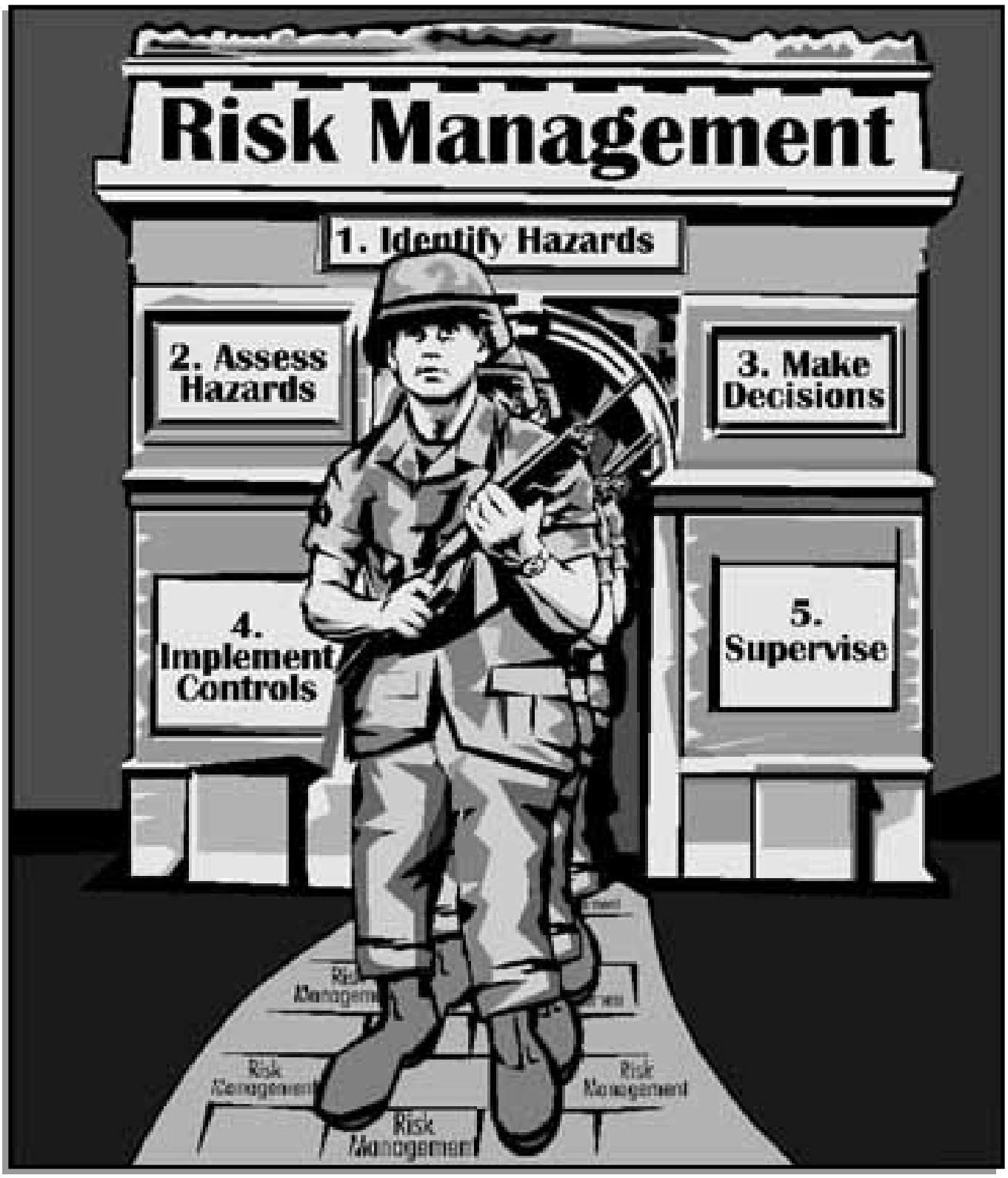
ARMY GROUND-ACCIDENT REPORT

COUNTERMEASURE

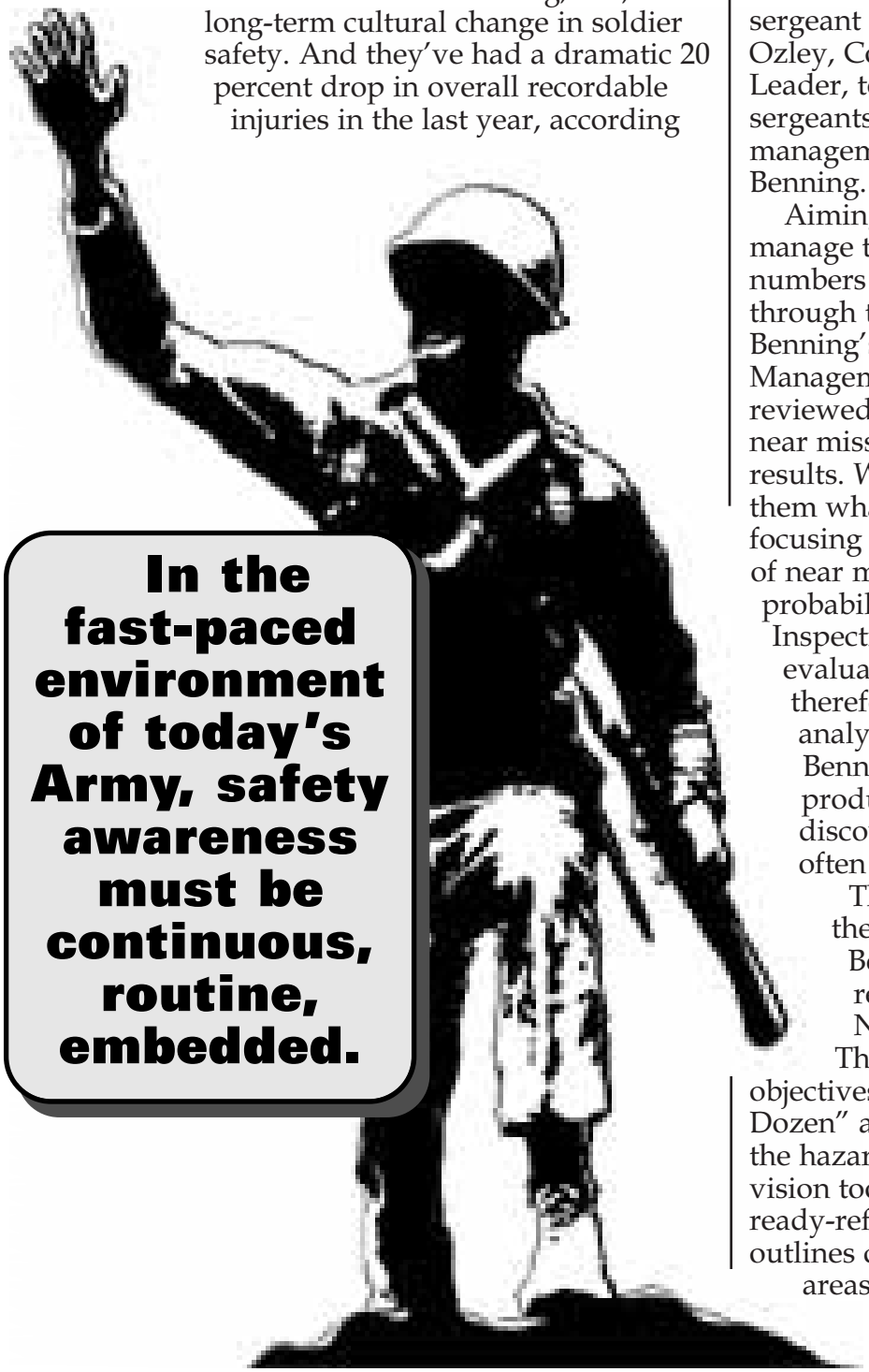
Volume 17 Number 8 August 1996



Follow me!

Infantry Branch leads the way in safe training

Infantry NCOs are leading the way at the Infantry Center and School at Fort Benning, GA, in a long-term cultural change in soldier safety. And they've had a dramatic 20 percent drop in overall recordable injuries in the last year, according to SGM Steven G. Chittum, Garrison Sergeant Major. The idea that NCOs will make safety happen led the sergeant major and Mr. James F. Ozley, Combat Safety Support Team Leader, to work with the other post sergeants major in integrating risk management into all training on Fort Benning.



In the fast-paced environment of today's Army, safety awareness must be continuous, routine, embedded.

Aiming to empower NCOs to manage the risks of training the vast numbers of soldiers that come through the post each year, Fort Benning's Sergeants Major Risk-Management Process Action Team reviewed and analyzed all accidents, near misses, and safety inspection results. While accident reports told them what has happened in the past, focusing on the blinking yellow light of near misses alerted them to the probability of future accidents. Inspections allowed them to evaluate unit readiness and, therefore, unit safety. From this analysis, the PAT identified Fort Benning's top 12 accident producers. The PAT's key discovery was that soldiers quite often underestimate risk.

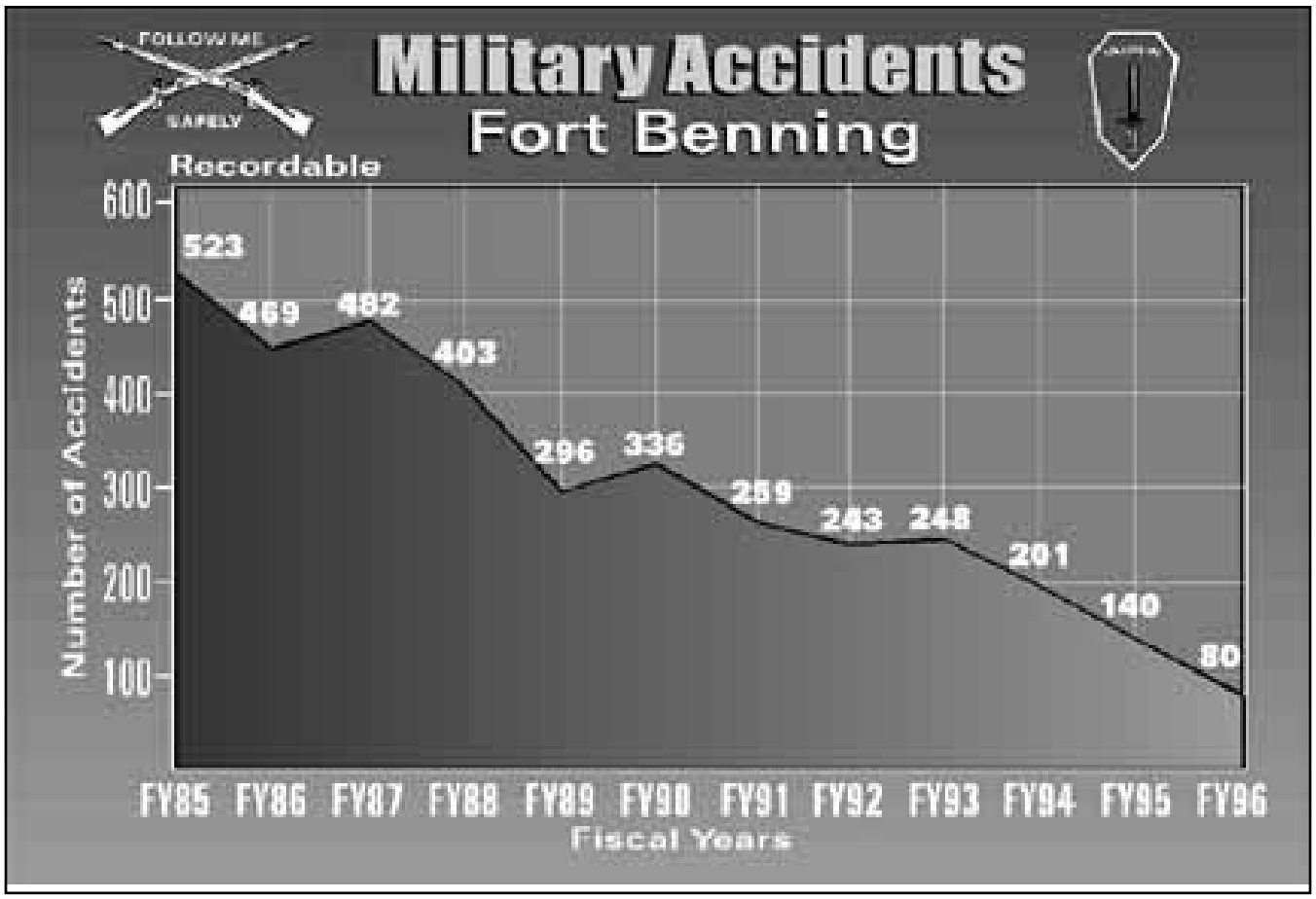
The PAT's goal was to reduce the number of injuries to Fort Benning soldiers by reinforcing the role of the NCO in all aspects of safety. The PAT envisioned goals and objectives for "Cleaning Up the Dirty Dozen" and developed controls for the hazards they identified. This vision took form in a laminated, ready-reference pocket card that outlines controls for the 12 identified areas. A portion of their mission-unique card has been modified in our example

on pages 11 and 12.

The Infantry's common-sense safety guide starts NCOs to thinking in key risk-management terms: identify and assess the hazards; implement controls. It also focuses NCOs on the supervision step necessary to successful risk management while the PAT carries out the evaluation function.

The card is not meant to replace the risk-management process. It is a teaching tool for NCOs that enhances soldier use of risk management. Our hat's off to Fort Benning for their mission-focused, safety-conscious, integrated risk-management approach. ♦

POCs: SGM Steven G. Chittum, Garrison SGM, DSN 835-2813 or (706) 545-2813 or Mr. James F. Ozley, Infantry Branch Safety Office, DSN 835-2939 or (706) 545-2939



Near misses can have far-reaching consequences

Near misses serve as the yellow caution light that can alert us to future accidents before they stop the mission. The Safety Center and *Countermeasure* need your "war stories" to analyze trends that could point to the next accident victims. Contributors' identities will be protected. Please e-mail your near-miss experiences to Saftnews@rucker-safety.army.mil. ♦

Getting it straight

Risk-management terminology

In the decade since 1987, when risk management was introduced to the Army, there has been an evolution in risk-management terminology. Standardizing the language so we understand the process will help leaders capture the power of risk management.

Risk management is a key component of force protection doctrine and will be included in AR 5-1: *Army Management Philosophy*. This risk-management standardization information was developed jointly with Training and Doctrine Command. It applies across the spectrum of force protection in Army operations, processes, and activities and includes force development, force sustainment, force projection, and individual decision making.

The standardized terms are—

- **Risk management—** the *process* of identifying and controlling hazards to protect the force. Its five steps represent a logical thought process from which users develop tools, techniques, and procedures for applying risk management in their areas of responsibility. It is a closed-loop process that's usable on any mission, any time, any place and by anybody.
- **Hazard—** any real or potential condition that can cause injury or illness to, or death of personnel or damage to or loss of equipment or property.

Your unit is going to convoy from one installation to another over 2-lane state and 4-lane interstate highways. The M939 has a known hazard with braking, and it has a mandatory 40-mph speed limit.

- **Risk assessment—** the first two steps of the risk management process. (Identify and assess hazards for their probability and severity.)

You must assess the risk of taking M939s on an interstate highway, especially if the posted minimum speed is 45 mph. You're dealing with a known hazard at even slightly higher speeds than safe operational limits.

- **Risk—** chance of hazard or bad consequences; exposure to chance of injury or loss. Risk level is expressed in terms of hazard probability and severity.

If I take my 13 M939 5-tons, with their 40-mph speed limit, on an interstate where the minimum speed limit is 45 mph, what are the chances of an accident? How bad could that accident be? Would an accident stop the mission? How bad would the accident have to be to stop the mission? Could I lose soldiers? How?

- **Exposure—** the frequency and length of time subjected to a hazard.

I'm going to have 13 M939s on a high-speed highway for 4 or more hours. Five vehicles will carry 18 personnel each. Possible exposure of 100 soldiers to catastrophic accident.

- **Severity—** the expected consequence of an event in terms of degree of injury, property damage, or other mission impairing factors such as loss of combat power or adverse publicity.

M939s are known to rollover because of braking problems at speeds higher than 40 mph. In a rollover, I could lose soldiers—up to 20 killed or injured if just one truck is involved. This unit can't function if we lose even one soldier. I'm not going to lose a soldier. In addition, if we run down and kill civilians, our own personal anguish would demoralize the unit, and either way, publicity would take a terrible toll.

- **Probability—** the likelihood that an event will occur.

Minimum speed on the expressway is 45 mph. That's not much over the set limit, but it's over. If trucks exceed 40 mph, probability of an accident increases. I've got 13 trucks.

- **Develop controls—** actions taken to eliminate hazards or reduce risk.

If the mission is not tactical, can I get a bus?

I have the option of putting my soldiers on an interstate below the minimum legal speed and expecting them to perform to that standard. I also have the option of picking a different route—one that keeps my people off the interstate and

bypasses the cities. It doesn't take appreciably longer, and this is a routine mission with no sense of urgency.

I have selected experienced drivers – we're fortunate in that we have plenty.

I can eliminate one risk: We'll take a route that eliminates expressway travel. Now I must ensure that all soldiers have strip maps and that they're briefed on planned rest stops and supervised.

● **Make risk decision—** the decision to accept or not accept the risks associated with an action; it is made by the individual responsible for performing that action.

I'm responsible for the outcome of this mission. I decided to not accept the risk of putting my soldiers on an expressway in M939 trucks. We can still complete our mission in a timely manner and do it with less risk of losing soldiers and equipment to accidents. If I couldn't lower the risk with controls, I would take the decision "upstairs."♦

POC: Mr. Dennis Keplinger; Chief, Training Division; DSN 558-2947 or (334) 255-2947 or MAJ Cliff Hefner; Chief, Integration Division; DSN 558-3856 or (334) 255-3856

RISK-ASSESSMENT MATRIX

SEVERITY	HAZARD PROBABILITY: Frequent	Likely	Occasional	Seldom	Unlikely
Catastrophic	E	E	H	H	M
Critical	E	H	H	M	L
Marginal	H	M	M	L	L
Negligible	M	L	L	L	L

Risk Level: E - Extremely High, H - High, M - Moderate, L - Low

PROBABILITY

The likelihood that an event will occur.

FREQUENT - Occurs often, continuously experienced.
LIKELY - Occurs several times.
OCCASIONAL - Occurs sporadically.
SELDOM - Unlikely, but could occur at some time.
UNLIKELY - Can assume it will not occur.

SEVERITY

The expected consequence of an event in terms of degree of injury, property damage, or other mission-impairing factors.

CATASTROPHIC - Death or permanent total disability, system loss, major property damage.

CRITICAL - Permanent partial disability, temporary total disability in excess of 3 months, major system damage, significant property damage.

MARGINAL - Minor injury, lost workday accident, minor system damage, minor property damage.

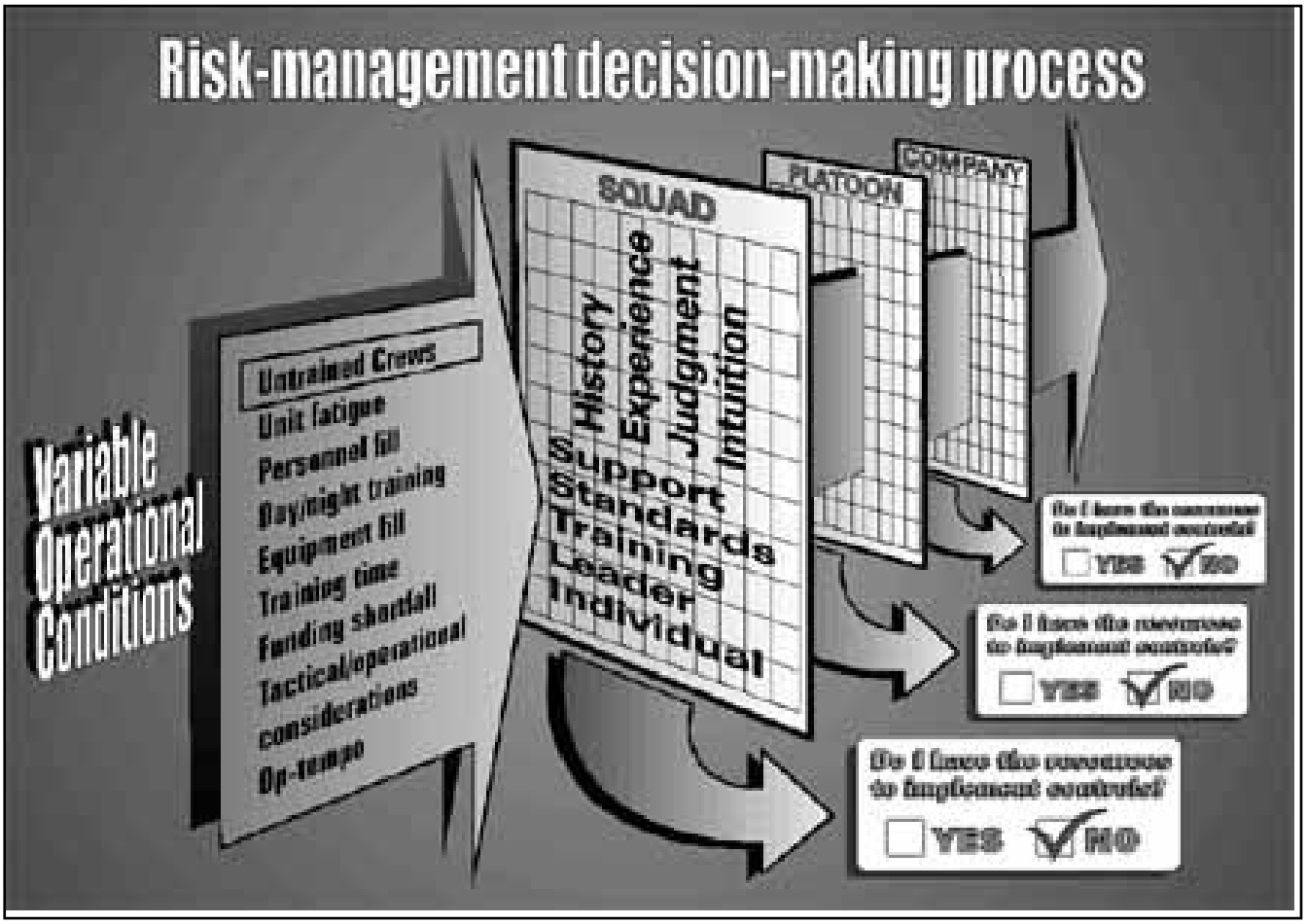
NEGLIGIBLE - First aid or minor medical treatment, minor system impairment.

Risk-management tools

In addition to the five-step risk-management process, risk-management tools can be tailored to the unique requirements of the unit or mission. They can be used by civilians as well as soldiers, on duty and off. Risk-management tools available from the Safety Center (DSN 558-2062 or 334-255-2062) include—

- The Next Accident Assessment (Leader's Guide to Force Protection and Hazard Identification Toolbox)
- Automated Risk Assessment and Controls Programs
- Leader's Guide to Force Protection
- Hazard Tracking Systems (AR 385-16 and DA PAM 385-16)
- Risk-management AAR Worksheet (Center for Army Lessons Learned (CALL) Newsletter 9509, U.S. Army Safety Center Technical Report 95-1)
- Commander and Staff Risk Management Card, 10 Jul 96
- Small Unit Risk-Management Booklet, 10 Jul 96
- ASMIS data base (U.S. Army Safety Center Army Repository for Accident Reports, DSN 558-2001 or (334) 255-2001) ♦

The Safety Center offers training in risk-management processes and techniques. For more information, call Training Division at DSN 558-2947 or (334) 255-2947.



The process

Risk management is a closed-loop process that is applicable to any situation and environment. The five steps are—

❶ Identify hazards. Identify hazards to the force, both soldiers and equipment. Consider all aspects of current and future situations, environment, terrain, and known historical problem areas.

❷ Assess the hazards. Assess hazards to determine risks. Assess the impact of each hazard in terms of potential loss and cost, based on probability and severity.

❸ Develop controls and make risk decisions. Develop control measures that eliminate the hazard or reduce its risk. As control measures are developed, risks are reevaluated until all risks are reduced to a level where benefits outweigh potential costs.

❹ Implement controls. Put controls in place that eliminate the hazards or reduce their risks.

❺ Supervise and evaluate. Enforce standards and controls. Evaluate the effectiveness of controls and adjust or update as necessary. ♦

We're looking for a few good means—

Of practicing risk management. The Safety Center is trying to "capture" your good ideas and spread them Armywide. Send examples of risk-management techniques and "tools" that have helped you along with descriptions of the tools that best fit your levels of leadership from team or squad through corps. In addition to the Leaders Risk-Management Tool Guide being developed, we'll run them in *Countermeasure*. E-mail to saftnews @rucker-safety.army.mil or fax to Ms. Betty Marcum at DSN 558-9478 or (334) 255-9478, or phone her at DSN 558-2688 or (334) 255-2688. ♦

POC: Mr. Dennis L. Keplinger; Chief, Training Division; DSN 558-2947 or (334) 255-2947

At the speed of life

Voice of experience came too late

My friend said "Tim, you should let me drive you home. You don't look so good. Really."

That's what he said to me, and I did what any (check one)—

- ☐ Red-blooded American male
- ☐ Intrepid Army aviator
- ☐ Safety professional

would do. I replied, "Hey! No problem! I can drive myself. If something goes wrong, my car knows the way home."

Did this conversation take place at—

A. Happy Hour?

B. The local watering hole?

C. Unit party?

D. None of the above?

The answer was D, none of the above. That conversation took place at my office about 9 a.m. on a Monday. My friend was right: I didn't look good. I also didn't feel good, and hadn't for about a week. I'd been nauseated; I had a rash; I felt blah. I'd even talked to the flight surgeon, and he'd given me a prescription and told me to take it easy. Again, I did what any (see paragraph above—the one beginning red-blooded American male) would do. I followed his directions—except the part about taking it easy.

It was a holiday, after all, and around my house, that usually means friends and family, a nice meal and fellowship. My appetite was gone, but I put up a good front. I tasted everything and then turned in early. I awoke the next day feeling lousy and fleetingly entertained the idea of calling in sick. But being (see same paragraph referenced above, "red-blooded..."), I didn't. Within an hour of reporting to work, I knew I had to go home. *Yet, I turned down my friend's offer of a ride*.

You can guess the rest. Just seconds from my driveway, I became disoriented, drove off the road into a concrete drainage ditch, and struck a culvert head-on. I now have four disks in my back with compression fractures, and I may never fly again.

Would I have agreed to fly a mission (or drive a tank) in the physical condition I was in that morning? Of course not. It would be inexcusable to operate high-tech, potentially dangerous equipment in that condition. So why would I think there was a difference between flying high-tech, potentially dangerous equipment and driving a high-tech, potentially dangerous automobile?

Take a lesson from me: If you're too sick to fly (or accomplish the mission), you're too sick to drive. Every time I pass that culvert on my way to the house, I think to myself, "Sure wish I'd accepted that ride!" ♦

Risk-management pointer

Soldiers who aren't mission ready also aren't up to driving a privately owned vehicle. The POV is the Army's number one killer of soldiers. ♦

Editor's note: The above article was written by CW5 Tim Skinner, Operations Officer, Investigation Division. While he flies for a living, the ground bound can also learn a valuable lesson from his experience. He is recovering nicely.

New Safety Center SGM addresses the field

"My job as the new sergeant major of the Safety Center is to see that soldiers in the field get the best we have to give them. I believe that our best product is risk management, and I will push for the integration of risk management Armywide. I'll also be taking the risk-management concept on the road, as it were, to get it to the users—soldiers in the field—where it can be used to save lives and equipment. Used this way, risk management will increase the Army's potential combat power. In addition, I'll be working with Training and Doctrine Command to embed risk management into NCO training at all levels.

"We want NCOs to know and live by the five simple steps that save lives. Risk management works. It can and should be incorporated into the way soldiers think and act.

"I also come to the Safety Center to be a conduit for information concerning risk management and safety issues to and from the field. And, of course, we at the Safety Center will continue to perform the functions we always have: investigating accidents, getting the word out on accident causes and lessons learned, and maintaining a database for accident-prevention purposes. I plan to continue the Safety Center's tradition of working actively to protect the greatest natural resource this Army has—its soldiers." ♦

—SGM Gregory L. McCann, U.S. Army Safety Center, 558-3575 (334)-255-3575 or E-mail, mccanng@rucker-safety.army.mil

"It will make a difference if NCOs, soldiers, and other leaders use risk management to protect the force."

Mine detection

GPS not a stand-alone procedure

If you've been reading your technical manuals or even some local newspapers, you may have gotten the idea that global positioning systems (GPS) are the wave of the future for minefield recording. They are not. In fact, using GPS alone to locate or record minefields will lead to injuries and deaths that could have been prevented.

GPS has been touted as accurate enough for precise minefield recording. This is incorrect. GPS can provide a minefield's general location, but it may not be used for specifics. Approved doctrine and tactics, techniques, and procedures (TTPs) still require that all minefields be located relative to a safe, fixed reference point that is at a prescribed safe distance from the suspected minefield.

GPS can provide a reasonable means of building a database of general minefield locations and boundaries for overprinting 1:50,000 scale maps, but GPS does not negate in any way the absolute necessity for following approved procedures for recording and mapping minefields. Approved TTPs must be followed whenever soldiers or civilians are required to precisely locate mines or minefields or navigate or work in the vicinity of any known minefield. Specific instructions for safe use of GPS are as follows—

■ Based upon the high probability that civilian GPS systems as well as military ones will be used, the fixed reference point for locating a minefield should be located a minimum of 140 meters from the minefield.

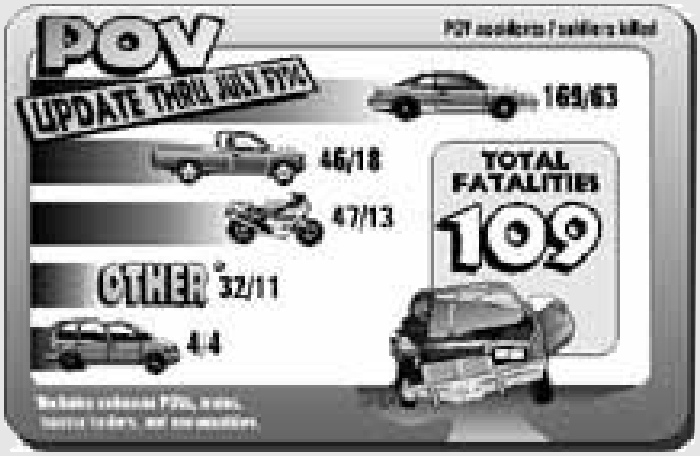
■ Do not use any GPS system for precisely locating mines or minefields. Use GPS systems for general positioning or capturing the approximate boundaries of the minefield relative to the fixed reference point.

■ Do not use GPS for way points in lanes through minefields.

- When passing coordinates, always indicate the source of the coordinates.
- For GPS: GPS/type/datum/coordinate (Example: GPS/PLGR/WGS-84/coordinate)
- For map: Map sheet/scale/datum/coordinate (Example: 7267/1:50,000/WGS-84/coordinate)

The U.S. Army Engineer Center POC for the approved TTPs and doctrine is CPT Rick O'Donnell, DSN 676-0131, ext. 3-5518 or (573) 596-0131, ext. 3-5518. ♦

POC: SFC Charlie Olsen, Engineer NCO, DSN 558-2695 or (334) 255-2695



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THOMAS J. KONITZER
Brigadier General, USA
Commanding

CUT

NCOs will ensure that soldiers carry at least 1 quart of water and, as a minimum, drink the following amounts—

Heat category	Quarts per hour
1-2	½
3	1
4	1½
5	2

Objective 3. During severe storms or lightning, NCOs will direct soldiers to disperse and squat down in an area away from tall trees or other hazards, ground weapons and load-bearing equipment away from themselves, and reduce the use of tactical radio to a minimum.

Objective 4. Adverse-weather safety will be evaluated as a part of risk-management worksheets. NCOs in the field will adjust training if weather conditions present imminent danger to soldiers.

Objective 5. NCOs will advise soldiers to reduce speed when driving in adverse weather.

Objective 6. During prolonged training under adverse weather conditions, NCOs will reinforce the use of buddy teams to monitor soldiers and will ensure transportation/shelter has been arranged.

Process goal #6: NCOs will ensure recreational activities are conducted safely.

Objective 1. NCOs will set the example during unit physical fitness training by demonstrating proper warm up methods prior to physical activity and by using authorized running routes only.

Objective 2. To prevent injury during recreational activities, NCOs will ensure participants are briefed on safety and game rules. NCOs will ensure participants are in good physical condition; that bodily contact is not excessive; that proper protective clothing and equipment is worn; and that referees ensure rules are followed.

Objective 3. As a safety precaution, recreational sports will be seasonal and oriented to the most popular sports for that specific season. An example would be conducting water survival training before warm weather.

Objective 4. NCOs will ensure designated drivers are appointed before the consumption of alcoholic beverages.

Objective 5. NCOs will ensure that their soldiers born on or after 1 Jan 1961 will attend an approved hunter-safety course before going hunting. ♦

CUT

Risk-Management Process and Objectives

The United States Army _____ Fort_____ is the best installation in the United States Army; and as the Army's premiere (large) installation, will implement and execute the best force-protection safety program through the following NCO risk-management objectives.

Process goal #1: NCOs will ensure all training is conducted safely.

Objective 1. Risk management will be built into all training. Hazards will be identified and fully assessed. The assessment will address all aspects of the training situation, including environment, terrain, and known hazards. Controls will be developed to eliminate hazards or lessen accident risk. Hazards will be reassessed during training.

Objective 2. NCOs will ensure that instructor personnel/unit NCOs and cadre are trained on all training being conducted and that appropriate safety classes are attended prior to training.

Objective 3. During all live-fire training, procedures for the storage, transportation, and handling of weapons and ammunition will be strictly enforced.

Objective 4. NCOs will brief all soldiers on medical evacuation (medevac) procedures for day/night, ground, air, and water operations. Emergency radio frequencies and telephone numbers will be distributed to all NCOs and radio operators. All NCOs will know standard phone and standard medevac frequency.

Objective 5. NCOs will ensure that all power projection operations (rail loading, ship loading, aircraft loading, and convoy movements) will be closely supervised to ensure aggressive safety measures are adhered to and any deficiency immediately corrected.

Process goal #2: NCOs will ensure unit training is conducted safely.

Objective 1. NCOs will ensure that instructor personnel/unit NCOs and cadre are properly trained and certified for the tasks being conducted and that appropriate safety classes are attended prior to training.

Objective 2. Prior to training, NCOs will conduct safety briefings that cover all hazards as well as controls and will emphasize balancing safety with realistic, high-quality training. Risk-management work sheets will be used as guides for briefings, with risk-assessment checklists completed daily.

Objective 3. NCOs will identify all combat lifesavers prior to training that requires combat lifesavers. NCOs will ensure that combat lifesaver certification is current and that all life support equipment is present, maintained, and updated as necessary.

Objective 4. Prior to field training, NCOs will brief soldiers on the hazards of wild life in the training areas, specifically snakes and stinging insects, and on hazard controls. NCOs will ensure personnel who are allergic to insect stings are identified prior to training and that insect repellent and sting kits are available.

Objective 5. NCOs will identify potential safety hazards by walking terrain where and when possible and rehearse training.

Objective 6. NCOs will recognize the hazards presented if soldiers sleep near roads, trails, or other areas where vehicles may travel. Dismount points will be established and all vehicles will be ground guided at night. Sleeping areas will be planned and briefed. Guards will be posted to protect sleeping areas as deemed necessary by NCOs. NCOs will ensure soldiers do not sleep in front of or under vehicles or trailers.

Objective 7. NCOs will ensure road guards are posted IAW unit SOPs for all unit training.

Objective 8. NCOs will evaluate all field expedients for hazards and ensure controls minimize or eliminate risk to soldiers. Training will be adjusted or cancelled if hazards place soldiers in imminent danger or risk of serious injury or death.

Objective 9. NCOs will encourage soldiers to report any hazardous acts or conditions. NCOs will direct soldiers to immediately halt training or call cease fire or check fire until a hazard is eliminated or controlled.

Process goal #3: NCOs will ensure all privately owned motor vehicles are operated safely. (The term "POV" includes motorcycles.)

Objective 1. To prevent POV accidents, NCOs will counsel soldiers with prior driving violations.

Objective 2. NCOs will conduct random POV inspections throughout the year.

Objective 3. Prior to any extended weekend (3- or 4-day), NCOs will inspect POVs and conduct safety briefings. The safety briefing will cover, as a minimum, seatbelt use, fatigue and rest breaks, speeding, reckless driving, driving under the influence of alcohol or drugs, designated driver programs, and phone numbers to call in circumstances requiring assistance.

Objective 4. NCOs will have the authority to deadline a POV based on safety considerations.

Objective 5. NCOs will ensure that all soldiers who own or operate motorcycles will attend the installation motorcycle safety course and register their motorcycles on post.

Process goal #4: NCOs will ensure military vehicles are operated safely.

Objective 1. NCOs will ensure all military vehicles are treated as extremely dangerous. Unit vehicle safety programs will include—

- –Driver training
- –NCO supervision
- –PMCS
- –Load plans
- –Assistant driver responsibilities
- –Seatbelts
- –Vehicle limitations
- –Passengers vs. equipment load limits
- –Defensive Driver Course
- –Safety straps
- –Emergency procedures

Objective 2. NCOs will ensure ground guides walk a minimum of 10 meters outside the path of the vehicles they are ground guiding and 20 meters outside the path when space permits. NCOs will ensure two ground guides are used while a vehicle is backing or maneuvering in close quarters or in or near bivouac areas. NCOs will ensure ground guides have portable lights during periods of reduced visibility.

Objective 3. NCOs will ensure all personnel exposed to eye and/or hearing hazards wear appropriate protective gear.

Objective 4. NCOs will caution ground troops, drivers, and vehicle commanders on the hazards of ground troops and vehicles training together in darkness.

Objective 5. To increase risk-management integration, NCOs will question soldiers on hazards and controls for different situations pertaining to their particular missions.

Process goal #5: NCOs will ensure training in adverse weather is conducted safely.

Objective 1. Soldiers who have had previous cold- and hot-weather injuries or recent illness will be identified prior to training in adverse weather conditions and will be closely monitored by NCOs IAW unit SOPs. Soldiers exhibiting signs of cold- or hot-weather injuries will be treated and evacuated as determined by the injury.

Objective 2. During hot-weather training or activities, NCOs will ensure that water is available to soldiers at all times. In addition,

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It's more than skin deep . . .

Today's high-tech Army uses bigger, better, faster equipment that brings with it many new materials—and many different chemicals that must be risk managed to lessen the chance of injuring soldiers and other workers.

The right chemistry

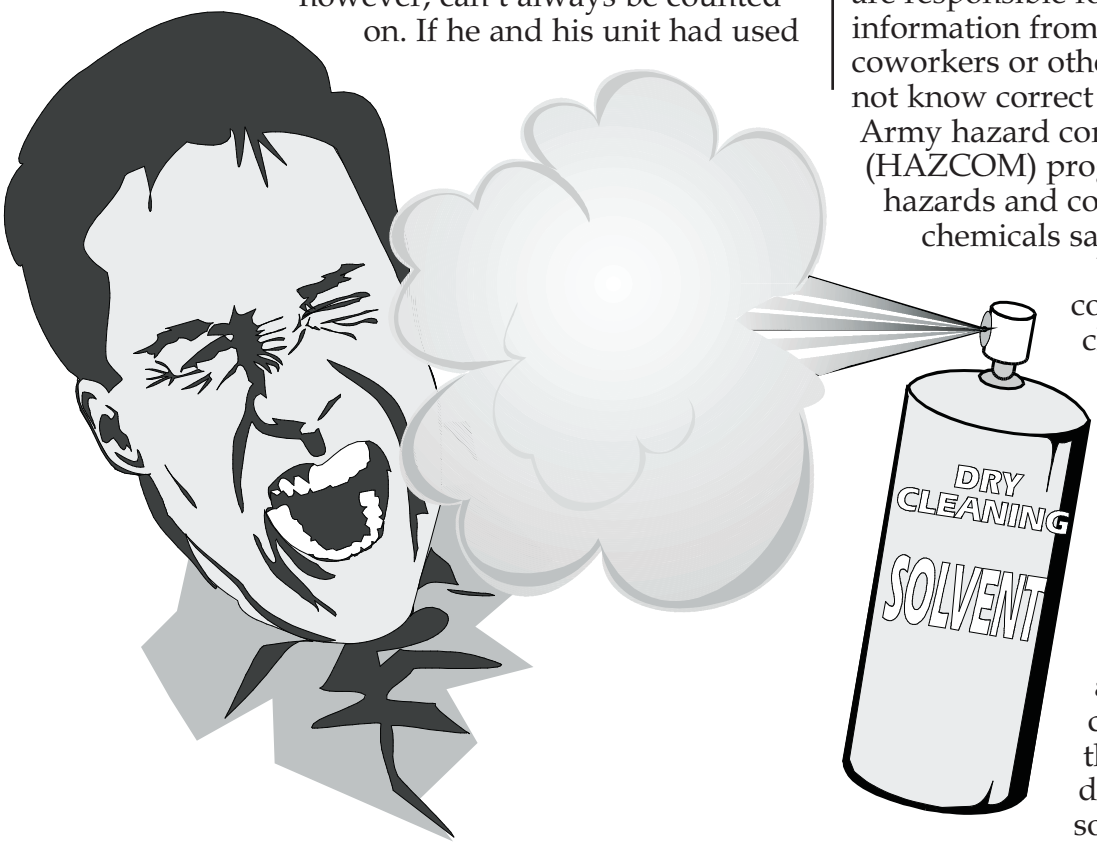
Education and training are essential to safe use of chemicals

A soldier reporting to work at the motor pool found his coworker in severe pain. The worker had sprayed himself in the eyes with dry-cleaning solvent, and he couldn't see to get help. The soldier laid his coworker on the ground and gently flushed his eyes with water from a hose. The victim suffered painful corneal burns, which fortunately, healed with no permanent damage to his vision.

That soldier courted disaster by working alone with a potentially hazardous chemical. He was lucky his injuries were no worse. Luck, however, can't always be counted on. If he and his unit had used the risk-management process properly, he wouldn't have had to depend on luck when he reported to work each morning. Risk management would have identified system inadequacies that were building up to an accident with possible severe consequences.

Each chemical has its own properties and characteristics. It's important that leaders understand the chemicals their soldiers use, the potential hazards, and how to protect soldiers in the event of an emergency.

Leaders are responsible for getting this information to soldiers. Soldiers are responsible for getting this information from leaders—not from coworkers or others who may or may not know correct procedures. The Army hazard communications (HAZCOM) program outlines hazards and controls for using chemicals safely.



Detailed information concerning potential chemical hazards appears on the material safety data sheet (MSDS). Federal law requires chemical manufacturers or importers to provide an MSDS to accompany the chemical product through the distribution chain. All soldiers must read the

applicable MSDS before using chemicals. The MSDS contains eight specific pieces of information—

- Name of the chemical. This must match the information on the label.
- Hazardous ingredients and all other substances that make up the material.
- Physical and chemical characteristics such as appearance, odor, boiling point, vapor pressure, density, solubility (ability to mix in water), melting point, and evaporation rate.
- Fire and explosive hazards and the conditions under which the chemical might catch fire or explode.
- Reactivity of the chemical (ability to burn or explode when exposed to air or water or when mixed with other substances).
- Health-hazard information (how the chemical can cause harm, symptoms of exposure, the body organ primarily targeted by the chemical, and emergency first-aid procedures).
- Safe handling procedures (how to store, move, and use the chemical).
- Control measures (protective clothing and equipment, safe work practices, cleanup procedures).

Leaders must ensure soldiers understand and comply with procedures for chemical use and associated hazards. Technical assistance is available from installation safety offices and the occupational health section of medical treatment facilities.

SOPs should provide the guidance soldiers and other workers need to keep them working safely. The Army HAZCOM program provides training on chemical hazards and controls, including safe handling procedures. ♦

POC: MSG Eugenia Ulman, Chemical NCO, DSN 558-2919 (334-255-2919)

The ABCs of PPE wear

Little things can have a big impact

A worker was injured as he transported a toxic chemical to the disposal area. He was carrying the load improperly, and even though he had worn the proper personal protective equipment (PPE), he had not taped the small grommets at the top of his toxicological agent protective (TAP) boots. Sulfur mustard leaked through the small holes at the top of the boots and through his coveralls to burn his legs. He spent 3 days in the hospital and another 7 on restricted duty.

Many chemicals can burn or be absorbed through the skin. Though this is less likely than inhalation, a greater effort is needed to protect workers. Soldiers and other workers who handle contaminants must use gloves, coveralls, goggles, or other appropriate PPE, and it must be used and maintained correctly if it's going to offer complete protection.

Personal protective equipment can't help if it isn't used correctly. Soldiers should always—

- Wear the proper PPE at the appropriate time and place for each task.
- Inspect PPE for serviceability before using.
- Ensure PPE fits properly.
- Use only approved substitutes.
- Keep PPE clean and store properly. ♦

SOP: Road map to safe hazmat handling

According to the Environmental Protection Agency, about 250 million tons of hazardous wastes are generated annually in the U.S. The Army contributes used oil and antifreeze; batteries; paint, paint-related wastes, and solvents; nuclear, biological, and chemical wastes; radiological wastes; household hazardous wastes; and POL-contaminated soil.

Army installations must comply with federal and state standards for military use of hazardous products. Non-compliance is a safety issue: It can kill or injure soldiers and other workers.

The route to keeping installations uncontaminated and soldiers at work is through the road map provided by standing operating procedures. SOPs—like equipment—must be managed, meaning a soldier should be assigned to review and update each SOP annually, at the least. U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) publishes Technical Guide No. 176: *How to Write and Manage Standing Operating Procedures.* It is available from CHPPM's Information Services Branch, DSN 584-4408 (410-671-4408) or e-mail mchbcsiis@aeha1.apgea.army.mil.

SOPs should have risk management written into operations, using by-the-book standards as controls to lessen or eliminate

Risk-management pointer:

Eye or face protection must be used by workers exposed to flying particles, molten metal, liquid chemicals, acids or other caustic liquids, chemical gases or vapors, or potentially injurious light radiation. ♦

hazards. The SOP should be coordinated with the installation Directorate of Public Works (DPW) or its equivalent. Guidance on subjects that should be covered in the SOP can be found in 29 CFR 1910. Some of those topics include—

- Hazardous materials.
- Permissible exposure limits.
- Personal protective equipment (PPE), including eye and face protection.
- Hazardous waste operations and emergency response such as: cleanup operations, corrective actions, voluntary cleanup operations at uncontrolled hazardous waste sites, operations involving hazardous wastes, and emergency response.
- Occupational exposure to hazardous chemicals in laboratories.
- Hazard communications standard.
- Hazard communications program.
- Container labeling.
- Material safety data sheets
- Training. ♦

Soldiers and other workers must be informed on possible chemical hazards and side effects.

POC: MSG Eugenia Ulman, Chemical NCO, DSN 558-2919 (334-255-2919)

Respirator rules

If a respirator is required for a particular chemical, that information is on the material safety data sheet (MSDS). The MSDS provides guidelines on respirator type and ventilation requirements, as well.

Beyond that, however, the respirator must fit properly and be in good condition. Monthly inspections are required. If the chemical can be smelled, the soldier should probably be using a respirator. If the chemical can be smelled while using the respirator, the mask may not fit properly or the filters need to be replaced; the soldier may need to be medically evaluated.

Before a soldier can be assigned to work with a respirator and chemical tools, he or she must have a pulmonary function screening and cardiovascular and respiratory test. Not all soldiers can use respirators. Certain conditions prohibit a soldier from using a respirator: diabetes, epilepsy, or alcoholism; certain medications; punctured ear drum; skin sensitivities; impaired or nonexistent sense of smell; emphysema; chronic pulmonary obstructive disease; bronchial asthma; coronary artery disease or cerebral blood vessel disease; severe or progressive hypertension; pernicious anemia; claustrophobia or difficulty breathing when wearing a respirator. Respirator users must be medically evaluated and enrolled in the Respiratory Protection Program. Respirators should never be altered or modified. According to AR 11-34: *Army Respirator Protection,* respirators should be—

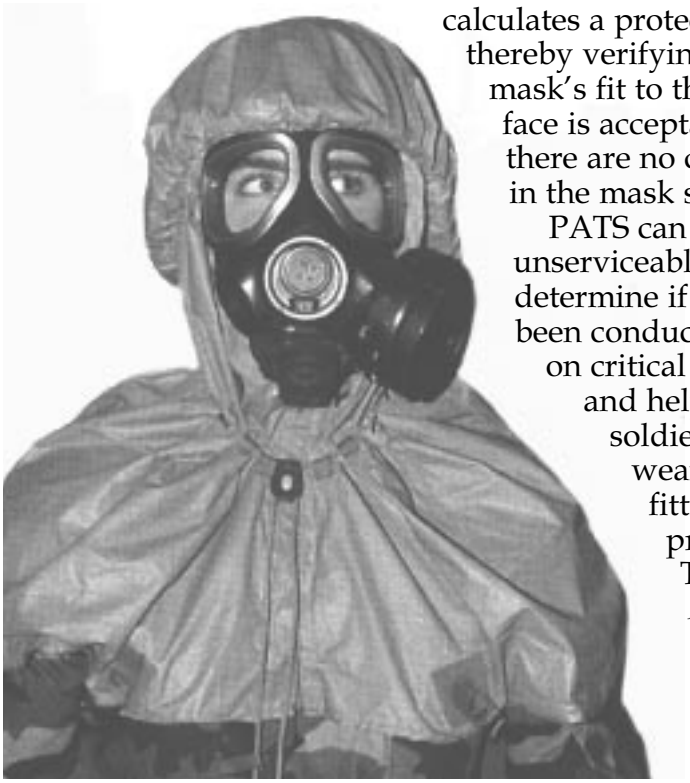
- Used only in well-ventilated areas.
- Properly fitted with no leaks.
- Cleaned after each day's use. ♦

Right face!

New mask may mean different size

NBC NCOs should be aware that the M40/42/43 protective mask is sized differently than the M17/24/25. The new mask is made of a silicon rubber, and it feels different than the old one. You can't assume that, just because a soldier wore a size medium in the old mask, he or she will wear that same size new one. In addition, old methods of checking fit won't necessarily put the right size mask on the right face.

The M41 protection assessment test system (PATS) is the scientific method of testing fit and should help fit the mask correctly. PATS continuously samples and counts individual particles and measures the concentration of particles both inside and outside the mask. From this, it calculates a protection factor, thereby verifying that the mask's fit to the soldier's face is acceptable and that there are no critical leaks in the mask system.



PATS can also detect unserviceable masks, determine if PMCS has been conducted properly on critical components, and help in training soldiers on proper wear. Further fitting criteria is provided in TC 3-41: *Protection Assessment Test System (PATS)*, Nov 94.

Masks are in plentiful supply. If, after cross-leveling, you don't have enough of the right size masks, requisition more through the Armament Chemical Acquisition Logistical Activity (ACALA) National Inventory Control Point. Masks being exchanged for different sizes may be retained until the requisitioned masks have been received. Excess serviceable masks will be turned in using standard report-of-excess procedures.

Requisitions should include the quantity needed by size. Use project code "DJZ" to indicate that masks are being exchanged for different sizes. Guidance is in AR 725-50 and 710-2. Requirements code two-zero (20) must go in columns 55 and 56. This code is extremely important; its absence can get a requisition rejected.

If doing a bulk requisition, the document identifier code is AOE or AO5. "Bulk requisition" should be written in the remarks block; this will assure special handling and prevent automatic cancellation. Unit-level or single UIC users will not use bulk requisitions.

POCs at the National Inventory Control Point are—

M40/M17 masks Mr. Fuoto, DSN 793-4285 or (309) 782-4285; e-mail ffuoto@ria-emh2.army.mil

M42/M25 masks Ms. Wright, DSN 793-5757 or (309) 782-5757; e-mail rwright@ria-emh2.army.mil

M43/M24 masks Ms. Viren, DSN 793-7545 or (309) 782-7545; e-mail dviren@ria-emh2.army.mil ♦

POC: MSG Eugenia Ulman, Chemical NCO, DSN 558-2919 (334-255-2919)

Low down on the cover up

If it moves, feed it; if it doesn't, paint it. This old Army axiom has kept soldiers covering equipment with paint for decades. Chemical agent resistant coating (CARC) is the standard paint for Army tactical equipment. It lasts four times longer than ordinary paints and doesn't soak up chemical agents. CARC—and other paints—have their hazards: They're flammable. Paint solvents can be inhaled or absorbed through the skin. They can irritate eyes and skin and cause headaches, dizziness, and intoxication. Large doses can lead to unconsciousness and death. Continual overexposure can permanently damage vital organs.

Spray painting is more hazardous than rolling or brushing. Solvent exposures are higher, and paint mists usually contain toxic chemicals. Isocyanates—found in CARC and some other paint mists—irritate eyes, throat, and lungs and can produce an extreme allergy. Airless spray guns can inject paint under the skin, delaying poisoning and injury.

Material safety data sheets (MSDS) list the hazards and controls for each paint or solvent, as well as disposal instructions. Ensure soldiers are implementing the controls listed on the MSDS as well as those in SOPs and TMs. Under most conditions, CARC users will need a respirator, but it must be used carefully. (See related article, page 5.) If soldiers are having difficulty breathing, become dizzy, or "taste" the paint, work should be stopped, and the area evacuated. If symptoms persist or become more severe even after evacuation, the worker should be taken immediately for medical evaluation and treatment.

To ensure paint work is safe work, leaders should consult the local safety office and Preventive Medicine Activity and get them involved before initial CARC painting. In addition, leaders should cover the following—

- **Flammability**. Don't allow soldiers to paint near flame, heat, or spark producers such as electrical components, heaters, and running motors.
- **Ventilation**. Paint should be handled only in well-ventilated areas or outdoors. Leaders should ensure soldiers use spray booths and ventilation systems designed for paints, but painting operations must be kept away from other ventilation systems and air intakes. Vehicles should be parked away from painting structures to ensure vapors aren't trapped.
- **PPE**. Make sure soldiers wear eye splash protection, clothing that fully covers the skin, and the appropriate gloves. Soldiers should also shower after work to avoid taking toxic chemicals home.
- **Disposal**. Paint and paint products and supplies must be disposed of in accordance with local policy. ♦

POC: MAJ Robert Wallace, Installation Branch, DSN 558-1122 (334-255-1122) or Mr. Geoffrey Braybrooke, USACHPPM, Industrial Hygiene Field Services Program, DSN 584-7391 (410-671-3118)

Welding CARC-painted surfaces

In a word, don't. Don't ever weld, burn, or cut CARC-painted material. It releases toxic gases, vapors, and metal fumes. Grind or sand off CARC paint out to at least 4 inches from the area to be heated before applying heat. If the other side of the metal is painted, remove that paint also. In addition, soldiers doing the sanding must use high-efficiency respirators. ♦

HC smoke—managing the risks

A soldier died after inhaling hexachloroethane (HC) smoke for only a couple of minutes. His platoon was conducting a mortar ARTEP, and a friendly artillery smoke screen would cover their movement across an open field. One soldier drove the HMMWV providing the smoke screen while another threw HC smoke grenades from the back of the vehicle. He wore no protective mask. One of the grenades ignited in the back of the HMMWV, but the two soldiers kept the smoke screen moving. The HMMWV was spewing so much smoke it looked like it was on fire, and the driver was afraid to stop for fear of being run over from behind by tracks following them.

The soldier in the HMMWV's rear endured the smoke for the 2 minutes or so it took to get to a stopping place. He was immediately evacuated for treatment, but no one told emergency room personnel that he had been exposed to HC smoke; "white smoke" was all the information given. Trips to three different medical facilities couldn't save him. He died almost a month after the incident. The tragedy is that the soldier had a protective mask in the back of the truck, but he never put it on. As this accident shows, HC smoke can be deadly.

Safety-of-use messages on the hazards of HC smoke have been sent to field units. Commanders and other leaders should ensure that soldiers are briefed and trained on its hazards and use before they go

to the field. Soldier awareness is crucial because of the delayed effects of zinc chloride, the major toxic ingredient in HC smoke. A soldier could be in real trouble and not know it well before he or she has trouble breathing.

Identifying the hazards

Corrosive zinc chloride fumes in HC smoke are deadly. In high concentrations, these fumes destroy lung tissue and cause dry-land drowning. Victims "drown" as their lungs fill with fluid.

The sneaky nature of HC-smoke injury lulls both doctors and victims into a false sense of security. A symptom-free period of days, or even weeks, may follow overexposure, or a sick soldier may seem to be responding. The victim can then be hit suddenly with severe respiratory distress. Soldiers won't realize they've inhaled too much until hours, or even days, after the exposure. By this time, the critical designator "HC" may not be mentioned in connection with "smoke," making the injury much harder to treat.

Assessing the risks

When planning smoke operations, leaders must consider weather, wind conditions, and potential wind drift. Observation and communication, as well as control measures, must be established to prevent exposure of unprotected personnel. HC smoke must not, under any circumstances, be used in an enclosed space, and it should not be deployed from a moving vehicle.

Controlling the risk

Precautions on the use of HC smoke are listed on a card found in each box of smoke grenades. Leaders should ensure the following precautions are taken—

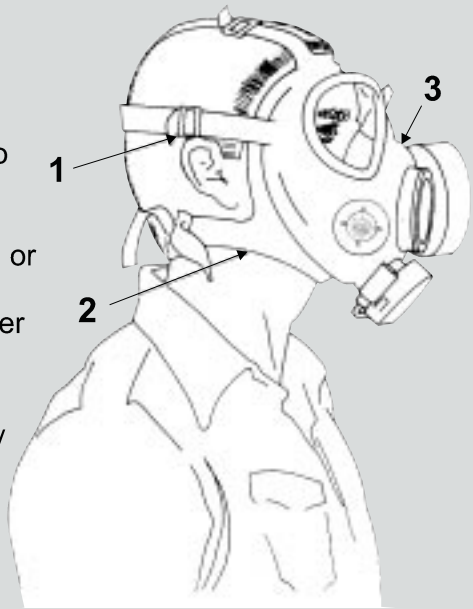
- Store and transport grenades in their fiber containers.
- Inspect the fuse safety pin before removing the grenade from its container. If the pin is missing, soldiers should not remove the grenade.

In addition, personnel will carry their protective masks when participating in exercises that include the use of smoke. Soldiers will mask—

Checking for Fit

(NBC NCO) With soldier standing, check for proper fit according to following order of importance:

- Edge of facepiece comes up on forehead but not into hairline and within 1 inch (2.5 cm) of ear.
- Temple straps (1) and cheek straps (2) do not cut into ears.
- Eye pupils are centered.
- Facepiece does not press flesh so eyes are partly closed.
- Bottom of facepiece does not cut into throat.
- Skin in front of ear is not wrinkled.
- Nosecup (3) does not obscure vision or press into nose.
- If facepiece is difficult to fit, try another size mask.



WARNING

Soldier's safety depends on properly fitting face-piece.

NOTE

FOLLOW-ON MAINTENANCE: Check the facepiece for leaks (para 2-8).

● Before exposure to any concentration of smoke produced by AN-M8 HC white smoke grenades, smoke pots, or metallic powder obscurants. TRADOC requires masking whether or not the release is for chemical warfare training.

● When passing through or operating in dense smoke such as smoke blankets and smoke curtains. Dense smoke is that in which visibility is less than 50 meters.

● When operating in or passing through a smoke haze and the duration of exposure will exceed 4 hours. A smoke haze is that in which visibility is greater than 50 meters.

● Anytime exposure to smoke produces breathing difficulty, eye irritation, or discomfort for even one soldier. At that time, all similarly exposed personnel will mask.

In addition, soldiers will mask when HC smoke is used in MOUT training and other enclosed areas. Smoke-generator personnel will mask when it is impossible to stay upwind and clear of smoke. Other precautions for MOUT training include having soldiers—

● Reduce skin exposure by rolling down sleeves.

● Shower and launder clothing immediately following the exercises to eliminate the risk of skin irritation following smoke exposure.

SOPs should provide clear guidance for issuing, storing, handling, employing, and accounting for HC smoke grenades. Excellent information on HC smoke and its health effects are in FM 3-101-1: *Smoke Squad/Platoon Operations*.

Further, SOPs should address HAZCOM with health-care providers since victims may not be able to communicate with caregivers. Leaders should work with their health-care providers to develop automatic referral and followup for soldiers exposed to any concentration of HC smoke. ♦

Ten 'hut!

SGM is looking for good-news stories to share with the rest of the Army. Being the Safety Center, we get plenty of bad-news stories—unfortunately. But the accident that didn't happen doesn't get reported. We want to hear about NCOs and soldiers who identified hazards, assessed risk, developed controls in the decision-making process, implemented those controls, supervised, completed their missions without incident, and evaluated the process afterwards. Fax your articles to SGM McCann at DSN 558-9136 (334-255-9136). You can reach him by e-mail at mccanng @rucker-safety.army.mil. ♦

Hazard alert:

Soldiers with smoke-injury symptoms should be evacuated along with the expended pyrotechnic to the nearest hospital. Medical personnel should be advised immediately of possible HC-smoke injury. Victims should be admitted for at least 48 hours for inhalation treatment and observation for delayed symptoms. In no case should a soldier be discharged or returned to duty during the observation period. ♦

Safety Center SGM speaks out on POV accidents

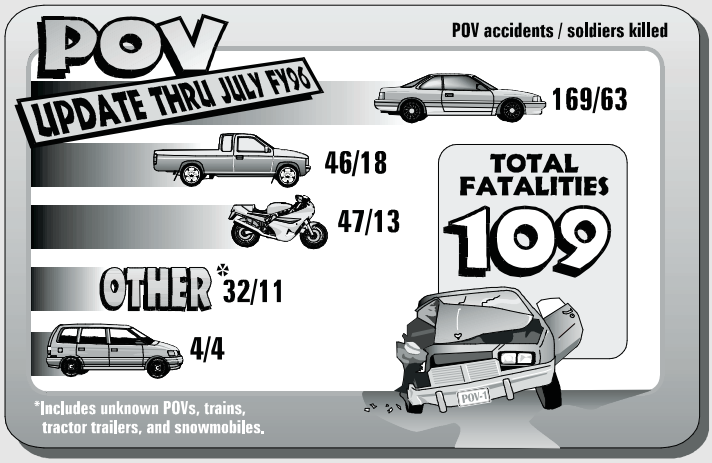
I want the word to reach to all soldiers and NCOs that our philosophy is to protect the force through risk management to enhance warfighting. The risk-management process is a proven effective method of doing business. It works in planning and executing military training and operations, and it works in our off-duty lives as well. Right now, more soldiers are dying on streets, roads, and highways than anywhere else.

Preventable training accidents still happen, even though less frequently than in the past. Key leaders—the ones in positions to change the ways soldiers work and play—are the small unit leaders. They have the big job of influencing soldiers' behavior. NCOs know soldiers. They live and train with them and can identify their high-risk behaviors. It is critical that these first-line leaders have our support. We must give them risk-management training, ensure that they know the standards and are prepared to enforce them, and support them at all levels of the chain of command.

The Safety Center can help commanders and other leaders with training. We have exportable safety courses, and we provide risk-management publications such as *Countermeasure.* We're also working with Training and Doctrine Command to institutionalize the risk-management philosophy as one step of integrating risk-management into all Army operations. We must change the way the Army thinks. That's a tall order. Is it worth it? If it saves a soldier's life, you bet! ♦

"Forty percent of the force—our young, junior-grade soldiers—is having 60 percent of the POV fatalities."

—SGM Greg McCann, USASC SGM, DSN 558-3575 (334-255-3575)



Report of Army ground 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 558-2688 (334-255-2688). Address questions about distribution to DSN 558-2062).

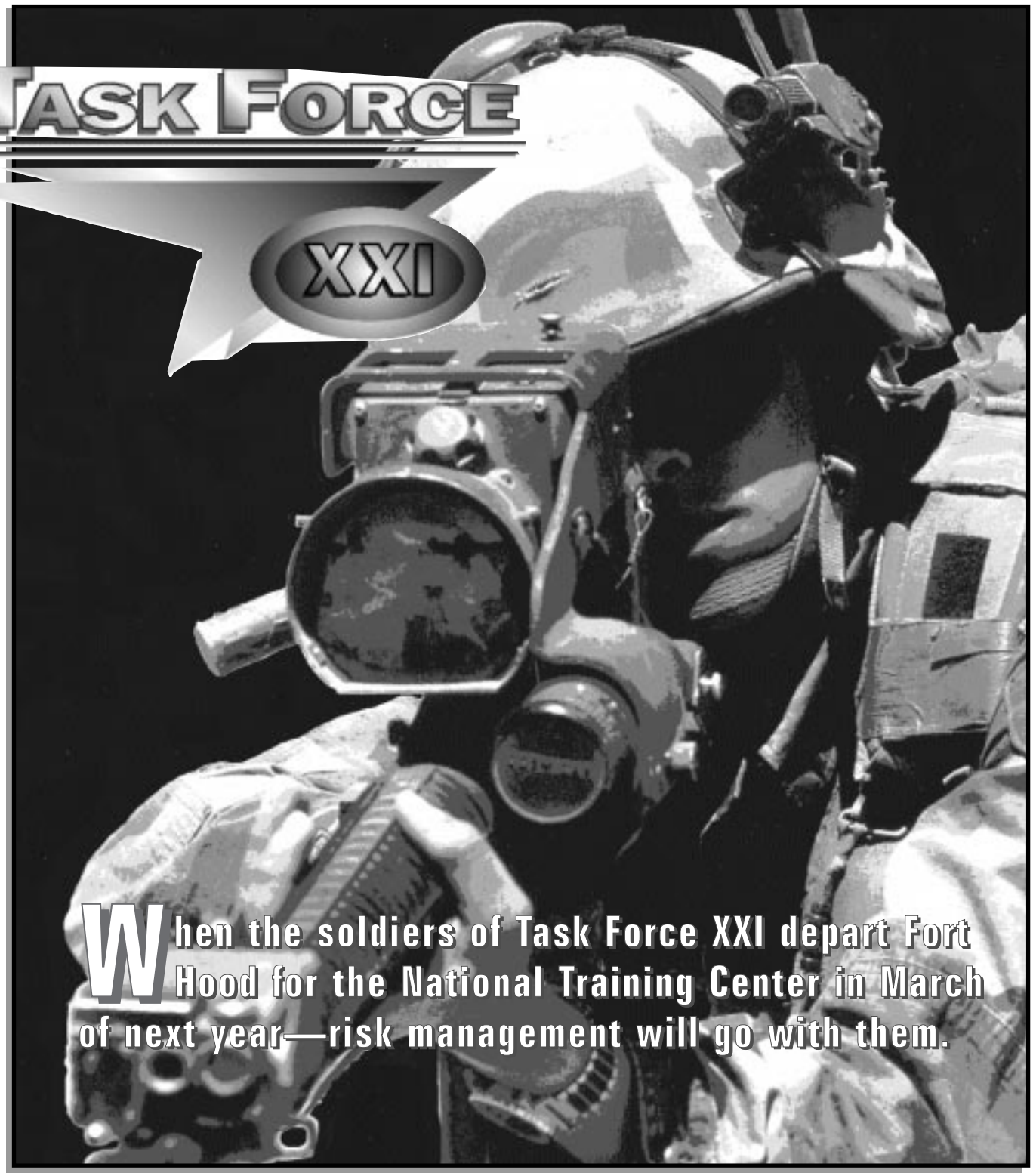
THOMAS J. KONITZER
Brigadier General, USA
Commanding

MURPHY'S FLAWS
WHAT CAN WE DO FOR TODAY'S SAFETY BRIEFING?
IT'S GOT TO BE EXCITING?
HEY! HOW ABOUT A P.E.? THAT WILL GET'EM EXCITED!
YEAH! WE CAN TELL THEM NEVER TO DO THIS--ESPECIALLY INSIDE A BUILDING. HEH! HEH!
COUGH! COUGH! YA' THINK THIS SMOKE WILL HURT US?
HACK! HACK! NAH! A LITTLE WHITE SMOKE WON'T HURT REAL SOLDIERS
COUGH! COUGH! HACK! HACK!
I WONDER WHY THEY DIDN'T JUST MASK OR LEAVE THE BUILDING?
YA'SEE ANY REAL SOLDIERS AROUND HERE?
SAINT PETER'S

ARMY GROUND-ACCIDENT REPORT

COUNTERMEASURE

Volume 17 Number 10 October 1996



When the soldiers of Task Force XXI depart Fort Hood for the National Training Center in March of next year—risk management will go with them.

Protecting the force through risk management

Growing out of a concept of Force XXI, Task Force XXI is a living, breathing, on-the-ground force at Fort Hood, TX. In March of 1997, Task Force XXI will move out with its soldiers, ground equipment, and aircraft for a 14-day advanced warfighting experiment (AWE) at the National Training Center (NTC).

Task Force XXI, which is the 1st Brigade of the 4th Infantry Division (ID), comprises an armor, field artillery, mechanized infantry, light infantry (attached from Fort Lewis, WA), engineer, and forward support battalion as well as an aviation task force. Task Force XXI is an experimental force (EXFOR) that will try out 105 initiatives ranging from the way a brigade in the 21st century is structured to new equipment.

Structure

One of the initiatives that will be under scrutiny is called combat service support redesign. In Task Force XXI, all combat service support for the armor and infantry—from medics, to fuel, to food—will be consolidated in a forward support battalion. Where the armor battalion commander used to have his own refuelers, cooks, and other support, in the Task Force XXI brigade model he must go to the support battalion for his slice of these support services.

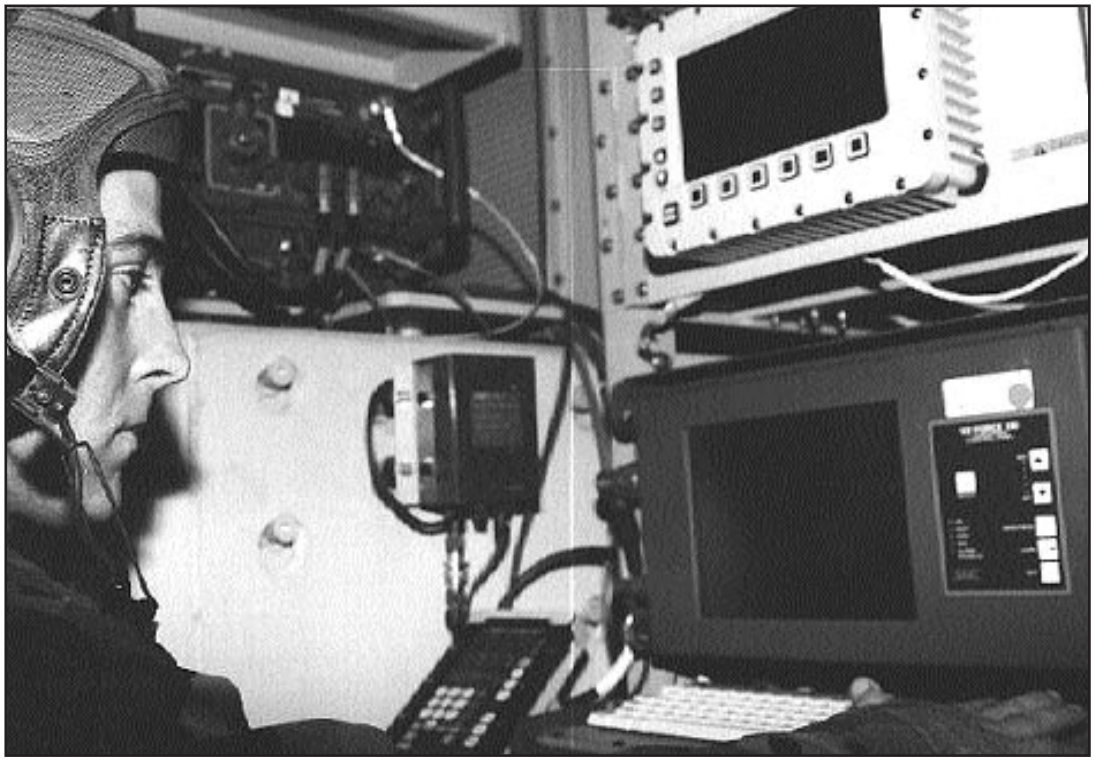
Equipment

Many of the initiatives for Task Force XXI involve new equipment. The infantry will take the newest Bradley fighting vehicle, the M2A3, to the NTC. In the artillery battalion, the new Bradley FIST vehicle will be working with the M109A6 Paladin howitzers.

The task force armor battalion will have M1A1s. The task force will also be equipped with the latest night vision equipment.

The aviation task force is so designated because some of the aircraft will come from outside the 4th ID. The only two Longbow Apaches in the Army will be part of the aviation task force, and the Texas Army National Guard with their Chinooks will provide lift capabilities. Scouts will come from the 1st Cav (located at Hood, but not part of the 4th ID). Observation and attack aircraft will come from the 1-4 and 2-4 Aviation, 4th ID.

John T. Love II 4ID PAO



This Task Force XXI soldier is manning the Appliqué computer network site in the rear of a C^2V (command and control) vehicle. Built from the ground up for the task force, this mobile command system provides the commander with detailed battlefield information.

Integrating risk management into Task Force XXI

In January of 1996, BG Thomas J. Konitzer, Director of

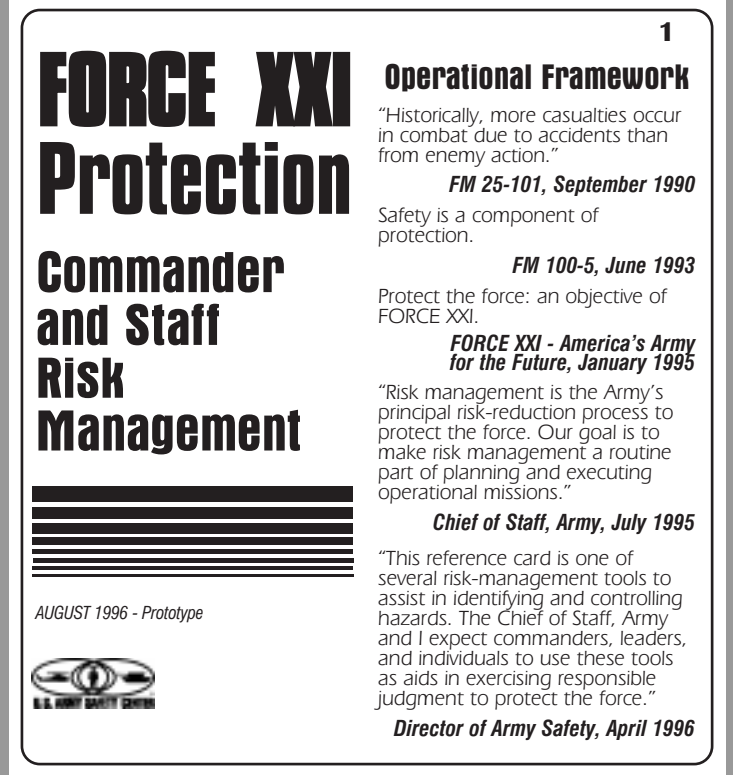
Army Safety, took a Safety Center team to Fort Hood to brief MG Robert S. Coffey, then 4th Infantry Division Commander, and COL Tom Metz, Chief of the EXFOR Coordination Cell (ECC), on an initiative to integrate risk management into the Army's decision-making processes. If approved, it would become one of the Task Force XXI initiatives. General Coffey and Colonel Metz agreed with the initiative, and it was submitted to the EXFOR Working Group at Training and Doctrine Command. With the EXFOR Working Group's approval, integrating risk management into the military decision-making processes became a Task Force XXI initiative.

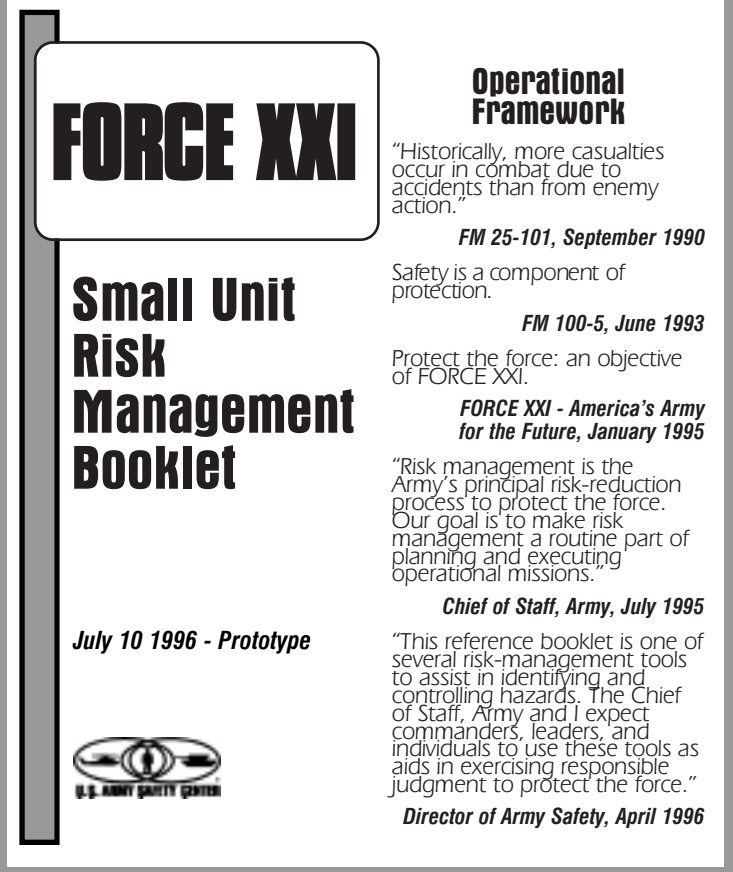
In response to a request from COL Tom Goedkoop, Task Force XXI Commander, the Safety Center conducted an assessment of the protect-the-force (safety) status of the Task Force XXI units at Fort Hood in April 1996. The purpose of the assessment was not to see how well the task force had integrated risk management into its operations; it was an across-the-board assessment to help them see where they were on protecting the force. It included such things as driving, firing, and other day-to-day activities that go on in a unit, and it was tailored toward the NTC. The Safety Center was there by invitation in a strictly advisory role to help the commander conduct an assessment of force protection (safety) and risk-management areas to sustain and improve before taking the task force to the NTC.

Developing tools

During the outbrief, the task force commander asked that the Safety Center develop a risk-management training support package (TSP) for his units.

In response to that request, the Safety Center team developed a Task Force XXI risk-management pocket card for commanders and staffs and a risk-management booklet for small-unit leaders: company commanders, first sergeants, platoon leaders, and platoon sergeants. The Safety Center also developed training support packages for





Shown above are two of the risk-management tools developed by the Army Safety Center and tailored to Task Force XXI units.

both platoon-level leaders and soldiers.

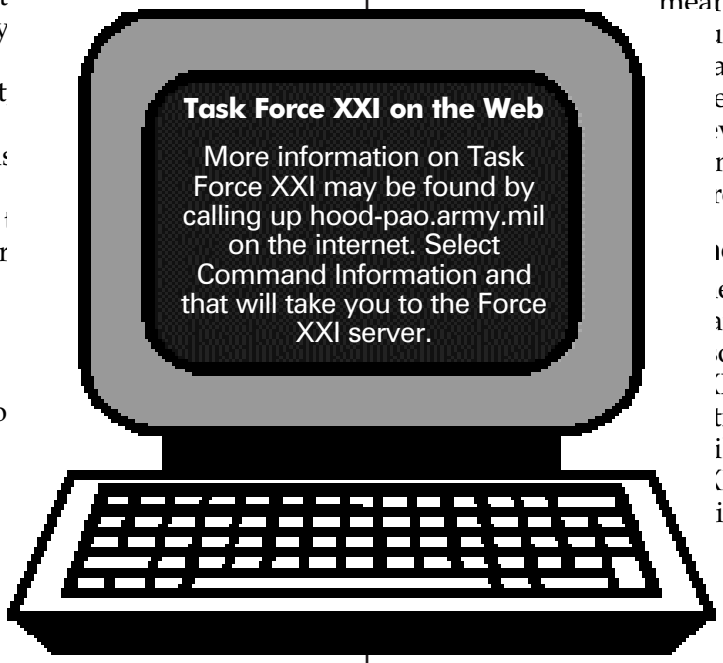
To assist the task force in conducting its own assessment in the future, the Safety Center developed a self-assessment booklet, specifically tailored to Task Force XXI units. Task force safety personnel were trained on the self-assessment in July, and in September, the task force conducted its own assessment of Task Force XXI units. This assessment was to tell them where they were on protecting the force, compared to the initial assessment conducted by the Safety Center in April.

During development these products were coordinated with the tas force and their changes were incorporated into t version delivered to For Hood in early July. Although the products were tailored for Task Force XXI, they can be used Armywide (see bo for how to request).

In late August, the Safety Center conducted a protect-the-force safety assessment of the 1-5 Infantry at Fort Lewis. With that completed, every unit in the task force has undergone an assessment. This light infantry battalion will move to Fort Hood in November to join the rest of Task Force XXI.

The next step will be when the Safety Center team returns to Fort Hood to train members of the 2d Brigade, 4th ID, as observer/controllers. Members of this unit will observe the task force during their trainup at Fort Hood.

On 30 September, the Safety Center sent a small team to the NTC to train their observer/controllers. This training was two-fold: risk management and how to assess the task force's integration of risk management into the decision-making processes.



What does this mean to you?

If the Task Force XXI AWE is successful, this will become the model for an Army brigade and how it will function in a battlefield environment in the 21st century. Sooner or later, all of the Army will go to this same model. If that happens, it will be a safer and more effective force because risk management will be integrated into the Army's decision-making processes. Whether you are now or will be a leader, that means you will be better ıipped to use the risk-anagement process to entify hazards and velop/implement ntrols to protect the rce.

e road to the future

e EXFOR risk-anagement initiative o includes Division I. The Safety Center has tiated coordination that ill allow the Task Force XI initiative of integrating risk management into the military decision-making processes to be carried to the division level. Coordination has also been initiated to use the Battle Command Training Program and the Prairie Warrior '97 exercise to develop risk-management tools, techniques, and procedures appropriate for division-level operations.

Even beyond this is integration of risk management at corps and joint-service levels. Already the military services—Army, Air Force, Navy, and Marines—are sharing risk-management experience and information. In the 21st century, protecting the force should mean *all of the force*. ♦

POC: MAJ John R. Hefner, Chief, Integration Division, DSN 558-2450 (334-255-2450)

How to Obtain Tools

To obtain a copy of the tools developed for chain-teaching risk management and conducting self-assessment, call Ms. Theresa Wright, Integration Division, DSN 558-2377 (334-255-2377). Local reproduction of these products is encouraged. ♦

Safety Alert Message

High-risk behavior

Emerging insights from the Navy's recent series of aviation incidents show that a number of these were attributed to human error on the part of individuals who had a record of previous mishaps. The Army family can gain some insights from these unfortunate events. This message is intended to raise leader awareness of the hazards associated with soldier indiscipline and improper crew selection for Army ground and air systems.

Human factors account for 80 percent of Army accidents. Those accidents involving "individual failure," an element of human factors, means that a soldier chose to disregard an established standard to which he or she was trained. Examples include the OH-58 crew that crashed while attempting a loop; the HMMWV driver who rolled his vehicle when he elected to drive in excess of established speed limits under limited visibility; the M1 commander who refused to listen to his driver, which resulted in the tank rolling over in a ditch; or the CH-47 crew that struck wires while flying low level down a river. These very serious accidents are examples of the worst-case effects of indiscipline. Fortunately, they do not happen often.

Studies show that in many of these accidents other soldiers or the chain of command knew of the high-risk behavior associated with indiscipline before the accident occurred, but no action was taken.

Today's environment of high operational pace, personnel turnover, and fewer resources requires that commanders be more vigilant of indicators of high-risk behavior among their soldiers. These indicators include previous accidents, traffic violations, DUI, spouse or child abuse, drug or alcohol history, disciplinary offenses, criminal offenses, AWOL, and poor work record. Other less obvious indicators can include marital strife, frequent family separations, accident proneness, financial problems, and high overall stress levels.

Commanders are encouraged to establish both formal and informal processes to capture the indicators of individual and crew high-risk behavior. For example, most aviation units have a formal "pilot-in-command board." The board consists of the unit commander, an instructor pilot, a safety officer, another pilot-in-command, and perhaps a flight surgeon who evaluate a candidate for pilot-in-command status. In some ground units, a board consists of the unit commander, a senior noncommissioned officer, a master driver, and a safety officer. This group evaluates drivers and crews for evidence of requisite training, maturity, judgment, and the ability to perform the unit's mission. At each of these reviews, the board should watch for the indicators of indiscipline that may develop after a soldier is placed in a crew status.

The bottom line is for leaders to know their soldiers. This can best be accomplished by applying the risk-management process. Start by identifying these behavioral indicators (the hazards) that occur both on and off duty. Then implement controls—for example, additional training, performance review boards, counseling—to mitigate the risks. ♦

POC: CW5 Robert A. Brooks, USASC Product Development Branch, DSN 558-3969 (334-255-3969)

Recap of FY96 Safety Alert Messages

The Army Safety Center issued the following Army safety alert messages in FY 96. Contact your installation safety office for copies.

161532Z	Oct 95	M1A1/M1A2 Abrams Tank
161543Z	Oct 95	G/VLLD, AN/TVQ-2
171558Z	Oct 95	M939 Accident Awareness
062143Z	Dec 95	OH-58D(I) Autorotations
151951Z	Dec 95	MOUT Training
211324Z	Dec 95	POV Fatalities
301711Z	Jan 96	M1A1 Tank Turret Fatalities
051503Z	Feb 96	Civilian Accident Prevention
141814Z	Feb 96	Civilian Accident Prevention—Injury Reporting
291423Z	Feb 96	AH-64 Ground Fire
181832Z	Mar 96	UH-60 Blade Strike Fatality
191910Z	Mar 96	Parachute Fatality
091312Z	May 96	High-Risk Behavior
201506Z	May 96	Accident-Site Hazardous Materials
041835Z	Jun 96	Task Overload and Loss of Situational Awareness
111935Z	Jul 96	Lightning-Strike Awareness (e-mail)
061356Z	Aug 96	Use of Flak Jackets and Compliance With Minimum Safe-Distance Requirements
141306Z	Aug 96	Entanglement Hazards Associated With Load-Bearing Equipment In Airborne Operations
201353Z	Aug 96	Military Driver Selection/Training/Incentives
111846Z	Sep 96	Seatbelt Usage

Soldiering in cyberspace

At a conference in San Antonio earlier this year, BG Thomas J. Konitzer, Director of Army Safety, asked MACOM safety directors to propose units to field test the Automated Risk Assessment and Controls (ARAC) for POV Operations. The test programs were sent to selected units in July, accompanied by an assessment sheet for their comments. The response from these units will help the Safety Center identify "bugs" and make improvements in the program before making it available Armywide.

Today's soldiers probably spent a lot of their growing-up years in video arcades or at a computer keyboard, playing video games. And more and more soldiers are spending at least part of their work days at some kind of computer, either on a weapons system or in an office. In a survey of military personnel about a year ago, the Army Research Institute found that 96 percent of officers and 60 percent of enlisted personnel have access to a PC, either at home or at work. So sitting down at a computer and going through the Automated Risk Assessment and Control (ARAC) program for privately owned vehicle operations will be simple for most soldiers.

Why do we need ARAC?

Privately owned vehicle (POV) accidents are the number one killer of soldiers; that's a shocking fact. In spite of the good commanders and NCOs, who are out there doing everything they can think of to prevent these accidents, they just keep happening. Clearly something more had to be done.

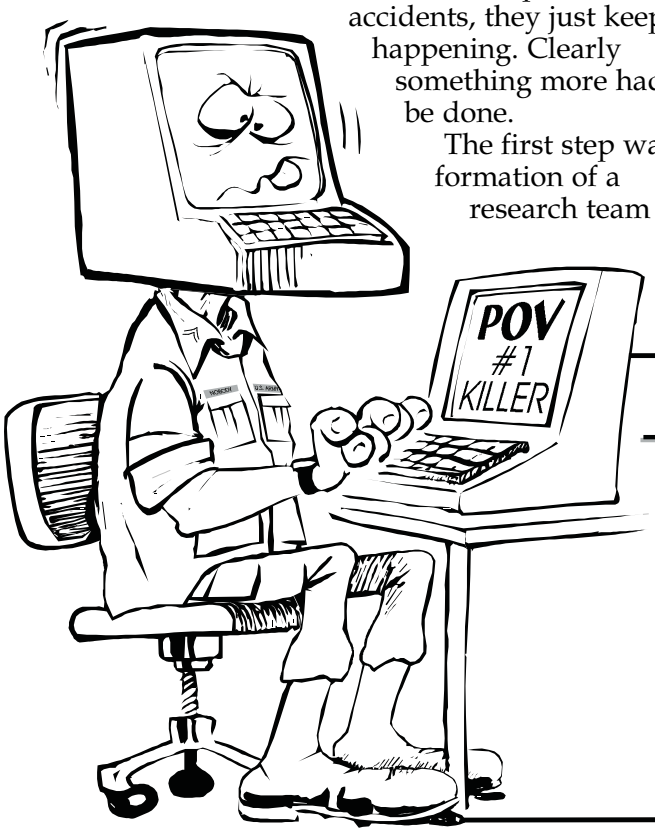
The first step was formation of a research team from the Army Safety Center and the Army Warfighting Center at Fort Rucker, AL. The team—which included safety personnel, senior officers, and NCOs—studied accident data and developed five accident profiles of the most common types of driver-error accidents that happened in FY 93 and 94 (see page 8). Then they developed the Automated Risk Assessment and Control (ARAC) Options Program for Privately Owned Vehicle Operations.

ARAC is a computer-based program that will help soldiers identify hazards, estimate their individual risk of having an accident, and choose controls that will lower that risk.

Soldier friendly

ARAC is easy to use. A soldier sits down at a computer, enters information about him or herself, driving habits, and driving history (see box below). Based on this information, the computer calculates the probability/risk that the soldier will have one of the five most common types of POV driver-error accidents.

After the computer calculates the soldier's risk without controls, it will offer a list of control options. These are suggestions or solutions, which were developed by the research team, to lower the soldier's risk of having an accident. The team reviewed research literature, existing programs and tools, and solicited field input to develop these controls. In addition to being included in the ARAC computer program, these controls (see sidebar, page 7) are described in detail in the hard copy "POV Force Protection (Risk Management) Toolbox" that will accompany the ARAC when it is fielded.



ARAC POV Info

- Driver information
- Vehicle information
- When driving occurs
- Where driving occurs and typical conditions
- Holiday, leave, and pass driving
- Driving habits
- Driving history

As the soldier selects controls, the risk is lowered, and the computer displays the residual risk of having each of the five types of fatal POV accidents.

If the soldier wants to further reduce risk, ARAC will again present each control that was not previously selected and give the soldier another chance to select it if he or she wants to.

The controls presented in the program don't mean that it is impossible to have an accident. There will always be some risk when soldiers drive their vehicles regardless of the controls used. But the risk can be significantly reduced.

The computer isn't a snitch

If, at this point, you're thinking "Wait a minute, I tell this computer all about where, when, and how I drive and all about my bad habits and tickets I've got, and somebody gets hold of it, then what?" Not to worry. When you start using the program, you do have to enter your name (or make one up), but when you're finished, you can delete your name and nobody is the wiser. This program isn't an electronic snitch, ARAC is designed to tell you things about yourself and your driving that you may not have realized before. You may think of yourself as a pretty good driver, but when all the factors are combined and weighed, you may find that one of those soldiers who died in a POV accident during FY 93 and 94 was a lot like you.

Other uses

ARAC provides commanders, leaders, and individuals a toolbox of ideas and control options (instant expertise) from which to choose. They can also come up with their own controls to fit their particular unit situation.

Nintendo and other computer games are as familiar to today's soldiers as GI Joe was to their dads. Why not use something that is so familiar to make sure you aren't one of those soldiers who needlessly die every year in POV accidents? ♦

POC: Ms. Mary Ann Thompson, Research, Analysis, and Studies, DSN 558-3842 (334-255-3842)

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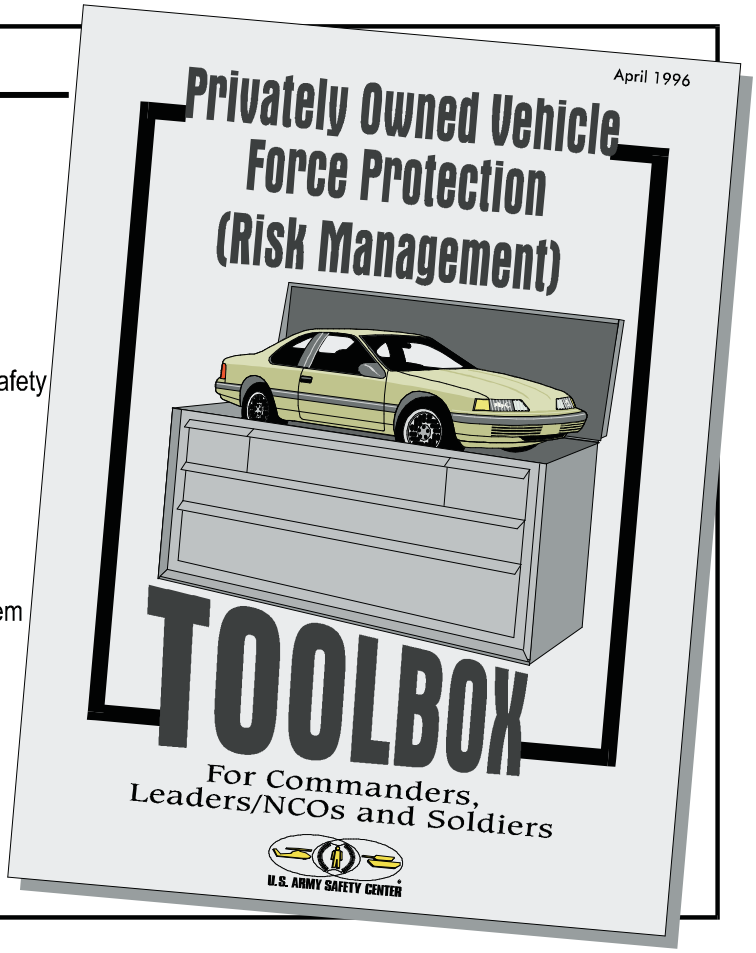


Privately Owned Vehicle (POV) Accident Scenarios

Profiles of Fatal POV Accidents with Military-Driver Error

1. Young driver, late at night (52% of driver-error cases).

Young soldier driving too fast, late at night, while fatigued and/or under the influence of alcohol.

- 66% less than 24 years old
- 80% night
- 81% 2300-0500 hours
- 62% summer/fall
- 53% rural road
- 56% fatigue/fell asleep
- 42% excessive speed
- 34% alcohol

Example

It was a Thursday night like many others except that 2 soldiers were killed and another injured when their car went out of control and hit a concrete culvert at 100 mph. The driver—a 22-year-old sergeant and two friends—a 23-year-old sergeant and a 21-year-old private, had been drinking into the late hours of the night. They started back to post, probably hurrying because they had to report for duty the next day.

The driver hit the dashboard before being thrown out the rear of the hatchback. The front-seat passenger was also thrown out. The force of the impact threw him out the side window. They died instantly. Although the rear-seat passenger was not thrown out, he was hospitalized for 3 days. None of the soldiers were wearing their seatbelts.

2. Highway day trip (18% of driver-error cases).

Soldier on 4-lane/rural road, day trip, for pleasure or return to duty during summer/fall.

- 10% Army Reserve
- 89% 4-lane/rural road
- 93% day
- 38% Sunday
- 72% summer/fall
- 28% excessive speed
- 21% improper passing
- 14% inattention

Example

Returning from a day at the beach, a 20-year-old PFC was killed when he was thrown from his car. He was on an interstate when his car drifted to the right. He lost control when he overcorrected. The car rolled and stopped in the median. He was not wearing his seatbelt.

3. Night city driving (12% of driver-error cases).

Soldier driving in city at night during summer/fall, going too fast and/or under the influence of alcohol.

- 80% E4-E6
- 55% motorcycle
- 90% city
- 25% on-post
- 25% intersection
- 75% summer/fall
- 75% night
- 35% Saturday
- 45% excessive speed
- 35% alcohol

Example

A 30-year-old staff sergeant was killed in a motorcycle accident when she was hit by an oncoming car. She failed to yield the right-of-way and turned left in front of oncoming traffic. One car sideswiped her motorcycle. She was hit by a second car and thrown onto its hood.

4. Too fast for conditions (11% of driver-error cases).

Soldier driving on rural road during winter, going too fast for conditions of road (slippery/restricted visibility) or self (fatigue/alcohol), and losing control due to abrupt steering/braking.

- 22% TRADOC
- 11% female
- 39% truck
- 67% rural road
- 72% winter
- 50% too fast for conditions
- 39% slippery road
- 17% restricted visibility
- 39% fatigue/fell asleep
- 24% alcohol
- 44% abrupt steering/braking

Example

A 23-year-old PFC was killed when his car hit a bridge. The soldier, who was on the way home to visit his seriously ill mother, was driving on an icy, wet road when his car went out of control. He was killed instantly.

5. Curves on rural roads (7% of driver-error cases).

Soldier driving on Friday after work/at night failed to properly negotiate sharp curve on rural road.

- 67% FORSCOM
- 17% female
- 42% motorcycle
- 83% rural road
- 92% curve
- 42% holiday/leave/pass
- 58% Friday
- 67% improperly negotiated curve
- 33% excessive speed

Example

A soldier was killed when his car hit a culvert and flipped as he was on his way home after work on a Friday. In a rush to be with his family, he took a sharp curve without slowing down and lost control. The car went airborne after hitting the culvert and flipped. It came to rest upside down, crushing the roof.

Protecting the force in winter

Everything becomes more difficult under cold weather conditions. Tasks take longer and require more effort. Fuel freezes. Metal becomes brittle. And a leader's job of protecting soldiers gets tougher.

Keep soldiers in shape

Soldiers who are in top physical condition have a better chance of survival in cold conditions. Cold-weather clothing is heavy and when added to the normal equipment a soldier must carry can burn up a lot of energy, especially when trudging through mud or snow.

Eat to keep fit

Soldiers need nutritious, high-calorie, hot food if their bodies are going to have the fuel needed to sustain heat production and protect against lowering of the core body temperature.

Drink plenty of water

Soldiers may not realize how important water is to their physical condition during cold weather. Exposure to cold increases the urination rate, which compounds the dehydration commonly seen in the field. Because they don't feel thirsty, soldiers may fail to drink adequate water and become dehydrated. Soldiers should avoid eating snow as a substitute for water because it wastes body heat, irritates the mouth, and may lower the body's core temperature.

Maintain a positive attitude

Cold weather operations are tough, but so are soldiers. Soldiers watch their leaders, and their attitudes and performance will reflect what they observe. Leaders must watch for early signs of cold stress in their soldiers such as fatigue, lethargy, apathy, irritability, withdrawal, loss of dexterity or decision-making ability, decreased group cooperation, disorientation, or slurred speech. ♦

—Information on cold weather in this issue has been adapted from *Winning in the Winter*, published by the Center for Army Lessons Learned, Fort Leavenworth, KS

Nutrition Tips for Leaders

- Ensure soldiers eat all their rations.
- Allow time for hot meals, which are more satisfying than cold rations.
- Encourage soldiers to save some snacks (cookies, candy) for between meals and when on the move.
- Train soldiers to drink plenty of hot liquids, especially non-caffeine liquids such as soups, to prevent dehydration.
- Ensure stoves are filled each night, and that enough water has been prepared for breakfast. (See Sep 95 issue of *Countermeasure* for tips on stove safety.)
- When heating water, use all available stoves because this is the most time-consuming operation. Melting and purifying sufficient snow or ice for beverages may take 45 to 60 minutes.
- When operating the Yukon stove, always use a cooking pot to melt ice or snow. Do not use containers that have been used to store petroleum products or are painted on the inside. Keep canteens and water cans full from this reservoir.
- Situate areas from which ice or snow will be taken for water production well away from, and up-wind of, latrine and garbage disposal sites.
- Keep extra snow in a plastic trash bag to minimize trips to gather snow/ice.
- Discourage soldiers from eating snow or ice; it may reduce body temperature and can result in painful cracking of lips, leading to infection.
- Train soldiers to refill their canteens regularly, and to carry one canteen close to the body.
- Don't keep soldiers standing around in the cold. If it is unavoidable, plan to provide hot drinks and snacks, if possible. Use the buddy system to check on the condition of the soldiers. Check soldiers for early stages of cold injury.
- Prohibit consumption of alcoholic beverages. The perceived warming effects of alcoholic beverages are illusory and are brought about by a quick release of internal body heat through increased circulation of the blood to the surface of the skin. This temporary feeling of warmth is soon lost, leaving the soldier much colder than before. It also promotes dehydration.

Cold-weather injuries

Hypothermia

The most dangerous threat to soldiers during cold weather operations is hypothermia. Hypothermia can kill, and it can kill quickly. In fact, it can be a threat even when the weather is relatively mild; for example during extended exposure in thunderstorms, hail, rain, and accompanying winds.

When body temperature drops to 95°F or lower, hypothermia is a danger. A 7° decrease from the body's normal temperature of 98.6° is life-threatening. If body temperature drops as low as 80°F, death is likely.

■ Mental signs. Mental functions are the first to be affected by hypothermia. The soldier's decision-making ability deteriorates. Under hypothermic conditions, his mental responses are slow, improper, or indifferent. He becomes apathetic and lethargic and complains more. There is a noticeable decrease in cooperation in group activities. Speech may be slurred and disorientation can progress to incoherence, irrationality, and even unconsciousness.

■ Muscular signs. In the early and moderate stages of hypothermia, soldiers exhibit shivering. Hypothermic soldiers lose fine motor ability, which may cause them to become too clumsy to walk or stand. They may stumble or fall. In severe cases, shivering ceases, and the soldier exhibits stiffness and inability to move.

Biochemical processes become slow and deficient as the body cools. Unfortunately, early signs and symptoms of hypothermia can be difficult to recognize and may easily go undiagnosed. A soldier may deny he is in trouble; *believe the symptoms, not the victim.*

Signs and Symptoms of Hypothermia

Body Temperature (Degrees Farenheit)	Symptoms	Observable in Others	Felt by Yourself
(Early Stage) 98.6 → 95.0	Intense and uncontrollable shivering; ability to perform complex tasks impaired	Slowing of pace. Intense shivering. Poor coordination.	Fatigue. Uncontrollable fits of shivering. Immobile, fumbling hands.
(Moderate Stage) 95.0 → 91.4	Violent shivering persists, difficulty in speaking, sluggish thinking, amnesia begins to appear.	Stumbling, lurching gait. Thickness of speech. Poor judgment.	Stumbling. Poor articulation. Feeling of deep cold or numbness.
(↓Severe Stages↓) 91.4 → 87.8	Shivering decreases; replaced by muscular rigidity and erratic, jerky movements; thinking not clear but maintains posture.	Irrationality, incoherence. Memory lapses, amnesia. Hallucinations. Loss of contact with environment.	Disorientation. Decrease in shivering. Stiffening of muscles. Exhaustion, inability to get up after a rest.
87.8 → 85.2	Victim becomes irrational, loses contact with environment, drifts into stupor; muscular rigidity continues; pulse and respiration slowed.	Blueness of skin. Decreased heart and respiratory rate. Dilation of pupils. Weak or irregular pulse. Stupor.	Blueness of skin. Slow, irregular, or weak pulse. Drowsiness.
85.2 → 78.8	Unconsciousness; does not respond to spoken word; most reflexes cease to function; heartbeat becomes erratic.	Unconsciousness.	
78.8 ↓	Failure of cardiac and respiratory control centers in brain; cardiac fibrillation; probable edema and hemorrhage in lungs; apparent death.		

Treatment

Leaders and soldiers should understand that prevention of hypothermia is simple—treatment is not. Controls should be instituted to prevent hypothermia or spot soldiers in trouble early. Soldiers suffering early to moderate hypothermia may be rewarmed in the field (see box for treatment procedures).

Treatment for Hypothermia

- Body temperature above 90°F (early and moderate)
  - Prevent further heat loss
    - Remove from cold
    - Dry
    - Insulate
  - Actively rewarm
    - Sleeping bags
    - Heat sources
    - Hydrate, hot drinks
- Body temperature below 90°F (severe)
  - Units should not take time to rewarm a severely hypothermic soldier in the field. Immediate evacuation to a medical facility is the proper field treatment.
    - Dry, insulate
    - Prevent further heat loss (apply heat)
    - Monitor ABC (airway-breathing-circulation)
    - Transport/handle gently

In severe cases of hypothermia, heart rhythm may be affected. Jarring or bouncing while transporting a patient in the field can trigger abnormal heart rhythm. There may also be complications from an underlying medical condition, wound trauma, and complex disturbances in the body's biochemical balance. For these reasons, **a soldier with severe hypothermia must be rewarmed in a medical treatment facility; immediate evacuation is the proper field treatment.**

During evacuation, further cooling must be prevented. Hot water bottles, canteens filled with hot water, even warmed stones from a campfire can be wrapped in socks or other material and applied to the chest, abdomen, neck, and groin (which contain large blood vessels) to prevent further cooling.

Frostbite

The extremities (fingers, toes, and ears) are usually affected first by frostbite and suffer the most serious injury. The affected area will be numb. It may tingle or be blistered, swollen, or tender. The skin will be pale, yellowish (grayish in dark-skinned soldiers), and waxy looking. Frozen tissue feels wooden to the touch.

Low temperatures, contact with moisture, and wind chill accelerate heat loss and increase the likelihood of frostbite.

Soldiers suffering from deep frostbite must be evacuated to a combat support field hospital for proper treatment. No attempt should be made to thaw deeply frostbitten feet before evacuation. Treatment of deep frostbite injuries requires rapid rewarming of the frozen area by immersion in water kept at a

Contributing Factors to Frostbite

- Cold stress
- Low temperatures
- Wind chill
- Moisture
- Poor insulation
- Contact with supercooled metal or fuel
- Interference with circulation of blood
- Cramped position
- Tight clothing/accessories (gaiters, wristwatch, belt)
- Localized pressure
- Tight-fitting or tightly laced boots
- Dehydration

temperature between 100° and 108°F. This should only be attempted under the supervision of a medical officer. Water colder than 100°F will not thaw deeply frost-bitten areas rapidly. Water hotter than 108°F may burn the patient.

Deep frostbite injuries normally require an extended period of treatment and recovery. There is a strong possibility that deeply frost-bitten soldiers may not return to field duty.

Immersion foot

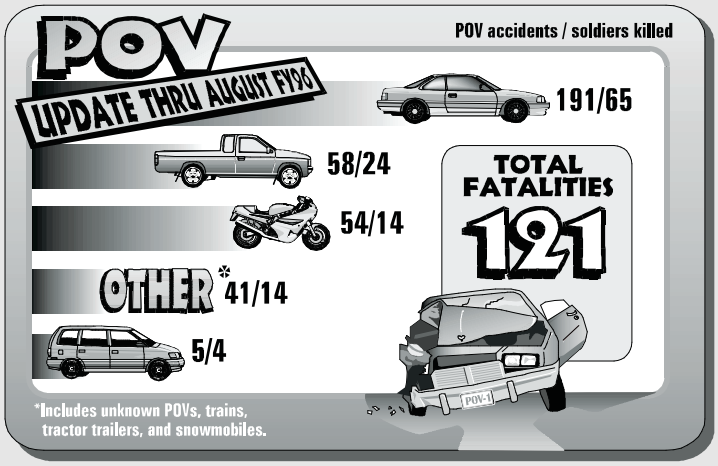
Immersion foot results from prolonged exposure, normally in excess of 12 hours, in water at temperatures usually below 50°F. Soldiers can avoid this kind of injury by paying regular attention to their feet—drying them and changing to clean dry socks once a day, or more often if feet get wet. Prevention is simple—but the damage that results if this cold injury is allowed to develop is serious. Recovery is painful and may take weeks. Nerve damage may be permanent and blisters, ulcers, and gangrene are possible. Loss of a foot or lower leg is also possible.

Treatment

Soldiers suffering from immersion foot should have their feet warmed slowly at room temperature. In most cases, their feet will be sore. Soldiers should avoid walking on injured feet, and the feet should be elevated to reduce swelling. Bed rest and avoidance of trauma are necessary until the injury heals. You won't have to worry about soldiers with a severe case of immersion foot walking—it hurts too much. These soldiers may be cold-weather casualties for an extended period. ♦

Immersion Foot

- **Signs and symptoms**
  - Cold, streaked or splotched extremity
  - Foot feels wooden, numb, pins and needles
  - When rewarmed, the foot becomes red, dry, and painful with bounding pulses
- **Prevention**
  - Change socks as needed to keep feet dry
  - Check feet daily
  - Sleep with feet warm and dry
- **Treatment**
  - Remove the feet from the cold, wet environment
  - Air-dry
  - Do not rub
  - Do not constrict the extremity
  - Protect the feet from trauma
  - Elevate the feet to reduce swelling



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THOMAS J. KONITZER
Brigadier General, USA
Commanding

ARMY GROUND-ACCIDENT REPORT

COUNTERMEASURE

Volume 17 Number 11 November

The Halloween pumpkins are barely off the shelves before the Christmas trees go up in stores, so it's time to think about holiday safety. The holiday period means a lot of soldiers and their families will be on the roads and highways. We want to be sure that nobody's holiday turns into a tragedy, so once again we're warning about drinking and driving, trying to drive too far, and adjusting your speed to road conditions.

Apply the same risk-management principles to your off-duty activities as you do on the job: identify hazards, assess the hazards, develop controls and make risk decisions, implement controls, supervise and evaluate. If it works for operating wheels and treads, it will work for your leisure time. Give your POV a safety check—tires, brakes, lights—then as you plan your trip, consciously use the five steps of risk management to be sure that you and your family have nothing but happy memories of the holidays this year.

Keeping the happy in the holidays

The holiday season means, for many people, a time for joy, for worship, for parties, and for good times. For many soldiers and their families this year, unfortunately, the holidays will mean a time of separation and loneliness and a time for accidents.

As we have said in this publication many times, POV accidents are the number one killer of soldiers. Preliminary figures for FY96 indicate that 67 percent of all accidental soldier fatalities were due to POV accidents. The fatality rate is up 17 percent from FY95. The reason? Young junior soldiers, the group that has the majority of these accidents, have demonstrated a low ability to recognize hazards—they underestimate their own personal risk and they overestimate their personal ability. In short, they think they are indestructible and while an accident may happen to someone else, it won't happen to them. They're wrong. And it's not confined to young soldiers either. Senior people and all of our family members are at risk as we travel during the holidays.

Most of the POV accidents that happen during the holiday season are with soldiers traveling long distances, right? Wrong! Most POV accidents occur relatively close to the soldier's duty station, although long-distance driving does account for some of the accidents.

I know that NCOs will be doing everything possible to help prevent tragedies on the highways this holiday season. Although it probably won't be available in time to be incorporated into your holiday accident prevention programs this year, the Safety Center has developed a Privately Owned Vehicle Force Protection (Risk Management) Toolbox (see the October issue of *Countermeasure*) that will help in POV accident prevention throughout the year. If you would like to have a copy, contact Ms. Sharrel Forehand, e-mail forehans@rucker-safety.army.mil or write to Commander, U.S. Army Safety Center, ATTN: CSSC-SIM, Bldg 4905 5th Avenue, Fort Rucker, AL 36362-5363. After completion of the test of the Automated Risk Assessment and Control

(ARAC) program for privately owned vehicles (which is currently underway in the field), a copy of the toolbox will be sent to you.

We don't claim this to be the final word on preventing POV accidents, but it can be a good reference for commanders and other leaders to use in implementing their own programs.

While we're talking about the holidays, let's not forget those soldiers who will be spending this holiday season deployed on missions at various locations around the world. Many will face the holidays separated from their loved ones, and they need the support of their unit and chain of command to see them through. And many of these soldiers have family members back home. Leaders should make a special effort to ensure these "waiting families" are included in holiday plans. Depression and loneliness during the holidays can definitely be a factor in accidents.

The Army is (or should be) like a big extended family. As such, all of us must rely on our family to help us through significant emotional events. The holidays can be such an event. Let's all do our part this year to make the holiday season happy, joyous, and accident free.

Protect the force through risk management! ♦

—SGM Gregory L. McCann, U.S. Army Safety Center, 558-3575 (334-255-3575), e-mail mccanng@rucker-safety.army.mil

Driving tips to arrive alive

■ **Don't drink and drive.** Forget the BAC charts; it only takes one beer to mess up your life.

■ **Use a designated driver.** Or call for a ride or take a taxi if you're going to be drinking.

■ **Always buckle up.** Insist that your passengers do too.

■ **Be prepared; watch the road and the traffic; check your mirrors often.** Monitor the traffic situation frequently; it can change rapidly. Take evasive action when other drivers make mistakes, because they will.

■ **Stack the odds in your favor.** When the weather is bad, slow down. Always allow enough distance between your vehicle and others to react to changes in traffic.

■ **Maintain your vehicle.** A well-maintained vehicle is a safe vehicle. Maintain yours as you'd maintain your weapon.

■ **Buy the best tires you can afford and check tread and inflation often.** Your life depends on those four small rounds of rubber.

■ **Avoid fatigue.** Try not to drive during your normal sleep hours. Limit the number of hours you drive without rest. Make frequent stops.

■ **Snow chains.** If you will be traveling in areas where snow and ice are possible, have snow chains available.

■ **Just in case.** It's a good idea when traveling in cold weather conditions to have blankets in your vehicle. And on any trip, you should include a well-equipped first-aid kit when you pack your vehicle.

■ **If possible, avoid driving when drunk drivers are more likely to be on the road.** Late Friday and Saturday nights and early morning hours are times to avoid. Be especially vigilant during holiday periods. ♦

See the video

Every soldier who's going to be driving this holiday season should see *Christmas Mourning* (PIN 700912). It's a very brief (4-minute) video with a hard-hitting message about drinking and driving, fatigue, and failure to buckle up. Get it from your installation Training Aids Service Center or audiovisual library. Schedule a viewing for your soldiers before turning them loose for the holidays. ♦

Tanker rollover

A soldier operating an M931A2 5-ton tractor at the National Training Center (NTC) while pulling an M969A1 5,000-gallon fuel tanker on a combat service support (CSS) mission was too confident in his ability to negotiate a curve in about a 10-degree downgrade.

The vehicle was traveling at 20 to 25 mph, and the driver failed to decrease his speed as he approached the "S" curve. As the vehicle entered the first curve (to the left), it veered off the road to the right. The driver turned the steering wheel to the left, oversteering, and pulled the vehicle back onto the road. As he approached the curve (to the right) at the bottom of the grade, the driver was unable to steer the vehicle so that he could negotiate the turn. As a result, the vehicle ran off the road on the left side. The driver began applying brakes, and the tractor lost traction and began to slide. The 5,000-gallon tanker continued to push the tractor and it started to jackknife. The driver turned the steering wheel hard right. His action aggravated the situation even more. The vehicle continued out of control and rolled over, coming to rest with all of its wheels on the ground. The assistant driver was killed, and the vehicle was extensively damaged.

Overconfidence

This soldier knew he was going too fast (the CSS convoy speed had been established at 15 mph, with a catchup speed of 20 mph). Many soldiers are overconfident in their capabilities to operate the M939 vehicle. Some think it's a lot like driving their own POV, but there's a lot more to operating a 5-ton tractor than meets the eye, especially when it is pulling a 5,000-gallon tanker loaded with 4,000 gallons of fuel (see article "Too fast for conditions" in this issue).

A lack of driver training and experience were causal to this accident. When the driver found himself in trouble on the "S" curve, he took the wrong action. Everything he did from that point on made his situation worse, and an accident was the result.

This M931A2 pulling an M969A1 fuel tanker was traveling at 20 to 25 mph as it approached an "S" curve in about a 10-degree downgrade. The assistant driver was killed when the vehicle ran off the road and overturned.

The fifth wheel

The M939 series vehicle's design and characteristics make it unique, requiring a well-trained and experienced operator. One of the designs that make this vehicle unique is its fifth wheel. The fifth wheel, or semitrailer coupler, is mounted on the rear of the M931 and

M932 tractor. When connected to a semitrailer, the fifth wheel pivots up, down, and sideways to allow for changes in road conditions. The fifth wheel is rated at 55,000 pounds (24,970 kg) on the highway and 37,500 pounds (17,025 kg) cross country.

Risk management

Company-grade leaders were aware of the risk-management process, but it was not well understood. Not only did they not understand the process beyond hazard identification and assessment, they didn't understand that each activity during a rotation should be considered a mission. If the risk-management process had been applied to this mission, it would have shown—

Hazard. A soldier, not trained to division driver-training policy, coupled with little driving experience, operating an M931A2 5-ton tractor, towing an M969A1 5,000-gallon tanker loaded with 4,000 gallons of fuel. He approached an "S" curve on a 10-degree downgrade in excess of the briefed catchup speed of 20 mph. Weather was clear, daylight. Resulted in loss of control of vehicle and vehicle overturned.

Risk. Damage to vehicle, one fatality.

Controls.

1. Use a different route (if available).
2. Use a more experienced driver.
3. Put an NCO as the TC of the vehicle.
4. Establish checkpoints before and after the "S" curve and slow the convoy down before proceeding through it.
5. Conduct a ground reconnaissance of route.
6. Train drivers on vehicle restrictions, capabilities, and limitations, especially considering that these change when tractor-trailer combinations change.

Training to and enforcing standards is a good risk-management tool. ♦

POC: SFC John B. Dawson, Transportation NCO, DSN 558-9197 (334-255-9197)

Attention master drivers

The new TC 21-305-100: *The Military Commercial Driver's License Driver's Manual*, dated 19 Aug 96, now requires the driver to be licensed in the operation of liquid cargo haulers. Be on the lookout for it.

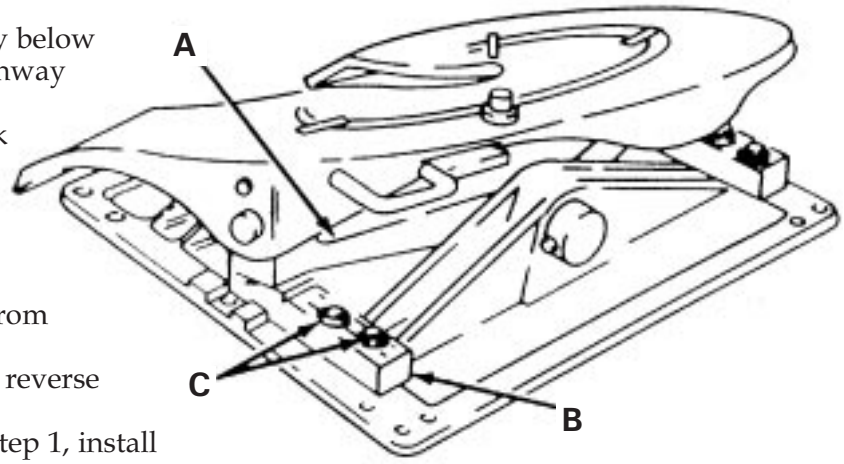
Figure 1
Highway position of the fifth wheel.

To adjust wedges

1. Position wedges (B) fully below the walking beam (A) for highway operations.
2. Position wedges (B) back and away from the walking beam (A) for cross-country operations (low speed only).

To position wedges

1. Remove capscrews (C) from center of each wedge (B).
2. Remove wedges (B) and reverse position.
3. Using same holes as in step 1, install capscrews (C) and tighten.



Too fast for conditions

On just about every evening's newscast, there is a report of an accident where a vehicle was "going too fast for conditions." The questions that always come to mind are "What was the proper speed? How fast is too fast?" Maybe the problem is not just the speed but the equipment or the environment.

When we hear this phrase used to refer to an Army accident, it usually means an Army truck. So let's take a look at the equipment.

- Was the equipment properly maintained?
- Was the tractor designed to be "forgiving" of driver error?
- Were all the hazards of the vehicle identified and ways to reduce the risks developed and implemented (controls)?
- Was the driver properly trained to operate the equipment?

Not all Army tractors are alike. There are many differences in tractors of the same model series as well as in tractors of different series. One of the most recent hazards in tractors that has been identified as causing accidents is the "off-road" or cross-country fifth wheel.

Fifth wheel

The cross-country fifth wheel differs from the highway fifth wheel in that it allows the trailer to oscillate side-to-side between 4.5 to 7 degrees (approximately 3 to 5 inches). In some series, some of the tractors will have cross-country fifth wheels and others will have highway fifth wheels. For example, the M915 and M915A1 have the highway fifth wheel, but the M915A2 has the cross-country fifth wheel.

Hauling liquid cargo

Another hazard that has recently been identified in accidents is liquid haulers, fuel or water. The hazards involved in pulling a lowbed trailer are different from those of liquid haulers. The reason is that liquids react differently to the road surface than does solid cargo. Tanker trailers operating full or empty handle much like any other trailer, but tanker trailers operating somewhere between empty and full act differently. The liquid moves—not only forward and backward but side to side—and that moving liquid has mass and weight. When the liquid load shifts on a curve, the mass and weight displaces the center of gravity and the tractor and trailer can roll over.

Environment

The environment also presents conditions that can cause good drivers to "commit an error" and have an accident. These environments include interstate highways, other highways, state roads, county roads, dirt and gravel roads, and off-road cross country. We all would like to think that the roads we travel have been constructed to the finest standards, but some have not.

Several years ago, a major interstate highway was constructed that included a tunnel under a river. The speed planned for the tunnel approach was 65 mph. During the first year this stretch of interstate was open, there were five fatal accidents at the tunnel approach. Each time, the cause was listed as "going too fast for conditions." It wasn't until a million-miler trucker (a driver who has driven more than a million miles without an accident or even a speeding ticket) had a wreck there that people began to ask questions. When they started looking into how the highway had been constructed, they found it was not built to design. Several changes had occurred after the roadway was planned. The actual safe speed for the approach to this tunnel was 40 mph. Several drivers had lost their lives because of a design flaw.

What it all means

When the equipment hazard (cross-country fifth wheel) is combined with the hazards associated with hauling a liquid tanker, experience with this particular type of equipment is everything. Drivers with many hours (even years) of experience in driving a tractor hauling solid cargo may not be qualified for hauling liquid cargo. It takes time and exposure to hauling liquid cargo before a driver acquires the feel of the tractor and the additional pushing and shifting of the weight on the rear axle so that he or she can safely operate this equipment.

What to do

- *Leaders*—Select and train your best soldiers as operators and look for drivers with many hours of experience in the vehicles you have in your TO&E. Instill a sense of discipline in implementing controls for hazards. Cross-country travel speed limits that leaders impose should be taken seriously.
- *Master drivers*—review your training plans for cross-country and highway fifth wheels. Study the test routes to determine if you can add the standardized test for cross-country fifth-

wheel operation. Obtain and implement TC 21-305-100, dated 19 Aug 96, which requires drivers to be licensed in the operation of liquid cargo haulers.

■ *Drivers* – review the operator's manual for your tractor *as well as the operator's manual of the trailer* for warnings and limitations of the trailers. Remember, the stricter controls, whether they are for the tractor or for the trailer are the ones you go by. If tractor maximum speed is 40 mph and that of the trailer is 35 mph, then 35 mph is the maximum speed for the system. Review the operator's manual to ensure that you have the proper truck/trailer combination.

■ *Installations* – review curves, intersections, or sites where accidents are occurring to determine if the actual speed limits are "too fast" for the design.

Individual controls

■ Consider reducing speed for varying road or weather conditions.

■ Don't tailgate. Always maintain a safe following distance. Stopping can be adversely affected by poor road and weather conditions. ♦

POCs: MAJ Julian Simerly, Chief, Ground Tactical Branch, DSN 558-3901 (334-255-3901) or Mr. Donald Wren, Safety Engineer, DSN 558-9864 (334-255-9864)

Safe speeds for M939s

Ground precautionary message (GPM) TACOM-96-09 (Tanker M131), 142901Z Jul 96, regarding semitrailer, tank, fuel, 5,000-gallon, M131. *Editor's note: Information in this message summary has been updated by TACOM as of 27 Sep 96.*

Reference: GPM TACOM 96-04, 131807Z Dec 95, subject: Safe Operating Speeds for the M939 family of vehicles.

Problem: The M52/A1/A2, M818 FOV, M931/A1/A2 and M932/A1/A2 towed load is limited to 37,500 pounds. The M131 series and M969 series 5,000-gallon fuel tankers exceed this limitation. A waiver is required to allow these 5-ton tractor/trailer combinations to transport a full load of fuel.

User actions:

■ A waiver has been received from Department of the Army (number 96-3, dated 30 Apr 96) authorizing the 5,000-gallon semi-trailers (M131 series, M967/A1, M969/A1/A2 and M970/A1) to carry 5,000 gallons of fuel (but not water) when towed with the M818, M931/A1/A2, and M932/A1/A2 tractors when operating on all prepared surfaces, to include paved, gravel or dirt roads.

■ There is no waiver for the M52/A1/A2 tractors; therefore, the M131 and M969 series (5,000-gallon fuel tankers) are limited to a maximum payload capacity of 3,000 gallons when towed with the M52/A1/A2 tractor on all surfaces.

■ At unit-level maintenance, all operators must adhere to the following conditions:

- Maximum speeds
  - Prepared surfaces (paved, gravel, or dirt roads - 40 mph
  - Cross country - 35 mph
  - Sand-snow - 25 mph
  - Icy roads - 12 mph

■ Tire pressure on the rear tires of the M931A1/A2 and the M932A1/A2 must be increased to 70 PSI. Tractors equipped with central tire inflation systems (CTIS) must have the CTIS disabled IAW applicable vehicle technical manual.

■ When operating on cross-country terrain, the payload is limited to 3,000 gallons of fuel if the prime mover is an M818-, M931-, or M932-series 5-ton tractor.

Warning

Do not drive too fast for road or weather conditions! The maximum safe speed limit for highway is 40 miles per hour. Don't tailgate. Always maintain a safe following distance. Stopping can be adversely affected by poor road/weather conditions. Drive at a slower speed if conditions call for it. Death or serious injury to personnel or damage to equipment can occur if excessive braking is used under these conditions. ♦

POCs: PM trailers: Ms. Julie Jacobs, DSN 786-7928 (810-574-7928), e-mail jacobsj@cc.tacom.army.mil. PM tractors: Mr. Gerald Taube, DSN 786-8009 (810-574-8009), e-mail taubeg@cc.tacom.army.mil.

From the sergeant major

Five-ton truck: Situational awareness

The M939 family of 5-ton trucks is a vast improvement over the previous generations of Army vehicles. Drivers no longer have to search for gears with a stick shift they have to throw a couple of feet; no more do they have to grip the steering wheel with both hands and throw their body weight into turning the steering wheel; and the clutch pedal is gone, so they don't have to worry about their left leg being 4 inches thicker than their right.

Maybe that's part of the problem with the 5-ton truck. The history of accidents involving the 5-ton suggests that the typical driver is not an MOS-trained truck driver but drives as an additional duty. Unlike older versions of Army cargo trucks, these newer vehicles are easy to drive . . . so easy, in fact, that you can forget what it is you're driving.

In the old days, and that was not so many years ago, there was no doubt in your mind that you were driving an Army truck. It was loud, it was hard to steer and shift, it was green, and it smelled like the Army: wet canvas and diesel fuel. Today's 5-tons are relatively easy to drive, have more comfortable crew cabs, and are better insulated against sound and fumes.

I suspect that many of our drivers, especially those not school trained in truck driving, become complacent and forget that they're driving a large vehicle. It's easy for your mind to drift as you drive along, and before too long, the driver is operating this big truck as if it were his POV. That's a big mistake! Five-tons handle nothing like an automobile. They take longer to stop, they require more area in which to turn, and they are much more likely to overturn for many reasons. Often they are pulling trailers, which further alters the characteristics of how they handle.

OK. We've identified a **hazard**: the 5-ton is easy to drive, and drivers tend to forget they're driving a large truck and have accidents. What controls can we apply to prevent this from happening? It's as simple as this:

- Emphasize during driver training the many differences between driving larger cargo trucks and small utility vehicles and POVs.
- Consciously tell yourself before, during, and after you drive that **this is not a car; this is a truck and it handles differently!**
- Assistant drivers should help remind the soldier behind the wheel that they must

maintain situational awareness as they drive.

Where do I get this crazy idea that you can forget you're driving a truck? It happened to me a few times in Korea as I was driving a 5-ton expandable van. Fortunately, I didn't have an accident, but there were several times when I realized that I was over- or under-steering, driving too fast for conditions, or neglecting to remember my size as I drove along rural roads because I had forgotten, if only for a few seconds, what I was driving.

Let me talk straight to you drivers. There have been far too many soldiers killed while driving 5-ton trucks. One of the problems is speed. There is currently a 40 mph speed limit on the M939 series of 5-ton vehicles on prepared surfaces (paved, gravel, or dirt roads). The speed limit cross country is 35 mph. These speed limits were established as a control to counter the hazard of loss of traction and rollover caused by braking and running off the road. It is critical that you observe the speed limits. If your convoy requires you to drive faster, inform your convoy commander of the restriction. The 40 mph speed limit cannot be waived.

Remember that when you drive a 5-ton, you're in charge of many tons of steel moving pretty fast. You're wider, higher, and heavier than you may think. You must always remember to drive the vehicle within the limitations you learned in training and in the operator's manual. These limits weren't put there to take away the fun of driving . . . they were put there to control hazards, prevent accidents, and save lives. Follow them! ♦

—SGM Gregory L. McCann, U.S. Army Safety Center, 558-3575 (334-255-3575) or e-mail, mccanng@rucker-safety.army.mil

Listen up drivers

The Army Transportation School has completed work on TC 21-305: *Training Program for Wheeled Vehicle Accident Avoidance*. The circular is designed to sharpen driving skills, standardize training, increase awareness, and enhance the Army's driver training program. It provides basic knowledge and motivational training in the safe operation of all wheeled vehicles—privately owned as well as Army motor vehicles (AMVs).

The instructions in TC 21-305 will help wheeled-vehicle drivers maintain a high degree of proficiency. The contents are not restricted to any particular vehicle. It is a guide to normal everyday driving and driving under difficult conditions. The lesson content is arranged sequentially and includes lesson outlines, transparencies, and handouts.

In addition to the standardized training required by AR 385-55, this program may also be used for sustainment and remedial training. When used for sustainment training, commanders have the flexibility to choose and arrange training material based on the unit's mission, driver behavior, and/or accident history. When the TC is used for remedial training, the unit should focus on the task errors involved and use that portion for retraining.

TC 21-305 was distributed via pinpoint distribution in July 1996. Units desiring to receive additional copies must requisition them through the U.S. Army Publications and Printing Command.

The Army Safety Center is currently revising AR 385-55. One of the major changes is the addition of a standardized accident avoidance course. The present AR 385-55 states in paragraph b-4(a), page 10, under Driver Education, that all personnel (active Army, U.S. Army Reserves, Army National Guard, and civilian) required to drive AMVs will be given classroom instruction in accident avoidance. The Safety Center will publish a new AR 385-55 that details implementing instructions and guidance for TC 21-305. ♦

POC: SFC John B. Dawson, Transportation NCO, DSN 558-9197 (334-255-9197)

Adjusting NVGs in the field

You're in the field, and you need the sharpest possible image from your night vision goggles (NVGs). But you're just not satisfied with the image you're getting. What do you do?

First of all, you aren't going to get 20/20 vision with the goggles technology available today, but you should be able to get a *sharply focused* image at infinity and at distances short of infinity. To accomplish this, however, you have to know how to adjust your goggles properly. Before you start trying to adjust your goggles, there are some things you need to know.

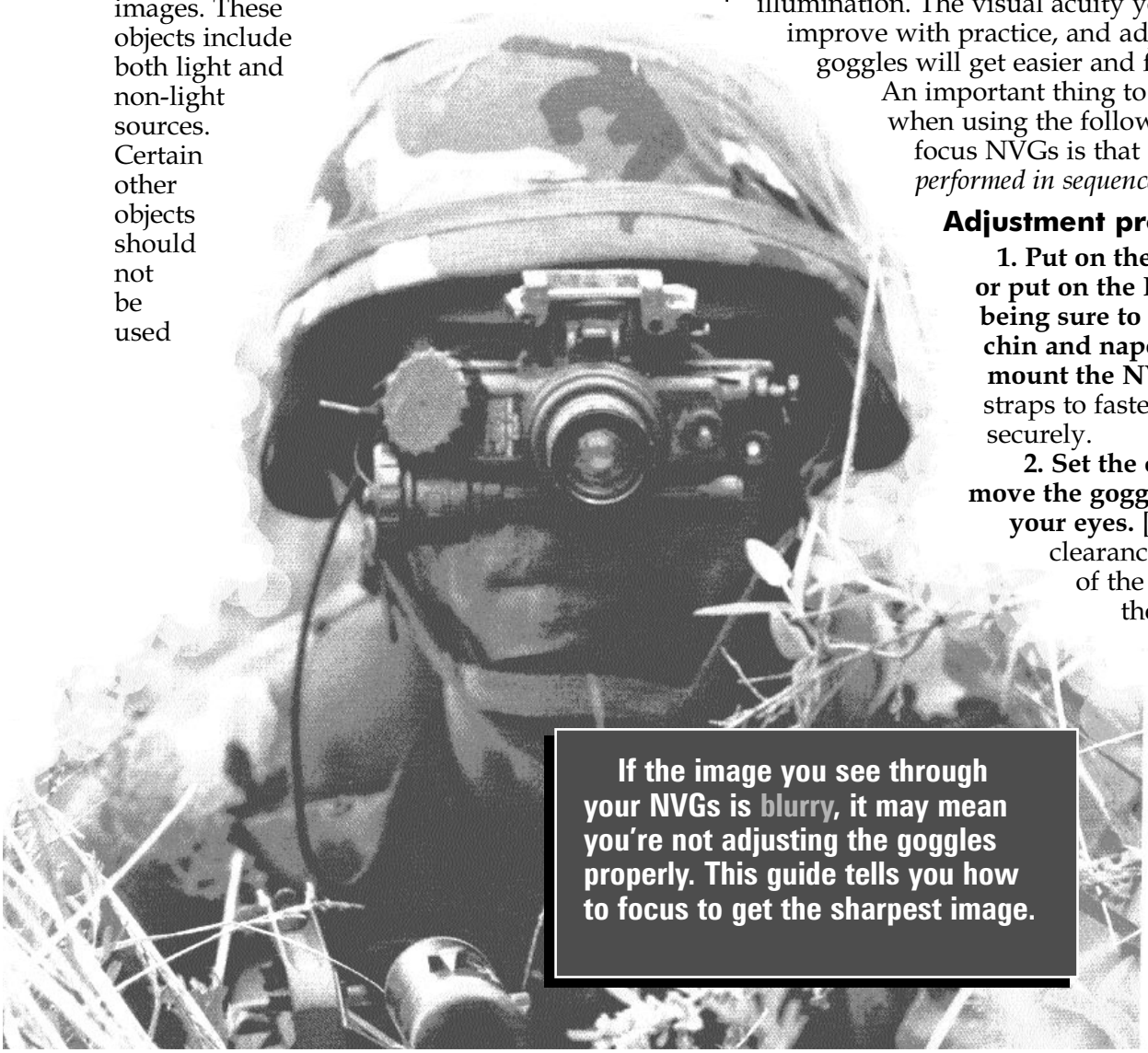
■ There are certain objects you should look at in the field when focusing your goggles because they provide sharp images. These objects include both light and non-light sources. Certain other objects should not be used because they don't provide the sharpest images.

■ NVGs do not correct for all vision problems. For example, if you have an astigmatism, you will still have it when you wear NVGs.

Note: When the tactical situation requires light security, operators will need to remove eyeglasses and use the eyecups.

■ In the following guide, which is based on tests conducted by the Army Research Institute at Fort Benning, GA, and guidance developed by Army, Air Force, and Navy aviation agencies, you will find some practical exercises to help you determine when you have adjusted your NVGs well. Experience in looking at different objects will help you determine when you have the best adjustment under different levels of night illumination. The visual acuity you achieve will improve with practice, and adjusting the goggles will get easier and faster.

An important thing to remember when using the following guide to focus NVGs is that *the steps must be performed in sequence.*



If the image you see through your NVGs is blurry, it may mean you're not adjusting the goggles properly. This guide tells you how to focus to get the sharpest image.

Adjustment procedures

1. Put on the head harness or put on the Kevlar helmet, being sure to tighten the chin and nape straps, and mount the NVGs. Adjust straps to fasten head harness securely.

2. Set the eye clearance—move the goggles close to your eyes. [The eye clearance is the distance of the eyepieces from the eyes.]

● Depress the socket-release button on the NVG mount and move the goggles toward your eyes. The eyepieces should *not* touch your eyelashes or corrective

glasses.

3. Turn on the NVGs.

4. Adjust tilt on helmet-mounted goggles, using the tilt adjustment knob, until you get a comfortable viewing angle. This means you should not have to tilt your head up or down excessively to make the tube approximately level.

5. Set the eye span—center each eyepiece over each eye. [The eye span is the distance between the two eyepieces. It is also called the interpupillary distance or the IPD.]

- Set the eye span to correspond to the distance between the two eyes.
- Start by pulling the eyepieces as far apart as possible.
- Close one eye. For the eye that is open, move the corresponding eyepiece inward until the image you see is a full circle, not an oval. (If you have trouble closing one eye, cover it by folding the eyecup over the NVG eyepiece.)
- Once one eyepiece is set, do the same process with the other.

6. Select an object to look at. [Select objects that provide a high-contrast or light sources whose "bloom" can be reduced.]

Recommended objects

- *Tree trunk*. Get within 5 feet of a tree trunk and look at the bark.
- *Vehicle*, positioned so you can distinguish sharp lines, corners, and other features.
- *Vehicle trail* that stands out in its environment (for example, a white, sandy trail in the middle of a grassy field).
- *Star.*
- *IR chem light.*
- *Blue chem light.* Leave the wrapper on the chem light and expose only the round end of the light. Do not expose the entire chem light.

Focus objects that do not work as well

- Flashlight with a red filter.
- Red chem light.
- Phoenix transmitter.
- Flashlight with an NVG-compatible filter.
- Tree trunk silhouetted against the night sky.
- Piece of white paper.

7. Set the objective lens focus—focus the goggles for the object's distance. [The objective lens focus is the *outside lens* located at the end of the NVG image-intensification tube. It adjusts for *distance only*. When the objective lens focus is turned to its full left or counterclockwise position, it is on the maximum distance or infinity setting. Use this setting when looking at objects farther than 30 feet from you.]

- Turn the objective lens focus to the right or to the left until the object you are looking at is as clear as possible.
- If the object you are viewing is beyond 30 feet, simply turn the objective lens focus to its full left or counterclockwise position.

8. Set the diopter adjustment ring for each eye to adjust for the unique vision in each of your eyes. [The diopter adjustment rings are the two rings closest to your eyes. These rings can be rotated to correct for refractive errors in your eyes (that is, whether you are near-sighted or far-sighted), and will determine the visual acuity you obtain. The acuity is also dependent upon the amount of illumination available and the contrast of the target.]

- First, close one eye (or cover eyepiece with eyecup) and adjust the diopter ring for the open eye.
- Turn the diopter adjustment ring to the left (counterclockwise) until it stops.
- Stop for a second, blink, and let your open eye relax.
- Slowly turn the diopter adjustment ring back to the right (clockwise) until the object just becomes sharp. **Stop!!** *Do not turn the diopter ring beyond this point.* Do not go beyond the initial clear focus.
- Repeat these procedures for the other eye.

9. Check the objective lens focus again (step 7). This will ensure your distance focus is still sharp. Readjust if necessary.

10. Repeat steps 8 and 9 as necessary to determine if you have the best adjustment.

Reminders

- Do not readjust the diopter adjustment rings once good visual acuity has been achieved.
- You must readjust the objective-lens focus to correspond to the distance of objects you encounter in the field to provide the sharpest image.
- The more you practice, the easier it becomes. ♦

POC: Dr. Jean Dyer, Army Research Institute, Fort Benning, GA, DSN 835-5589 (706-545-5589). USASC POC: CW5 Bob Brooks, Product Development Branch DSN 558-3969 (334-255-3969).

For additional information on night-vision equipment, see the February 1996 issue of *Countermeasure*.

Take note AN/PVS-7B maintainers

No matter how well soldiers can adjust their NVGs, if the PVS-7Bs are not properly maintained, they cannot be optimized.

TM 11-5855-262-23+P-2: *Night Vision Goggles, AN/PVS 7B*, dated 15 Mar 93, requires unit-level PMCS each month. (The next version of this TM will change the frequency requirement so be sure and watch for it!) Table 3-1 of the TM spells out each of the checks. A particularly important area of this monthly inspection includes checking the *mechanical assemblies*.

■ The first point in this section requires the maintainer to check the headmount assembly for freedom of movement and to make certain the socket release works properly.

■ Next ensure the individual eyepieces move left and right. This movement should require deliberate effort but should not be excessively stiff.

■ Next check the diopter focus rings for freedom of movement. Total movement here should be only about one-third of a full turn. If more than that is present, turn the goggles in for maintenance.

■ Then check the objective lens focus ring for freedom of movement. Again, total movement should only be about one-third of a full turn. Very often, the infinity focus lock ring is not tight, and this condition allows the objective focus ring or knob to move without focusing. Again, if this ring is loose, turn the goggles in for service.

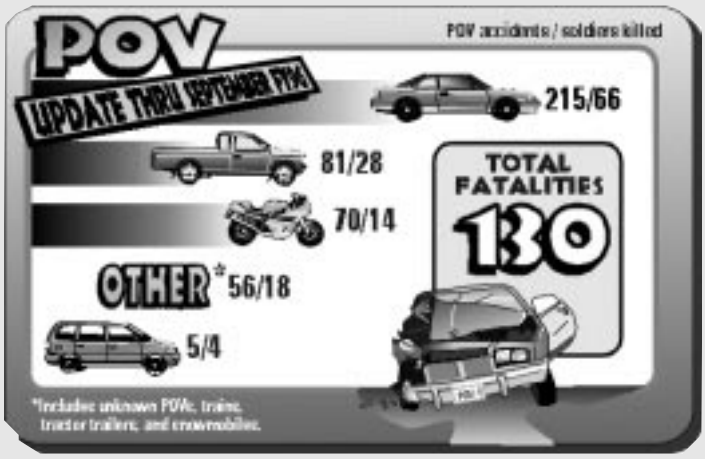
The next section of Table 3-1 discusses checking optical surfaces for cleanliness and for lens scratches, chips, or cracks. The lenses should be cleaned with lens paper. If the lenses are very dirty, you may moisten the lens paper to clean them. Do not submerge the NVGs in water to clean them. This step is very important and cannot be overemphasized. Dirty lenses can cut resolution in half. (Also, do not use water to clean demisting shields. Using water removes the coating and will allow the shields to fog up when needed most.)

Another very important area to check is the on-off switch. Whenever the NVGs are inadvertently dropped, they invariably land on the on-off switch, which is easily broken.

The rest of Table 3-1 is pretty cut and dried. Not so clear, however, is the use of TS-4348/UV. This is the small test set that most units leave in the arms room in the small black plastic boxes. This test set works great in checking goggles resolution at the unit level. One very important note though—*make sure that you dark adapt for at least 10 minutes before making the check.*

Document this service, using DA Form 2404, and schedule the services on DD Form 314. ♦

POC: CW5 Bob Brooks, USASC Product Development Branch, DSN 558-3969 (334-255-3969)



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THOMAS J. KONITZER
Brigadier General, USA
Commanding

ARMY GROUND-ACCIDENT REPORT
COUNTERMEASURE
Volume 17 Number 12 December

Another banner year for the Army
FY 96 sets safety records

Army units have put new marks on the wall toward achieving world-class safety performance. FY 96 shows record lows in five major categories of accidents—

■ The total accident rate of 4.22 per 1,000 soldiers is down from the previous record-low rate of 4.98 set in FY 95.

■ The FY 96 Class A through C ground-accident rate continues downward, setting a record of 4.02 per 1,000 soldiers compared to the FY 95 all-time low of 4.79.

■ Army aviation set another record low in FY 96 with its lowest Class A flight rate ever: .65 per 100,000 flight hours. The previous low of .83 was set in FY 95.

■ Personnel-injury Class A through C accidents also recorded a new low of 2.51

compared to 3.05 in FY 95.

■ Civilian lost-time claims dropped to a new low of 22.83 from a previous low of 23.29 in FY 88.

Congratulations on another record-setting year. It was not an *accident*. Everyone is responsible for making safety happen, and you can take credit for your contribution.

Unreported accidents

The statistics look good, but they are also suspect. They are based on your reporting effectiveness. When you're up to your hips in alligators, doing more with less, it's easy to put off the admin stuff. That includes accident reporting. And there's a temptation after you've done that to say "It really won't make any difference, so I'll forget about it and take care of the 'gator that's chewing my leg." The thing is—it does make a difference.

We've got to know what's happening and why it has happened so we can identify trends and provide hazards and recommended controls to the rest of the Army. The overall downward trends are good, but how many accidents were not reported? That's something we've got to improve on, and we at the Safety Center are also working to make that happen. Future issues of *Countermeasure* will tell you more about things we're doing to reorganize our assets and be more responsive to your needs. We're going to make the reporting system more user friendly, and we're also going to make it easier for you to retrieve information from the Army's safety data base.

Safety is not just leaders' business—everyone makes safety happen!

We've got some alligators of our own

We're going to do some alligator (make that dinosaur) slaying of our own, getting rid of the cumbersome main frame computer system and replacing it with a more responsive relational data base to serve you.

That's our part. Your part is to do a better job of reporting. But that's still reactive stuff. Let's talk about preventing accidents so that there are fewer to report in the first place. That brings us to the proactive approach to business—risk management.

Risk management

Did I hear you say "That again?" Absolutely, positively, undeniably, because that's how it has to be done. We've already made some real strides, but we've still got a long way to go.

We have found that "risk assessment" is pretty well understood in the field. People are identifying hazards and assessing risks—the trouble is, it often stops there. And when it does, that means no controls have been designed during the decision step to implement so therefore no supervision takes place to ensure that the controls are used.

By firmly fixing risk management into all of the Army's processes—decision making, training management, force protection, personnel assignments, maintenance, et al—we can stop killing soldiers and destroying equipment. It can be done, and we're going to do it; we just need to get on with it. Until we can institutionalize risk management (and that's just a big word that means we've got to get into the head space of every leader, every soldier, every civilian, every contractor and make risk management an intuitive part of everything we do) we will never get it into our off-duty behavior so that we can stop losing people to the greatest hazard to soldiers. POV fatalities are 67 percent (130 soldiers) of all FY 96 fatalities.

So I've told you that **you did good.** But I'm also telling you that we can do better. We can't go on letting trucks roll over because drivers were poorly trained; we can't let paratroopers die because the unit didn't enforce the standards; we can't let soldiers be crushed by tank turrets or between vehicles because communication broke down; we can't do any of the things that cause soldiers to be injured or killed. Everyone is an important member of the team. Teammates don't let their buddies down.

World-class performance in safety is not losing our nation's most precious resources—its sons and daughters—to an unplanned behavior or condition called an accident. World-class performance is achieved through a combination of proactive leadership, tasks performed to standard, teamwork, effective communications, and a process to identify hazards and implement controls called risk management. Safety is not just leaders' business—everyone makes safety happen! Just do it, and FY 97 will be world class. ♦

—BG Thomas J. Konitzer, Director of Army Safety

"I'm gonna live forever"

Those of you who remember the TV show "Fame" will recall the faces of young people as they sang this opening song. It's an easy transition to see the faces of young soldiers because they, too, somehow feel "I'm gonna live forever." Certainly, they don't expect to die in their own vehicles. But they do. In FY 96, 130 soldiers died in POVs, that's 67 percent of all Army accident fatalities. The POV fatality rate increased by 17 percent over FY 95. These 130 soldiers are about the equivalent of a headquarters and headquarters company in an infantry battalion.

Who are these soldiers?

Forty percent of the Army population are soldiers in grades E1 through E5 and the ages of 18 to 25. Sixty-six percent of the soldiers killed in POV accidents fall in this 40 percent of the population. The greatest contributing factors are speed, fatigue, and nonuse of seatbelts.

Speed

A question naturally arises as to whether there is any relationship between the increase in Army military personnel POV fatalities and the recently increased speed limits in most of the U.S. According to the National Highway Traffic Safety Administration there is some relationship between increasing state speed limits and fatal POV accidents, however, this does not appear to be the central reason for the Army's increase in POV fatalities. Personal attitude and lack of *self-discipline* are the main contributing factors. Drivers who tend to speed will do so regardless of what the posted speed limit says. POV fatalities will continue to increase until a fundamental change in the thinking process prompts a change in personal attitude and discipline.

Fatigue

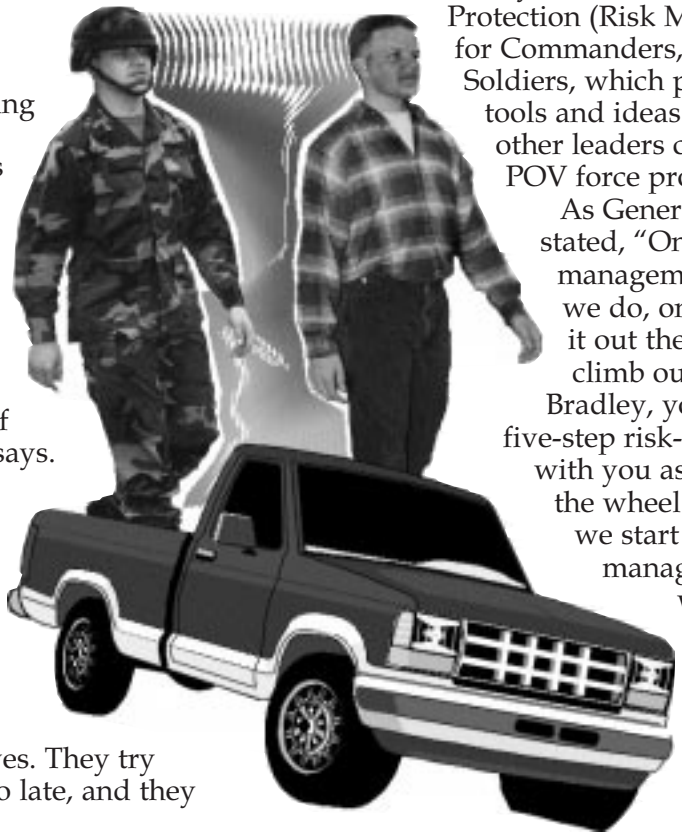
Fatigue is a factor because soldiers overextend themselves. They try to go too far or come back too late, and they fall asleep at the wheel.

Seatbelts

Nonuse of seatbelts is up 7 percent in FY 96. We don't really know why. We do know that if you are wearing your seatbelt during an accident, your chance of receiving fatal injuries is reduced by 45 percent.

Safety Center analysis also shows that many POV accidents are directly related to soldiers' inability to recognize hazards, underestimation of their personal risk, and overestimation of their personal ability. This tells us that we need to help soldiers assess themselves as drivers and offer them some controls they can use to lower the risks. We've done that. The October issue of *Countermeasure* describes the Automated Risk Assessment and Controls (ARAC) Program that will let soldiers sit down at a computer and input data about their driving history and habits. The program will tell them the risks and offer control options they can select to lower their risk of having a POV accident.

POV ARAC has been field-tested with selected units and Armywide distribution began in November. Accompanying the program is the Privately Owned Vehicle Force Protection (Risk Management) Toolbox for Commanders, Leaders/NCOs, and Soldiers, which provides a variety of tools and ideas commanders and other leaders can use for their unit POV force protection programs.



As General Konitzer has stated, "Once we embed risk management into everything we do, one can't help but take it out the gate." When you climb out of a 5-ton or a Bradley, you've got to take the five-step risk-management process with you as you slide behind the wheel of your POV. When we start thinking risk management off duty as well as on duty, we're going to decrease POV accidents just like we have in our tactical operations. ♦

Safe use of lithium batteries

Primary lithium batteries (non-rechargeable)

The Army's lithium battery is a lightweight, high-energy, portable power source with several built-in safety features. It can operate your equipment safely and effectively over a wide range of temperatures.

Lithium batteries have shown that they can stand up to normal handling, storage, and use conditions. *However, they must be handled with care to prevent hazardous conditions.* You are an important part of an intelligent safety program that minimizes the risks associated with the use of these batteries.

Transportation

■ All lithium batteries are classified as Class 9 hazardous materials. Coordinate all shipments with your installation transportation office.

■ Lithium batteries may be shipped in bulk by surface transportation or cargo aircraft.

■ Lithium batteries may be carried in equipment or as spares IAW chapter 3, TM 38-250: *Air Transport Regulations* for tactical, contingency, and emergency conditions.

Handling/use

■ Use only those batteries authorized for a specific item.

■ Use batteries from stock on a first-in, first-out basis. Do not use batteries beyond the expiration date.

■ Before using, examine all batteries for any signs of obvious defects or damage or if any liquid is visible within the plastic bag.

■ Remove all batteries from equipment as soon as they fail to operate the equipment or when their cumulative use reaches the recommended useful life of the battery for the particular item.

■ Shut off equipment if the battery compartment becomes hot and wait for the compartment to cool before removing the batteries.

■ Leave the immediate area if you detect an irritating odor coming from the equipment or battery or if a hissing sound is heard.

■ Report any battery venting to your local safety office within 24 hours and contact your local CECOM logistics assistance representative (LAR) as soon as possible. Save the vented battery and equipment for analysis.

■ The unit will file a product quality deficiency report (PQDR) with the LRC Power Sources Group and the CECOM Safety Office and provide disposition instructions for the damaged battery and equipment. The LAR can be of assistance in this instance.

Storage

■ Store new batteries in original packaging until ready for use.

■ Store in cool, dry, well-ventilated areas separated from other combustible and hazardous materials.

■ Keep an approved Class D fire extinguisher available for all areas where lithium batteries are stored.

■ Coordinate fire-protection measures for all battery-storage areas with the installation fire department.

Disposal

■ All battery disposal must be coordinated with the installation environmental office to ensure compliance with local environmental regulations.

■ Lithium sulfur dioxide batteries are classified as non-hazardous waste in Resource Conservation and Recovery Act (RCRA) and bioassay states when fully discharged. Lithium manganese dioxide batteries are classified as non-hazardous waste in RCRA states but are classified as hazardous waste in bioassay states when fully discharged.

■ All multicell lithium batteries have a complete discharge device (CDD) to ensure complete discharge for disposal.

■ Only personnel designated by the unit are to activate the CDD.

■ The CDD is to be activated in a secure, well-ventilated area away from personnel occupancy and separated from other hazardous materials.

■ Once the CDD is activated, store the batteries so that they are separated on all sides by at least 2 inches. Store the batteries for a minimum of 5 days after activating the CDD before packaging for disposal.

Reference

TB 43-0134: *Battery Disposition and Disposal*, 1 Oct 95. ♦

—POCs CECOM Safety Office: Mr. Philip Klimek, DSN 992-9723 ext. 6437 (908-532-9723 ext. 6437),

e-mail klimek@doim6.monmouth.army.mil and Mr. David Kiernan, DSN 987-3112 ext. 6447 (908-427-3112 ext. 6447), e-mail kiernan@doim6.monmouth.army.mil. POC Power Sources Group: Mr. Patrick Lyman, DSN 992-8824 (908-532-8824), e-mail lyman@doim6.monmouth.army.mil.

Lithium sulfur dioxide battery venting incidents

Recently, the number of ventings in lithium sulfur dioxide batteries has increased. This is particularly true of the BA-5800/U and the BA 5590/U batteries. As a result, two ground precautionary messages (GPMs) have been issued by the Communications-Electronics Command (CECOM) Safety Office. These messages consolidate and supersede all previously issued battery GPMs.

GPM 96-012, BA-5800/U (NSN 6665-99-760-9742), lithium sulfur dioxide batteries. The principal issues covered in this message are:

■ All BA-5800/U batteries manufactured by Crompton Eternacell Ltd. are deadlined. These batteries must be turned in for exchange. They may **not** be used in any equipment.

■ BA-5800/U batteries manufactured by Ballard Battery Systems only under contract DAAB07-90-C-C024 may **not** be used in the AN/PSN-10 small lightweight global positioning system receiver (SLGR) or the stand-alone aviation global positioning system receiver (SAGR). All other BA-5800/U batteries may be used. *Note:* The contract number can be found on the printed label on the side of the battery.

■ When using an external power source with the precision lightweight global positioning system receiver (PLGR), remove the BA-5800/U batteries before connecting the external power source.

■ CAM batteries (NSN 6135-21-906-7728) are **not** BA-5800/U batteries (although equivalent in size). They may be used only in the chemical agent monitor (CAM).

■ BA-5800/U batteries manufactured by Power Conversion Inc (PCI) (contract DAAB07-94-C-E002) and SAFT (contract DAAB07-94-C-E004) should be checked for residual voltage 5 days after activating the complete discharge device (CDD) before disposing of the batteries.

GPM 96-013, BA-5590/U lithium sulfur dioxide non-rechargeable batteries (NSN 6135-01-036-3495). The principal issues covered in this message are:

■ BA-5590/U batteries manufactured by SAFT (contract DAAB07-90-C-C020) are not to be used in SAWE MILES II equipment.

■ BA-5590/U batteries manufactured by SAFT (contract DAAB07-90-C-C020) should only be used in other items for a cumulative use time of the hours listed in appendix A of this message.

■ BA-5590/U batteries manufactured by SAFT (contract DAAB07-90-C-C020) and stored in depot are being preconditioned to minimize the risk of venting. These batteries have a nonextendable shelf life of 12 months after preconditioning (expiration date on battery label) and have the same restrictions as previously listed. These batteries have a new NSN 6135-01-435-3097 and may be obtained at a reduced cost.

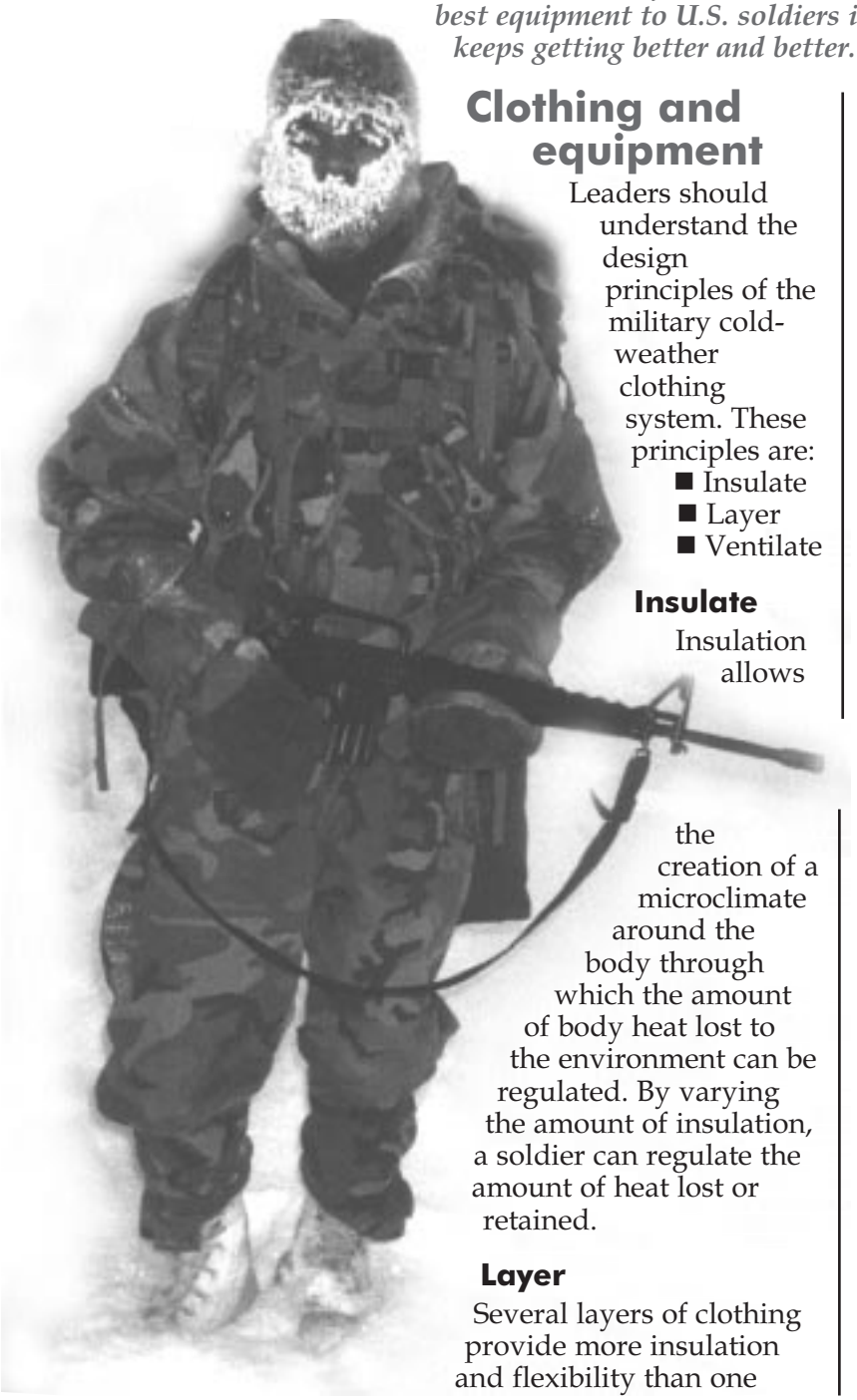
■ BA-5590/U batteries manufactured by PCI may be used without restrictions. Those batteries manufactured by PCI under contract DAAB07-95-C-G322 should be checked for residual voltage 5 days after activating the CDD.

Complete texts of these messages may be obtained directly from the CECOM logistics assistance representative (LAR), the CECOM Safety Office, or the Power Sources Group. ♦

—POCs CECOM Safety Office: Mr. Philip Klimek, DSN 992-9723 ext. 6437 (908-532-9723 ext. 6437), e-mail klimek@doim6.monmouth.army .mil and Mr. David Kiernan, DSN 987-3112 ext. 6447 (908-427-3112 ext. 6447), e-mail kiernan@doim6.monmouth.army.mil. POC Power Sources Group: Mr. Patrick Lyman, DSN 992-8824 (908-532-8824), e-mail lyman@doim6.monmouth.army.mil.

Cold weather revisited

The October issue of Countermeasure contained information about protecting the force from cold-weather injuries. In this issue, we've included a reminder about the importance of protecting soldiers with the right cold-weather clothing and equipment. We've also included a caution about possible static discharge from the extended cold-weather clothing system parka and trousers during certain cold-weather operations. And there's a good-news story about a new family of space heaters developed at Natick Research, Development and Engineering Center that should make life more bearable for soldiers in the field. Furnishing the best equipment to U.S. soldiers is good risk management—and it just keeps getting better and better.



Clothing and equipment

Leaders should understand the design principles of the military cold-weather clothing system. These principles are:

- Insulate
- Layer
- Ventilate

Insulate

Insulation allows the creation of a microclimate around the body through which the amount of body heat lost to the environment can be regulated. By varying the amount of insulation, a soldier can regulate the amount of heat lost or retained.

Layer

Several layers of clothing provide more insulation and flexibility than one heavy garment, even if the heavy garment is as thick as the combined layers. By adding or removing layers of clothing, soldiers can regulate the amount of heat lost or retained.

Ventilate

Ventilation helps maintain a comfortable microclimate around the body, thereby helping control body temperature. By ventilating, the soldier can release excess heat and minimize sweating which can lower body temperature later as it evaporates.

Making the principles work

There are four ways to apply the principles in the military cold weather clothing system.

- Keep it — **C**lean
- Avoid — **O**verheating
- Wear it — **L**oose in layers
- Keep it — **D**ry

- *Keep clothing clean.* Dirt and grease clog the air spaces in clothing and reduce the insulating effort. Dirty clothes are cold clothes.
- *Avoid overheating.* Select the clothing needed to stay comfortable, or even a little cool. Leaders should ensure that their soldiers are not overdressed for the job they are performing.
- *Wear it loose.* All items of the cold-weather uniform are sized to allow wearing of the appropriate number of layers; this means, for example, that the field jacket may appear too large when worn without all of the layers designed to fit under it. If the uniform items do not fit loosely, the insulation will be substantially reduced.

● *Keep it dry.* It is vital that all layers of clothing be kept dry because wet clothing conducts heat away from the body, compromising the microclimate around the body and making it difficult to regulate body temperature. Moisture soaks into clothing from two directions; from melting snow and frost that has collected on the outside of the clothing and from perspiration. Leaders should ensure that soldiers brush snow and frost from clothing before entering heated shelters or vehicles. ♦

Static advisory

Extended cold weather clothing system (ECWCS)

Soldiers conducting static-sensitive operations need to be aware of possible static discharge from the ECWCS parka, NSN 8415-01-228-1306 (series) and trousers, NSN 8415-01-228-1336 (series).

These outer garments of the ECWCS are made of a synthetic laminated cloth (commonly known as Gore-Tex). These synthetic materials can develop a static electric charge that does not readily dissipate. Synthetic fabrics generally develop greater static charges and maintain these charges for a longer period than natural fibers such as cotton or wool.

Electrostatic discharge (ESD) during operations such as ammunition or missile handling, fuel dispensing and refueling, and maintenance of electronics may present an immediate operator hazard or have a delayed adverse effect upon systems.

Units should identify operations where ESD can be a hazard and implement controls to reduce or eliminate these hazards. References that specify established procedures include, but are not limited to, the following:

■ FM 10-68: *Aircraft Refueling.*

■ FM 10-69: *Petroleum Supply Point Equipment and Operations.*

■ FM 10-20: *Organizational Maintenance of Military Petroleum Pipelines, Tanks, and Related Equipment.*

■ FM 9-38: *Conventional Ammo Unit Operations.*

Fortunately, no incidents have been attributed to ESD from field clothing, however, units should ensure normal engineering controls, such as grounding, bonding, and ventilation of fuel/air mixtures are part of their standing operating procedures for static-sensitive operations.

Points of contact

■ Technical—Mr. Neil E. Smedstad, U.S. Army Natick Research Development and Engineering Center, DSN 256-4032 (508-233-4032).

■ Safety—Mr. Paul G. Angelis, U.S. Army Natick Research Development and Engineering Center, DSN 256-5208 (508-233-5208). ♦

New space heaters available

Over the past 50 years, the military has utilized World War II vintage M-41 and Yukon heaters. These space heaters have plenty of solid attributes, such as a simple design and a low cost. But current standards of safety and efficiency are much more stringent. There's also a need

Mike Kingston (CRTC) Ft. Greely AK

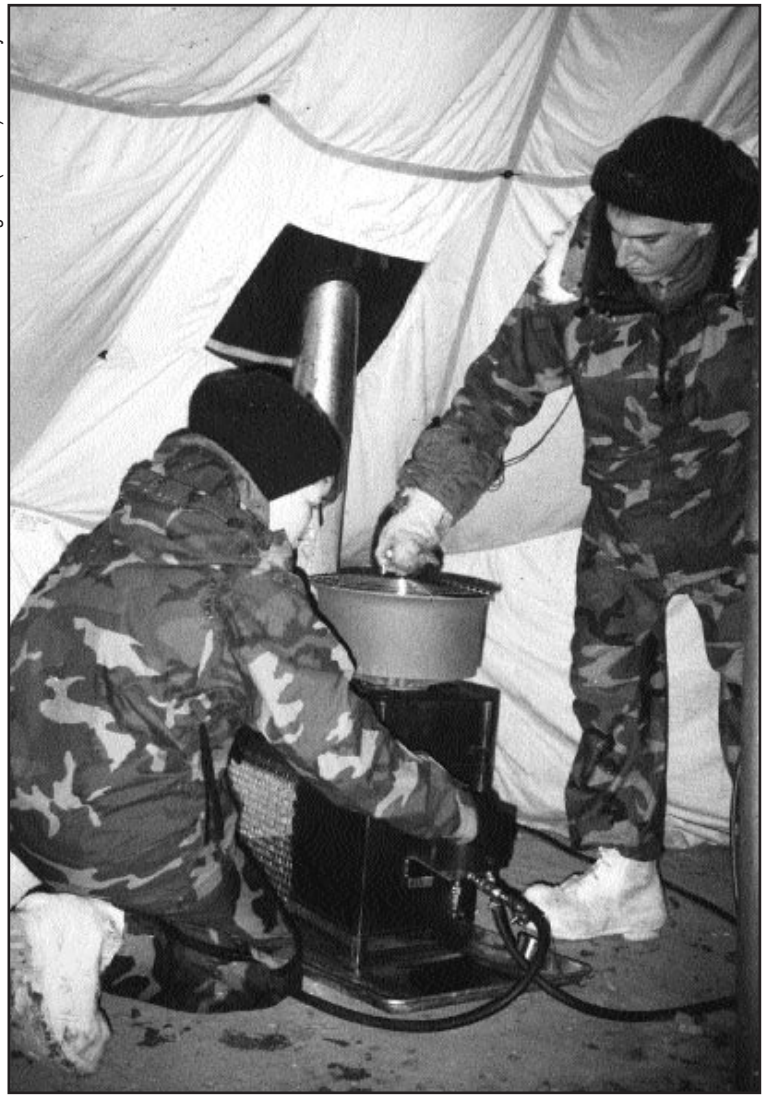
to keep pace with recent technological advances that have led to the development of new shelter systems (various sizes) and equipment. One example is a tent called the Modular Command Post System, which has special heating needs because it houses expensive sensitive computer equipment.

Now a new family of space heaters (FOSH) is being developed by researchers at the U.S. Army Natick Research, Development and Engineering (RD&E) Center, located in Natick, MA. These heaters are designed to meet the many new demands on cold-weather heating units, including—

■ Operation without the use of external electrical power.

■ Cold-weather operation, at arctic temperatures as low as -60°F.

■ Ability to run on all types of liquid and solid fuels.



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Description

Three nonpowered heaters form the nucleus of the new family of tent heaters. Because the spectrum of anticipated climatic conditions is broad and varying tent volumes, each unit has a different heating capability. For the sake of standardizing the operating procedure all of the nonpowered heaters share certain features, including—

■ **Vaporizing burner.** This new technology turns combustion into a two-step process. First fuel is vaporized in a unique r-shaped tube, then combustion takes place when air is mixed with the vaporizing fuel. This design helps to simplify operation and also improves safety by providing a means of control over the flow of fuel.

■ **Multi-fuel control valve.** This newly developed component keeps the flow rate constant for the many different viscosities of liquid fuel found in the field.

■ **Thermoelectric fan.** To improve the distribution of heat, this compact fan can be set on top of any of the three heaters. It's powered by a built-in thermoelectric module that develops electricity from the high temperatures at the heater's top surface.

The Natick researchers have also introduced a fourth member of the heater family. This is a special convective space heater that is completely self-powered, generating its own electrical power through thermoelectric modules that are located in the combustion chamber. This is the first successful integration of thermoelectrics into a field heater. The heater can be used either inside or outside of the tent and its operation is completely automatic. Another bonus: the combustion is cleaner and more efficient, so fuel consumption is lowered.

The U.S. Army Natick RD&E Center is employing state-of-the-art technology with their new nonpowered heaters and self-powered convective heater. This family of space heaters provides safer and more responsive heating. For the soldiers in the field, that translates into a more comfortable environment that can boost the quality of life and morale. ♦

—POC: Mr. Joe MacKoul, Natick RD&E Center, DSN 256-4104 (508-233-4104)

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Inexperienced driver killed when M931A2 tractor went out of control and turned over – *June*
Soldier killed when pinned between two M35A2s – *June* ♦

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Safety Guardian Award

Saving lives getting to be a habit for this NCO

SFC Curtis A. Page, U.S. Army Recruiting Battalion, Pittsburgh, PA. People were enjoying themselves during a riverboat cruise for hospitalized veterans. Then SFC Curtis Page, Armed Forces coordinator for the event, saw that a patient seated at a nearby table appeared to be choking. Others were trying to dislodge whatever was causing him to choke. Page ran over to help and saw that the patient had turned white and his eyes had rolled back. He applied the Heimlich maneuver with greater force and was able to dislodge the object from the patient's throat.

Although untrained as a medic, Page was forced into medical service many times in Vietnam when wounded soldiers needed help. In 1989, a 5-year-old started choking on a piece of candy in Page's recruiting office. The child's father tried to help, but Page saw that the child was turning blue. Using the Heimlich and "some prayers," Page was able to save the youngster.

The previous year, Page had come upon an accident scene on his way home from work. A vehicle had hit a utility pole, and the driver was bleeding profusely from a cut on his head. Power lines were dangling over the car, the street was wet, and bystanders were reluctant to approach the vehicle. Placing his leather coat over his hand, Page carefully removed the victim from the car and applied direct pressure to the victim's wound until help arrived.

Because of his action in an emergency situation, which saved the life of a fellow human being, SFC Curtis A. Page has been awarded the Army Safety Guardian Award. ♦

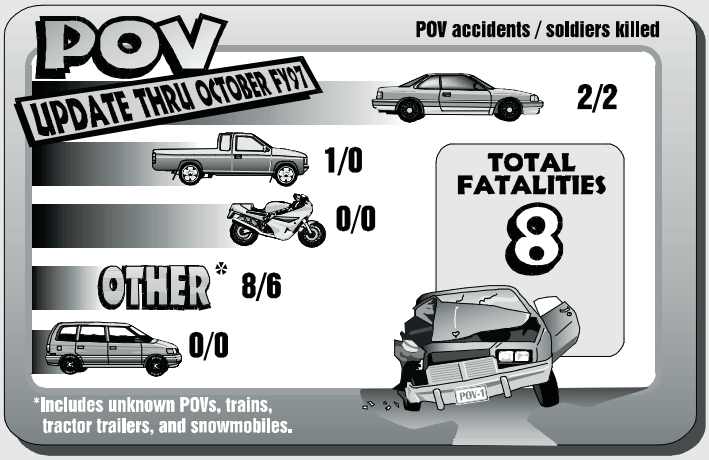
—adapted from an article by Bill Hines in *The Centurion*, U.S. Army Recruiting Battalion, Pittsburgh

More about the Safety Guardian Award

The Army's Safety Guardian Award recognizes Army personnel for extraordinary actions in emergencies. To be eligible for the award, a soldier or Department of the Army civilian must have accomplished one of the following:

- Prevented injury to personnel
- Prevented an imminent-danger situation
- Minimized or prevented damage to Army property

Further guidelines are in AR 672-74: *Army Accident Prevention Awards Program.* ♦



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