fatal.

First, the LMTV pulled over to tighten a cargo strap. The convoy commander, who wanted to stay on schedule, allowed only the trail vehicles to stop instead of the entire convoy. This was the first factor: a poor decision. Second, the sandstorm was unforecasted and appeared out of nowhere. This was the second factor: a sudden environmental

condition. Third, the lieutenant didn't enforce the unit's "Kevlar on while operating a vehicle" policy because it was unpopular and uncomfortable. The new platoon leader wanted to be cool with his Soldiers, which led to the third factor: a violation of standing policy. Fourth, the driver's seatbelt was defective and was identified as such during preventive maintenance checks and services (PMCS). However, the motor pool didn't have any spares, and the seatbelt worked on occasion if it was fastened just the right way. The operator didn't write up the fault because the LMTV was the unit's only transportation to the base camp's dining facility. This was the fourth factor: improper PMCS procedures. Bad decisions and disobeying orders are important factors, but the LMTV should've been deadlined for safety due to the PMCS violation.

Monday morning on most training schedules is called "command maintenance." Commanders can use this time to focus on their equipment's combat readiness and train their Soldiers in proper maintenance procedures. Leaders at every level must balance the competing priorities of maintenance and realistic combat training. However, the half-day used for maintenance training and PMCS every Monday is time well spent if it isn't wasted. A good command maintenance program includes three vital components: command emphasis, leader involvement, and sustainment training.

Command emphasis

Commanders should make command maintenance a top priority and their presence known. One technique is pushing all important meetings to the afternoon and having a unit formation at the motor pool. If the commander is at the formation alongside their Soldiers, the correct message is sent: This is important! Commanders on-site are more likely to catch Soldier mistakes and also know the status of all assigned equipment.

An effective maintenance program doesn't end with vehicles. Command maintenance Mondays are a good time for unit armorers and nuclear, biological, and chemical (NBC) and night vision goggle (NVG) custodians to perform PMCS on that equipment. Taskings and details are unavoidable and drain the number of Soldiers at the motor pool. Even so, the program will be successful if a half-day is reserved each week on the training schedule for command maintenance and the commander is present.

Leader involvement

Commanders can't be everywhere at the same time, but their leadership can be felt by empowering their NCOs during PMCS. NCOs are the backbone of the Army, and PMCS is the backbone of a good command maintenance program. With NCOs supervising PMCS, the commander can be confident proper procedures are followed and safety issues are corrected. A good NCO will ensure Soldiers use the operator's manual and follow each step of the PMCS process within its guidelines. NCOs should be familiar with Army Regulation 385-55, *Prevention of Motor Vehicle Accidents*, and also guide those Soldiers who might need extra supervision. Strict adherence to standards and safety are a vital component of every successful program, and leadership involvement at every level makes it happen.

Sustainment training

PMCS can become more effective through sustainment training once the other two criteria—command emphasis and leader involvement—are met. Every program's goal is 10/20 standards, but there must be a program in place and trained Soldiers working toward that goal to achieve it. Take, for example, the DA 5988. Does every equipment operator in the unit know how to read this document? Accuracy of the three-section 5988 is critical and should be reviewed every time PMCS is performed. Soldiers must understand the document and know how to fill it in correctly. For instance, faults noted in section III should have parts requested and annotated in section II with valid document numbers. Soldiers must be trained to properly cross-reference sections in these type documents.

In addition, Soldiers who conduct PMCS must be licensed and familiar with the equipment. Units should incorporate operator-level training and licensing as part of their quarterly training program. Personnel will rotate constantly, and others must serve as operators when the primary Soldier is absent due to TDY, leave, or a special tasking.

Can a good command maintenance program save lives? The answer is an obvious yes, so long as the command emphasizes it, leaders are involved, and Soldiers are trained sufficiently. Mistakes are made every day, so we can't become complacent. The lives of our Soldiers depend on standards, discipline, and the examples set by their leaders. Don't let events snowball until someone dies.

Contact the author at (334) 255-1227, DSN 558-1227, or by e-mail at richard.s.arnold@rucker.army.mil.

BACK TO THE

Few events are more regrettable than a Soldier dying because someone was careless. Following basic safety principles and using good, commonsense judgment are essential to maintaining a secure environment in theater and at home. For Army mounted operations, these principles are outlined in numerous "ground safety" guides.

We must be diligent about ground safety in and around all Army vehicles, whether they're wheeled or tracked. Leaders must perform a risk assessment before all mounted operations. It's the responsibility of every leader to manage the risks—including those posed by the enemy—once the risk assessment is complete.

Training, ground guides, seatbelts, and PMCS

All vehicle operators must be licensed and trained properly for their vehicle. Ground guides are an essential element of safe driver practices, and equally as important is the use of seatbelts in all Army vehicles. All too often we've seen the terrible harm unbuckled Soldiers suffer, such as severe neck and abdominal injuries. Preventive maintenance checks and services (PMCS) also must be performed before any vehicle is used.

Mechanically unsafe vehicles, such as those with faulty brakes, errant steering systems, or even exhaust problems, should never be put into operation before all deficiencies are corrected. Drivers should conduct a 360-degree search around their vehicles to detect problems. The 360-degree search also allows drivers to ensure no one is close to or under the vehicle before they move it.

Troop and cargo loads

Another consideration is the vehicle's physical dynamics, which change when it's loaded with troops or cargo. Vehicles must not operate under conditions where passenger or cargo loads exceed their carrying capacity. Every vehicle's –10 includes factory-specified load limits. Vehicle loads also should be inspected and secured before departure, and troop and cargo straps must always be used. Soldiers also must not ride on top of cargo. Leaders must brief all drivers, assistant drivers, and the highest-ranking vehicle occupant before each mission. Hazardous areas or conditions must be identified and discussed during this brief, along with safe following distances, proper speed, route of travel, rest periods, and signals.

Carbon monoxide poisoning

Vehicle accidents such as rollovers or collisions are obvious hazards. However, carbon monoxide poisoning is another potential danger in vehicle operations. Carbon monoxide is a gas emitted from many sources, including internal combustion engines. It's colorless, odorless, tasteless, and deadly. Several Soldiers over the past few years have died from carbon monoxide poisoning in a variety of situations, including heated tents.

To counter this threat, Soldiers must not sleep in vehicles with the engines running. Carbon monoxide is heavier than air and concentrates in low-lying areas, so Soldiers should use extreme caution around vehicles parked in depressions. Electric generators in the field should be considered an equal hazard to any AMV engine, since they also emit high concentrations of carbon monoxide. Also know the symptoms of carbon monoxide poisoning: headache, dizziness, sleepiness, and tightness across the forehead. Seek medical attention immediately for any Soldiers exhibiting these symptoms, and move them to fresh air as quickly as possible.

Noise disassociation

Noise disassociation usually occurs around day six of an operation. At this point Soldiers hear the noise of vehicles or equipment but fail to observe the direction of the noise. In effect, noises are heard but subconsciously silenced. Soldiers are more likely to be run over if they're suffering from this "masking effect," when noise doesn't trigger an alarm to get out of the way.

Soldiers must always find the source of any new sound. If all

BASICS

2LT ERIK JOHNSON
Task Force Protector Safety Officer
Camp Bondsteel, Kosovo

Soldiers made this practice a habit, ground safety in general would be enhanced greatly. Additionally, Soldiers must never eat, rest, visit, or sleep on vehicle trails.

Sleep deprivation

It's well known the human body can't function without sleep. But those of us in uniform often must perform extended missions with little or no sleep. After all, how would it look for a Soldier to admit he can't keep up with his comrades because he's tired? Fatigue causes errors in judgment, slowing of the reflexes, and a general dulling of the senses. A fatigued Soldier is at higher risk of making potentially deadly mistakes than a well-rested one. Soldiers must get a minimum of 4 hours continuous sleep every 24 hours—any less will impair military effectiveness.

Whether you're on a peacekeeping or combat mission or on post at home, all risks should be calculated with a very low tolerance for error. Excluding combat losses, driving accidents kill the greatest majority of our Soldiers today. Don't become a statistic—take care and drive safe!

Contact the author at DSN 781-6352 or by e-mail at erik.n.johnson@us.army.mil.

The M939-series 5-ton truck is a workhorse of the Army. These trucks provide vital transportation services both in theater and at home, and their value has been proven countless times. Unfortunately, the M939 and its variants have been involved in numerous fatal accidents over the past several years. In one recent accident, an M923A2 rolled over in Iraq, killing one Soldier and injuring seven more. Speed was a factor in this accident, like most involving the 5-ton.

Safety of Use Message 98-07 established a maximum speed limit of 40 mph for the M939 and its variants, and also directed a tire replacement for the fleet. This SOUM was complemented by a modification work order (MWO) to equip every vehicle in the M939 fleet with antilock braking systems. However, this MWO is not yet complete.

The Pentagon recently reannounced the original message—dated 230739Z May 02—to clarify the safe operation of M939 trucks not equipped with the antilock braking system. The message places special emphasis on annual sustainment training for active-duty M939 operators and semi-annual sustainment training for Reserve Component operators. In addition, a placard stating the maximum safe operating speed of 40 mph must be placed in a prominent location in the driver's position of all trucks not equipped with the antilock braking system.

Leaders must know the hazards associated with the M939, especially in the Army's present deployed environment. Keep the following known hazards in mind when you or your Soldiers step into the driver's seat of these vehicles.

Driving too fast for conditions. Until the MWO is complete, M939 trucks are not to be driven above 40 mph, which means 40 mph is the extreme limit. Driving too fast for conditions creates an environment for compounding the effects of the other hazards listed below. Unit leaders must evaluate and re-evaluate the conditions the truck will be used in and apply the appropriate controls.

Applying excessive pressure to the brake pedal. Tailgating can create an extremely hazardous condition when drivers overreact to vehicles braking to their front. Over-braking can lock up the wheels and stall the engine, causing the driver to lose control.

Operating on asphalt roads in damp or wet conditions. Damp or wet conditions contribute to the vehicle losing traction when the brakes are applied suddenly and with too much pressure. Drivers must slow down when damp or wet conditions exist. Leaders also must re-evaluate the need to operate in these conditions, implement additional control measures, and inform drivers of the increased risks.

Operating with light loads on asphalt roads. The M939-series truck was designed to carry heavy loads in off-road conditions. The accidents we often see involve the trucks operating on asphalt roads. The trucks generally are used to haul cargo or transport Soldiers to and from training and details (see Army Regulation 385-55, *Prevention of Motor Vehicle Accidents*, for guidance on transporting Soldiers). You don't have to add weight to operate the truck safely, but leaders must recognize the increased risk of operating in these conditions. Speed limits and safe distances between vehicles must be enforced, and drivers must be informed of the increased risks.

Other hazards. The following hazards must be considered in addition to the ones listed above:

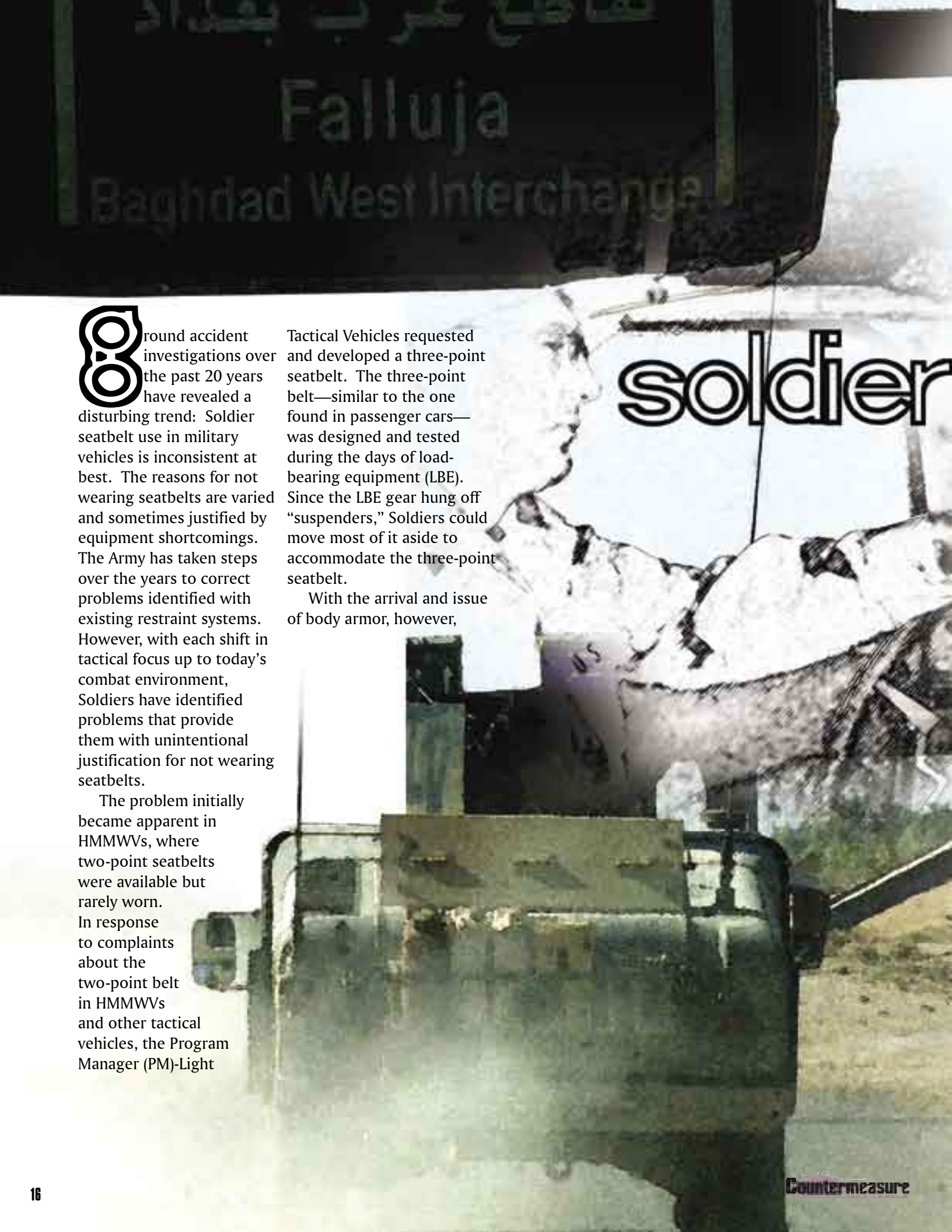
- **Tailgating.** Leave enough room between you and the vehicle to your front to brake correctly and safely.

"Leaders must know the hazards associated with the M939, especially in the Army's present deployed environment."

- **"Cruise control."** Don't use the hand throttle as a "cruise control." When used in such a manner, the hand throttle will not disengage when the brakes are applied.
- **Tire pressure.** Do not let tire pressure get below 60 psi.

The M939-series of vehicles will be around for a long time, so make sure you learn how to operate them safely. It's a matter of you and your Soldiers making it home from the fight.

Comments regarding this article may be directed to the editor at (334) 255-1218, DSN 558-1218, or by e-mail at julie.shelley@safetycenter.army.mil.



soldier

Ground accident investigations over the past 20 years have revealed a disturbing trend: Soldier seatbelt use in military vehicles is inconsistent at best. The reasons for not wearing seatbelts are varied and sometimes justified by equipment shortcomings. The Army has taken steps over the years to correct problems identified with existing restraint systems. However, with each shift in tactical focus up to today's combat environment, Soldiers have identified problems that provide them with unintentional justification for not wearing seatbelts.

The problem initially became apparent in HMMWVs, where two-point seatbelts were available but rarely worn. In response to complaints about the two-point belt in HMMWVs and other tactical vehicles, the Program Manager (PM)-Light Tactical Vehicles requested and developed a three-point seatbelt. The three-point belt—similar to the one found in passenger cars—was designed and tested during the days of load-bearing equipment (LBE). Since the LBE gear hung off "suspenders," Soldiers could move most of it aside to accommodate the three-point seatbelt.

With the arrival and issue of body armor, however,

—friendly seatbelts

COMING SOON

DON WREN
Ground Systems Engineer
U.S. Army Combat
Readiness Center

and

JACK GIANNOSA
Safety Engineer
U.S. Army Tank-Automotive
and Armament Command

problems with the three-point belt became apparent. The older three-point belts were too short and did not fit around Soldiers wearing body armor. The Army then began a program to replace the short belt with longer three-point belts.

Shortly thereafter, the HMMWV—typically used in the past for Soldier transport—was pressed into service as a combat vehicle during Operations Enduring and Iraqi Freedom. Soldiers continue to fight from the HMMWV on a daily basis in Iraq and Afghanistan. Soldiers in these vehicles must be ready to act on a moment's notice when confronted with an enemy ambush or improvised explosive device. Vehicle accidents such as rollovers have become more common as Soldiers drive faster and more erratically to escape real threats. In many of these accidents, one or more Soldiers not wearing their seatbelts were either ejected from the vehicle or crushed, often with fatal results.

The Director of the Army Staff reviewed recent accident reports and requested that the Army G4 establish new seatbelt and occupant restraint systems for the entire wheeled vehicle fleet. A Tiger Team was assembled to determine if the current configuration supported contemporary Army doctrine and applications. Various fleet vehicles were inspected, and the team concluded most seatbelts were generally inadequate. The team found numerous seatbelt configurations: two-point belts in some HMMWVs, the short three-point belts in others, and the longer three-point belts in the remaining vehicles.

The team developed a written survey and interviewed Soldiers from three in-theater divisions—the 101st Airborne Division and 3rd and 4th Infantry Divisions (ID)—with nearly 850 passionate responses returned. The Soldiers said the primary reason they did not wear their seatbelts was fear they could not exit the vehicle quickly during an enemy attack. The Soldiers also said the belts were too short and snagged on their mission equipment. The team concluded the seatbelt design—including the seatbelt attachment point position, latch location, shoulder strap placement, and length—reduced the belts' effectiveness. The team confirmed Soldier complaints after evaluating the belts with Soldiers wearing full mission equipment including body armor, ammunition pouches, protective masks, first aid kits, and hydration kits.

The PM-Tactical Vehicles was assigned to develop a solution for the HMMWV—the most common vehicle involved in accidents, followed by the M939-series and Family of Medium Tactical Vehicles. These three vehicle series account for more than half of all Army Motor Vehicle accidents. During the redesign, the team built upon multi-point seatbelt systems already in use in the Army and industry. The team also identified the need to standardize seat frames and restraints between fleet-series vehicles.

Once prototypes became available, the sterile world of design had to meet the reality of combat. Soldiers from the 101st tried out the new seats and five-point seatbelt configurations. Based on their comments and observations, the seat and restraint systems were refined and delivered to the 4th ID. The suggestions from these combat-experienced units were incorporated in the final design.

The new HMMWV integrated seat and restraint system includes the seats, five-point seatbelts, mounting kit, and pillar upgrades for rollover protection. The system must complete federal motor vehicle safety testing before being sent to the Army Test and Evaluation Command for certification.

Comments regarding this article may be forwarded to Mr. Wren at (334) 255-2744, DSN 558-2744, or by e-mail at don.wren@safetycenter.army.mil.

Stuff Happens

1LT MATTHEW NOWLIN
A Company, 1/151 Aviation Battalion (Attack)
Forward Operating Base Endurance, Iraq

Stuff happens when you least expect it. This cliché perfectly describes my experience in Iraq. High operational tempo is no excuse for cutting corners or taking chances, but many times safety considerations are the first things overlooked in combat. Combat itself involves a long list of hazards we can never eliminate fully, and our operational environment is often just as dangerous. Fire is one such hazard I've encountered several times since deploying to Iraq.

There are many potential sources of fire in Iraq, which isn't surprising when you consider the tangle of wires that seem to come from everywhere. Some wires are left from our buildings' former residents (was there no building code before the war?). Most, however, were installed after the war in the most field-expedient—and often haphazard—way. These wires are of mixed type and output quality and were rigged for speed, not safety. When you factor in a potentially wet environment, a fire is just waiting to happen. I'm only a few months into my deployment and I've already witnessed several fires caused by electricity in command posts and living areas.

Vehicle fires are another issue commanders are concerned with in theater. The causes of these fires are varied, and often Soldiers don't have the resources to react quickly. And, if a vehicle catches fire outside the relative safety of the camp, Soldiers are vulnerable to hostile action. Vehicle fires also aren't limited to the wheeled variety. In fact, aviation fires are a serious concern to many Soldiers because of their potential to start without warning and rapidly grow beyond manageable size. We're operating these vehicles—both wheeled and winged—in some of the most dangerous and demanding conditions imaginable, and we must anticipate the possibility of fires.

It's true combat is inherently dangerous, but some Soldiers will find ways to make it even more so. Soldiers must always use common sense, whether they're in theater or training back home. For instance, if you're on guard duty, it isn't wise to light trash on fire to stay warm. The fire might suddenly grow larger than you intended, and there's always the danger of carbon monoxide poisoning with indoor fires. You might also want to think twice about lighting a cigarette near a fuel spill. These examples may seem far-fetched, but they all happened recently and each could've escalated into a serious incident.

Many of our posts are remote and have limited access to firefighting and crash/rescue equipment, which reinforces the importance of fire extinguishers. Soldiers should be trained in the proper use, selection, and placement of fire extinguishers. Units should choose an extinguisher rated for the most likely type of fire to be encountered and ensure it's big enough to be effective.

Class A extinguishers are used for ordinary combustibles including wood and paper. Class B extinguishers are employed on flammable liquids, greases, and gases. Class C extinguishers are used for energized electrical equipment. Portable extinguishers also are rated for the size of fire they can handle. This rating is a number from 1 to 40 for Class A fires and 1 to 640 for Class B fires. The rating is listed on the label—for example, 1A or 2A and/or 5B, 10B, or 20B. The higher the number, the larger fire the extinguisher can handle.

Once the right extinguisher is selected, it must be placed in an obvious location such as an exit or corridor. Extinguishers should be inspected periodically for serviceability. Leaders must ensure Soldiers are trained to safely use the different types of fire extinguishers found in their workplace. Live training can be performed safely with the assistance of qualified firefighting personnel; however, if this isn't possible, the PASS technique should be discussed at a minimum. It's simple and goes like this:

- Pull the pin
- Aim the extinguisher nozzle at the flames
- Squeeze the trigger while holding the extinguisher upright
- Sweep the extinguisher from side to side at the base of the flames

Leaders also should point out that fire extinguishers aren't used as their name implies. They're designed only to suppress a fire long enough for everyone to safely exit the area and until firefighters arrive.

We're constantly reminded that combat is dangerous, and there's little we can do to change this fact. However, we can implement a system of controls—including preparation and training—to handle "secondary" dangers such as fires within the combat environment. Stuff happens when you least expect it, and there's little you can do to deal with it if you're not prepared. I never thought I'd help fight a C-130 post-crash fire with all the extinguishers we could find, but I did (that's a story for a different time). Be prepared and make it home from the fight!

1LT Nowlin is a member of B Troop, 1/158th Cavalry, Maryland Army National Guard, and is serving currently with Task Force 1/151 Aviation Battalion, South Carolina Army National Guard, near Mosul, Iraq. He may be contacted by e-mail at matthew.nowlin@us.army.mil.

HAVE A GOOD

Anyone in the Airborne community can relate to the famous phrase, "Any time you walk away from a jump, it's a good jump." Sometimes, however, Soldiers don't walk away—they either limp or are carried from the drop zone. Accidents during Airborne operations are common, and causes range from a weak or improper parachute landing fall (PLF) to Soldiers misjudging clearance of ground objects. Airborne operations are unforgiving!

One of the keys to walking away is stressing the importance of sustained Airborne training, also known as part of "pre-jump." Sustained Airborne training is a vital component of any Airborne operation. However, seasoned Airborne Soldiers are prone to complacency due to the repetitive nature of the training. Complacency is inexcusable—adherence to standards and attention to detail during this training are critical. The price of your mistake could be catastrophic or even fatal injury to yourself or your Airborne peers. The following paragraphs provide an overview of seven accidents that occurred during the first 2 months of Fiscal Year 2005.

- A Soldier conducting day jump operations followed standard Airborne procedures and conducted all checks before and during the jump. At 200 feet above ground level (AGL), the Soldier noticed a tree stump on the drop zone and thought he could avoid it. However, the Soldier couldn't significantly affect his speed or direction due to low winds. He pulled a slip at 100 feet AGL and prepared to land. The Soldier executed a front PLF and hit the stump with his right elbow, causing injury. The Soldier misjudged the clearance of the stump and was overconfident in his ability to avoid it.
- A Soldier participating in a day jump landed hard on the side of the drop zone's centerline road. The Soldier suffered strained ligaments in his right hip. Strained ligaments are a common injury in Airborne accidents, but seldom reported.
- A Soldier was conducting a non-combat equipment parachute jump. He executed the jump in accordance with the established procedure. However, the Soldier broke his right ankle upon impact with the ground. The injury was caused by an improper PLF.
- A Soldier landed on rough, uneven, sloping terrain, causing leg injuries. He was participating in a night jump and was looking at the horizon when he hit the ground backwards. The Soldier's feet, butt, and head impacted the ground. He suffered a broken fibula and tibia in addition to torn deltoid ligaments.
- A Soldier conducting a night jump successfully exited the aircraft and deployed his MC-4 Ram Air Parachute System at the appropriate altitude. After he gained control, the Soldier lowered his equipment and prepared to land in accordance with all applicable regulations. Although the Soldier kept a sharp lookout during the descent, the low-visibility conditions prevented him from seeing his combat equipment on the ground. The Soldier landed on his rucksack and suffered a broken tibia and ligament damage to his right leg. He was well-rested, had received adequate sustained Airborne training, and followed all applicable regulations and procedures. However, he could not control the environment.
- A Soldier was the jumpmaster for his lift. The Soldier exited the aircraft, and the parachute inflated with no problems. The winds were 7 to 8 knots when he executed a rear PLF on uneven terrain. The Soldier fractured his lower leg and ankle.
- While conducting basic Airborne training, a Soldier attempted to execute a rear PLF off the swing land trainer. However, the Soldier didn't keep his feet and knees together and knees bent. After landing, the Soldier complained of pain in his left ankle. The Soldier suffered a spiral fracture to his left fibula caused by the uneven distribution of body weight upon impact with the ground.

The accidents described above demonstrate that trainee, novice, or even master-rated

SFC BALDEMAR GONZALES
Accident Investigator
U.S. Army Combat Readiness Center

jumpers are susceptible to injuries. The culprit in most accidents is improper PLFs, a fact that supports continued attention to detail during sustained Airborne training. This training won't eliminate all accidents, but by mitigating hazards common to Airborne operations, it will provide a greater probability of you and your Soldiers walking away.

It's all about getting back to the basics. The next time you're on the drop zone, listen closely to your Soldiers excitedly saying "I made it!" Remember those words you heard once: "Hey Airborne, any jump you walk away from is a good jump." Your Soldiers' success is due to good leadership, the encouragement and example of Sergeant Airborne and the jumpmasters, and in turn their attention to detail during sustained Airborne training. Turn to those young Soldiers and say, "Way to go Airborne. You paid attention during pre-jump!" They deserve that praise for a job well done.

Contact the author at (334) 255-2933, DSN 558-2933, or by e-mail at baldemar.gonzales@safetycenter.army.mil.

AMV

Class A

■ Soldier was killed when the HMMWV he was riding in was struck by a civilian vehicle. The HMMWV's crew was on patrol and the deceased Soldier was serving as the truck commander. No other details were reported.

■ Two Soldiers were killed and two other Soldiers were seriously injured when they were struck by a civilian vehicle while changing a tire on an M1070 truck. No other details were reported.

■ Soldier died when the HEMTT wrecker she was driving collided head-on with a HET during a convoy movement. The vehicles were part of two separate convoys passing each other on the roadway.

■ Soldier suffered fatal injuries when the up-armored HMMWV he was riding in struck a barrier and rolled over during a convoy movement. The Soldier was serving as the vehicle's gunner.

■ Soldier was killed when the HMMWV he was riding in rolled over into a 4-foot embankment. The driver attempted to negotiate the embankment, or "wadi," during a combat patrol. The deceased Soldier was serving as the vehicle's gunner.

■ Soldier died when the up-armored HMMWV he was riding in rolled over. The driver lost control of the HMMWV while changing lanes. The deceased Soldier was serving as the vehicle's gunner.

Class B

■ Soldier suffered an unspecified permanent partial disability when the HMMWV he was driving left the roadway, crashed through a guardrail, and landed in an embankment. The HMMWV was carrying Hellfire rockets to an ammunition turn-in point.

Class C

■ Soldier's finger was severed partially when the travel lock on a HMMWV turret pinched his hand. The Soldier was attempting to tighten the gunner's seat when the gunner rotated the turret, causing the lock to catch the Soldier's finger.

Soldier suffered fatal injuries when the up-armored HMMWV he was riding in struck a barrier and rolled over during a convoy movement. The Soldier was serving as the vehicle's gunner.

Personnel Injury

Class A

■ Soldier suffered a fatal gunshot wound when he and a group of Soldiers and foreign national troops opened fire on a civilian vehicle that failed to stop at a checkpoint. The civilians in the vehicle did not stop at the checkpoint despite vocal and hand signals, as well as warning shots.

ACCIDENT BRIEFS

Information based on preliminary reports of ground accidents.

■ A foreign national troop died after being shot by a convoy element at night. The convoy was fired upon while approaching a local police checkpoint. The gunner of one of the convoy vehicles returned fire and struck the foreign national.

■ Soldier suffered a fatal gunshot wound while participating in a live-fire room-clearing exercise. *Editor's note: Complete details on this accident are available in the Investigator's Forum article "It Was an Easy Range" on page 12 of the March 2005* Countermeasure.

Class B

■ Soldier suffered a permanent partial disability to his right hand when a flash-bang exploded while he was cleaning his personal TA-50 and equipment.

Class C

Editor's note: The following Class C accidents all involve Airborne operations. Please see the article "Have a Good Jump" on page 20 of this issue for information on safe parachute operations.

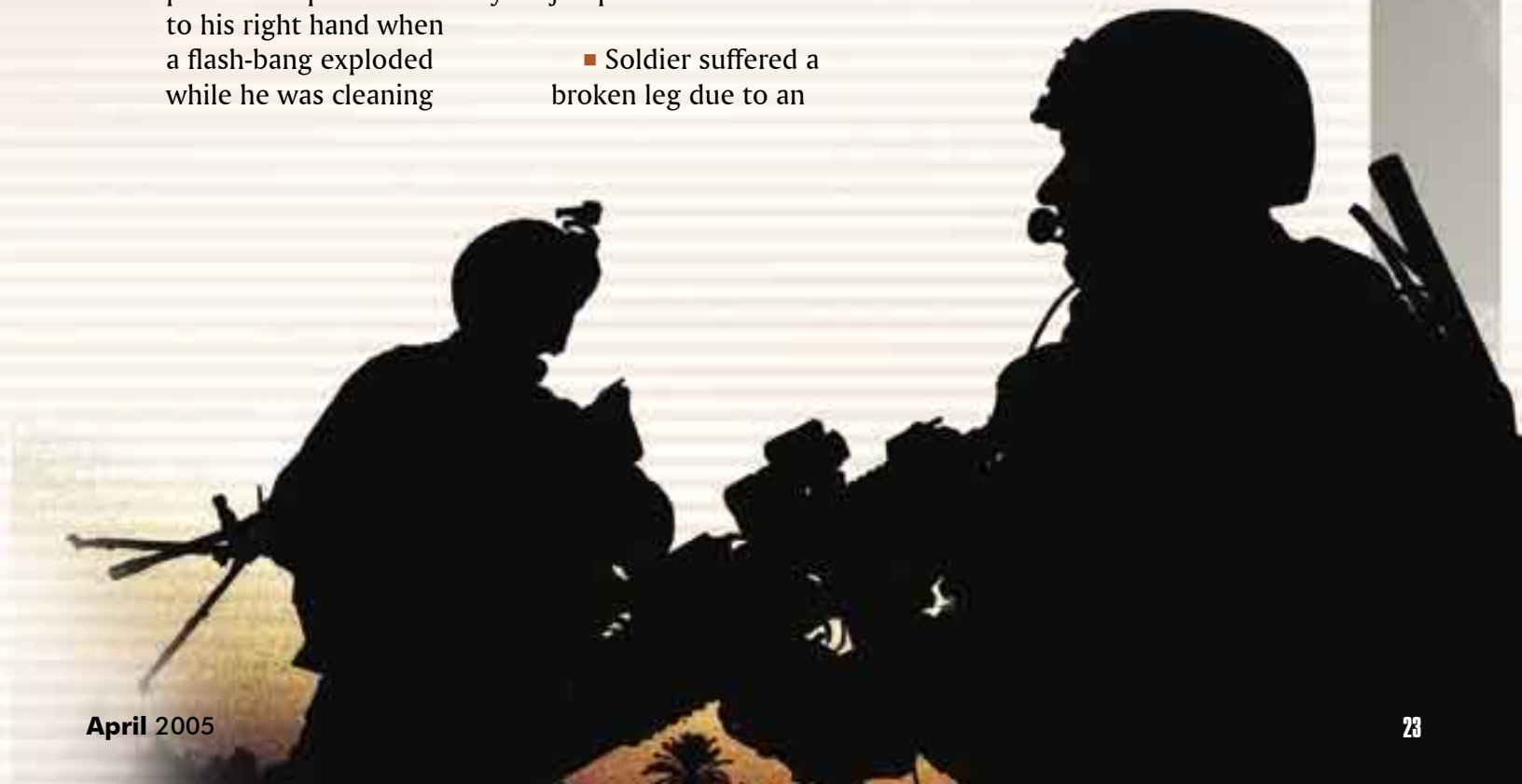
■ Three Soldiers suffered fractures to their ankles during separate parachute jumps. The Soldiers failed to keep their feet and knees together during the parachute landing fall (PLF) portion of the jumps.

■ Soldier suffered a broken hip when he failed to shift and rotate during the PLF of a parachute jump.

■ Soldier suffered a broken leg due to an improper PLF during a parachute jump.

■ Soldier suffered an ankle injury due to an improper PLF during a static line parachute jump.

■ Soldier suffered a torn bicep when he rotated his left arm over a static line while exiting the aircraft during a parachute jump. The line wrapped around the Soldier's arm, causing the injury.



ROLLOVER

rollover!

Rollover procedures

The driver—

- Releases the accelerator.
- Keeps his hands on the wheel and braces for an impact.
- Yells, "Rollover."

NOTE: All occupants should be wearing seatbelts.

- If time permits, shuts down the engine.

The gunner—

- Drops down from the hatch into the vehicle.
- Holds onto a stationary object.
- Yells, "Rollover."

NOTE: If possible, the vehicle commander grabs the gunner's legs to assist him into the vehicle.

After the rollover has been completed

The driver—

- Shuts down the engine.
- Activates the fixed fire extinguisher, if available.
- Disconnects the microphone plug, if available.
- Checks for injuries and seeks medical attention as needed.
- Exits the vehicle.
- Checks for fuel spills and attempts to contain them, if possible.

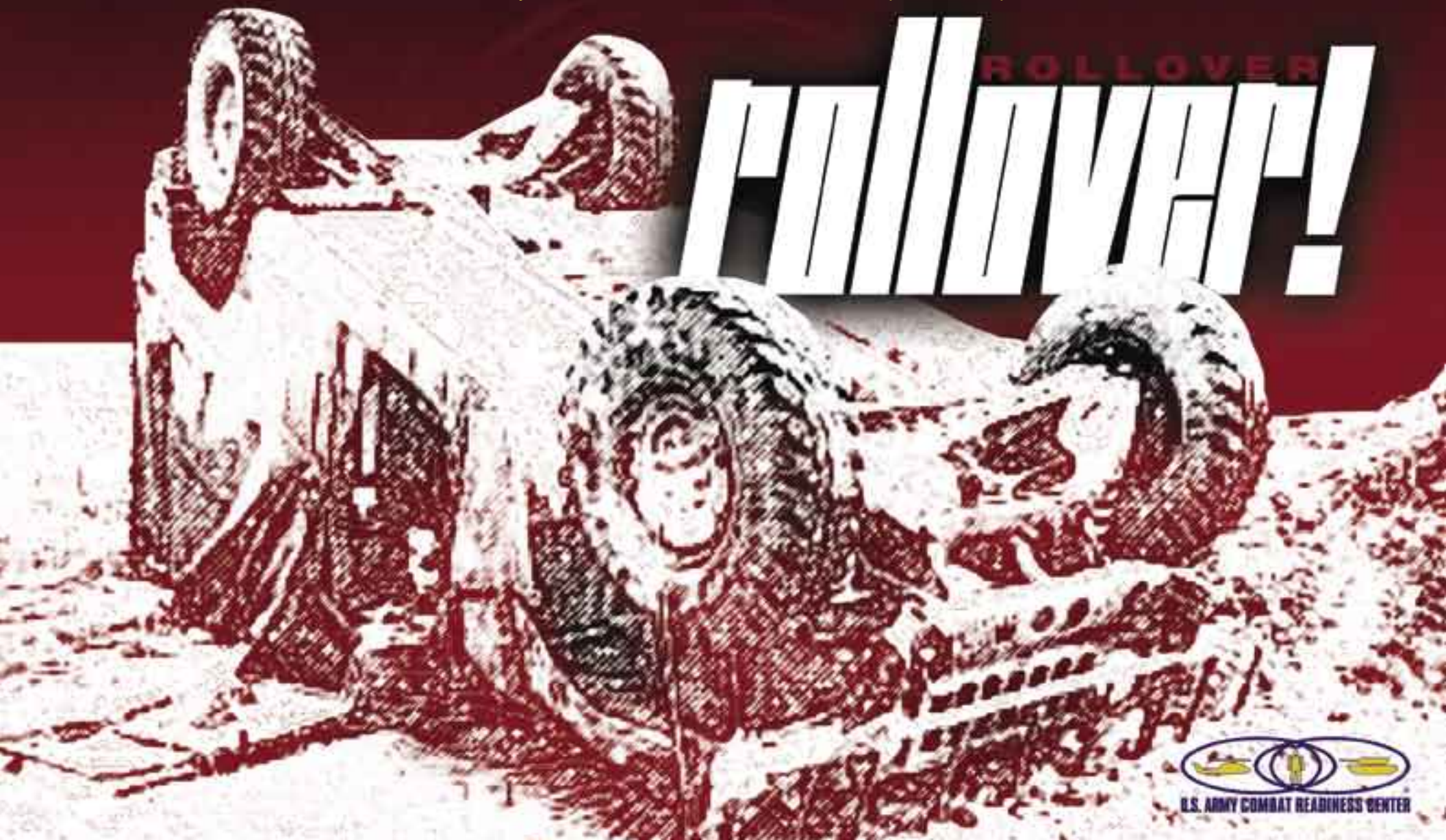
The vehicle commander—

- Checks the crew for injuries and seeks medical attention as needed.
- Disconnects the microphone plug, if available.
- Exits the vehicle with the crew.
- Accounts for personnel and sensitive items.
- Checks for fuel spills and attempts to contain them, if possible.
- Reports to higher headquarters.
- Seeks recovery of assets.

The gunner—

- Clears the weapons.
- Checks the weapons' serviceability.
- Disconnects the microphone plug, if available.
- Exits the vehicle and assists the driver.

Procedure taken from ARTEP-19-100-10-DRILL



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