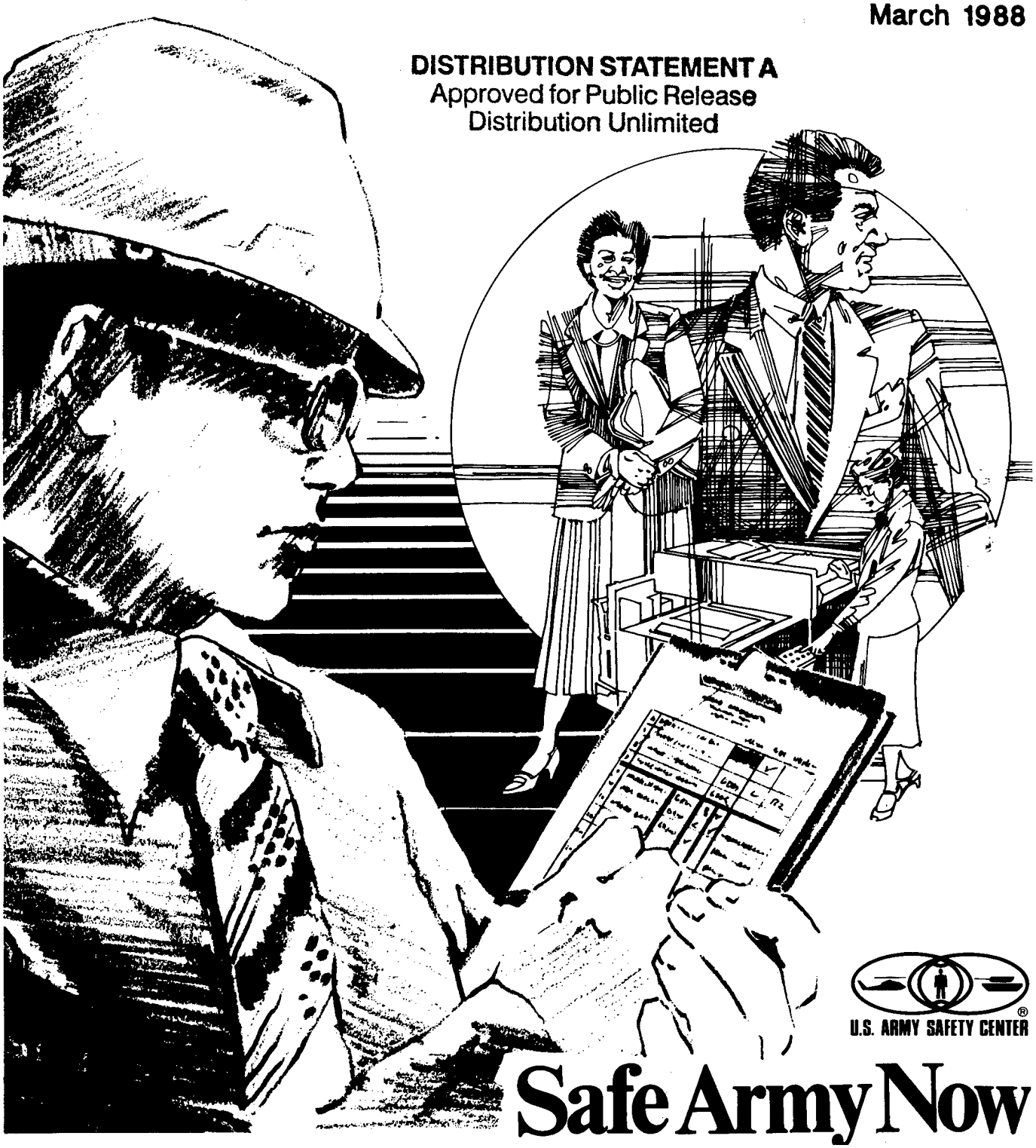
Civilian Supervisors resource manual

March 1988



U.S. ARMY SAFETY CENTER®

Safe Army Now

FOR FURTHUR INFORMATION CONCERNING DISTRIBUTION CALL (703) 767-8040

PLEASE CHECK THE APPROPRIATE BLOCK BELOW:

AO # _____

☐ _____ copies are being forwarded. Indicate whether Statement A. B. C. D. E, F. or X applies.

☒ DISTRIBUTION STATEMENT A:
APPROVED FOR PUBLIC RELEASE: DISTRIBUTION IS UNLIMITED

☐ DISTRIBUTION STATEMENT B:
DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES ONLY; (Indicate Reason and Date). OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT C:
DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES AND THEIR CONTRACTORS; (Indicate Reason and Date). OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT D:
DISTRIBUTION AUTHORIZED TO DoD AND U.S. DoD CONTRACTORS ONLY; (Indicate Reason and Date). OTHER REQUESTS SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT E:
DISTRIBUTION AUTHORIZED TO DoD COMPONENTS ONLY; (Indicate Reason and Date). OTHER REQUESTS SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT F:
FURTHER DISSEMINATION ONLY AS DIRECTED BY (Indicate Controlling DoD Office and Date) or HIGHER DoD AUTHORITY.

☐ DISTRIBUTION STATEMENT X:
DISTRIBUTION AUTHORIZED TO U S GOVERNMENT AGENCIES AND PRIVATE INDIVIDUALS OR ENTERPRISES ELIGIBLE TO OBTAIN EXPORT-CONTROLLED TECHNICAL DATA IN ACCORDANCE WITH DoD DIRECTIVE 5230.25. WITHHOLDING OF UNCLASSIFIED TECHNICAL DAT \FROM PUBLIC DISCLOSURE. 6 Nov 1984 (indicate date of determination). CONTROLLING DoD OFFICE IS (Indicate Controlling DoD Office).

☐ This document was previously forwarded to DTIC on _____ (date) and the AD number is _____

☐ In accordance with provisions of DoD instructions. the document requested is not supplied because:

☐ It will be published at a later date. (Enter approximate date. if known).

☐ Other. (Give Reason)

DoD Directive 5230.24, "Distribution Statements on Technical Documents," 18 Mar 87, contains seven distribution statements, as described briefly above. Technical Documents must be assigned distribution statements.

Cynthia Gleisberg
Print or Type Name

DSN 558-2924
Telephone Number

Cynthia Gleisberg
Authorized Signature/Date

Introduction

The first-line supervisor is the key to accident prevention. This resource manual will help you be successful in:

. Implementing the Army Safety Program.

. Understanding the economics of safety.

. Performing supervisors' duties and responsibilities.

. Motivating subordinates to perform safely.

. Performing your workplace inspection and accident investigation and reporting.

. Establishing effective and safe job control procedures.

. Managing risks in the mission.

Contents

Chapter		Page
1.	The Army Safety Program	1
2.	The Supervisor and Safety	4
3.	Personal and Professional Consequences of Accidents	8
4.	Fundamentals of Accident Prevention	16
5.	Accident Investigation	29
6.	Occupational Safety and Health Act (OSHA)	41
7.	Civilian Personnel Job Injuries	46
8.	Job Hazard Analysis	62
9.	Ergonomics	67
10.	Education and Training	68
11.	Motivation for Safe Performance	71
12.	Risk Management for Supervisors	74
13.	Safety and Occupational Health Advisory Committees or Councils	79
14.	Safety Inspections	82
15.	Personal Protective Clothing and Equipment	87
16.	Maintenance Activities	95
Readings		112
References		113
Appendix A -	Model Policy on Light Duty for Injured Employees	114
Appendix B -	Supervisor Key Actions	115
Appendix C -	Safety Checklists	117
Appendix D -	Ernonomics - The Long and Short Of It	118
Appendix E -	Protecting the Worker in Materials Handling	122
Appendix F -	What You Should Know About Administrating Personal Protection	128

Chapter 1
The Army Safety Program

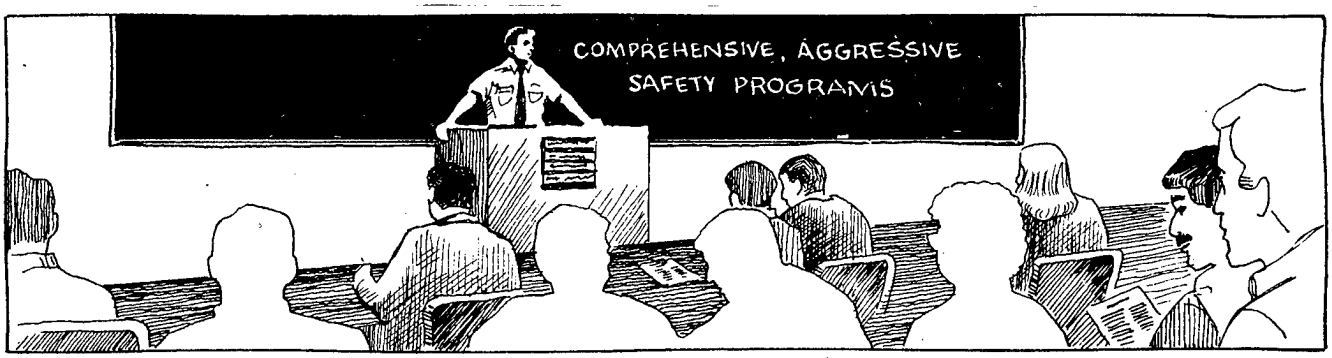
AR 385-10: Army Safety Program establishes the Army Safety Program. It prescribes policies, procedures, and guidance for implementing the safety program including OSHA and DOD requirements throughout the Department of the Army.

Army safety policy requires all commanders to establish and maintain comprehensive, aggressive safety programs to--

- Protect all Army and non-Army personnel from work-related deaths, injuries, and occupational illnesses as a result of Army operations.
- Prevent off-duty accidental deaths and injuries to military and civilian personnel.
- Provide a safe and healthful environment at all times for all Army personnel and others exposed to Army operations.
- Safeguard military and DA civilian family members from accidental death and injury.
- Protect Army materiel against accidental loss and non-Army property against loss as a result of Army operations.

These safety goals can be achieved through programs targeting a broad spectrum of mission-supportive objectives as follows:

- Protect mission continuity and capability by using specialized analytical techniques to detect, eliminate, and control risks to mission equipment, facilities, and personnel.
- Prevent injury and occupational illness by effectively managing OSH programs.
- Control damage to Army and non-Army materiel and facilities as a result of Army operations by detecting and eliminating the causes of property-damage accidents.
- Assure compliance with statutory and regulatory requirements by developing procedures for economical compliance with applicable safety requirements of Federal, host nation, State, and local statutes and regulations and Army regulations.
- Limit Army fiscal liability through prompt and prudent action to reduce the potential for legal or claims action against the Army associated with accidents.
- Improve management by systematically analyzing data to determine and correct management deficiencies causing hazards and accidents.



AR 385-10 requires that the policies below be followed by commanders and program managers at all levels in carrying out accident prevention activities:

- The Army Safety Program must fully support the Army mission while minimizing adverse impact on operations associated with administrative processes or unnecessary constraints on operational procedures.
- Accident prevention is a command responsibility. Commanders must ensure compliance with required safety procedures and establish necessary additional requirements to ensure the safety of personnel under their control.
- Accident prevention programs will be developed centrally to deal with accident problems common to several subordinate commands to ensure efficient accident prevention and reduce wasteful redundant effort. Each command will coordinate studies, prevention projects, and evaluations with commands having similar operational responsibilities.
- Programs developed centrally should allow subordinate commanders sufficient flexibility to develop alternative approaches to meet their individual operational and environmental situations.
- Risk management procedures will be used to identify and control hazards in systems, facilities, and operations during planning stages. Commanders must emphasize the use of early detection techniques such as risk assessments. These techniques must be given priority over techniques that rely on detecting hazards or accident causes after an activity is operational or after an accident has occurred.
- Available resources will be applied against hazards on a priority basis. Evaluation of hazard priority must include consideration of the overall consequences defined by mission impairment; injury, occupational illness, and damage potential; and accident probability. Legal and statutory implications of each hazardous situation will also be considered.
- Accidental losses during transition to war and actual combat seriously degrade Army combat capabilities. Integration of safety at all levels of command must be a priority objective of commanders and safety staffs.

Commanders should outline their safety policy in a letter that is maintained in each unit, directorate, and organization. The commander's policy letter may be supplemented by subordinate commanders, safety representatives, and supervisors for their operation or mission. A sample policy letter is on the following page.

Safety Policy Letter

XXXX-XX

SUBJECT: Commander Safety Policy Letter

1. Safety should be foremost in the mind of every member of this command. Accidents resulting in injuries or property damage could be eliminated through proper emphasis on safety at all levels. Safety is a commander's job--I expect each commander to be directly involved in his or her unit's safety program.

2. My safety policy is to provide every employee, military and civilian, with a safe work environment. Nothing we do should jeopardize our people. The two principles to remember are awareness and prevention. Awareness allows us to recognize and eliminate the potential for accidents. To prevent accidents we must control or eliminate unsafe practices and unsafe conditions.

3. (In this and following paragraphs, the commander should outline his or her policy and the duties and responsibilities of each commander, director, safety officer, supervisor, and employee in active support of the safety program.)

XXXXX X. XXXXXXXXXXX
XXX, XXX
Commanding

Chapter 2
The Supervisor and Safety

Supervision is a method of preventing accidents through continuous instruction and guidance, official persuasion, and recourse to enforcement when necessary. Supervision is a basic accident prevention control, functioning on the principle that individual observance of safety standards can be assured. If the necessary guidance, proper training, and development of good work habits are provided, accident prevention can be achieved regardless of whether or not supervisors are in the area.

Safety supervision

In effect, anyone who has authority over another person, whether the authority is permanent or temporary, is a supervisor. All supervisory personnel should assist in accident prevention by promoting adherence to established safety procedures.

The qualities necessary for effective supervision are the same in safety as in any other endeavor. Effective supervision is in large measure associated with leadership. Leadership that enlists the cooperation and support of the group works best. The supervisor is responsible for demonstrating the importance of safety through his own actions. As a leader, he cannot ignore safety regulations himself and expect others to follow them.

To maintain safe performance among their personnel, supervisors must--

- Explain and stress safety rules and the reasons for the rules.
- Be able to safely perform each task and to adequately demonstrate proper performance of the task.
- Train their people in safe performance.
- Make available safe tools and equipment.
- Properly assign people tasks that are within their abilities.
- Develop safe methods of performing the task.
- Motivate their people to perform safely.
- Promote teamwork among their people.
- Demonstrate a personal commitment to safety.

Supervisory responsibilities

The supervisor orients new personnel, teaches safe practices, enforces rules and regulations, investigates accidents, prepares and submits accident reports, and conducts safety inspections and safety meetings as required. No one is better qualified or in a more strategic position to discover and correct safety hazards than the supervisor of an activity. The supervisor is the one person who deals directly with both the worker and the job and is in the best position to improve the worker's attitudes toward the job, improve the worker's knowledge of the job, improve the worker's skill, insist on safe practices on the job, and correct unsafe conditions involved in the job. When the supervisor fails in any one of these responsibilities, inefficient and costly results can be expected.

To fulfill the basic requirements of an accident prevention program, the supervisor must--

- Be familiar with applicable safety regulations.
- Write and interpret safety policy and plans.
- Conduct safety surveys and inspections.
- Assist in eliminating or controlling unsafe behavior and environments.
- Assist in accident investigating and reporting.
- Recommend action to remove or control hazards and conduct followup inspections.
- Maintain safety records.
- Promote safety campaigns.
- Incorporate safe practices into operating procedures.
- Determine the need and procure material for safety training and promotion.
- Establish and maintain liaison with people and offices that can assist in promoting the safety program.
- Conduct briefings.
- Report progress to higher headquarters.

Six things supervisors can do to save lives and equipment

1. Set high standards. Set and enforce high operating standards in every activity of your operation. Safety is a by-product of professionalism, of doing the job right the first time, and every time. By-the-book, disciplined operations are mandatory.

2. Know your employees. Know their training status and their qualifications. Test new people's knowledge, regardless of whether or not they have been previously certified in equipment operation. This applies to every type of equipment, even gas masks--all equipment. Consider this information when assigning job tasks.

3. Know your equipment. Knows its capabilities and its condition. Numerous check sheets and publications are available to guide you. Consider this information when assigning job tasks.

4. Apply dispatch discipline. Many accidents involve equipment that should not be in use. Ensure equipment is operational and meets regulatory standards before dispatching to employee. Strict dispatch discipline reduces exposure to accidents.

5. Manage mission risks. Integrate the requirement for safety with the demand for the mission. A high degree of safety can be achieved through the systematic management of inherent mission risks. Be constantly aware of the mission-critical importance of safety in all your operations.

6. Maintain awareness. You cannot allow yourself to relax your vigil and become complacent when everything is running smoothly. Continuous awareness of the requirement for integrating safety into all day-to-day operations is essential.

Ten commandments of safety for supervisors

Your job as a supervisor in management places you in a unique position of trust. For not only does the Army rely on you as the direct representative of management to apply its policies wisely and fairly, but also entrusts you with the obligation to safeguard the well-being of the workers in your charge. No responsibility transcends this responsibility in importance.

On-the-job accidents represent a serious threat to the physical well-being of your people. Prevention of accidents calls for your constant vigilance. Therefore, as you guide your people safely through their daily work, use these precepts:

1. You are a supervisor and thus, in a sense, have two families. Care for your people at work as you would care for your people at home. Be sure each understands and accepts his or her personal responsibility for safety.

2. Know the rules of safety that apply to the work you supervise. Never let it be said that one of your people was injured because you were not aware of the precautions required by his or her job.

3. Anticipate the risks that may arise from changes in equipment or methods. Make use of the expert safety advice that is available to help you guard against such new hazards.

4. Encourage your people to discuss with you the hazards of their work. No job should proceed where a question of safety remains unanswered. When you are receptive to the ideas of your workers, you tap a source of first-hand knowledge that will help you prevent needless loss and suffering.

5. Assign sufficient and qualified people and equipment to get the task done safely. Instruct your people to work safely, as you would guide and counsel your family at home, with persistence and patience.

6. Follow up your instructions consistently. See to it that workers make use of the safeguards provided them. Routinely spot check their work. If necessary, enforce safety rules by disciplinary action. Do not fail the Army, which has sanctioned these rules, or your workers, who need them.

7. Set a good example. Demonstrate safety in your own work habits and personal conduct. Do not appear as a hypocrite in the eyes of your people.

8. Investigate and analyze every accident--however slight--that involves any of your people. Develop corrective measures to prevent similar accidents from occurring. Where minor injuries go unheeded, crippling accidents may later strike.

9. Cooperate fully with those in the organization who are actively concerned with employee safety. Their dedicated purpose is to keep your people fully able and on the job and to cut down the heavy personal toll of accidents.

10. Remember: Not only does accident prevention reduce human suffering and loss, it is good business. Safety, therefore, is one of your prime obligations to the Army, your fellow supervisors, and your workers.

By leading your people into "thinking safety" as well as working safely day by day, you will win their loyal support and cooperation. Good people do good work for a good leader.

Chapter 3
Personal and Professional Consequences of Accidents

All government employees are responsible for ensuring that they perform their work safely and for ensuring that their work area is safe for all who enter it. The degree of responsibility depends on the extent of the worker's authority. Therefore, a supervisor is responsible not only for his own actions, but to some extent for the actions of his subordinates since he has the authority to inspect, correct and direct their activities. This responsibility assigns accountability to supervisors, to subordinates, to society, and to yourself if you fail to perform satisfactorily. Accountability can be administrative, criminal or civil.

We are all accountable to our supervisors for the efficient performance of our job. Part of the efficiency is safety. A poor safety record or negligence resulting in an accident can be the basis for adverse action under the civilian personnel regulations. Such actions can include denial of within-grade step increases or promotion, reassignment, removal, reprimands or suspension. These actions can be based on substandard performance or, if an SOP or regulation has been violated, on misconduct. In addition, negligence which results in damage or destruction of government property can result in an assessment of financial liability equal to as much as one month's pay under the report of survey system (AR 735-11).

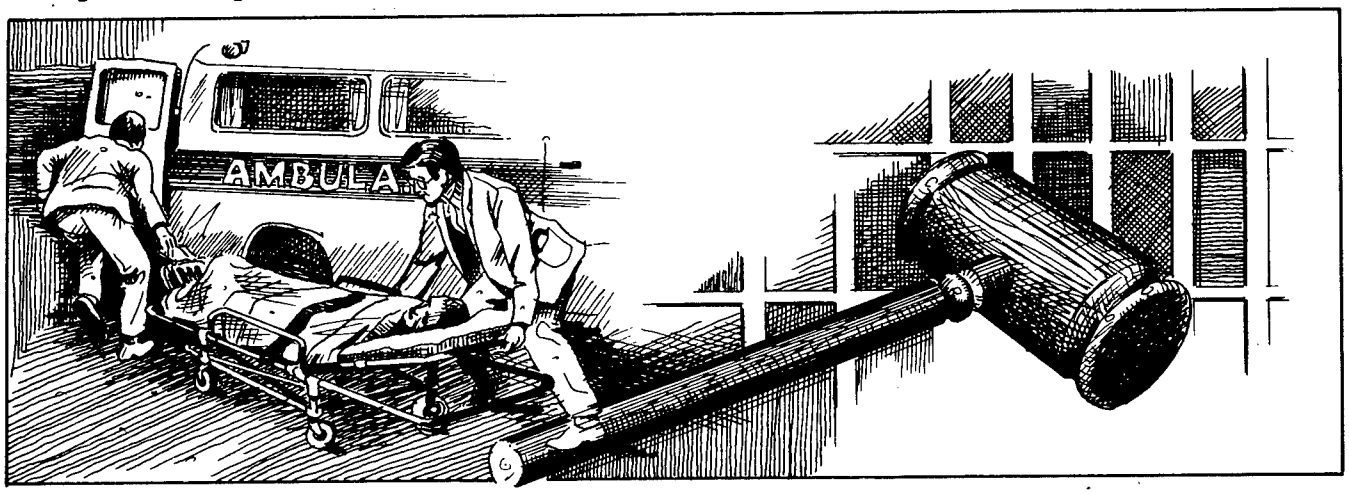
Although a supervisor's accountability to his subordinates is less formal, it is no less critical. Every analysis of what constitutes a good leader or manager includes a discussion of the importance of being concerned for the welfare of subordinates. A perception that a supervisor is genuinely concerned for his worker's welfare is a strong motivating factor. Conversely, a perception that a supervisor is not concerned with safety in the workplace can cause the workers to believe the supervisor is not concerned for their welfare. This can

lead to an antagonistic work environment which can reduce efficiency even if there are no accidents. Workers who feel they cannot get safety problems resolved by their supervisor will seek alternate avenues such as complaints through outside agencies (e.g., OSHA) or through regulatory or negotiated grievance procedures.

Society, through our legal system, will hold negligent workers and supervisors accountable for unsafe acts that result in death, injury, or property damage. Under the Uniform Code of Military Justice, simple negligence by a soldier, which results in the death of another person, can be the basis for a criminal prosecution against the soldier. While civilian supervisors are not subject to the Uniform Code of Military Justice, some states have a similar law, often limited to simple negligence in the operation of a motor vehicle, which applies to everyone. All states have laws which makes gross negligence a crime if it results in the death of another person (i.e., manslaughter). State criminal laws can be applied to accidents on military installations even if the installation is under exclusive Federal jurisdiction. The Assimilative Crimes Act allows a Federal prosecutor to incorporate a state law into the Federal code if there is no Federal law covering the misconduct.

Government employees may also be sued in civil court if their negligent actions cause death, injury or property damage. Your exposure to these types of lawsuits is less than that of someone in civilian industry, but you are not entirely immune. Soldiers who are injured in the line of duty may not sue the government or another government employee because of the Feres doctrine. This doctrine gets its name from a Supreme Court case which said that soldiers injured in the line of duty could not file a claim or bring a lawsuit against the government because of the potential adverse effect such suits could have on discipline in the services.

Soldiers who are not on duty when injured and civilians not employed by the Federal government may sue the government under the Federal Tort Claims Act if any government employee is responsible for their injury or damage to their property. As part of that lawsuit they may also name as a co-defendant any employee they believe was responsible. However, the government will normally defend the suit and pay money the court awards.



Federal employees who are injured on the job may not sue the government. The Federal Employees' Compensation Act (FECA) is their exclusive remedy. In some cases, the injured employees may not be satisfied with the compensation they received under FECA. They may try to get additional money by suing another government employee they believe was responsible for their injury. These lawsuits are not barred by the Feres doctrine and the government will not pay any damages awarded to the injured employee. However, if the act or omission which allegedly caused the injury was within the scope of the official duties of the employee who is sued, the U.S. Government, through the local U.S. Attorney, will defend the suit.

The Federal government and its employees also have a qualified immunity from lawsuits. They have not been sued for damages or injuries which are the result of a discretionary act "within the outer perimeter" of the government employees duties. The key to this immunity is the court's determination whether an act was "discretionary" or "operational." If employees are required to do something (e.g., check fire extinguishers monthly) in a precise manner or at a certain time, they can be liable if they fail to do so in an incorrect way and someone is injured as a result. But if the employee has an option to do something or to select among different options (e.g., inspect machine shop or inspect wood working shop), the courts are likely to say that this act was discretionary. Therefore, even if the supervisor made the wrong decision, he/she will be immune from suit.

Following are reports of cases which illustrate this concept.

Finally, even if supervisors are not held accountable by their superiors, their subordinates or society, they are always accountable to themselves for their acts. A failure to be concerned with safety not only places them at risk but also their colleagues and co-workers. The personal remorse and regret someone feels after their negligence has caused injury to themselves or a friend can be a very high price to pay even if no one else holds them accountable.

Federal employees, like all people in our society, are subject to criminal penalties if they are directly responsible for the death of another person because of some grossly negligent acts or omission. They may also be subject to civil lawsuits and adverse administrative actions for their unsafe acts. The accountability and potential liability of employees increase as their authority increases since the government and society hold supervisors responsible for the acts of their subordinates to the extent that the supervisor had the ability to control or influence such acts.

PERSONAL LIABILITY OF FEDERAL EMPLOYEES

FRANKS V. BOLDEN
774 F.2d 1552
November 4, 1985
United States Court of Appeals,
Eleventh Circuit

The Facts

There is a giant metal torus (i.e., a doughnut-shaped vessel) under the Unit 2 nuclear reactor at the Tennessee Valley Authority's Browns Ferry power plant. The torus is a receptacle for steam from the reactor in the event of an emergency shutdown. Steven Ray Franks, the plaintiff, and three co-workers (all TVA employees) were assigned to work inside the torus. Because the torus was contaminated with radioactivity, each worker was required to wear protective clothing consisting of heavy coveralls, rubber gloves and boots, a full-face mask respirator, and a rainsuit. The job they were sent to do was expected to take four hours.

It was a hot day, and the temperature inside the torus was at least in the 90's and may have gone as high as 115. Ventilation was poor (since the ventilation system for the torus was still under construction). Because of the heat, the four workers had to leave the area after no more than 25 minutes. Three of the four, including Franks, were diagnosed as having heat exhaustion.

Heat exhaustion had not previously resulted in serious injury at Browns Ferry, and it is ordinarily a temporary condition. Franks, however, claimed long-term consequences called "chronic hyperventilation syndrome." He has difficulty coping with hot or humid conditions, and he is unable to participate in strenuous activities. He claims that because of this condition his work opportunities are now limited.

Franks filed suit against six TVA employees as individuals, claiming that they had negligently failed to correct or discover a dangerous working condition, the high temperature in the torus, which led to his injuries. All six of the defendants shared some responsibility for safety in the plant, and all were aware of the risk of heat stress which is a hazard associated with the wearing of heavy protective clothing. All six either knew that the torus ventilation system had not been completed or did not know whether the system was operational. All six were aware that some workers might have to enter the torus in heavy protective clothing. Four of the defendants were present on the day Franks was injured, and they knew that a crew was being assigned to the specific job that Franks and the other three workers were given. The job could have been postponed until the ventilation system was completed. Bolden, one of the defendants who was a safety engineer, prepared a report on the accident and concluded that the accident was caused by high temperature within the torus coupled with the heavy protective clothing, and he stated in the report that better ventilation could have prevented the incident.

At the trial, the district court jury found that all six defendants were negligent and awarded Franks damages totaling $5000. The defendants appealed on grounds that they are immune from liability under the "official immunity" doctrine, and that the district court erred in not directing a verdict or entering judgment notwithstanding the verdict for the defendants on the issue of negligence.

The Legal Rules

The leading Supreme Court case on "official immunity" is Barr v. Mateo, 79 S.Ct. 1335 (1959). The application of the official immunity doctrine in a particular case depends on an inquiry into whether the "contributions of immunity to effective government . . . outweigh the perhaps recurring harm to individual citizens." The Supreme Court has indicated that immunity is available to federal employees exercising discretionary functions and acting within the "outer perimeters" of their duties. If the six defendants can qualify under this doctrine, then they are immune from lawsuit for the actions complained of.

The defendants further contended that they were simply following normal operating procedures which had never before resulted in injuries and that the injury to Franks was unforeseeable. Thus, the court should have ruled as a matter of law that the acts were not negligent, and that therefore they were not liable.

The Ruling of the Court

The Court of Appeals affirmed the decision of the district court, thus ruling that the six TVA employees were <u>personally</u> liable to Franks for his damages of $5000.

"We have recently noted, however, that not every act which might literally be termed `discretionary' is sufficient to invoke the immunity doctrine. Indeed, in the strict sense, every action of a government employee, except perhaps a conditioned reflex action, involves the use of some degree of discretion. . . . To prevent the discretionary function requirement from being rendered meaningless, we have held that official immunity may be extended only to those acts of federal employees involving planning or policy considerations. . . . Where, on the other hand, the acts in question concern day-to-day operations, official immunity is not available."

"The acts in question here were clearly operational in nature; indeed, the defendants do not even claim that any real policy considerations were implicated. Instead, they contend that they are entitled to immunity because of the adverse impact the threat of a suit would have on the morale and efficiency of TVA employees. This concern cuts far too broadly. It suggests that immunity should be available for any and all work-related acts of government employees. Accepting that contention would too greatly extend the limited immunity contemplated by Barr [and subsequent cases] . . . Defendant`s argument also does not account for the special nature of certain government employment, which is the rationale for official immunity. The threat of a lawsuit is something with which, under our system of justice, private employees must regularly contend. Only the `contributions of immunity to effective government' . . . justify immunity for workers employed by the United States. Where, as here, the acts of federal employees have no noticeable implications for government policy, those employees are no more entitled to be free from responsibility for their acts than are employees in the private sector."

"The defendants' other contention is that the district court should have entered a directed verdict . . . on the ground that Franks failed to present sufficient evidence of negligence to create a jury question. Under Alabama law, a plaintiff seeking to prevail on a claim of negligence must prove the existence of four elements: a legal duty on the part of the defendant, breach of that duty, proximate cause, and resulting injury. . . . The defendants argue that Franks failed to prove breach of duty and proximate cause. We disagree. . ."

"We agree that the evidence presented by Franks is less than compelling. Both breach of duty and proximate cause, however, are issues of fact normally within the province of the jury. The jury could have reasonably found that because the defendants were aware that heat stress was a serious hazard for workers dressed in heavy protective clothing, they also knew or should have known that heat stress could lead to consequences more severe than the usual short period of illness. We concur in the district court's conclusion that the evidence does not point so strongly and overwhelmingly in facor of the defendants . . . as to justify overturning the jury's verdict."

TVA SUPERVISORS' PERSONAL LIABILITY

HEATHCOAT V. POTTS
790 F.2d 1540
June 10, 1986
United States Court of Appeals
Eleventh Circuit

Supervisors enjoy immunity from tort liability only if their acts are discretionary acts and are within the "outer perimeter" of their line of duty.

The Facts

"Heathcoat was working on the dismantling of a building at TVA's National Fertilizer Development Center. His job was to cut steel supports below the roof as part of the effort to remove the roof. He went upon the roof to help pry loose concrete slabs and pried up one or two slabs, but the next slab collapsed beneath him and he fell approximately 50 feet to his death."

"Plaintiff alleged that the defendants failed to provide her husband a safe place and environment in which to work and did not properly control the conditions, methods, and manner in which work was performed. The defendants answered and moved for summary judgment on the grounds that (1) they were federal supervisory employees exercising discretionary functions and acting within the outer perimeters of their lines of duty and thus are absolutely immune from this state tort action; (2) plaintiff's claim is barred by the release contained in Heathcoat's personal services contract with TVA; and (3) the action is barred by the exclusive remedy provisions of FECA, 5 U.S.C. sec. 8116(c) (1982), because the defendants were acting as alter egos or instrumentalities of TVA in fulfilling duties that TVA owed Mr. Heathcoat."

"Following discovery, plaintiff responded to defendants' motion for summary judgment. The district court, without a hearing, denied defendants' motion without any statement of reasons."

"Defendants filed a timely notice of appeal from the district court's order pursuant to 28 U.S.C. sec. 1291, on the ground that the denial of official immunity was appealable under the collateral order doctrine. This became case No. 84-7805. Contemporaneously defendants moved the court to certify under 28 U.S.C. sec. 1291(b) the two remaining questions presented by their motion for summary judgment. The district court granted the motion, this court granted permission to appeal, and this appeal became case No. 85-7288. The two appeals were consolidated."

"A number of cases have permitted collateral order appeals from denial of a claim of absolute immunity. [citation omitted] Heathcoat contends that this case is not within Cohen v. Beneficial Indus. Loan Corp. [citation omitted] because it does not present a serious and unsettled question. We hold that Cohen applies. The unsettled nature of a serious question is demonstrated by events in his court that followed the taking of the instant appeal."

"In march 1985 we held in Johns v. Pettibone Corp. [citation omitted] that defendant TVA employees enjoyed absolute immunity for ordinary torts committed within the scope of their jobs unless the tort alleged was of constitutional magnitude. On August 26, 1985, the court withdrew its March opinion and entered another opinion. On petition for rehearing and rehearing en banc, on November 12, 1985, the court deleted part of the August 26 opinion and substituted a new part C, covering the immunity issue. . . ."

"Intervening in these events, a different panel handed down for the court on November 4, 1985, Franks v. Bolden [citation omitted], holding that official immunity did not extend to acts performed by TVA employee-defendants concerning day to day operations and not involving planning or policy consideration. Despite the later issue date of the opinion, Franks cites to the November 12 amended opinion entered in Johns."

"Also to be considered is Hendrix v. Patterson [citation omitted], an opinion issued October 24, 1985, and handed down for the court by the same panel that decided Franks. Citing both Franks and the November 12 opinion in Johns, it holds summarily that the acts of the TVA defendants at issue were operational in nature and involved no governmental policy or planning concerns, thus official immunity was not available."

"Despite this confusing sequence of events the governing principle is clear a government employee enjoys immunity only if the challenged conduct is a discretionary act and is within the outer perimeter of the act or the line of duty. [citation omitted] `Discretionary acts' involve planning or policy considerations and do not concern day to day operations. [citation omitted]."

"In Johns the district court granted summary judgment to the defendants on the ground that plaintiff's decedent was an invitee on TVA property and the individual TVA defendants had no duty to warn invitees of the hazard involved. On appeal the TVA defendants asserted immunity as an alternative ground supporting the summary judgment, although the issue had not been mentioned by the court in granting summary judgment. This court declined to reach the issue under these circumstances and remanded it to the district court to deal with it. In Franks the district court had conducted a hearing on the immunity issue, and the case had been tried before a jury with a verdict for plaintiffs. Thus the issue was before the court of appeals on a full record, and this court held, construing all the evidence in the light most favorable to the TVA defendants, that there was no way in which the acts in question could be termed anything but operational. [citation omitted] Hendrix also had been tried to a jury which returned a verdict for plaintiffs. Presumably, as in Franks, there was a full record for this court to consider. . . ."

"Each of [the seven individual] defendants was in some fashion a supervisor of the removal operations being conducted by TVA's Office of Agricultural and Chemical Development. The summary judgment record contains job descriptions for each of the defendants and the

defendants' answers to interrogatories propounded by the plaintiff. The job descriptions are detailed but abstract. The responses to the plaintiff's interrogatories are defensive and unilluminating. On this record we find no error in the denial of summary judgment on immunity grounds: whether, on a fuller development of the facts, an immunity defense might prove meritorious is for the district court."

The Ruling of the Court

The court of appeals affirmed and remanded the case.

"Plaintiff made a claim for her husband's death under the Federal Employees' Compensation Act (FECA), 5 U.S.C. secs. 8101-8193. The defendants contend that the exclusive remedy provision of FECA, 5 U.S.C. sec. 8116(c), bars this suit. FECA is silent on the matter of co-employee suits. FECA provides that if the United States and its `instrumentalities' are liable under its provisions, recovery under this act is the employee's exclusive remedy against these parties. 5 U.S.C. sec. 8116(c) (1982). In Allman v. Hanley [citation omitted], this court held that this provision does not bar suits by co-employees. The Sixth Circuit in Bates v. Harp [citation omitted], adopted the Fifth Circuit approach. Defendants try to distinguish these cases on two grounds. First, they argue that these cases only decided the issue of suits against co-employees and therefore courts are free to determine on a case by case basis whether a particular co-employee is an `instrumentality.' This distinction fails because the courts in Allman and Bates held that absent specific language the statute should not be construed to abrogate the common law right to sue a co-employee."

"Defendants also attempt to avoid the bite of Allman by arguing that the court in Allman ruled that this statute should be construed in accordance with the law in the majority of the states and that since the decision in Allman the majority of states have adopted a contrary rule. This argument fails for two reasons. First, the Allman court did not establish such a rule; it only looked to the law of the majority of states to determine what the common law was so that it could apply the canon of statutory construction that a court will assume that Congress changed the existing law when the statute shows a clear manifestation of intent on the part of Congress to do so. Second, defendants' proposed rule would allow states to change the contours of established federal law where there is no indication that Congress had any intention of delegating such power to the states. As just noted, the court in Allman only looked to the common law of the states to determine the context in which Congress acted: it did not decide that state law controls interpretation of federal law."

"Defendant's final contention is that this suit is barred because the Alabama Supreme Court in Slagle v. Parker [citation omitted] held that provisions of the workmen's Compensation Act immunized co-employees from wrongful death suits. [citation omitted] There is no indication that the TVA is covered by the Alabama Workmen's Compensation Act. The fact that the Alabama legislature has relieved employees of participating employers from certain liabilities does not imply that they wished to relieve employees of the federal government of the same liability. In the first situation, the relief is part of one compensation scheme enacted by the state: the second situation would involve applying part of that scheme to unrelated compensation scheme."

Chapter 4
Fundamentals of Accident Prevention

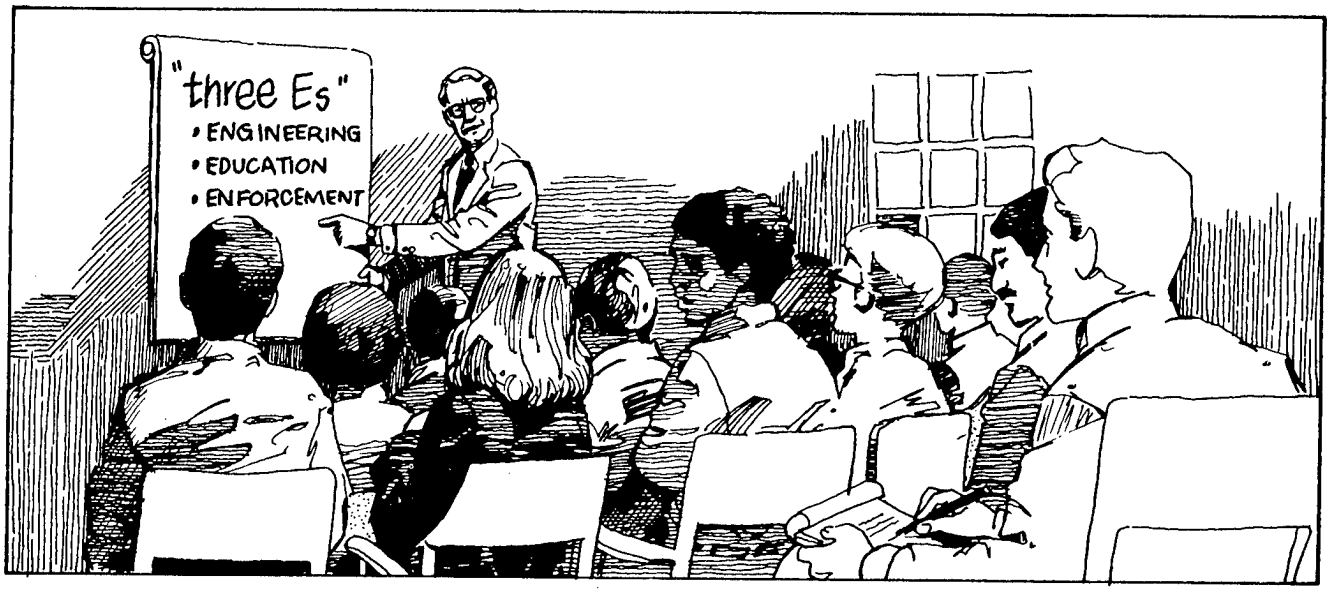
An accident is an unplanned event that does damage to people or property exclusive of damage caused by action of an enemy or hostile force. A recordable accident is an unplanned event or series of events that result in injury to personnel resulting in one or more lost workdays or total property damage of $1,000 or more.

Accidents are preventable. Three time-proven methods that are effective in reducing accidents and keeping them to a minimum are referred to as the "three Es": engineering, education and enforcement.

Engineering

Engineering uses personnel who are familiar enough with a given job, piece of equipment, or activity to make a valid assessment of the safety factors involved in the job. The five basic principles of engineering for safety are:

- Knowing the hazards. This usually requires the experience of someone who has worked with the job. However, many safety requirements are established and set forth in specific publications.
- Finding the hazards. This involves the use of supervisory personnel who have ability to detect the hazards.
- Eliminating hazards. This does not imply that a particular job, operation, or activity should be avoided. The object is to reduce or remove hazards by correcting, changing, or modifying a mechanical feature of a job.
- Compensating for hazards that cannot be removed. Identify the hazard to people who need to be aware of the hazard and teach them the correct procedures to do the job safely. Most important, provide adequate competent supervision.



• Avoiding the creation of unnecessary hazards. This requires continuous supervision by competent supervisors and periodic evaluation of jobs, operations, and activities.

Education

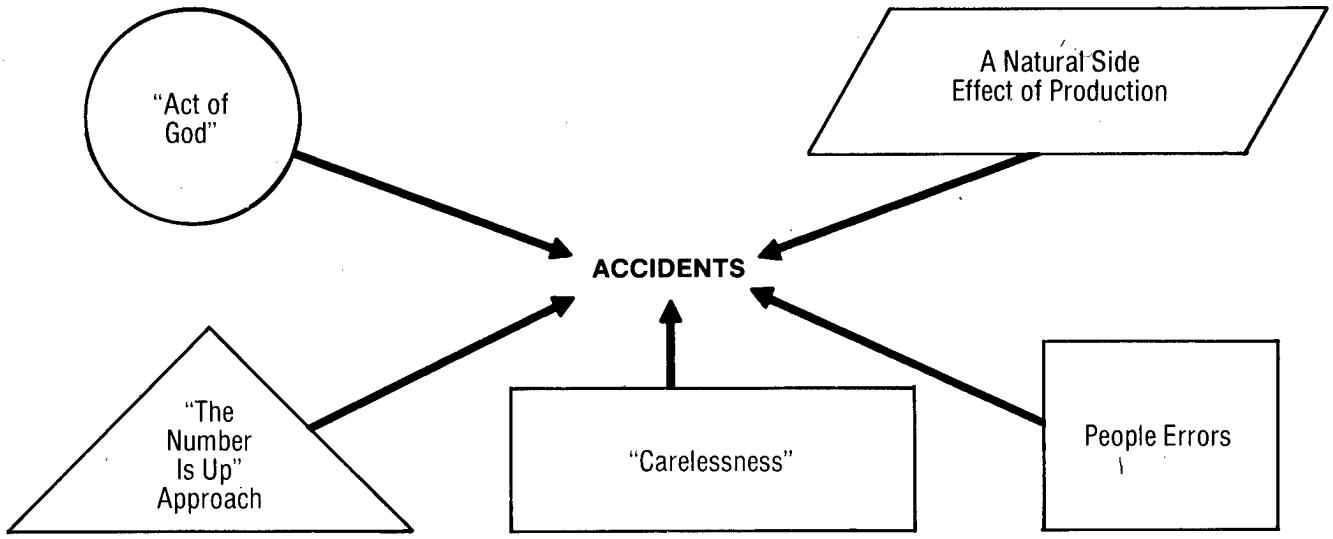
Education and training are the means for developing safe behavior. Education is a long, slow procedure, and sometimes the results are difficult to evaluate. Nevertheless, it provides the most durable and long-lasting results. Safety knowledge of the rules and regulations governing specific jobs, operations, and activities is essential for safe performance.

Enforcement

Some people are a hazard to themselves and others because of their failure to comply with accepted safety standards. For these people, strict enforcement of safety practices backed by prompt corrective action is necessary. When directives are not issued and enforced, responsible personnel are tacitly condoning conduct that leads to preventable accidents.

UNDERSTANDING ACCIDENT CAUSATION
Popular Views of Accident Causation

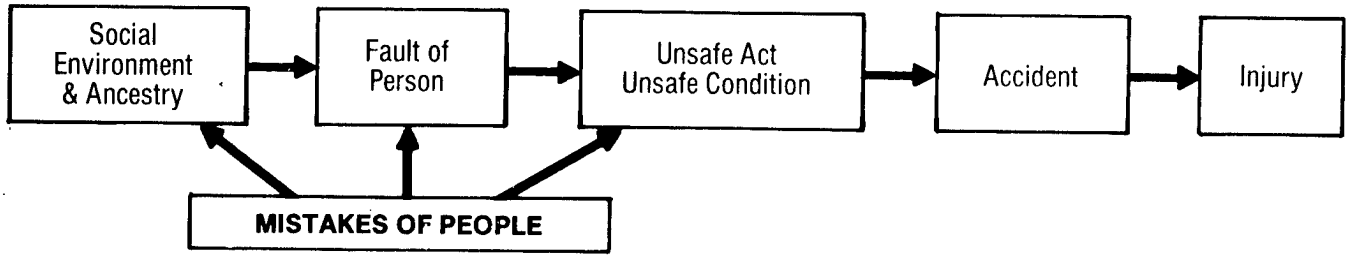
In the past, people have expressed many views of the nature of accident cuasation. Perhaps the most common os these are the carelessness concept and the related personnel error approach.



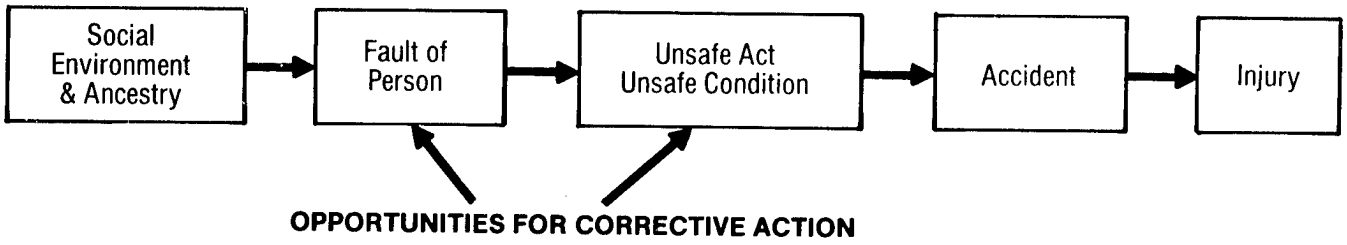
THE HEINRICH CAUSATION MODEL

H.W. Heinrich, in his book Industrial Accident Prevention, advanced a

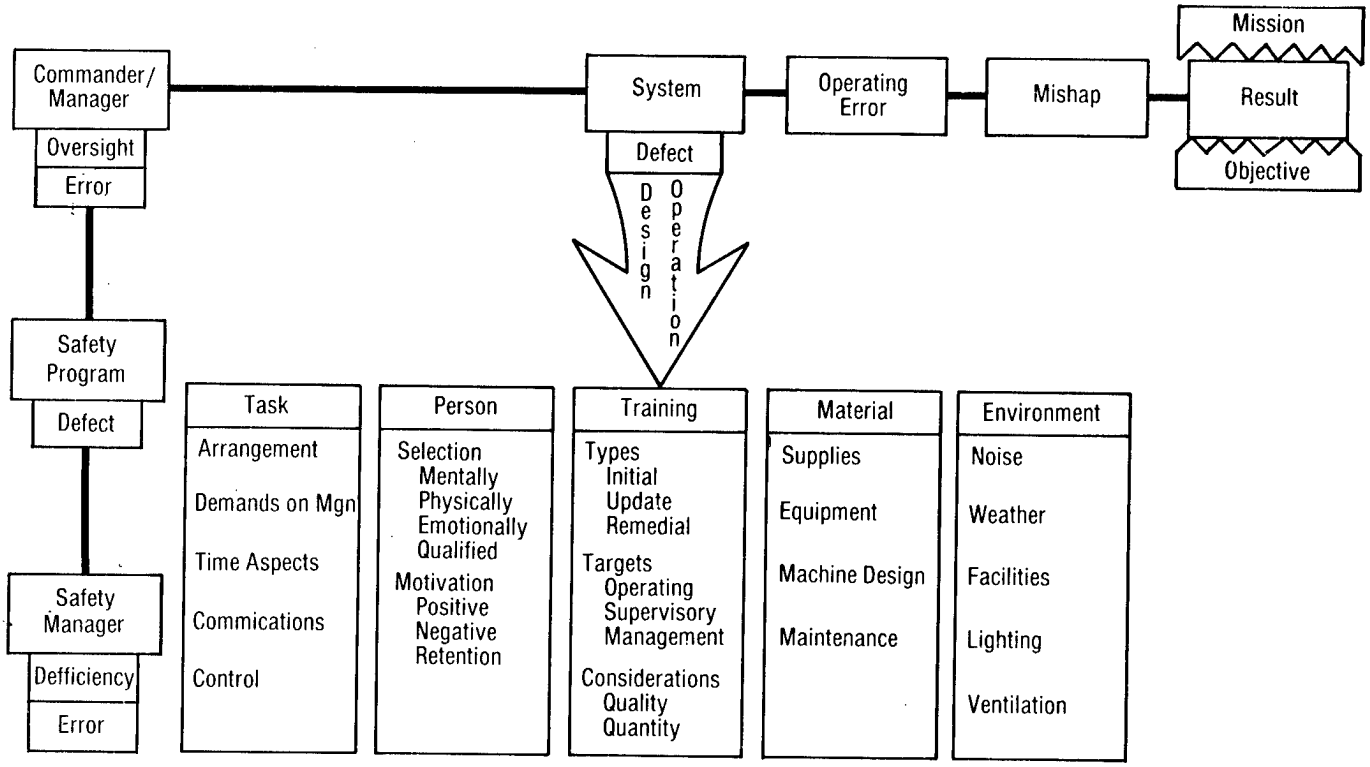
causation model based on personnel fault. His model has been the basic causation model for nearly 40 years.



Henrich's model allows relatively limited scope for corrective action. He identified the four basic remedies as engineering revision; instruction, persuasion and appeal; personnel adjustment; and discipline. These are applied as shown below.



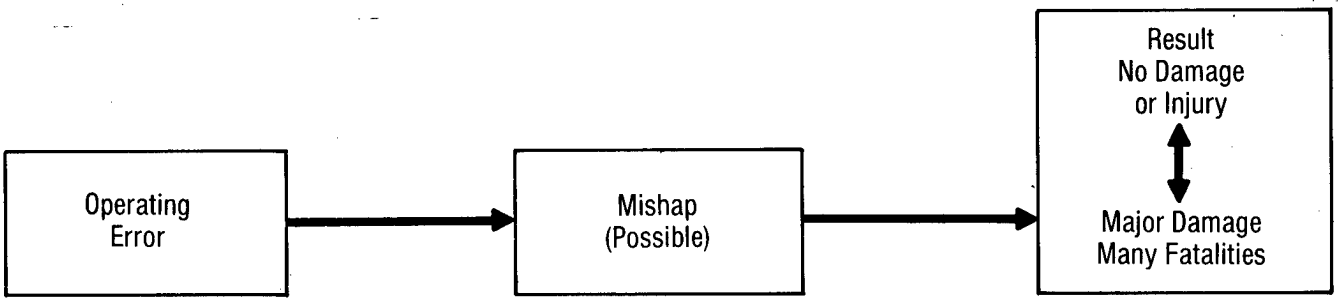
SYSTEMS APPROACH TO ACCIDENT CAUSATION



The Army accident causation model emphasizes--

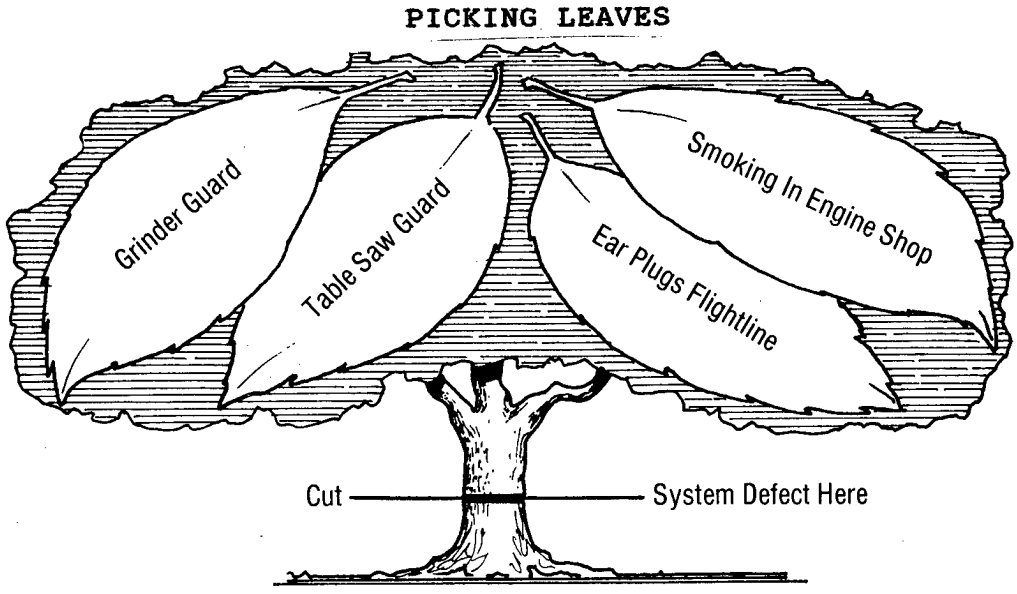
- Variability of result: the result of an accident may be no damage or injury, minor damage or injury, or major damage or fatality.
- The possibility, not inevitability, of accidents and stresses the countermeasures against possible accidents.
- The system origin of unsafe acts and unsafe conditions by identifying the system defect (weaknesses in the way the system is designed or operated).

The Department of the Army Model does a better job of depicting the causes of accidents.



The causation model parallels Heinrich's to this point, changing only a few items to improve understanding. Examples of operating errors include:

1. Improper fitting techniques.
2. Stacking supplies in unstable stacks.
3. Poor housekeeping in the workplace.
4. Removing a guard from a piece of machinery.



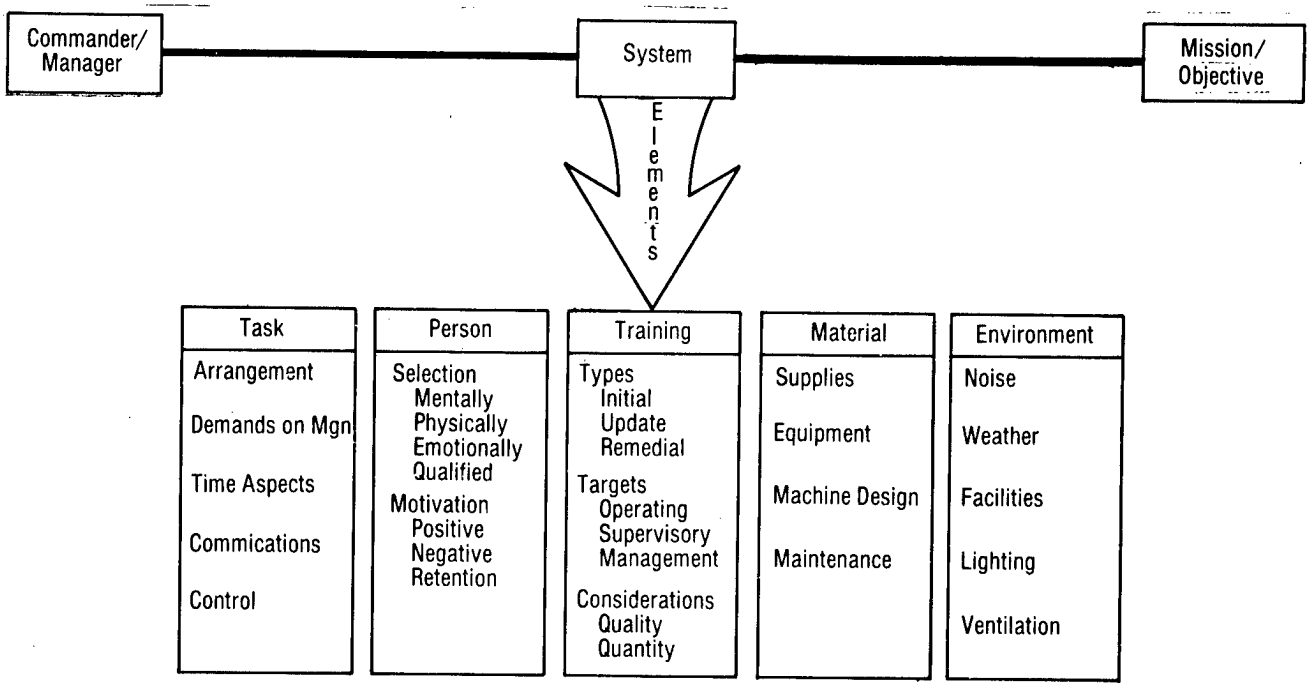
Operating Errors

Symptoms of something wrong in management's system occur because of people's faults but more importantly because of a DEFECT that exists in the SYSTEM. Examples of systems defects include:

1. Improper assignment of responsibility.
2. Creation of improper climate of motivation.
3. Inadequate provisions for training and education.
4. Improper procedures for selection and assignment of personnel.
5. Improper allocation of funds.

In each of the examples above, the supervisor caused the systems defects. The supervisors select the tasks and the employees to do the tasks, train the employees for the tasks, are responsible for the safe condition of equipment and materiel to do the tasks, and are responsible for the safe and healthful environment in which to work. If the system is designed in a defective way (for example, responsibility is not assigned), the employee may not be properly motivated.

Army Systems Model



An unsafe act or condition or an operating error is a symptom of something wrong in the system. A supervisory error is also a symptom of something wrong in the system.

A system contains five elements:

1. Task
2. Person
3. Training
4. Materiel
5. Environment

A system defect is a weakness in the way a system was designed or is operated. A system defect exists because a manager or supervisor designed or operated a system in a defective way:

If there is an unsafe act or condition (operating error), there is a defect in the system that may cause an accident. Also, supervisor errors in one or more of the five elements are weaknesses and defects in the system that may cause accidents.

If we remove, correct, or eliminate the unsafe act or condition or the operating error, we prevent the accident. If we remove the system defect or supervisory error in either task, person, training, materiel, or environment (whatever is wrong in the system) and correct the error, we prevent the accident. The results of both include objectives of the Army Safety Program. These results are:

1. Injury prevention.
2. Damage control.
3. Liability limitation.
4. Management improvement.
5. Mission protection.
6. Statutory compliance.

Let us look at the system and see what affects it. We can say in every system there are five elements; in every job there are five elements; and in every program there are five elements. Look at the elements individually.

1. Task. People are given the job of doing the first task element. They have to understand the task. It has to be made clear. This understanding will be accomplished through the use of an established procedure. This procedure may be in the form of an SOP, regulation, etc.

2. Person. Is the person mentally and physically able to do the job? Sequencing of the elements in the system is important. Motivation should be the last element to consider. You are unable to determine if motivation is a problem until you have considered the other elements. If other elements are in place and there are no deficiencies, then ask, "Is the employee motivated?" Consider positive and negative motivation. We can always punish or reprimand; however, use positive motivation as much as possible. Identify what the employee is doing right, and highlight it.

3. Training. The individual must understand how to do the task. Has he been trained? Is he aware of how the task is done? Is he qualified to accomplish the task?

4. Materiel. The individual must have the proper equipment and materiel to do the job safely. It is your job as a supervisor to identify what is wrong with the materiel. If you cannot do anything about the problem, it is your responsibility to identify the responsible level of authority at which corrective action can be taken. Surface the problem. Is the materiel available? Can you use the materiel as it is and get the job done safely? Is it as comfortable as possible to do the job? Examples of poor materiel or equipment are: eyeglasses that do not fit, safety shoes that are uncomfortable.

5. Environment. As a supervisor, you are responsible for the control of the environment in order to provide your workers a safe area in which to operate. You must control procedures, training, equipment and materiel, and the environment so that workers are not injured.

The five elements in the system parallel the seven supervisory responsibilities:

1. Provide employee training. Employee training equals the training element (for example, initial update or remedial training). The supervisor decides who, what, and when.

2. Develop safe job procedures. Developing safe job procedures equals task (for example, developing SOPs, etc.).

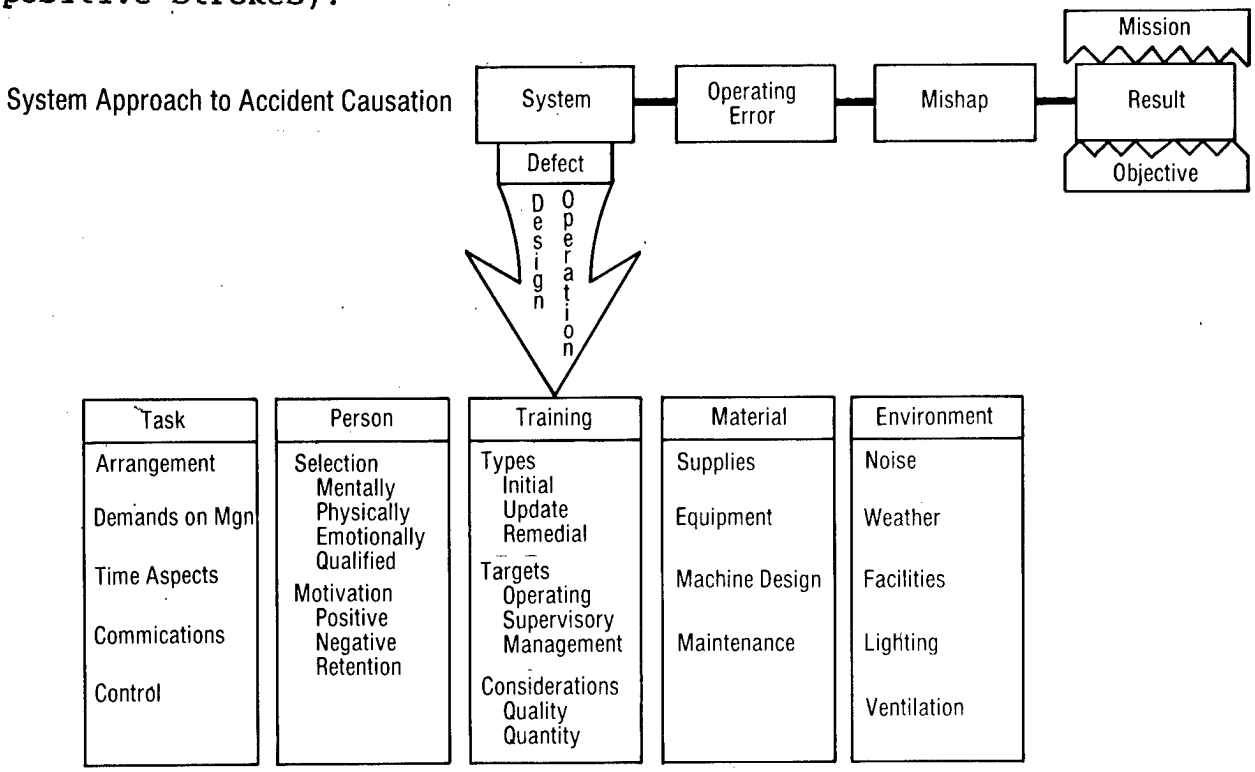
3. Enforce regulations and procedures. Enforcing regulations and procedures equals task (for example, enforcing SOPs and regulations).

4. Provide a safe and healthful work environment. Providing a safe and healthful work environment equals environment (for example, safe facilities, proper ventilation).

5. Identify and eliminate or control hazards. Identifying and eliminating or controlling hazards equals materiel (for example, providing safe supplies, equipment, and materiel).

6. Manage job risks. Managing job risks equals task (for example, risk management decision, communication, and control).

7. Create a positive safety attitude. Creating a positive safety attitude equals a personal trait (for example, motivation, attention, positive strokes).



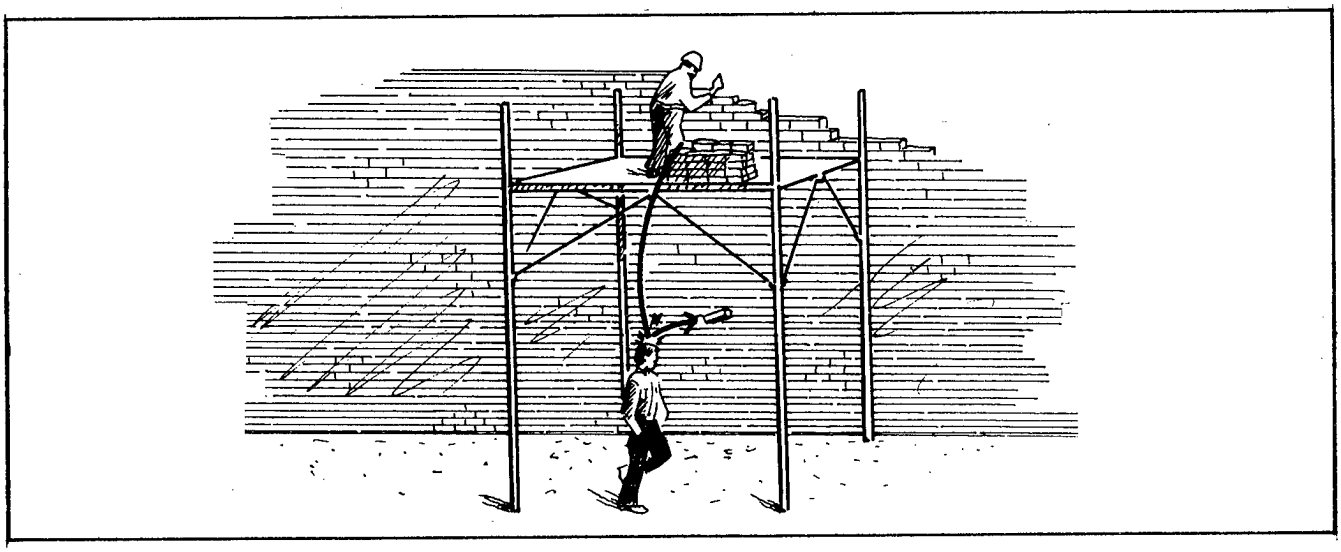
Who can change the wrong and make it right? Who can select the proper employee, the one who is best qualified? Who can decide who needs to be trained and the amount and quality of training? Who can do something about a machine that is poorly designed? Who can ensure that proper maintenance is performed on equipment? Who can ensure that proper ventilation is provided to accomplish work in a healthy environment? The answer to all of these questions is the supervisor. He or she is the one who controls the system. It is the supervisor who must make the system work--and safely. It is the supervisor's system.

What is the manager's part in this model? He or she has to allow the supervisor the time and effort to do the things we have discussed. The managers don't want "holes" (defects) in the system.

The model can be used in reverse after an accident has happened. It can be the supervisor's accident investigation tool. Select a specific accident and ask, "What caused the accident? What caused the worker to get hurt? What was the unsafe act or condition? What was wrong in the system?"

The following is an example of something wrong in the system: a worker walking under a bricklayer's scaffold. The worker is not wearing a hardhat. A brick falls on his head, and he dies.

Consider the factors that could cause an accident by using a checklist of the system. Answer the question of why the worker wasn't wearing a hardhat.



a. Person. Identify the person who should be wearing a hardhat. Is the person physically and mentally able to wear the hardhat?

b. Task. Is there a procedure established (SOP, regulation, etc.) that lists the jobs, and under what conditions hardhats must be worn?

c. Training. Is the worker trained for the operation?

d. Materiel. Is the hardhat available? Does it fit comfortably?

e. Environment. Has the environment been considered for the job? Is the temperature too hot to perform the job?

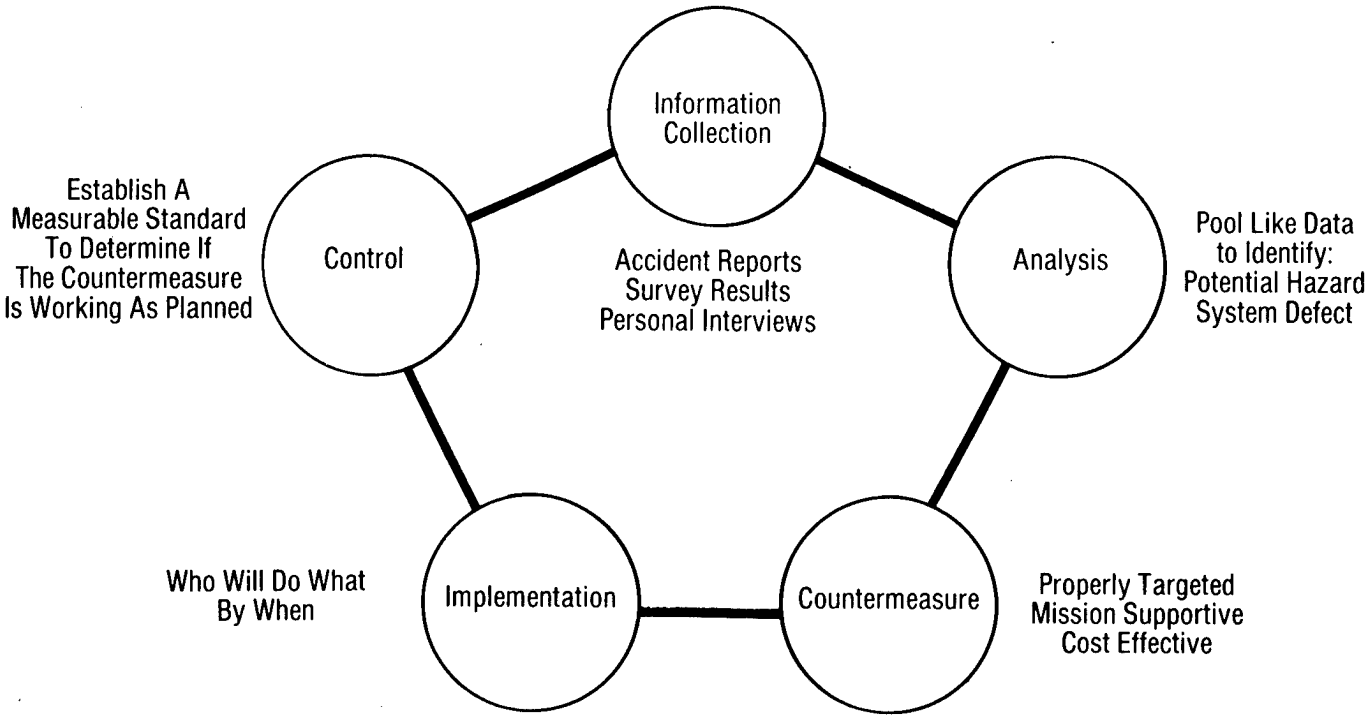
f. Motivation. Was the worker motivated to wear the hardhat? Had he been praised for wearing the hardhat when it was required?

Five steps are necessary in planning and controlling an effective safety program:

1. Information collection.
2. Analysis.
3. Countermeasures.
4. Implementation.
5. Control.

Let's take a brief look at the supervisor's application of the accident prevention process.

FIVE STEP ACCIDENT PREVENTION PROCESS



Information Collection

To effectively operate a safety program, the supervisor must know what is happening in the organization. Methods of collecting information are--

1. Inspections.
2. Surveys.
3. Informal observations.
4. Interviews.
5. Accident records.
6. Personnel information.

Accident Analysis

Identify potential hazards in the organization. Supervisors identify many hazards through job hazard analysis. Steps in performing accident analysis are:

1. Identify errors (unsafe acts or conditions) of man and machine.
2. Identify problems in equipment or materiel design and operation.
3. Pool and correlate data on related areas.

4. Establish an order of priority for correcting potential hazards.

Countermeasures

1. Select alternative methods for eliminating or correcting hazards (countermeasures).

2. There are sometimes so many countermeasures possible that it becomes difficult to pick those that are most effective and most economical and those that give the most return for the investment of time and money.

3. Determine which countermeasures you as the supervisor can implement from the ones you request and recommend to management for adoption.

4. Many times it will be necessary to make temporary corrctions pending management's approval or procurement of appropriate countermeasures.

The three common characteristics of good countermeasures are that they are--

- Economical.
- Mission oriented.
- Well targeted.

Implementation

Implementation is the task of putting the selected countermeasure into effect.

Control

Control can be defined by establishing a measurable standard that will indicate whether a countermeasure is performing as planned.

Recognizing Hazards

Accident prevention is recognizing and identifying hazards, compensating for the hazards, and/or correcting or eliminating the hazards. Hazard recognition is identifying unsafe acts (operating errors), unsafe conditions, and systems defects. Hazards can be recognized through many ways. Some of these are:

- Supervisors' routine daily checks.
- Monthly, quarterly, and annual inspections.
- Job hazard analysis.
- Accident investigations.

The supervisor is the best person to do all this. He or she can investigate accidents to determine their cause. You know the most about the people, equipment, materials, and processes. You as the supervisor know best how to get your people to cooperate and communicate, and you will be the one to follow up by changing and correcting.

Hazards result from factors such as normal wear and tear; misuse and abuse of materials, equipment, and facilities; lack of proper or preventive maintenance; poor housekeeping; and improper abilities, aptitudes, and attitudes. You, as a supervisor, have to train your eyes, ears, and other senses to zero in on potential problems,

substandard situations, or harmful hazards. For efficient followup, you might jot these informal observations in a pocket-sized pad or notebook. These notes will serve as memory joggers for remedial action. Critical parts to look at in the work environment are items that may likely cause problems when they are worn, damaged, or operating improperly. Common examples include machine guards, belts and gears, lifting cables, warning signals and cutoff valves, slings and chains, vehicle lights and brakes, and plugs.

Supervisors should identify and list items in their area to see that they are inspected regularly and properly. Records should be maintained on each, dates of inspections, and inspection results. In other words, to manage your system of equipment and parts, a supervisor should know what is to be done, how well it is being done, and take necessary action to correct performance if necessary.

First-line supervisors should frequently make general walk-through inspections of their entire area looking for substandard situations or potential problems. All items should be recorded accurately and classified by degree of potential loss. This permits a systematic approach to determining problem priorities, initiating remedial actions, and followup.

When looking for hazards, you look up, down, around, in, behind, between, over, and under. Here are some broad categories of the kinds of things you might look at:

- Air movers such as fans and blowers.
- Atmospheric conditions such as dust, fumes, vapors, and mists.
- Building elements such as windows, doors, stairs, roofs, floors and walls.
- Chemicals, conveyers, and containers of all sorts.
- Elevating equipment such as manlifts, hoists, jacks, and powered platforms.
- Electrical equipment such as switch boxes, panels, transformers, wiring fuses, and fixtures.
- Fire control equipment such as extinguishers, hydrants and sprinklers.
- Handtools, both powered and nonpowered.
- Machinery, machine guards, materials, and materials handling equipment of all types.
- Personal protective equipment.
- Power sources such as electrical, pneumatic, hydraulic, and steam.
- Pressure vessels, pumps, and compressors.
- Structural openings into which people, material, or equipment can fall.
- Vehicles such as cars, trucks, cranes, trains, and forklifts.
- Walking and working surfaces such as floors, aisles, mats, gratings, dockboards, platforms, and scaffolds.
- Warning systems such as sirens, buzzers, bells, and flashers.

The specifics of what you look at depend upon the processes, equipment, materials, and surroundings in your specific area. To ensure completeness, you must do a thorough job of preinspection

planning. You may find it helpful to develop and use a checklist memory jogger for inspecting; ask a safety representative to help.

You might, for instance, look for--

- Signs of wear and tear, overheating, stress, vibration, leaking and corrosion.
- Things that are bent, burned, cracked, or corroded.
- Things that are defective, dented, weak, or wobbly.
- Things that are too slippery, too loose, or too tight.
- Signs of disorder (cluttered, poorly arranged areas; improper piling that may damage material and be dangerous to people).
- Items no longer needed.
- Things going to waste because they're stuffed in out-of-the-way spots.
- Blocked aisle ways.
- Broken containers and damaged materials.

All of these are open invitations to accidents, inefficiency and waste. Find and correct them, and you'll profit from the resulting safety, efficiency, and profitability.

Keep both unsafe conditions and unsafe behavior in mind. Make sure you include both things and people, and remember to consider not only traumatic injury hazards, but also property damage, fire, and health hazards.

Looking for hazards through priority job selctions in Job Hazard Analysis

1. Set a goal for one or two jobs a month. Select the jobs that have the most past loss experience. The greatest number of accidents, (minor cuts and bruises and lost materials), the biggest quality problems, and the largest losses.
2. Probability of recurrence.
3. The new or unknown.
4. Potential for loss--jobs with a lot of minor accidents and near misses. Jobs likely to cause severe losses if something goes wrong.

Select jobs on a worst-first basis or a basis of greatest potential payoff. Analyzing jobs, writing proper job procedures, and using these to train workers bring better production, quality, and safety.

Summary

In summary, the supervisor has the responsibility to accomplish the assigned mission with assigned personnel with a minimum of accidents. The Army's method of doing this has been explained as the supervisor's system approach to accident causation.

Task

The supervisor develops safe operating procedures for accomplishing all tasks. The supervisor is responsible for the arrangement of the tasks, considering the demands the tasks make on the employees, and allowing sufficient time to complete tasks. The

supervisor is in control of all task assignments and enforces regulations and procedures.

Person

The supervisor selects the right employee for each job. Factors used in this process are mental, physical, and emotional capabilities. The supervisor encourages positive motivation by rewarding deserving employees and discourages negative motivation by punishing employees when necessary.

Training

The supervisor is responsible for training new employees and determining the need for update and remedial training of current employees. The supervisor determines specific needs of the organization, making sure employees and supervisors receive systematic training with up-to-date techniques. New technology requiring new equipment requires operation training.

Materiel

The supervisor is responsible for safe supplies and equipment. Supplies and equipment must be available and suitable for the job, and proper maintenance should be done routinely and systematically.

Environment

The supervisor is responsible for a safe work environment. Proper protective equipment must be available and used, and the supervisor must consider noise and weather when assigning tasks. Proper lighting and ventilation must be provided to accomplish all tasks, and clean, orderly, and safe facilities are also a must.

Hazard analysis

Hazard analysis is nothing more than an application of the above elements to prevent accidents.

Chapter 5
Accident Investigation

Army accidents are investigated to determine all contributing causes so that preventive measures may be developed to eliminate or reduce the number of accidents. Even accidents that do not cause major property damage or injury to personnel are investigated so that preventive measures can be taken before the same or a similar set of circumstances result in a serious accident. Even first-aid cases, however slight the injury may be, must be investigated and reported. Supervisors and/or safety representatives will be required to investigate all accidents involving operations, equipment, or personnel under their supervision, and the report will be forwarded for appropriate action. When an accident occurs, immediate action shall be taken by the supervisor or safety representative to--

- Care for the injured personnel by making them comfortable.
- Obtain medical attention.
- Care for property and protect against further damage.
- Notify personnel/management as specified in preaccident plan.
- Investigate the accident. Whenever possible, interview the injured person before he or she is sent for medical attention (table 5-1); observe conditions as they were at the accident scene; confer with employees, other supervisors, and witnesses for information as to cause (table 5-2); prepare or obtain photographs, diagrams, sketches, etc., as warranted by the circumstances (table 5-3); and determine if and how operations under your control contributed to the accident.
- Report the accident. Details for reporting accidents will be discussed later in this chapter. Take appropriate countermeasures (coordinate with appropriate staff agencies) (table 5-6); safeguard or repair physical or mechanical hazards; initiate action to correct conditions that resulted in the existence of the hazard or the permitting of an unsafe act; make appropriate recommendations; and follow up on recommended countermeasures.
- Follow up on actions required to return the injured employee to work. For further information on filing appropriate worker's compensation forms, see the chapter entitled "Federal Employees Compensation Act (FECA)."

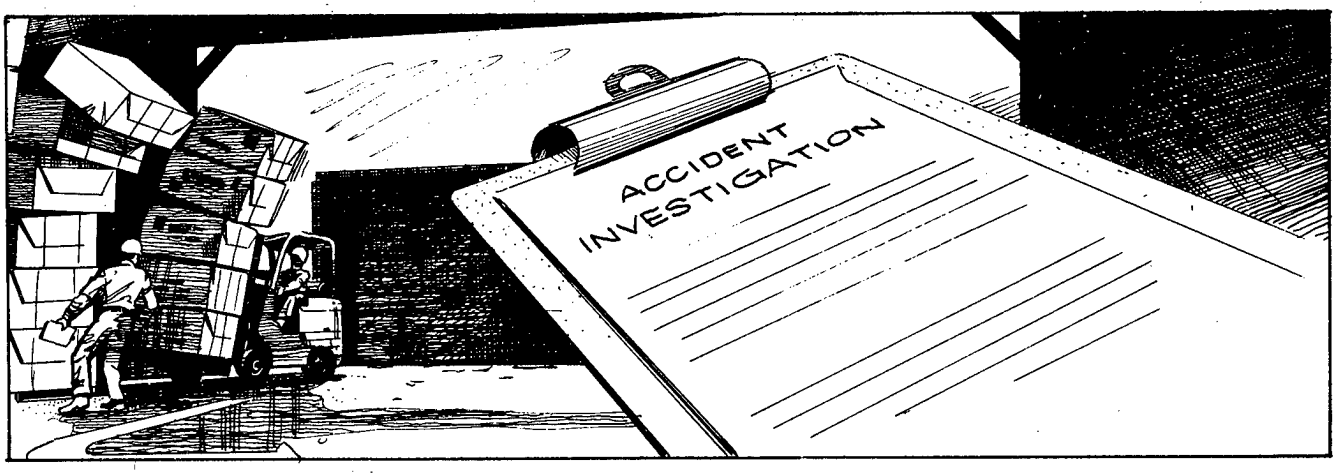


TABLE 5-1.--Interview Techniques

Interviews produce most of our investigation information and are critically important. For the person who is not a trained interviewer, there are some simple techniques that work best. There are some key points to help do a good job. Here are 10 tips to help get the best results from investigation interviews:

1. Put the person at ease. Reduce anxiety and fear with a simple, sincere explanation of the values that can come from the shared information. Use a friendly, understanding manner to create a climate of cooperation.

2. Interview on the spot. Experience provides that the actual scene helps both you and the person being interviewed to communicate clearly the circumstances and details involved.

3. Keep interviews private. Individuals will be interviewed separately, allowing each person to relate his/her own view of the situation and events. Private doesn't necessarily mean in an office but simply away from the prying eyes and ears of others.

4. Get the person's own version. Avoid leading questions and judgmental remarks that tell the person what you think and feel. Let him/her tell it as they see it and feel it. Have the individual tell what he/she knows, heard, and saw in their own version.

5. Try not to interrupt. Let the other person do most of the talking with a few words of encouragement and appreciation. Ask questions only when really necessary. Use open questions such as at what point did that happen, or where was the equipment at that time? Don't be an interrogator; be an interested listener.

6. Record critical data quickly. Except in the rare case requiring a verbatim written statement, write basic notes. Record items such as names, dates, locations, times, numbers, and dimensions, and complete the report promptly after the interview. Obtain positive identification and personal data: (1) driver's license number, (2) military ID number, (3) residence address and telephone number, (4) work address and telephone number.

7. Repeat the story back. Three benefits are gained. First, it lets the person know you have listened. Second, it gives the person a chance to explain or correct areas of possible confusion. Third, it ensures mutual understanding.

8. End the interview on a positive note. If the person has helped understand the accident, let him/her know. Express appreciation for ideas that may help prevent future accidents, and thank the person for cooperating.

9. Supplement interview information. Since conditions change quickly after an accident, a quick photograph may be a valuable reference. Accurate measurements and sketches often prove valuable. Defective or damaged materials and equipment involved in the accident may be vital for further investigative procedures and remedial actions.

10. Keep the "pipeline" open. Encourage witnesses to contribute additional facts they might remember. Maintain good supervisory rapport and profit from the continuing free flow of voluntary information that can be a great aid to accident investigation and accident prevention.

TABLE 5-2.--Five Key Questions in Accident Investigation

1. WHO:
   - Who was injured?
   - Who saw the accident?
   - Who was working with him/Her?
   - Who had instructed/assigned him/her?
   - Who else was involved?
   - Who else can help prevent recurrence?

2. WHAT:
   - What was the accident?
   - What was the injury?
   - What was he/she doing?
   - What had he/she been told to do?
   - What tools was he/she using?
   - What machine was involved?
   - What operation was he/she performing?
   - What instructions had he/she been given?
   - What specific precautions were necessary?
   - What specific precautions was he/she given?
   - What protective equipment should have been used?
   - What protective equipment was he/she using?
   - What had other persons done that contributed to the accident?
   - What problem or question did he/she encounter?
   - What did he/she or witnesses do when the accident occurred?
   - What extenuating circumstances were involved?
   - What did he/she or witnesses see?
   - What will be done to prevent recurrence?
   - What safety rules were violated?
   - What new rules are needed?

3. WHEN:
   - When did the accident occur?
   - When did he/she start that job?
   - When was he/she assigned the job?
   - When were the hazards pointed out to him/her?
   - When had his/her supervisor last checked job progress?
   - When did he/she first sense something was wrong?

4. WHY:
   - Why was he/she injured?
   - When did he/she do what he/she did?
   - Why did the other person do what he/she did?
   - Why wasn't protective equipment used?
   - Why weren't specific instructions given him/her?
   - Why was he/she in the position he/she was?
   - Why was he/she using the tools or machine he/she used?
   - Why didn't he/she check with his/her supervisor when he/she noted circumstances were not as they should be?
   - Why did he/she continue working under the circumstances?
   - Why wasn't the supervisor present at the time?

5. WHERE:
   - Where did the accident occur?
   - Where was he/she at the time?
   - Where was the supervisor at the time?

TABLE 5-3.--Techniques of Photographing Evidence

- Take a minimum of four views.
- An overhead view, if possible.
- Take detailed photographs of all damage.
- Photograph all pieces of wreckage.
- Photograph path of equipment/vehicle.
- Use a ruler or an objective of known size to include in the photograph as a "sizer."
- Match photographs, i.e., tire tread on fender to photograph of tread on actual tire.
- Use polaroid as backup, if possible.
- Label all photographs.

Do's/Don'ts of photography

- Do get help taking photographs if you don't know how.
- Don't interfere with rescue or endanger yourself.
- Don't move wreckage until documented.

TABLE 5-4.--Documents, Forms, and Records

Consider the following when investigating an accident:

- Pertinent Army regulations (ARs).
- Pertinent technical manuals (TMs).
- Organization SOP.
- Equipment records.
  (1) Are equipment records properly maintained?
  (2) Are they being kept in an operating status?
  (3) Review equipment post-history records.
- Personnel records.
  (1) Operator's qualifications. Does the person hold the proper license to operate the equipment?
  (2) Training records. Do the records document the person's qualifications and currency? Are there possible problems with the organization's training program?

TABLE 5-5.--Accident Investigations

Determine the cause (system inadequacies).

Operating errors. Identify the individual(s) making a task error. Identify the task error(s) the individual failed to perform correctly. Why did the operating error occur?

System defects. If there were a materiel failure or malfunction, identify why part of equipment failed or malfunctioned. Give nomenclature, etc., if known. Where was the system failure?

Environmental conditions. Identify environmental conditions that were present at the time of the accident that caused or contributed to the accident (driving rains, ice, etc.).

TABLE 5-6.--Countermeasures

Determine the remedial measures to prevent operating errors and system inadequacies from recurring.

Accident prevention efforts.
- Was safety equipment being used?
- Was safety equipment available?
- If it were being used, was it being used properly?
- Was the safety equipment the cause of the injury?
- Did the safety equipment function as designed?
- Is this type accident a recurring type for this unit or organization?
- Was fatigue a problem? If so, was management aware of the problem?
- Did the person involved have any major personal problems?

Record all damage experienced in the accident.
- Take sufficient photographs.
- Check for preaccident damage or failure.

When investigating damaged property, look for details out of the ordinary such as:
- Excessive wear, scratches.
- Unusual tools in the area.
- Fire before or after the accident.

AR 385-40 is the regulation that provides policies and procedures and assigns responsibilities for investigating, reporting, and recording Army accidents and incidents. This regulation also serves as the basis for complying with the Occupational Safety and Health Act; identifying accident cause factors and systems deficiencies, and assessing manpower and monetary losses; and developing and maintaining an Army Safety Management Information System (ASMIS) that will enable commanders, system managers, and safety and health personnel to develop accident prevention measures.

Following are excerpts from AR 385-40:

Investigating and reporting Army accidents.

The commander or supervisor directly responsible for the operation, materiel, or person(s) involved in an accident will ensure that--

(1) All accidents are investigated to obtain the facts and circumstances.

(2) The appropriate report is prepared on each accident in accordance with instructions in chapter 3-5 and forwarded without delay.

Commanders will investigate and report as required unplanned events that result in one or more of the following:

a. Damage to Army property (including Government-furnished material (GFM) or Government-furnished property (GFP) and tools provided to a contractor).

b. Injury (fatal or nonfatal) to on- or off-duty military personnel.

c. Injury (fatal or nonfatal) to on-duty Army civilian personnel, including nonappropriated fund employees and foreign nationals employed by the Army when incurred while performing duties in a work-compensable status.

d. Occupational injury or illness (fatal or nonfatal) to Army military personnel and Army civilian employees, nonappropriated fund employees, and foreign nationals employed by the Army.

e. Any injury (fatal or nonfatal) or illness to non-Army personnel or any damage to non-Army property as a result of Army operations. "As a result of Army operations" is Army involvement in an accident event with fault, regardless of degree.

Before completing accident report forms, the reporting agency safety representative or supervisor will-- (See table 5-7.)

(1) Determine the extent of all injuries and property damage.

(2) Review the reporting criteria to determine which applies.

(3) If more than one reporting criterion applies, report the accident based on the most comprehensive reporting requirement. For example, a full DA Form 285 is more comprehensive than only the shaded portion of the DA Form 285.

The official Army record and report for Department of the Army civilians (DAC) and direct-hire foreign nationals will be DOL Forms CA-1, CA-2, and CA-6 for reporting occupational illnesses, injuries, and fatalities. These data will be captured by the USASC from computer tapes received from the Office of Workers Compensation Program (OWCP), included in the ASMIS, and reflectd in Army safety statistics.

Fatal accidents incurred by Army civilians in a work-compensable status will be reported immediately by telephone, AUTOVON 558-2660/4273, commercial (205) 255-2660/4273, to USASC. Each fatal accident will be formally investigated using procedures in paragraph 5-10. The USASC will investigate selected fatal accidents with a USASC-directed team.

Duty status determination.

The following explanations should be used in determining duty status. These criteria are for accident reporting purposes only and have no relation to compensability or line-of-duty determination. (Judgment may be required in some cases that do not fit the criteria set forth below. Paragraph A.2.7 of ANSI Standard Z16.4-1977 may be used to assist in this determination.)

a. On duty. This applies to Army personnel who are--

(1) Physically present at any location where they are to perform their officially assigned work (includes those activities incident to normal work activities that occur on Army installations, such as lunch or coffee breaks and all activities aboard vessels).

(2) Being transported by Army or commercial conveyance for the purpose of performing officially assigned work (includes reimbursable travel in private motor vehicles for temporary duty but not routine travel to and from work).

(3) Participating in compulsory sports or physical training activities.

b. Off duty. This applies to Army personnel who are not in an on-duty status, whether on or off Army installations.

Army motor vehicle (AMV) accidents.

a. An accident involving an AMV may be classified as an AMV accident if the vehicle meets the following criteria:

(1) The vehicle is owned, leased (includes General Services Administration (GSA) vehicles that are under full operational control of the Army; for example, hand receipt or like document), or rented by DA (not an individual), to include Reserve components.

(2) The vehicle is primarily designed for over-the-road operation.

(3) The vehicle's general purpose is the transportation of cargo or personnel. Examples are passenger cars, station wagons, trucks, ambulances, buses, motorcycles, firetrucks, and refueling vehicles.

b. The following are not considered AMVs for the purpose of this regulation:

(1) Motor vehicle equipment designed primarily for off-the-highway operations, such as tracked vehicles, forklifts, road graders, agricultural-type wheeled tractors, and aircraft tugs. These vehicles are termed combat vehicle (para 2-8d) or other Army vehicles (para 2-8e).

(2) Privately owned vehicles (para 2-8g).

(3) Vehicles on memorandum receipt to, and operated by, non-Army persons or non-Army agencies and activities such as the U.S. Postal Service or the American Red Cross.

Reporting.

(1) To report property damage accidents involving $1,000 or more damage to Army property, the supervisor will submit a fully completed DA Form 285 to its designated safety office. The safety office will forward through appropriate channels to the USASC for recording in the ASMIS. There is no requirement to submit a DA Form 285 for recording in the ASMIS for damage to Army properly of less than $1,000, but local safety offices may require this report on all property damage accidents.

(2) To report accidents involving fatal or nonfatal injuries or illnesses to non-Army personnel or any damage to non-Army property, the responsible organization will submit a fully completed DA Form 285 to its designated safety office. If required, a DA Form 285-1 will be completed by the safety office or designated representative and forwarded with DA Form 285 to USASC for recording in ASMIS.

Accident classes.

Accident classes are used to determine the appropriate investigative and reporting procedures for accidents. Accident classes for other than aircraft accidents (para 4-6) are as follows:

a. Class A accident--an Army accident in which the resulting total cost of property damage and personnel injuries or occupational illness is $500,000 or greater; or an injury or occupational illness

that results in a fatality or permanent total disability.

b. Class B accident--an Army accident in which the resulting total cost of property damage and personnel injuries or occupational illness is $100,000 or more, but less than $500,000; or an injury or occupational illness that results in permanent, partial disability or hospitalization of five or more personnel in a single occurrence.

c. Class C accident--an Army accident in which the resulting total cost of property damage is $10,000 or more but less than $100,0000; or an injury or occupational illness that results in a lost-workday case.

d. Class D accident--an Army accident in which the resulting total cost of property damage is less than $10,000, an injury or occupational illness results in a lost-workday/lost-time case with 1 or more days of restricted work activity, or a nonfatal case without a lost workday or medical treatment.

Occurrences not constituting an Army accident are covered in chapter 2-9.

Computing accident cost.

Army accident costs are classified according to the severity of injury, occupational illness, or property damage and are computed as the sum of the costs associated with injuries, occupational illnesses, Army property damage, and non-Army property damage resulting from Army operations.

Damage costs. Costs of damage to Army property and equipment will be computed using criteria in AR 735-11, to include such items as actual cost of new or used parts or materials and labor cost at the standard rate of $14 per hour. Oversea commands may apply more realistic (lower) labor costs. When a damaged item or facility will not be replaced, the cost reported will be the acquisition cost (Army Master Data File (AMDF)) plus the cost to clean up the site. Credit should be taken for the scrap value of the parts that cannot be reused.

Safeguarding accident information.

Accident investigation reports are official documents that contain limited-use information. They will be used solely for accident prevention purposes. These reports and their attachments or copies and extracts will not be enclosed in any other report or document unless the sole purpose of the other report or documents is accident prevention. Common source documents, photographs, and those documents (other than witness statements) containing purely factual information that are available to collateral investigators are an exception to this rule.

Accident reports and the privileged documents contained therein may not be used as evidence, or to obtain evidence in any disciplinary action such as the following:

(1) Determining the misconduct or line-of-duty status of Army personnel.

(2) Military occupational speciality (MOS) reclassification actions.

(3) Determining liability in claims for or against the Government.

(4) Determining pecuniary liability.

(5) Any other adverse personnel action.

Policy guidance concerning release of accident information to the public is in AR 360-5.

Subpoenas for the production of accident reports or for the testimony of accident investigators should be referred to the recipient's legal advisor or Staff Judge Advocate for action required by AR 27-40. Requests for accident information on Class A, B, or C general-use reports will be forwarded to Commander, USASC, ATTN: PESC-ZJA, Fort Rucker, AL 36362-5363.

TABLE 5-7.--Accident Reporting Requirements (AR 385-40)

Table 1

Accident Reporting Requirements (AR 385-40)
Supervisors' Reporting Responsibilities

Type of Occurrence	Type of Report	Reportable Local Safety Office	Recordable	When to Submit to Local Safety Office	Due USASC
Army civilian injury (OWCP compensable status).	DOL CA-1	*Yes (Automatic) All FECA claims with DOL	*Yes (Automatic) All claims	On submission to CPO or MACOM/ Installation Policy	USASC will capture from computer tapes received from OWCP
Army civilian illness (OWCP compensable status).	CA-2	Yes All FECA claims with DOL - Submit reports to Occupational Health Clinic	All claims	On submission to CPO or MACOM/ Installation Policy	
Civilian permanent or partial disability or death (OWCP compensable status). Above occurrences include nonappropriated fund employee (NAF) and foreign nationals.	CA-1 or-2 and CA-6	All claims	All claims	Immediately	USASC will capture from computer tapes received from OWCP
Army motor vehicle (AMV). Damage cost $1,000 or more.	DA FM 285 and 285-1 if required by annual message	Yes	Yes - Classes A-C ($1,000 damage and/or 1+ day lost-time injury & selected Class D	As required by AR 385-40 and local suppl	Within 30 days
AMV damage cost less than $1,000.	Report as required by Safety Office	Yes - Class D	May be if total cost of injuries and damage are $1,000 or more	As required by AR 385-40 and local suppl	Within 30 days

Type of Occurrence	Type of Report	Reportable Local Safety Office	Recordable	When to Submit to Local Safety Office	Due USASC
Property damage other than AMV $1,000 or more (government furnished material, equipment, property, and tools provided a contractor).	DA FM 285 and 285-1 if required by annual message	Yes - As required	Yes - Classes A-C ($1,000 damage and/or 1+day lost-time injury & selected Class D)	As required by AR 385-40 and local suppl	Within 30 days
Property damage other than AMV less $1,000 (GFE) material, equipment, property, and tools provided by a contractor.	Report as required by Safety Office	Yes - Class D	May be if total cost of injuries and damage are $1,000 or more	As required by AR 385-40 and local suppl	Within 30 days
Property damage as a result of Army equipment/material failure or malfunction	Efficiency Improvement Report (EIR) and note number of EIR on DA FM 285	Yes	Yes	As required by local suppl to AR 385-40	Within 30 days
All fire damage - Army owned or leased fixed facilities and physical property except for willful arson.	DD FM 2324, Fire Incident Report	Yes	$1 or more	Submit to local Safety Office as required by AR 420-90 and local suppl	
Fires resulting in lost-time injuries to civilian personnel.	CA-1/6	All FECA claims	All claims	USASC will capture from computer tapes received from OWCP	
Chemical accidents causing environmental hazards. (Spill only)		Yes - Local Environmental Health Office			

Type of Occurrence	Type of Report	Reportable Local Safety Office	Recordable	When to Submit Local Safety Office	Due USASC
Other Army vehicle property damage - Examples: bulldozers, forklifts and similar vehicles.	DA FM 285 and 285-1 when required by annual message	Yes - As required	Same criteria as AMVs	As required by local suppl to AR 385-40	Within 30 days

All of the above occurrences are classified according to the severity of injury, occupational illness or property damage and the sum of the cost is used to determine accident classification for each accident; for example, a civilian employee injured in an Army motor vehicle accident damaging the vehicle. The accident classification will include total cost (cost of the injury and cost of the damage).

*Procedures for processing and handling of CA-series forms will be established by each local Civilian Personnel Office. The employee completes and the supervisor certifies.

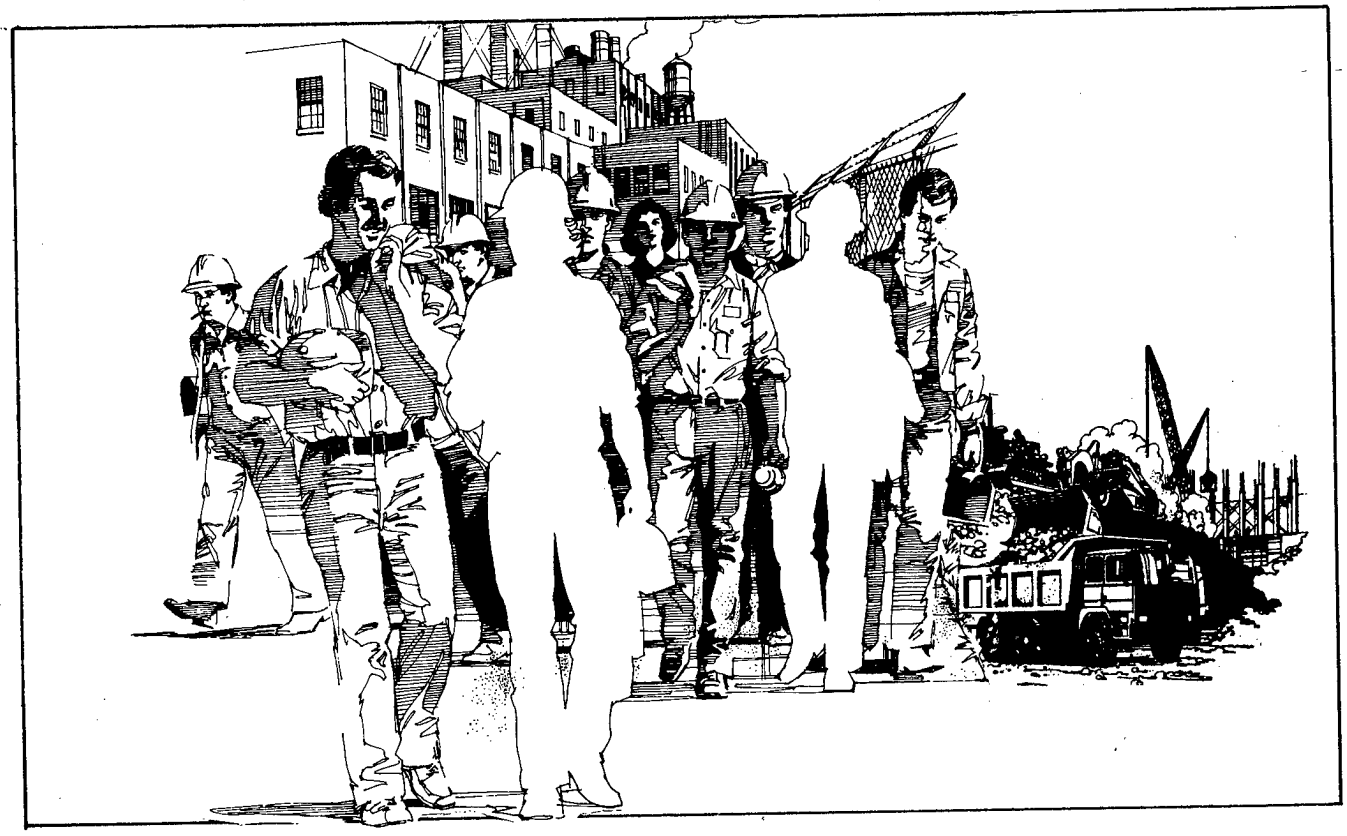
*If in doubt of reporting procedures contact the local Safety Office.

Chapter 6
Occupational Safety and Health Act (OSHA)

The objective of this section is to provide information about the Occupational Safety and Health Act of 1970, popularly called OSHA, and its impact on Army supervisors. This material will acquaint you with the requirements placed on the Army by Federal statute, Presidential executive order, and higher headquarters regulations. We will discuss ways that OSHA affects your workplace and the steps that are being taken to cope with OSHA requirements. In this section, the acronym OSHA will mean either Occupational Safety and Health Act, which is the basic law passed by Congress in 1970, or the Occupational Safety and Health Administration, which was established under the Secretary of Labor to administer this law.

The Occupational Safety and Health Act of 1970 was passed by Congress to assure as far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources. The law applies to all civilian employees and to all working conditions and workplaces except those involving uniquely military equipment, systems, and operations. (Military and civilian personnel are also covered by AR 385-10 and a number of other safety regulations.)

OSHA was enacted because America's industrial disabling injury rate began rising in 1960 following nearly 50 years of steady decline. This increase represented thousands of preventable deaths and injuries and seriously concerned labor, business, and government leaders.



Federal OSHA activity

Section 19 of the Act specifically describes responsibilities assigned by Congress to the heads of Federal agencies. Following the detection of serious deficiencies in Federal agency OSHA programs by the GAO in 1973 and 1974, President Carter issued Executive Order 12196 and sent a memorandum to heads of Executive departments and agencies establishing and emphasizing the importance of the Federal safety program. The President's guidance was then developed by OSHA Code of Federal Regulations, Part 1960, Safety and Health Provisions for Federal employees.

Supervisors must use OSHA standards as their workplace safety guidelines or follow Army regulations that are more stringent than OSHA standards. Military and civilian personnel have the opportunity to participate in the development of new or revised local safety and health standards through command channels and recognized labor representatives. All Army personnel shall comply with all OSHA standards issued (AR 385-10).

An example of an alternate standard. The Army maximum noise level exposure is 85 dB. The Army standard is more stringent than OSHA, which allows short exposures to louder noises without hearing protection. OSHA inspectors have the right of entry to Army workplaces to evaluate compliance with the standards.

Supervisors must detect and correct hazards existing in their work area to prevent future violations. This can require a major effort involving extensive resources. Average facilities, coupled with a backlog of maintenance and repair caused by years of underfunding, have created a situation in which your installation may have hundreds or thousands of potential violations. The following specific tasks are outlined in Part 1960 in connection with this requirement:

(1) Establish in-house and external inspection procedures (1960 25/26, AR 385-10) that include:

(a) Providing no notice. Although Part 1960 provides for "no notice" inspections, this procedure runs counter to long-established Army policy to be informed of visits by other Federal agencies. An agreement between DOD and OSHA permits unannounced inspections (P082030Z Oct 80 DAPE-HRS).

(b) Conducting inspections of all workplaces and operations at least annually and more often for highly hazardous operations.

(c) Notifying commanders of violations.

(d) Establishing systematic abatement procedures.

(2) These procedures also address the posting of Notices of Violation at the point of more serious violations for at least 3 days or until the violation is corrected. Abatement plans are required for most significant violations requiring more than 30 days to correct. Qualified Army safety inspectors must:

(a) Record the violations detected on DA Form 4754 (Violation Inventory Log).

(b) Designate correction priorities.

(c) Select the most effective remedy (AR 385-10).

(d) Reinspect to verify correction.

(3) The third area of concern is developing procedures for civilian and military participation in the program as required by regulations. The Office of Personnel Management furnished direction and guidance to Federal agencies on the proper interpretation and application of OSHA-related employee rights. Your employees have:

(a) The right to be represented during agency OSHA inspections (1960.27, AR 385-10).

(b) The right to make complaints orally or in writing during an OSHA inspection (1960.27(d), AR 385-10).

(c) The right to know of all violations in work areas including overexposures to toxic or harmful materials. Your employees, when notified of unsafe environments or unsafe equipment, will generate considerable pressure for prompt elimination of the problems (1960.26(b)(d)).

(d) They have the right to report unsafe or unhealthful conditions to the agency and appeal the disposition of such cases to OSHA through command channels. Based on experience in the private sector with an identical right, your employees and their representatives will make liberal use of the complaint channel, especially since the employee can require that his/her identity be kept secret from management personnel. We are required to place this poster in all work areas advising employees of all their rights. Careful management of this program will be required to keep this right from becoming a significant administrative burden (1960.28, AR 385-10).

(e) You must protect their right to comment on proposed local standards (1960.16) (DA Form 2028 system).

(f) Their right to access to standards, safety and health statistics, and agency safety and health procedures and findings (1960.71).

(g) Their right to request representation on a safety and health committee (1960.16 and 17).

(h) Their right to be protected against discrimination for exercising OSHA rights (AR 385-10). Any attempt to retaliate against an employee will be fatal to your career, at the least.

OSHA reporting requirements will create some significant problems. DOD requires reporting job-related fatalities and catastrophic incidents involving five or more disabling injuries or $200,000 damage in a single event to OSHA. The report must be made to the Department of Labor within 2 working days (1 day to DA; AR 385-40). OSHA and DOL currently have the ability to follow up on this information.

A court decision ruled that employers who intentionally conceal employee work-related injuries/illnesses can be held liable under common law, and those disabled employees can sue for aggravation of the injury or disease, even though the initial injury is compensable under Workers' Compensation. While Workers' Compensation law bars the employee's action by law for the initial injury, a cause of action may exist for "aggravation" of the disease because of the employer's fraudulent concealment of the condition and cause. Commanders and supervisors at all levels must ensure that the employees are informed of the hazards associated with their employment.

Your responsibilities. Briefly stated, these are the highlights of what OSHA is and what it means to you. OSHA has become a highly visible part of the overall safety program. Compliance with OSHA will obviously involve many elements of command. A summary of the general responsibilities of various groups includes the following:

(a) Your employees and their unions must exercise OSHA rights in a balanced and responsible manner. The CPO, unions, and you, as a supervisor, have key roles in this area.

(b) Employees must obey your safety rules.

(c) Employees should report job hazards through established channels. The objective here is to encourage use of the supervisory chain of command rather than the formal OSHA complaint channel. Should suit be brought against you for your proper implementation of safety and health regulations, the Department of Justice normally will appear and defend you. The United States Attorney would act as your lawyer, assuming that you were acting within the scope of his employment, were not grossly negligent, and had no conflict of interest with the Government (28 United States Code 507).

As a supervisor, you must:

- Minimize official OSHA complaints through responsive supervision and prompt investigation of complaints.
- Execute supervisory and personal safety responsibilities inherent in your job.
- Assure compliance with mandatory OSHA procedures. OSHA has shown the ability to discriminate between real and "paper" safety programs.

How far must you go to ensure compliance with a safety rule? A recent ruling by the Occupational Safety and Health Review Commission says, "A lot farther than merely issuing verbal reprimands to those who ignore safety rules." The ruling arose from a contested case in which the employer was cited for failure to enforce the rule requiring personal protective equipment to be utilized by employees. The employer argued that since the employee appeared to have certain mental handicaps (evidence showed the employee failed to use personal protective equipment even though he had been warned many times about not wearing it, and that the employee could not be relied upon to use personal protective equipment), it would be unreasonable to require suspension or discharge for failure to enforce the rule with disciplinary action stemmed only from sensitivity to the employee's handicap. The Occupational Safety and Health Review Commission disagreed and stated that because of the supervisor's failure to threaten discipline or impose it, it was no wonder the instruction to the employee about wearing personal protective equipment had no lasting effect. The Review Commission says that final responsibility for compliance rests with the employer and cannot be shifted by an employee's purported handicap or refusal by an employee to use personal protective equipment.

Management is obliged to provide support and leadership for meeting OSHA requirements in the form of policy statements and personal involvement.

You must motivate all personnel to fully meet the provisions of OSHA by holding accountable those individuals who are tasked to support this effort.

You must also obtain the necessary resource to support a vigorous and timely violation correction effort.

Your installation safety office will assure periodic review of the effort designed to provide and protect employee rights as guaranteed by Part 1960.

They will also provide technical guidance and expertise, develop and coordinate the necessary management actions and programs to effectively and expeditiously meet OSHA requirements, monitor progress in correcting OSHA violations, and integrate OSHA requirements into the overall safety program.

Accumulated evidence in recent years has dictated stronger health and safety prevention throughout the Army. Compliance with the Army Safety Program is mandatory. This will certainly result in greatly reducing the Army's unnecessary loss of manpower from health hazards and accidents. As managers and supervisors you shall, to the extent of your authority, comply with all OSHA program guidance. Nonsupervisory personnel will comply with OSHA program rules and regulations, specifically those involving work safety, health standards, proper protective equipment and clothing, and prompt reporting of unsafe conditions.

Chapter 7
Civilian Personnel Job Injuries
Federal Employees Compensation Act (FECA)

As a supervisor you play an essential role in reducing injuries and illnesses in the workplace. You must work closely with the Civilian Personnel Officer, the FECA Program Administrator, and the Safety Office staff and interact with the occupational health staff. This section provides general information about the Federal Employees' Compensation Act (FECA), gives specific guidance for the preparation of all forms necessary to report traumatic and occupational injuries, and outlines supervisory/employee responsibilities.

Your cooperation is essential for achieving the Presidential goal of a 3-percent reduction in workplace injuries and the SafeArmy 1990 goal of achieving a 3-percent reduction in no-lost-time civilian injury claims.

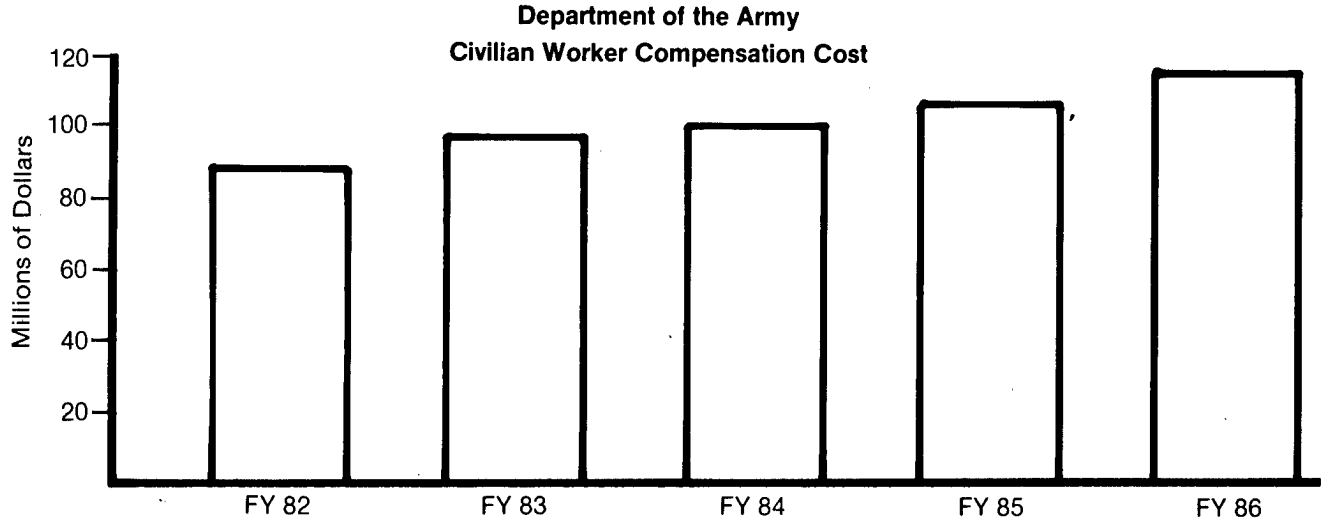


FIGURE 7-1.--Department of the Army Civilian Worker Compensation Cost

In 1983 President Reagan directed each Federal agency to reduce civilian employee workplace injuries and illnesses by 3 percent each year. The Army has not been achieving this goal. The cost to the Army for compensation and continuation-of-pay claims as a result of civilian job-related injuries and illnesses in 1985 was more than $102 million --enough to put 50 new Cobra helicopters on the flightline or 50 new M1 battle tanks in the field.

Financing

The FECA is financed by the Employees' Compensation Fund, which consists of funds appropriated by Congress, directly or indirectly, through a charge-back to the Army. A statement of payments made from the fund is furnished to the Army each year by the Secretary of Labor. The Army must include these amounts in budget requests. The resulting

sums appropriated are deposited in the fund.

Each supervisor will minimize the cost of the program by providing light duty as appropriate, maintaining close contact with the employee and/or physician during the lost-time period, advising the employee and/or the physician that light duty is available, ensuring that the employee returns to duty as soon as possible, and providing a safe work environment.

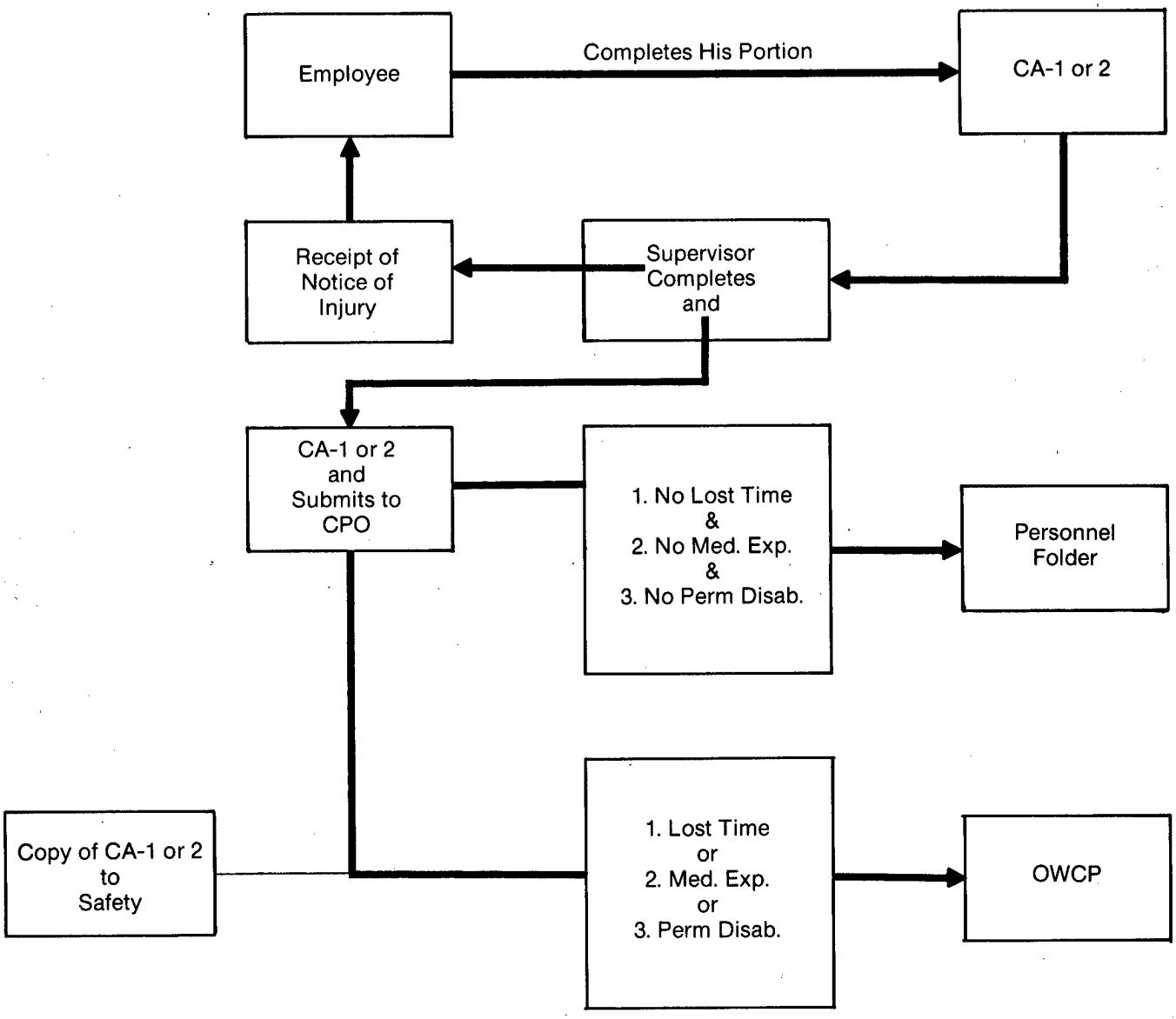


FIGURE 7-2.--How to Report an Injury

Penalties

The FECA is the only legal avenue by which a Federal employee (or survivors) may recover damages for an injury or death that is causally related to Federal employment, except for third-party claims. Employees who knowingly file fraudulent claims can be punished by a fine of no more than $2,000 or by imprisonment up to 1 year, or both. An officer or employee of the U.S. Government responsible for making reports, such as the supervisor who fails, neglects, or refuses to make a report of injury or files a false report, shall be fined no more than $500 or imprisoned no more than 1 year, or both. Employees who are partially disabled and refuse to accept suitable work, including light duty, will not be entitled to any compensation during the period of refusal.

Light Duty

Light duty will be provided injured employees as required by management's light-duty policy (see appendix A). One of the requirements of the policy is that any injured employee found medically able to perform some duties, regardless of how minor, will be provided light duty compatible with the disability for the first 30 days following such medical determination. The primary purpose of this requirement is to minimize costs associated with continuation of pay provided for traumatic injuries. Supervisors must adhere to this particular requirement as well as other requirements as contained in the light-duty policy.

Benefits

There are four basic types of benefits under FECA provisions: disability compensation, medical benefits, vocational rehabilitation, and death benefits. These benefits apply to any disability (temporary or permanent, partial or total) incurred as a result of employment-related traumatic injuries or occupational diseases.

Disability Compensation

Disability compensation is provided for job-related injuries and diseases that are classified in three categories: traumatic injuries, which include a continuation of pay benefit; occupational diseases; and recurrences of disability.

Traumatic injuries. A traumatic injury is defined as a wound or other condition caused by external forces including physical stress and strain. The injury should be identifiable as to time and place of occurrence and member or function of the body affected; it must be caused by a specific event or incident or series of events or incidents within a single workshift. Continuation of pay up to 45 days will be provided under the conditions discussed below, and medical treatment is authorized by the supervisor. Upon expiration of the 45-day continued pay benefit, the employee may receive compensation from the Office of Worker's Compensation Programs (OWCP) for lost time due to the injury.

Occupational disease. An occupational disease is defined as being produced by system infections, continued or repeated stress or

strain, exposure to toxins, poisonous fumes, etc., in the work environment over a longer period of time than one workshift. To qualify as a disease, the injury must be caused by exposure or activities of at least 2 days. Medical treatment cannot be authorized by the supervisor. Instead, approval for such treatment must be obtained from OWCP before payment can be guaranteed. Continuation-of-pay benefits are not available for occupational illnesses.

Recurrences of disability. A recurrence of an injury (either traumatic or occupational disease) is defined as occurring when the SAME kind of injury causes additional time loss from work. (Examples: An employee who sustained a knee injury returns to work and subsequently falls down and injures the same knee would have sustained a NEW injury. However, if the employee returns to work and subsequently develops pain in the same knee for no apparent reason or cause other than the previous injury, this would be considered a RECURRENCE.)

Continuation of Pay

Continuation of pay (COP) is the continuation of an injured employee's regular pay with no charge to sick or annual leave. The COP is available only in cases of traumatic injury and only for a maximum of 45 calendar days.

Qualification for COP. To qualify for COP, the injured employee must file a written notice of injury on Form CA-1 (Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation) within 30 days from the date of injury and provide medical information showing all dates of disability caused by the injury.

Determining date of eligibility.

- The first day of COP is usually the day following the date of injury when there is immediate lost time. The date of injury is usually considered to be duty time if the employee is injured during the official workday and if there is time lost on the day of injury. (Example: The workday begins at 0730 and the employee is injured on Wednesday, 5 May, at 0930. The employee seeks medical care and is off work the remainder of 5 May. The first day of COP would begin on 6 May; 5 May would be reflected on the Time and Attendance Report (DA Form 4395 (Test)) as duty time.)
- If the employee is injured at work but BEFORE the official workday begins and if time is lost on that day, the first day of COP would be the date of injury beginning at the start of the official workday. (Example: The workday begins at 0730 and the date of injury is Wednesday, 5 May, at 0715. The first day of COP would be 5 May.)
- If there is no immediate time loss, the first time loss (due to injury) following the date of injury will be the first day of COP unless the first time loss is more than 6 months from the date of injury. The first day of COP must be taken within 6 months from the date of injury; otherwise, the employee is not eligible for COP.

Counting COP. To properly count COP days, calendar days, NOT workdays, must be used, including holidays, weekends, and days off.

• Only days are counted. (Example: If 1 hour is used to see a physician and 7 hours are worked, it is still counted as 1 day of COP.)

. The time lost must be certified by a physician as being a result of the job-related injury. (Examples: The physician releases the employee to return to work on Friday, 10 May, but the employee does not return until Wednesday, 15 May; 10 May through 14 May would not be counted as COP days but as sick, annual, or leave without pay, depending on the employee's reason for not returning on 10 May; or, the employee's last visit to the physician is Friday, 10 May, and the physician states the employee will be unable to work because of the injury until 16 May, then 10 May though 14 May would be counted as COP days.)

• If the injured employee elects to use sick or annual leave when entitled to COP, be sure to explain to the employee that leave taken will be counted against the 45 days if medical information indicated disability for work because of the injury, and that leave taken can be changed to COP only if the employee makes the request and medical information indicated disability for work.

Completing the time and attendance report (table 7-1).

• If the employee requests COP (maximum of 45 calendar days) due to a job-related traumatic injury, the number of regular duty hours will be posted in the appropriate shift column on the ZVS side of the card; the following will be posted on the ZVT side of the card: "0" in column 22 and the number of COP hours in columns 23-26. In the remarks section, show "Con't Pay" and the number of days.

• If an injured employee's scheduled tour of duty includes night differential (ND) (columns 21-24 on ZVS card), enter regular hours worked between 1800 one day and 0600 the following day (ND hours) by GS employees only. The ND hours will be reported in increments of 1/4 hours, if applicable.

• If an injured employee's scheduled tour of duty includes Sunday premium hours, he or she is entitled to Sunday premium pay for each hour of Sunday work, which is not overtime work and is not in excess of 8 hours for each regularly scheduled tour of duty, which begins or ends on Sunday. First shift, all employees (columns 45-46 on ZVS card); second shift, WG employees only (columns 47-48 on ZVS card; third shift, WG employees only (columns 49-50 on ZVS card).

• Sunday hours worked, which fall within the employee's regularly scheduled tour of duty, will be entered in the appropriate shift columns and will be reported in increments of whole hours. The hours reported in this column are also included in the regular hours (1st, 2d, or 3d shift, columns 17-32 on ZVS card).

Overtime is not applicable under COP. Authorization for COP must be submitted on the normal submission date for the Time and Attendance Reports. The authorization to payroll will be made on DA Form 2496 (Disposition Form) (in duplicate) and should read as follows:

"Subject employee has stopped work because of a job-related traumatic injury sustained on (date). In accordance with the provisions of 5 USC 8118, it has been determined that he/she is

TABLE 7-1.--Time and Attendance Report

Traumatic Injury - Continuation of Pay. Post only regularly scheduled workdays in appropriate shift column (ZVS) and in Other Hrs (ZVT). In "Remarks," show date of injury and number of hours of continuation pay.*

TIME AND ATTENDANCE REPORT

ZVS	A	03	560056999	YEW B BRILLIANT	303CA	80 09 06
DIC	DEP. CD.	PCN	SOCIAL SECURITY NUMBER	NAME	COST CENTER	PAY PERIOD

TOUR OF DUTY FROM	TOUR OF DUTY TO	DAY	SH. CD.	1 ST SHIFT	ND SHIFT	2 ND SHIFT	3 RD SHIFT	OVERTIME HRS. 1 SH.	2 SH.	3 SH.	SUN. PREM. 1 SH.	2 SH.	3 SH.	HOL. SH. CD.	HOL. HRS. WKD.	COMP HRS. WKD.	LEAVE TAKEN ANN.	SICK	COMP	# INITIAL
		SUN																		
0730	1600	MON		8																
		TUE		8																
		WED		8																
		THU		8																
		FRI		8																
		SAT																		
		SUN																		
		MON		8																
		TUE		8																
		WED		8																
		THU		8																
		FRI		8																
		SAT																		
		SUN																		
PAY PERIOD TOTAL				080																
CORRECTIONS																				
COLUMNS																				

REMARKS: SEE REVERSE

CERTIFIED CORRECT AS TO ALL TIME WORKED AND LEAVE TAKEN THROUGH THE END OF THIS TIME PERIOD.

Shorty Doggy — SUPERVISOR — 2468 EXTENSION

DA FORM 4395, DEC 81

ZVT	A	03	560056999
DIC	DEP. CD.	PCN	SOCIAL SECURITY NUMBER

TOUR OF DUTY FROM	TOUR OF DUTY TO	DAY	SH. CD.	AWOP CD.	AWOP HRS.	OTHER CD.	OTHER HRS.	LSL, LSL & HOL. CODE	LSL & HOL. HOURS PAID	MISC. HRS. CD.	MISC. HRS.	MIL. LV. DAYS	LEAVE ACTION CODE	MAN PAY CODE	ENV. AND HAZ. PAY CD.	ENV-HAZ PAY HRS.	ENV. AND HAZ. PAY CD.	ENV-HAZ PAY HRS.	INITIALS
		SUN																	
		MON																	
		TUE				0	8												
		WED				0	8												
		THU				0	8												
		FRI				0	8												
		SAT																	
		SUN																	
		MON				0	8												
		TUE				0	8												
		WED				0	8												
		THU				0	8												
		FRI				0	8												
		SAT																	
		SUN																	
PAY PERIOD TOTAL						0	0720												
CORRECTIONS																			
COLUMNS																			

* CERTIFICATION FOR SICK LEAVE

I CERTIFY THAT THIS ABSENCE WAS IN ACCORDANCE WITH STATUTES AND REGULATIONS AUTHORIZING SICK LEAVE.

REMARKS

*Traumatic Injury 26 Aug Continuation of pay. No. of hours = 96 Auth attached

COP must be charged in one-day increments even if the employee worked a portion of the day. However, in fairness to the employee and in order to have an accurate picture of the employee work record, time card should reflect actual hours employee worked and actual hours of continuation of pay. Remember that continuation of pay can be charged in fractional hours.

entitled to continuation of pay from (date) to (date), which is supported by CA-1/CA-2a and medical reports provided to the Civilian Personnel Office."

This statement should be submitted with each Time and Attendance Report as long as the employee is entitled to COP; i.e., until the 45-day period expires, or the period covered by medical evidence ends, or the employee returns (whichever occurs first).

Following are examples to show whether or not to count the regular nonworkdays of the week as part of the 45-day entitlement. In these examples, Saturday and Sunday are the regular nonworkdays.

(1) Off work a part of Friday and a part of Monday. DO NOT count Saturday and Sunday because charging full days for the partial days off penalizes the claimant enough, and we can assume that the claimant was not disabled on either the Saturday or Sunday.

(2) Off work an isolated full day on Friday or Monday. DO NOT count the Saturday and Sunday, assuming that claimant was not disabled on either the Saturday or Sunday unless the medical evidence shows otherwise.

(3) Worked full day on Friday and off full day on Monday and Tuesday. DO NOT count the Saturday and Sunday, assuming that claimant was not disabled on the Saturday and Sunday unless the medical evidence shows otherwise.

(4) Off work all or part of Thursday, off work all of Friday, and worked all of Monday. COUNT the Saturday and Sunday, assuming that claimant was disabled on the Saturday and Sunday unless the medical evidence shows otherwise.

(5) Off work a part of Friday and all of Monday. COUNT the Saturday and Sunday, assuming that claimant was disabled on the Saturday and Sunday unless the medical evidence shows otherwise.

(6) Off work all of Friday and part of Monday. COUNT the Saturday and Sunday, assuming that claimant was disabled on the Saturday and Sunday unless the medical evidence shows otherwise.

COUNT the Saturday and Sunday (or off days) if:

Off duty at the <u>end</u> of Friday and at the <u>beginning</u> of Monday.

OR

Off duty a part of Thursday and a part of Tuesday in addition to being off a part of the Friday and a part of the Monday.

OR

Medical information shows employee was disabled on the weekends, holidays, or off days.

TABLE 7-2.--Continuation of Pay (COP) - Six-Month Time Allowance

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	Date of injury seen by physician	Returned to work 6 months begins				
	Date of injury *No medical treatment	Returned to work			Seen by physician	6 months begins

1/5/76	1/6/76	6/7/76	7/7/76	9/8/76
Date of injury Seen by physician	Returned to work 6 months begins	Held off duty for 30 days by physician Entitled to COP	Returned to work	Held off duty by physician Not entitled to COP
Date of injury *No medical treatment	Returned to work	Held off duty for 30 days by physician Entitled to COP	Returned to work 6 months begins	Held off duty by physician Entitled to COP

*If employee did not see a physician or receive medical treatment immediately following the injury, the six months does not begin until the first day immediately following the employee's initial medical treatment.

The law allows six months from the date the employee returns to work to begin using any balance of the full 45 calender days. However, once disability stops beyond the six months, the employee loses all remaining COP days, but is entitled to claim compensation for time loss.

In instances where the injured employee has two separate injuries, COP is calculated for each injury. One COP period is not added to another.

Controversion of COP. Controversion of COP is indicated by checking "yes" in item 42 of CA-1. The COP can only be controverted (opposed) based on one of the nine factors listed below:

- Disability results from an occupational disease or illness.
- The employee is excluded by 5 USC 8101 (1) B or E (Volunteer Service and Certain Appointees).
- The employee is neither a citizen nor a resident of the United States or Canada.
- The injury occurred off the employing agency's premises, and the employee was not involved in official "off-premise" duties.
- The injury was caused by the employee's willful misconduct or intent to bring about injury or death of self or another person, or the injury was proximately caused by employee's intoxication.
- The injury was not reported on Form CA-1 within 30 days following the injury.
- Work stoppage first occurred 6 months or more following the injury.
- The employee initially reports the injury after his employment has terminated.
- The employee is enrolled in the Civil Air Patrol, Peace Corps, Job Corps, Youth Conservation Corps, Work Study Programs, or other similar groups. Supervisors may only oppose COP; OWCP makes the final determination for eligibility for COP. The OWCP will generally not accept reasons for controversions other than one or more of the nine reasons given above.

Termination of COP. The COP may be terminated or not begun only if the controversion is clearly based on one of the nine acceptable factors listed above. The OWCP makes all final determination and can overturn the controversion and require that COP be paid.

Vocational Rehabilitation

Vocational rehabilitation, job counseling, and placement assistance may be provided an injured employee who is unable to return to usual employment because of permanent disability due to the injury. However, determinations on whether an employee should be offered vocational rehabilitation is made and initiated by OWCP.

Death Benefits

The FECA provides benefits for the survivors of Federal employees who suffer a job-related death, which includes allowable funeral expenses and survivor compensation. The Employee Benefits Sections, Management Employee Relations, Civilian Personnel office, is to be contacted immediately for assistance in completing the official Supervisory Report of Employee's Death should an employee suffer a job-related death.

Reporting Procedures

Traumatic injury cases. Upon receiving notice that an employee has sustained a job-related traumatic injury, the supervisor will:

(1) Promptly authorize medical care (see below) by issuing Form CA-16 (Request for Examination and/or Treatment) and DD Form 689

(Individual Sick Slip). The HSC Form 232-R (Record of Injury) is also required for MEDDAC and DENTAC employees only.

(2) Provide the employee with Form CA-1 for reporting the injury. Upon receipt of the completed form, return the Receipt of Notice of Injury to the employee.

(3) Advise the employee of the right to elect continuation of regular pay or use annual or sick leave, if the injury is disabling. Annotate the Time and Attendance Report accordingly.

(4) Inform the employee whether COP will be controverted, and if so, whether it will be terminated and the basis for this action.

(5) Submit Form CA-1, fully completed by both employee and supervisor, together with all other pertinent information and documents to the Civilian Personnel Office within 2 working days following the supervisor's receipt of the form from the employee. Send a copy of CA-1 to the Installation Safety Office.

(6) Submit an explanation for controversion to the Civilian Personnel Office on the supervisor's portion of Form CA-1, or by separate narrative report (or both), if the claim is controverted (whether or not pay is terminated).

Occupational disease cases. Upon receiving notice that an employee has sustained an occupational disease, the supervisor will--

(1) Provide the employee with Form CA-2 (Federal Employee's Notice of Occupational Disease and Claim for Compensation). Further, advise the employee that medical care cannot be authorized without prior approval from OWCP and that the necessary medical reports can be submitted on the physician's letterhead to include all information requested by instruction 3 of the employee's instruction sheet attached to the CA-2.

(2) Upon receipt of the completed CA-2, return the "Receipt of Notice of Disease or Illness" to the employee.

(3) Submit Form CA-2, fully completed by both the employee and supervisor, together with all other pertinent information and documents to the Civilian Personnel Office within 10 working days following receipt of the form from the employee. Send a copy of CA-2 to the Installation Safety Office.

(4) Advise the employee of the right to elect sick or annual leave, if disabled, pending adjudication of the claim by OWCP. If the claim is later approved by OWCP, the employee may elect compensation benefits for the loss of time and buy back his sick or annual leave.

Medical Care

An injured employee is entitled to first aid and medical care for an injury, including hospital care when needed. The medical care is to be provided by any duly qualified local private physician or hospital of the employee's choice. When travel is necessary to receive medical care, the injured employee may be furnished transportation and reimbursed for travel and incidental expenses.

(1) The supervisor shall immediately authorize examination and appropriate medical care when an employee is injured by accident while in the performance of duty. Form CA-16 (Request for Examination and/or Treatment) should be issued (traumatic injuries only) to a

United States medical officer or hospital, or any duly qualified physician or hospital of the employee's choice.

(2) The injured employee has the option to initially select a duly qualified private physician or hospital in the area. Generally speaking, the area is defined as within 25 miles of the employing establishment or the employee's home. The supervisor shall give the injured employee an opportunity to select the physician subject to the limitations in (3) below. The physician selected by the employee should be contacted by telephone to determine if the physician is available and will accept the employee for treatment. If not, the employee MUST select another qualified physician. Should the employee wish to change physicians after the initial choice, the OWCP MUST be contacted for approval.

(3) The term "physician" includes surgeons, osteopathic practitioners, podiatrists, and chiropractors within the scope of their practice as defined by state law. The term "physician" includes chiropractors only to the extent that their reimbursable services are limited to charges for physical examinations, related laboratory tests, X-rays to diagnose a subluxation of the spine, and treatment consisting of manual manipulation of the spine to correct a subluxation as demonstrated by X-ray. Naturopaths, faith healers, and other practitioners of the healing arts are not recognized as physicians within the meaning of the law.

(4) In cases of traumatic injury requiring emergency treatment, the employee should be referred to a military treatment facility, contract doctor, or nearest health care provider for initial treatment. If oral authorization for treatment is given, Form CA-16 should be issued within 48 hours thereafter. Any necessary further treatment shall be obtained as soon as possible from the physician or hospital of the injured employee's choice. It is the duty of the supervisor to authorize initial adequate medical treatment for acute injuries, exclusive of disease, and to transfer the employee for any treatment subsequently needed to the physician chosen by the injured employee.

(5) A Form CA-17 (Duty Status Report) will be used approximately every 2 weeks to obtain interim medical reports concerning the disabled employee's duty status. The CA-17 is used most often when COP is granted but can also be used after the employee applies for compensation benefits. The original CA-17 will be submitted to the Civilian Personnel Office.

Return to work. When the employee returns to work or the disability terminates, immediately notify the Civilian Personnel Office by phone, and follow up by completing and submitting Form CA-3 (Report of Termination of Disability and/or Payment).

Recurrence of disability.

(1) Traumatic injury cases.

(a) Should an employee suffer a recurrence of disability and again stop work, and the initial claim has been approved by OWCP, promptly complete Form CA-2a (Notice of Employee's Recurrence of Disability and Claim for Pay/Compensation). The employee shall advise

whether he wishes to continue to receive regular pay (COP) or charge the absence to sick or annual leave.

(b) If the employee elects COP, the pay will be continued, provided the 45 calendar days were not all used during the initial period of disability, which is applicable only during the 6-month period beginning from the date the employee first returned to work (see figure 2). If a recurrence happens after the 6 months have expired, COP cannot be given even if some of the 45 days remain unused. In such instances, the employee is entitled only to compensation payable by OWCP.

(c) If the 45-day entitlement period has been exhausted, or the 6 months have expired and the employee wishes to file for worker's compensation payments due to wage loss, the supervisor will make an appointment with the Employee Benefits Section, Civilian Personnel Office.

(d) Medical treatment for a recurrence will be authorized by issuing Form CA-20 (Attending Physician's Report).

(2) Occupational disease cases.

(a) Following recurrence of disability and work stoppage, complete CA-2a, and forward it to the Civilian Personnel Office.

(b) If the employee wishes to claim compensation as a result of the work stoppage and pay loss, the supervisor should make an appointment for the employee with the Employee Benefits Section, Civilian Personnel Office.

Medical expenses. Medical expenses are claimed on Form CA-1333 (Federal Employee's Compensation Program Medical Provider's Claim Form). The CA-1333 should be provided to the employee, and when completed, it should be forwarded to the Civilian Personnel Office. Travel expenses are claimed by submitting Standard Form 1164.

Following is a list of Federal Employees' Compensation Act (FECA) forms (CA series).

Federal Employees' Compensation Act Basic Forms

FORM NO.	FORM TITLE	PURPOSE
CA-1	Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation	Notifies Official Superior (supervisor) of traumatic injury and furnishes the Official Superior's report to OWCP when (1) the employee has sustained a traumatic injury which is likely to result in any medical charge against the compensation fund; or if (2) the injured employee loses time from work on any day following the injury date--whether the time from work is charged to the leave record or the employee chooses to receive continuation of pay; (3) prolonged treatment is indicated--even if the treatment is received on off-duty hours; (4) disability for work may subsequently occur; (5) permanent disability appears likely; or (6) serious disfigurement of the face, head, or neck is likely to result.
CA-2	Federal Employee's Notice of Occupational Disease and Claim for Compensation	Notifies supervisor of an occupational disease and furnishes the Official Superior's report to OWCP when (1) the disease is likely to result in any medical charge against the compensation fund; or if (2) the employee loses time from work on any day because of the disease--whether the time from work is charged to the leave record or the employee chooses to claim injury compensation; (3) prolonged treatment is indicated--even if the treatment is received on off-duty hours; (4) disability for work may subsequently occur; (5) permanent disability appears likely; or (6) serious disfigurement of the face, head, or neck is likely to result.
CA-2a	Notice of Employee's Recurrence of Disability and Claim for Pay/Compensation	Notifies OWCP that an employee, after returning to work, is again disabled due to a prior injury or occupational disease previously reported. It also serves as a claim for continuation of pay or for compensation based on the recurrence of a previously reported disability.
CA-3	Report of Termination of Disability and/or Payment	Notifies OWCP that disability from injury has terminated and/or that continuation of pay has terminated and/or that employee has returned to work.
CA-4	Claim for Compensation on Account of Occupational Disease	Claims compensation for an occupational disease when injury results in (1) loss of pay for more than 3 days; or (2) permanent disability involving the total or partial loss, or loss of use of an extremity of the body (or hearing or vision), or certain other external or internal organs of the body or serious disfigurement of face, head, or neck; or (3) loss of wage-earning capacity. Claims augmented compensation based on a dependent.
CA-5	Claim for Compensation by Widow, Widower and/or Children	Claims compensation on behalf of these dependents when injury results in death.

PREPARED BY	WHEN SUBMITTED	COMPLETED FORM SENT TO
Employee or someone acting on employee's behalf; witness (if any); supervisor	By employee within 2 working days but will meet statutory time requirements if filed no later than 3 years after the injury; by supervisor, within 2 working days following receipt of the form from the employee.	Supervisor, by employee or someone acting on employee's behalf then to the appropriate OWCP office by the supervisor.
Employee or someone acting on employee's behalf; witness (if any); supervisor	Within 30 days but will meet statutory time requirements if filed no later than 3 years after the injury; by supervisor immediately after receipt of the form from the employee.	Supervisor, by employee or someone acting on employee's behalf then to the appropriate OWCP office by the supervisor.
Supervisor	Immediately upon receiving notice that the employee has suffered a recurrence. When the employee stops work as a result of recurring disability, the employee shall advise the supervisor whether he/she wishes to continue to receive regular pay provided qualifications are met or charge the absence to sick or annual leave.	Appropriate OWCP office.
Supervisor	Immediately after the disability or continuation of pay terminates, or the employee returns to work.	Appropriate OWCP office.
Employee or someone acting on employee's behalf; supervisor; and attending physician (on attached Form CA-20)	In case of prolonged disability due to occupational disease, the form may be submitted without delay after pay stops. In cases of limited disability it is to be submitted 10 days after pay stops or when the employee returns to work if the disability is less than 10 days and pay was lost for more than 3 days.	Supervisor, by employee or someone acting on employee's behalf then to the appropriate OWCP office by the supervisor.
Person claiming compensation (or guardian on behalf of children) and attending physician	Within 30 days, if possible, but not later than 3 years after death. If the death resulted from an injury for which a disability claim was timely filed, the time requirements for filing death claim have been met.	Supervisor, by claimant or someone acting on claimant's behalf, then to appropriate OWCP office.

Federal Employees' Compensation Act Basic Forms

FORM NO.	FORM TITLE	PURPOSE
CA-5b	Claim for Compensation by Parents, Brothers, Sisters, Grandparents, or Grandchildren	Claims compensation for these dependents when injury results in death.
CA-6	Official Superior's Report of Employee's Death	Notifies OWCP of the employment-related death of an employee.
CA-7	Claim for Compensation on Account of Traumatic Injury	Claims compensation based on a traumatic injury if (1) medical evidence shows disability is expected to continue beyond 45 days and injury compensation is claimed after expiration of the period; or (2) the traumatic injury has resulted in permanent disability involving the total or partial loss, or loss of use of an extremity of the body (or hearing or vision) or certain other external or internal organs of the body or serious disfigurement of the face, head, or neck; (3) loss of wage-earning capacity. Also claims augmented compensation based on a dependent.
CA-8	Claim for Continuing Compensation on Account of Disability	Claims compensation when loss of pay continues beyond the time covered by the claim on Form CA-4 or CA-7.
CA-16	Request for Examination and/or Treatment	Authorizes an injured employee to obtain examination and/or treatment at the employee's option from a U.S. medical officer or hospital if available or -- from any duly qualified local physician (or surgeon, osteopath, podiatrist, dentist, clinical psychologist, optometrist, or, with certain limitations, chiropractor) or hospital. May also be used for illness or disease if prior approval is obtained from OWCP. Provides OWCP with initial medical report and physician or medical facility with billing form. It should be noted that the injured employee has only the initial option to select a physician or hospital of his/her choice.
CA-17	Duty Status Report	In traumatic injury cases, provides supervisor and OWCP with interim medical statement containing information as to employee's ability to return to any type of work.
CA-20	Attending Physician's Report	Provides medical support of claim and is attached to Form CA-4 and CA-7; provides OWCP with medical information.
CA-20a	Attending Physician's Supplemental Report	Provides OWCP with additional medical information in connection with supplemental claim filed on attached Form CA-8.
OWCP-1500a	Federal Employee's Compensation Program Medical Provider's Claim Form	Provides OWCP with uniform billing form to facilitate payment of medical bills. The form should accompany the CA-16 when employee is referred to a physician.

PREPARED BY	WHEN SUBMITTED	COMPLETED FORM SENT TO
Person claiming compensation (or guardian on behalf of children) and attending physician	Within 30 days, if possible, but not later than 3 years after death. If the death resulted from an injury for which a disability claim was timely filed, the time requirements for filing death claim have been met.	Supervisor, by claimant or someone acting on claimant's behalf, then to appropriate OWCP office.
Supervisor	Immediately upon knowledge by supervisor of the employment-related death of an employee.	Appropriate OWCP office.
Employee or someone acting on employee's behalf; supervisor, and attending physician (on attached Form CA-20)	In case of traumatic injury, the form must be completed and filed with OWCP not more than 5 working days after the termination of the 45 days.	Supervisor, by employee or someone acting on employee's behalf then to the appropriate OWCP office by the supervisor.
Employee or someone acting on employee's behalf; supervisor, and attending physician (on attached Form CA-20a)	Each two weeks after filing of Form CA-4 or CA-7.	Supervisor, by employee or someone acting on employee's behalf then to the appropriate OWCP office by the supervisor.
Part A -- Supervisor	Part A -- By supervisor, in duplicate, within 48 hours following first examination and/or treatment.	Part A -- Physician or medical facility.
Part B -- Attending Physician	Part B -- By attending physician or medical facility as promptly as possible after initial examination.	Part B -- Appropriate OWCP office.
The supervisor and the attending physician	Promptly upon completion of examination or most recent treatment.	Original to the employing agency and copy to appropriate OWCP office.
The supervisor and the attending physician	Promptly upon completion of examination or most recent treatment.	Appropriate OWCP office.
The supervisor and the attending physician	Promptly upon completion of examination or most recent treatment.	Appropriate OWCP office.
The attending physician. Employee must sign in item 12.	Promptly upon completion of examination or treatment; physician may submit in usual billing cycle.	Appropriate OWCP Office.

Chapter 8
Job Hazard Analysis

Looking for the Hazards

To be efficient, economical, and productive means, in part, to be safe. Job hazard analysis is a technique that has been used successfully to assure safe operations. This technique is compatible with methods taught in management improvement courses and outlined in DA Pam 5-3, "Management Improvement Techniques for First Line Supervisors."

On the following pages are two sample job safety analysis forms. The job hazard analysis is closely related to the Task List (DA Form 2030) and the Activity List (DD Form 2030). Job hazard analysis is consistent with techniques used to flow chart work progress. There are several advantages to using the job hazard analysis.

- It is systematic and thorough.
- It provides a permanent record of the safety situation for a specific job.
- It produces a protective equipment list and step-by-step safe job procedures.
- As long as the same job exists, the original job hazard analysis establishes the safe procedure.

Four basic steps are involved in making a job hazard analysis:

1. Select the job to be analyzed--jobs with the worst accident experience should be selected first.
2. Break the job down into successive steps. Each step should describe what is being done. Describe what is done, not the details of how it is done.
3. Identify the hazards and potential accidents. Identify all hazards--both those produced by the environment and those connected with the job procedure.
4. Develop ways to eliminate the hazards and prevent the potential for accidents. Change the physical conditions that create the hazards. Change the job procedure to eliminate hazards or find a new way to do the job.

This information can be obtained by observing the job, discussing it with your workers, and drawing on your own knowledge.

Job hazard analysis is a continuing program designed at uncovering hazards, not only hazards that have developed after production was started, but hazards that may have been overlooked in the design of the machinery, equipment, work processes and practices, or in the workplace layout. The job hazard analysis seeks to bring out hazards that arise out of continually changing work procedures, equipment modification, and installation of new or different equipment.

Sample Job Safety Analysis Form

Job Description CHANGE BRAKE LINING Job Location _____

Key Job Steps	Tools, Equipment or Materiel	Potential Health or Injury Hazard	Safe Practices Apparel, and Equipment
REMOVE WHEEL	Tire tools	Muscle strain, back injury Noise from power wrench Foot injuries	Proper lifting technique, 2-man rule Heating protection Steel tip shoes
REMOVE BRAKE LINING	Wrench, new linings Wet removal process kit	Airborne asbestos Disposal of asbestos waste	Use wet process process and follow SOP. Follow SOP for disposal.
REPLACE WHEEL	Tire tools	Muscle strain, back injury Noise from power wrench Foot injuries	Proper lifting technique, 2-man rule Hearing protection Steel tip shoes

Sample Job Hazard Analysis Form

Job Description Change tire	Job Location Maintenance area (Bays)		
Key Job Steps	Tools, Equipment or Material	Potential Health, Injury or Damage Hazard	Safe Practices Apparel & Equipment
1. Jack vehicle	Use shop jack	- Vehicle slips from jack - Jack fails	- Place jack as directed by applicable vehicle TM. - Conduct serviceability checks of jacks. Ramain clear of area under vehicle.
2. Remove tire	Lug wrench Wheel stands	- Strain or sprain from handling the tire and wheel - Bruises, cuts from slipping wrench - Vehicle falls from stands/jacks	- Get help or at least use proper lifting technique to avoid excessive strain. - Assure tool fits and use it properly. - Position stands properly. Leave jack in place.
3. Replace with spare tire	As above	See 2 above	See 2 above
4. Lower vehicle	Jack	See 1 above	See 1 above

Instructions for Making a Job Hazard Analysis

1. Under "job description," list the name of the job being performed.

2. Under "job location," list the physical location(s) where the job will be performed.

3. In the column labeled "key job steps," list the steps in sequence.

4. In the column labeled "tools, equipment, and material," list all of the proper ones to be used. Be sure to list the proper item in line with each successive job step.

5. In the "potential health, injury hazard, or damage" column, list the accident or unsafe conditions that can result if proper procedures are not followed. List the proper item in line with each successive job step.

6. In the last column, "safe practices, apparel, and equipment," list the factors needed to prevent an accident that may result from use of improper procedures. List the proper item in line with each successive job step.

ACTIVITY/TASK LIST	1. TYPE OF LIST ☐ ACTIVITY ☒ TASK	2. DATE 7-11 Feb
3. ORGANIZATION Automotive-Tank Shop Co C 507th Maintenance Bn	4. SUPERVISOR CW4 B. Kilmer	
5. NAME (Use for Task List Only) L. Brown	6. JOB TITLE (Use for Task List Only) Shop Foreman	7. GRADE/RANK (Use for Task List Only) E6

8. NO.	DESCRIPTION	HOURS PER	WORK COUNT	ACTY NO.
a	b	c	d	e
1	Supervise Shop Operations	5		1
2	Answer Shop Inquiries	4		1
3	Assist Repairmen in OJT	4		1
4	Assign MWO's to Personnel	3	15	2
5	Approve Parts Request	2	55	2
6	Perform Work Inspections	11		3
7	Training	4		4
8	Perform Motor Stables	5		5
9	Attend Meetings	1		6
10	Report to OIC	1		6

9. CERTIFIED BY (Signature of Organization Supervisor)	9a. DATE	TOTALS →	40		

DD FORM 1 SEP 76 2030 REPLACES ALL SIMILAR PURPOSE LOCAL FORMS WHICH MAY BE USED UNTIL EXHAUSTED

ACTIVITY/TASK LIST

1. TYPE OF LIST: [X] ACTIVITY [ ] TASK

2. DATE: 7-11 Feb

3. ORGANIZATION: Automotive-Tank Shop
Co C 507th Maintenance Bn

4. SUPERVISOR: Shop Officer: CW4 Kilmer
Shop Foreman: E-6 Brown

5. NAME *(Use for Task List Only)*

6. JOB TITLE *(Use for Task List Only)*

7. GRADE/RANK *(Use for Task List Only)*

8. NO.	DESCRIPTION	HOURS PER	WORK COUNT	ACTY NO.
a	b	c	d	e
1	Repair of Equipment			
2	Process Work Orders/Supply Requisitions			
3	Inspection of Work			
4	Training			
5	Motor Stables			
6	Miscellaneous			

9. CERTIFIED BY *(Signature of Organization Supervisor)*

9a. DATE

TOTALS →

DD FORM 1 SEP 76 2030 — REPLACES ALL SIMILAR PURPOSE LOCAL FORMS WHICH MAY BE USED UNTIL EXHAUSTED

Chapter 9
Ergonomics

Ergonomics involves human reaction to monotony, fatigue, repeated motion, and repeated shock.

The term "ergonomics" literally means the customs, habits, and laws of work. According to the International Labor Office it is:

... The application of human biological science in conjunction with the engineering sciences to achieve the optimum mutual adjustment of man and his work, the benefits being measured in terms of human efficiency and well-being. Ergonomics includes consideration of the total physiological and psychological demands of the job upon the workers. The human body can endure considerable discomfort and stress and can perform many awkward and unnatural movements -- for a limited period of time. When unnatural conditions or motions are continued for prolonged periods, the physiological limitations of the worker may be exceeded. To ensure a continuingly high level of performance, work systems must be tailored to human capacities and limitations.

Biomechanics is that phase of engineering devoted to the improvement of the man-machine task relationship in an effort to reduce operator discomfort and fatigue. Biotechnology is a broader term that encompasses biomechanics, human factors engineering, and engineering psychology. To arrive at solutions to workstress problems, physical and mental aspects need to be considered. Program areas of concern are:

- The consideration of stress on muscles, bones, nerves, and joints.
- The consideration of eye fatigue, color, audio signals, and the like.
- Environment such as lighting, glare, temperature, humidity, noise, atmospheric contaminants and vibration.
- The psychological and social aspects of the working environment.

The benefits which can be expected from designing work systems to minimize physical stress on workers are: more efficient operation, fewer accidents, lower cost of operation, reduced training time and more effective use of personnel. Among improvements that are reducing fatigue and stress are redesigned hand tools, adjustable chairs and workbenches, improvements in lighting, control of heat and humidity, and noise reduction.

Chapter 10
Education and Training

The need for safety and health training for all personnel is addressed by the Occupational Safety and Health Act of 1970 (OSHA). OSHA requirements have been integrated into the Army Safety Program; the Army complies with OSHA standards or with Army standards that are consistent with or more stringent than OSHA standards. Military unique activities such as combat training are not affected by OSHA requirements. However, it is important to realize that, for example, a maintenance operation involving tactical vehicles is not a military unique operation.

OSHA requires that all employees be made knowledgeable of the hazards to which they will be exposed during their course of employment (e.g., nature of exposure, emergency first aid). By exercising your safety supervisory responsibilities and by complying with OSHA requirements of the safety program, you will satisfy your OSHA responsibilities.

To establish an effective safety and health training and education program, supervisors must first prepare themselves for these duties. They must gain the knowledge necessary to assure a safe and healthful work environment in the activities they supervise. Included in this is the requirement not only to know the job and its safety and health requirements thoroughly but to know the employees supervised.

Supervisors must provide an initial safety and health orientation for employees. The orientation should be documented and a record maintained with the supervisor's employee record file. This orientation must include:

- All safety and health rules with an explanation of the value of each.
- Briefings on specific potential hazards and controls for those hazards.
- Emergency and first aid procedures.
- A safety-oriented walk-through of the job steps.

Remedial safety training must be conducted as needed. Remedial safety training is training designed to remedy some weakness or oversight in previous training. It can be directed to an individual or group as needs dictate. The key to successful remedial training is to make sure that the training is directed at actual training problems. Do not make the mistake of trying to solve nontraining problems such as poor attitudes or weak motivation in this way.

Updated safety training must be conducted. As an activity changes through the addition of new processes, procedures, or missions, so do safety training needs. Initial training must be updated, and employees must be informed of hazards. A good time to review updated refresher training needs is during periodic inspections.

Sustained safety and health consciousness must be maintained. All training has its greatest effect immediately after it is presented. After that, it continually loses effectiveness as the employee forgets the material. Accordingly, you should periodically present some safety and health-related training covering particularly important

problems. In this way, the most important procedures can be stressed and reinforced. To avoid repetition that could lead to boredom on the part of the employee, vary the method of presenting the material by using slides, films, charts, and other graphic aids.

Safety Meetings

Another method of sustaining training is in safety meetings. These meetings should be held for all personnel on a regular basis, and special meetings should be called when needed. In very large activities, it might be more appropriate to hold several meetings. In this case, employees should be grouped according to the types of jobs they do. This arrangement permits the presentation of only those items that apply to the group and makes the meeting more meaningful for participants.

Ideally, supervisors should have at least a brief, 10-minute "stand-up" or "tailgate" meeting with their people each week. Depending on the subject and circumstances, a brief get-together immediately following a lunch break, or including the subject in regular staff meetings, can serve to keep the safety message before your people.

How to get ready

Step 1 -- Determine the objective	a. Identify the problem b. Review the problem c. Determine net results desired d. Write this down
Step 2 -- Prepare Program	a. Select topics for discussion b. Select or prepare the data, charts, guides, information, pamphlets, etc. c. Determine "climactic points" d. Make outline and set up time schedules
Step 3 -- Map Strategy and Techniques	a. Consider group level b. Determine approach (what to say and how to say it) c. Plan for controls d. Predetermine final summarization
Step 4 -- Get Everything Ready	a. Arrange for facilities, rooms, chairs, etc. b. Set date and time for meeting c. Schedule and notify personnel d. Pre-position all material

How to conduct

Step 1 -- Position the Group	a. Put group at ease b. State the problem c. State the objective d. Arouse interest
Step 2 -- Get group participation	a. Start a discussion b. Keep discussion alive and on the ball c. Get thinking of all members d. Use visual aids
Step 3 -- Weigh Facts and Opinions	a. Avoid "experting" b. Summarize frequently c. Analyze important points d. Restate and rephrase
Step 4 -- Draw Conclusions	a. Stress important points b. Get group agreement c. Determine plan of action d. Point out or assign responsibilities

In summary, the success or failure of safety and occupational health rests primarily on the supervisor. Supervisors, through their daily contact with employees, are aware of the work situation and how it impacts on workers' safety and health. Your responsibility by law is, to the extent of your authority, to furnish your employees employment and a place of employment that is free from recognized hazards that are causing or likely to cause death or serious physical harm. Your safety and occupational health personnel are available to assist you.

Chapter 11
Motivation for Safe Performance

The basic problem in accident prevention is getting people to perform safely. A high degree of safety is incorporated into the design of highways, automobiles, buildings, and all types of equipment. If only we could design safety into human beings! The closest we can come to this is getting people to want to be safe.

We are constantly bombarded with appeals to buy things--clothing, cars, toothpaste. The manufacturers of these products are attempting to motivate us to buy their products. Basically, motivation from a management perspective is simply the art of getting people to want to do things your way!

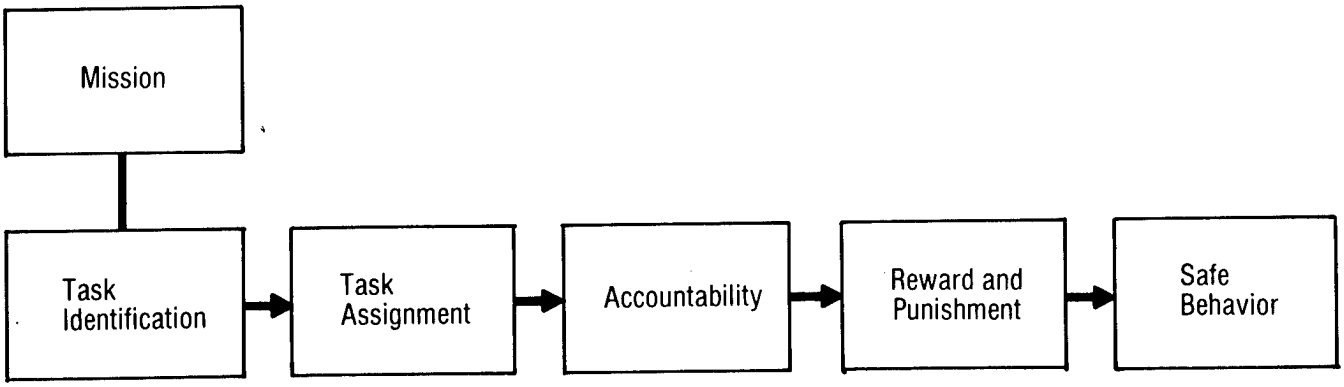
Before we can motivate, we must know the motive to which we want to appeal. A motive is "an emotional condition which arouses and directs an individual's activity." How do we appeal to motives? We do this by providing appropriate incentives--praise, reproof, rewards, participation, security--to stimulate desirable motives among people.

The distinction between needs and incentives is an extremely important one. We must recognize that although many individual needs are common to everyone--food, drink, self-preservation--each of us places different values on many other needs such as safety, respect from others, and expression of the creative urge. Some individuals have little desire for recognition while others spend most of their waking hours seeking such recognition. When we understand the nature of human needs, we can then develop incentives that will motivate the particular group or individual whose behavior or attitudes we wish to change. This leads us to the key to safety motivation--you must know the person you are dealing with and select an incentive that will appeal to one of his or her needs.

Incentives that fill basic needs common to us all can be used with confidence with all groups or individuals. However, other incentives appealing to less general needs must be selected based on an understanding of the group or individual we are attempting to influence. For example, a supervisor may recognize that the need for recognition is very high among a group of employees. A good incentive in this case would be a formal awards program recognizing safe performance. Another group may not respond well to the recognition need and may scoff at official awards; however, they may have a very high desire for acceptance by their fellow employees. In this case the supervisor should strive to develop a situation in which the group of employees, particularly the informal leaders or outstanding individuals of that group, accept the safety objectives of the supervisor. In this way those who seek to belong to the informal group will be influenced to conform to the group's support of safety objectives. Failing to do so will earn group disapproval.

Motivation is especially important to supervisors. They are the ones who must recognize and use the needs of the individuals and groups under their control by continually applying incentives that will fill these needs while inducing safe behavior.

The Motivation Model



Task Identification: Identifying task behaviors that have special safety relevance and determining acceptable levels of performance, i.e., those that result in acceptable risk levels.

Task Assignment: Ensuring that an individual responsible for a key safety behavior is fully aware of that responsibility and of the performance standards expected. See task assignment techniques below.

Accountability: Establishing the means by which a responsible individual and others can evaluate safety task performance against a standard.

Rewards and Punishment: Ensuring that achieving prescribed performance levels is reinforced and that failure to achieve prescribed levels is punished if appropriate.

Safe Behavior: Operational or management task performance based on suitable training and suitable motivation that results in acceptable risk levels.

Task Assignment Techniques

- SOPs
- Job Description
- Signs
- Training
- Safety Committee
- Verbal Order
- Command Letter
- For supervisors - Proposals of compelling logic.

Motivation in Practice

Safety Objective--Assure employees use protective equipment.

Task Definition--Establish specific areas and/or operations. Specify hard-hat areas, eye-protection areas, and noise-hazardous areas, etc.

Task Assignment--Put protective-equipment requirements into job and process SOPs. Make it a part of the job.

Task Assignment--Require use of the protective equipment as a condition of employment. The employee learns use of the equipment just as he/she learns any other aspect of the job.

Task Assignment--Train and educate users. Teach the employee why use is necessary for his/her benefit and to comply with the law. Teach him/her how to wear and properly maintain the equipment. Use sustained training to ensure he/she remembers.

Task Assignment--Ensure that equipment is readily available when needed. The man is not likely to walk 50 yards or wait 5 minutes to get a pair of goggles for a special job.

Accountability--Set the example. You must use the equipment without fail when exposed to the hazard.

Accountability--Look for violations and for proper use. Someone must monitor performance of the task.

Reward and Punishment. Praise those who use the equipment. Make them feel good for cooperating; notice them.

Reward and Punishment--Establish a schedule of automatic penalties for violations. Let all employees know you are serious.

Chapter 12
Risk Management for Supervisors

Risks are inherent in human activity. Society has devised a series of tools (or modes of behavior) to cope with risk; some of the coping takes the form of risk-reduction behavior, and some takes the form of rationalizing the acceptance of risk.

Risk management has received a great deal of attention in the recent past, especially in the Department of Defense. There is considerable interest in the estimation, evaluation, and acceptance of the various risks to which our society is exposed.

A significant societal viewpoint on risk is the discrimination our society makes between a voluntarily accepted risk and an imposed risk.

Our society is willing to let individuals voluntarily accept extraordinarily high levels of risk; thus, we tolerate, and even financially reward, the daredevil. Risks involving one in five or even higher risks of death are accepted by these individuals, and spectators pay to watch. On the other hand, society doesn't normally accept much higher than a 1 in 10,000 chance of death when risk is imposed. Risks greater than a 1 in 10,000 chance of death are normally compensated for by some sort of premium or hazardous duty pay.

This voluntary versus imposed risk is a relevant concern to the Army where many activities are undertaken only by volunteers, at least in peacetime. One problem often encountered in working with risk estimates is comparing the risk of events that occur rarely but involve extraordinary risk to events that occur frequently but involve only minimal or moderate risk.

The concept of average annual risk (AAR) of death or injury is useful in resolving this problem. The AAR assumes that what really matters to the individual is the risk of an activity over time, in this case a year. Individuals perceive that at the end of the year, it won't make any difference whether you are dead because you performed a low-risk activity many times--dead is dead. It is the chance of being dead at the end of the year that counts.

Risk is defined as an expression of potential loss stated in terms of hazard exposure, severity, and probability. The three components of risk are:

- Exposure. How many people, how much equipment--the operations requirement/job sheet is the basis of measuring scope. It identifies generally how many personnel to be exposed to what hazards for how long. This data is critical to the risk assessment process: 100 people exposed to a hazard with a 1-percent risk of injury will produce 1 injury; 10,000 people exposed to the same hazard will produce 100 injuries--a significant difference.
- Severity. What is the likely result of each event--injury, damage, or death? The accident data base is the key here. It can tell the distribution of hazard events by severity.
- Probability. The likelihood that exposure to a hazard will result in an accident.

As a supervisor, which of the three components should concern you the most? Probability, because probability is a realization of the exposure and severity of a hazard occurring. For example; compare the risk of injury from being in the classroom as contrasted to working in an ammunition plant. The severity of a building collapse contrasted to an ammunition accident is comparable. Exposure to the classroom environment (hazard) is greater than working in an ammunition plant, but the probability of an accident is low because the limitations for a building collapse are few in number and wide in scope. Conversely an ammunition plant employee has a myriad of operational limitations (hazards) with a small margin for error (scope). This speaks to the heart of the problem...Risk Management.

The Risk Management Process

1. Risk Identification
   This is risk; this isn't.

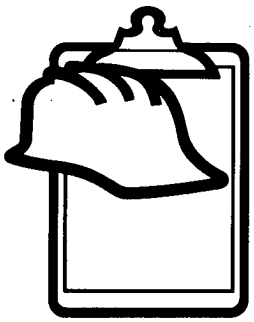
2. Risk Evaluation and Quantification
   This risk is this great.

3. Risk Reduction
   Risk can be reduced by this and this.

4. Risk Decisionmaking
   This risk we can live with; this we can't

5. Risk Decision Followup
   Is the risk and benefit as projected?

6. Risk Research
   What is the risk? What risk is essential?



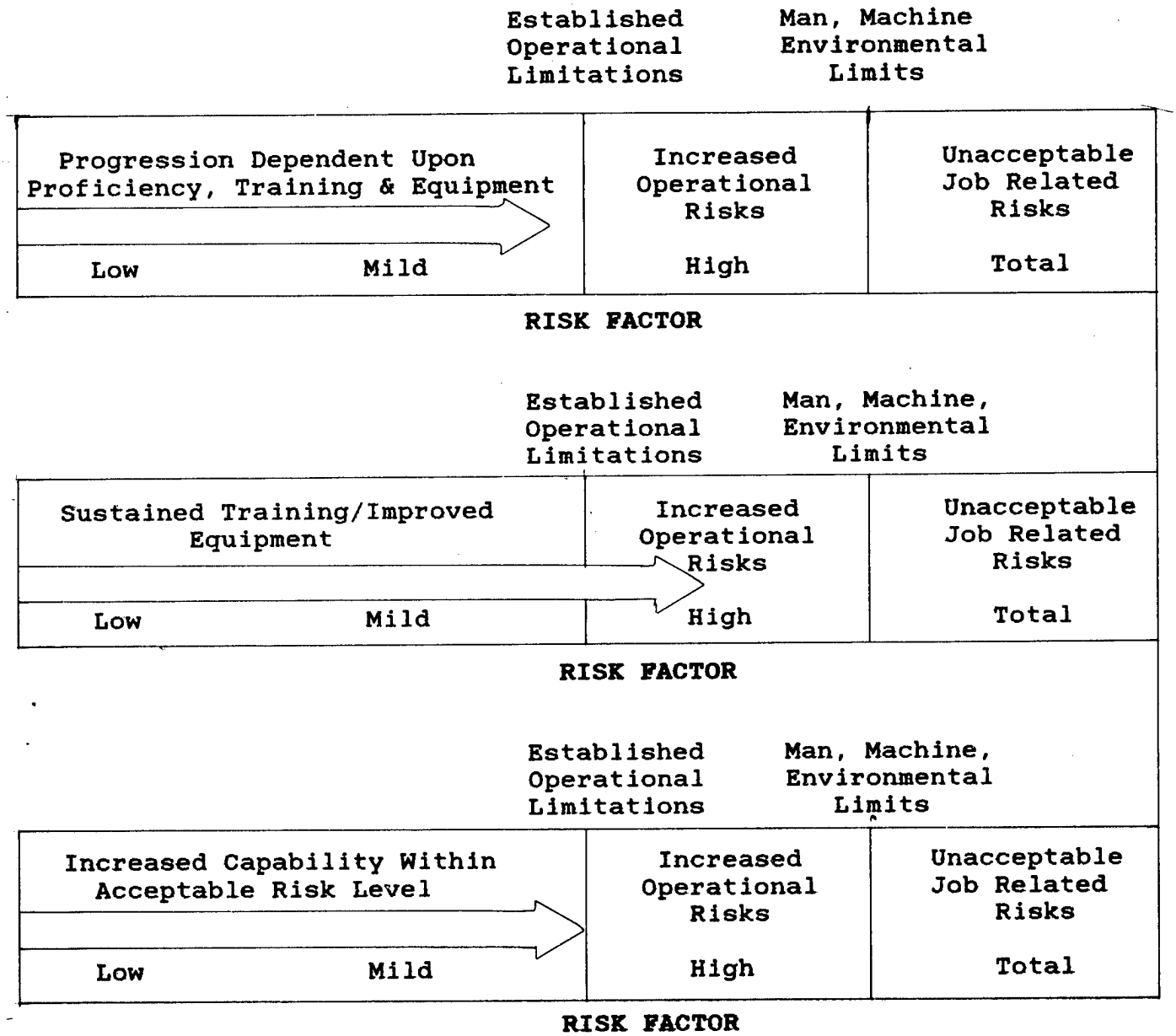
Advantages of Risk Management

- Detect risks before losses
- Quantify risk
- Provide risk reduction alternatives
- Better management decisions
- Greater integration of safety
- Increased mission capability

How do the factors of a temporary condition affect risk? During any job a number of varied factors interact continuously. For example, consider the following factors for a specific situation:

- Physical - Individual endurance considerations.
- Psychological - Stress, external factors, and apprehension.

The six possible accident scenarios:
(1) Environment
(2) Materiel
(3) Proficiency
(4) Inadequate training
(5) Wrong course of action
(6) Blatant disregard of established procedure



- Rules, regulations, and procedures.
- Materiel failure - Currently 5 percent of accidents are attributed to failure of materiel-related items.

- Environment - Natural phenomena such as ice and poor visibility.
- Specific situation - Day driving/night driving, etc.

The more factors that are added to a temporary condition and the more these factors exceed the limitations intended, the more an accident is likely to result. Thus, in the situation above, day driving versus night driving; more factors enter into the picture to consider. This action is called risk assessment.

Risk assessment. There are no hard and fast rules for assessing risk. For the most part, risk measurement is a subjective assessment of hazards. Risks may be assessed by first measuring the various risks, combining their values, then making a value judgment of what safety precautions are appropriate. By adding the values together, the supervisor can determine whether a proposed task falls within acceptable risk limitations. He then has the option to take action to reduce the risk. He has the flexibility in planning and executing and can reduce the probability or severity of an accident. As a minimum, he will become aware that he is functioning in a variable risk environment.

The overall increase in the level of risks puts greater demands on risk managers and supervisors to first minimize the risks inherent in an operation and secondly, to reconcile inherent risks with essential job needs. Risk management is the term used to describe the systematic process for doing this. By applying this process, safety and job never conflict; rather they are balanced at a point, producing optimum overall benefit to the organization. The risk management process begins by clearly defining job requirements and then establishing acceptable risk factors. This is done by identifying risks associated with job operations and weighing them against benefits to be gained. The key is not accepting preventable risks. Preventable risk is risk that can be reduced or eliminated by establishing operational limitations within the constraints of existing resources and technology without unacceptable impediment of the job. Operational limitations can be tailored by controlling the variables affecting the job; for example, illumination levels, time standards, weather criteria, etc. Beyond these limitations, the risk level is an unacceptable job-related risk.

	Established Operational Limitations	Man, Machine, Environmental Limits
Job Requirements Within Acceptable Risk Level	Increased Operational Risks	Unacceptable Related Job Risks
Low Mild	High	Total

RISK FACTOR

Let's now discuss the risk management concept payoff. Based on job requirements, acceptable risk levels are established. As organization proficiency increases due to improvements in equipment, operations within the green area of acceptable risk are expanded. Improved technology provides an improved balance of risk. This improved capability will then allow the organization to expand operations into the high-risk zone, beyond the operational limitations previously set for normal operations. Penetration into this zone of increased risk is knowingly and carefully done for a clearly predetermined benefit essential to job accomplishment. The further into the zone, the greater the risk, which in turn demands a high level of risk management decision, more careful planning, and more stringent consideration of any controllable variables.

The level of the decision maker should correspond to the level of the risk. The greater the risk, the more senior the final decisionmaker should be. When in the high-risk zone, everyone from management to supervisor must be aware of the risk implications. By-the-book disciplined operations are mandatory. All controllable risk variables must be controlled.

Where we get into trouble from an accident standpoint is when management has not clearly established operational limitations within acceptable risk levels, and individuals must decide for themselves the level of risk they will accept; also, in those cases where vehicle and machine operators willfully and knowingly violate established limitations and exceed risk levels.

Carefully planned operations in the high-risk zone based on risk management decisions will give managers and supervisors an increased operational capability within acceptable risk levels. The risk management approach gives managers and supervisors as much capability as possible with the least amount of potential risk. However, the level of capability must be realistically assessed based on job requirements. If the organization job does not require the capability that would be gained from operating in the higher-risk zone, the manager and supervisor can cash in his improved proficiency as a result of sustained improvements in equipment for a higher margin of safety within the previously established levels of risk acceptance.

In conclusion, the problem is not one of choosing between the job and safety. We have no such choice to make. By the same token, if we are to conserve lives and resources so that we can perform our job, WE MUST HAVE SAFETY.

Chapter 13
Safety and Occupational Health Advisory Committees or Councils

Why have a group do something that can be done by one person? Pulling key people away from their duties to perform a job that can be done by one person would certainly be inefficient. The point is--the Safety and Occupational Health Officer or supervisors cannot operate the safety and health program by themselves. People can be ordered or compelled to do things up to a point, but the best way to get them to accept something is through PARTICIPATION.

The organization Safety and Occupational Health Advisory Committee is a medium for achieving this participation. No one person can be expected to possess the vast amount of diversified knowledge required to know all the safety and occupational health measures for all the jobs, operations, and activities in an organization. A properly organized safety committee has this varied knowledge. Management may appoint safety and occupational health advisory committees in accordance with AR 385-10.

Functions

The Council's functions are mainly to: make recommendations to the commander and perform safety and occupational tasks directed by the commander or chairperson; address on-the-job personnel safety, health, workers' compensation matters, and other safety and occupational health concerns; share members' diversified knowledge to assist safety and occupational health officers and supervisors in reviewing safety and health problems, developing means to solve these problems and converting these methods into action for safety and health; and, devise recommendations concerning safety and health policy that safety and occupational officers and supervisors can refer to management for approval.

Organization and representatives

The size of safety and occupational health councils will depend on the size of the unit and the number and variety of jobs, operations, and activities in the organization. Membership of these councils shall include representatives of appropriate functional areas (line and staff supervision): safety, occupational health, fire prevention, traffic control personnel, environment coordinator, facility engineering, FECA administrator, recognized labor organizations, etc. No more than one member should be selected from any area or activity; for example, one member from the transportation office, one member from supply. Collectively, the members of the council should represent all, or nearly all, activities in the organization. Safety and health representatives and selected supervisors serving as council members provide data on hazards and accidents and information regarding new developments in accident prevention and present safety problems for consideration by the councils.

Selection of committee members. Management should select the committee members. Safety and occupational health representatives should develop a list of names from which management can make selections. The deciding factors when selecting individuals should be interest in safety problems and leadership ability.

Frequency of safety committee meetings. To ensure appropriate status, safety and occupational health committees should meet on a regular schedule. If meetings are called on a haphazard basis, committee members and organization personnel may feel that the meetings are not really important. There should be at least one meeting every 3 months. In addition to regularly scheduled meetings, special meetings should be called when critical and urgent safety problems arise. "Striking while the iron is hot" is of great value. For example, a meeting to discuss the development of a safety campaign dealing with electrical hazards should be called immediately after the occurrence of an electrical fire.

Preparing for committee meetings. Safety and occupational health representatives should prepare a detailed agenda for each committee meeting well in advance of the date set for it. Sufficient information should be included to show the extent of the problem, the need for doing something about the problem, and suggested approaches to solving the problem. These facts are the foundation for discussion during the meeting.

Results of committee meetings. The unit safety and occupational health representative is responsible for recording the pertinent points coming out of the committee meetings. Councils shall publish the minutes of the meetings. These ideas should then be used as the basis for developing safety and health promotion campaigns. The results of the safety campaign should also be documented and presented to committee members for further discussion at the next meeting. Such information is necessary in determining whether the campaign achieved its objective; whether it should be continued or terminated; whether it was successful, and if so, the extent of its success. Each committee decision requiring action should include designation of the individual or group that is to take the action.

Safety meetings

Safety meetings should be held periodically within each activity group in the organization. The safety and occupational health committee member in the specific activity should act as chairman of the safety and health meeting. He or she can bring to the attention of all personnel involved in the activity the facts and information discussed at the safety and occupational health committee meetings and can motivate personnel to participate in the safety campaigns promoted by the committee.

Chapter 14
Safety Inspections

The purpose of the safety inspection is to eliminate accident causes through specific, methodical procedures. An adequately planned safety inspection will--

- Detect specific unsafe conditions that may cause accidents.
- Detect unsafe practices or acts such as operating equipment without authority or at unsafe speeds, unsafe handling of materials, and using improper personal protective equipment.
- Highlight the need to specific safeguards for men and machines.
- Help to sell safety program to personnel.
- Encourage employees to inspect their own work areas and work practices.
- Allow safety personnel personal contact with other department or unit personnel.
- Detect deficiencies in the management of the safety program itself.

A safety inspection has a two-fold function; to determine what is being done right and what is being done wrong. Specifically, safety inspections are concerned with condition of work areas, condition of equipment, personnel practices, and job procedures.

Safety inspections require competent inspection personnel, definite schedules regarding what to inspect and how frequently, adequate systematic procedures (an inspection checklist), effective supervision, and followup to assure that conditions have been corrected. Safety inspections are usually conducted by qualified specialists, supervisors, safety officers, NCOs, or maintenance personnel. However, inspection committees may be formed to increase participation and to ensure that the inspections are comprehensive in their coverage. The installation safety manager is responsible for training unit safety personnel and supervisors in inspection techniques.

Types of inspections

- Continuing and routine inspections are performed by the supervisor and may be performed by a safety representative. Each activity requires periodic safety inspections. These inspections, which might be termed "quality control," are maintained to discover conditions, procedures, and practices that, if allowed to exist, might cause accidents. Special targeted hazards may be scheduled; i.e., wearing safety glasses one month; using machine guards the next month. The installation safety office and preventive medicine activity are available to provide assistance if necessary.
- Standard Army Safety and Occupational Health Inspections (SASOHI) are performed at least annually using SASOHI procedures. Facilities and operations involving special hazards will be inspected more frequently as determined by qualified installation safety and occupational health officials. These inspections are normally performed by a safety representative from the installation safety office, but inspections of low-hazard areas may be performed by

supervisory personnel. Inspection personnel will notify appropriate union representatives to participate in inspections.

- Special or command one-call inspections are made by a safety representative from a higher echelon of command. The purpose of this type of inspection is to appraise the safety performance of the unit or department to determine areas where improvement is needed and to present these facts to the commander or directorate head.
- DA MACOM safety evaluations are conducted every 2 years.

These inspections are of particular importance when changes are being made in an activity's mission or operations. The following factors should be considered in establishing an effective continuing safety inspection system.

- Development of a list of the areas to be inspected.
- Establishment of a schedule for periodic checks of each piece of equipment, operations, or activity to be inspected.
- Assignment of qualified personnel to conduct the inspection.
- Maintenance of a file for reports, records, and forms required for inspections.
- Development and use of procedures for channelling recommendations for corrective action.

All areas must be inspected annually, but inspections may be conducted more frequently as required by local directives.

Preparing for a safety inspection

In planning safety inspections, activities presenting the greatest accident potential and those activities having the highest accident frequency should be inspected most frequently. This requires maintaining an up-to-date accident analysis record.

Scheduling inspections should ensure the most effective use of safety personnel and time. Consideration must be given to inspecting an activity so that normal operations will be disrupted as little as possible. Inspections may be conducted with or without prior notice. No-notice inspections will provide a significantly more meaningful assessment of actual operating conditions and practices. Appropriate representatives of civilian employees and recognized employee organizations should be notified when management receives prior notice of an inspection.

Developing a checklist as an inspection guide, while not required, can prove very helpful.

Special inspections should be conducted to cover installation of new equipment, establishment of new procedures, relocation or revision of operations, and after an accident to ensure adequacy of corrective actions.

Resulting recommendations and their safety value must be related to the mission of the organization. Findings should be made available to appropriate supervisors and pertinent safety personnel.

Conducting a safety inspection

Hazards are any of the many unsafe acts or conditions that can lead to accidents. To prevent accidents we must find hazards and

their causes and eliminate or control them. There are three basic ways to inspect for hazards:

- Spot checks.
- Mandatory annual inspection.
- Job hazard analysis.

The spot check technique enables safety representatives and supervisors to integrate the search for hazards into their everyday activities. Spot checks consist of the following steps:

- Decide to make an observation.
- Look for any improper or unsafe acts, procedures, or conditions.
- Correct any operating errors you see through the responsible supervisor, then seek ways to prevent its recurrence.
- Report the problem and make a record of it for followup by appropriate supervisor, safety representative, or higher level safety channels if appropriate.

A key duty of the supervisor is to spot check to find unsafe acts and unsafe conditions that have accident-causing potential. Efforts should be focused on the activities and operations that higher headquarters have singled out as priority problems.

Continuing and periodic inspections provide a search for hazards and a review of procedures, hazard control requirements, contingency plans (i.e., emergency evacuation, severe weather), and program status. There are four important stages in conducting effective inspections:

a. Targeting.
b. Reviewing the checklist.
c. Executing the inspection.
d. Correcting the problem.

Targeting focuses the inspection effort on the places and operations that have been found to be the causes of the most serious accident prevention problems. Once the priority areas are identified, a logical inspection procedure should be developed using a checklist to aid the memory. Including references to the pertinent publication on the checklist is also very helpful.

Once the inspection has been made, it is important to promptly follow up on each problem area revealed. Remedial action such as facility engineer work orders, contact with the installation safety office, self help, and special training should be started as soon as possible.

Job hazard analysis

Job hazard analysis is a technique that has been used successfully to ensure safe operations. The job hazard analysis is a job-oriented, analytical tool that determines for a single job the major hazards and their probable outcomes. Remedies are then prescribed. Forms are used to document findings and provide continuity. Advantages of using this technique include the following:

- It is systematic and thorough.
- It provides a permanent record of the safety situation for a specific job.

• It produces a protective equipment list and step by step procedure to complete a job safely.

Inspection records

During an inspection unsafe conditions and practices should be recorded. The record should contain the date, type of inspection, detailed account of items that failed inspection, and recommendations made for correcting those deficiencies.

A copy of the most recent inspection will be retained. Recommendations based upon the inspection should be followed up until the conditions have been corrected or decisions have been made indicating no action will be taken.

Hazard classification

Hazards will be classified based on their severity and potential for causing injury and/or property damage. Hazard severity and accident probability are described and defined in the following tables. These tables are taken from draft AR 385-10.

Table 14-1.--Hazard Severity

Category:	I
Description:	Catastrophic
Definition:	Death or permanent total disability system loss; major property damage
Category:	II
Description:	Critical
Definition:	Permanent partial disability or temporary total disability in excess of 3 months; major system damage; significant property damage
Category	III
Description:	Marginal
Definition:	Minor injury, lost workday accident or compensable injury or illness; minor system damage; minor property damage
Category:	IV
Description:	Negligible
Definition:	First aid or minor supportive medical treatment; minor system impairment

Table 14-2.--Accident Probability

Description:	Frequent
Level:	A
Individual item:	Likely to occur frequently (once per month) in life of system, item, facility, etc.
Fleet or inventory:	Continuously experienced
Description:	Probable
Level:	B
Individual item:	Will occur several times in life of item
Fleet or inventory:	Will occur frequently
Description:	Occasional
Level:	C
Individual item:	Likely to occur sometime in life of item
Fleet or inventory:	Will occur several times
Description:	Remote
Level:	D
Individual item:	Unlikely but possible to occur in life of item
Fleet or inventory:	Unlikely, but can reasonably be expected to occur
Description:	Improbable
Level:	E
Individual item:	So unlikely it can be assumed occurrence may not be experienced
Fleet or inventory:	Unlikely to occur, but possible

Table 14-3.--Risk Assessment Code Matrix

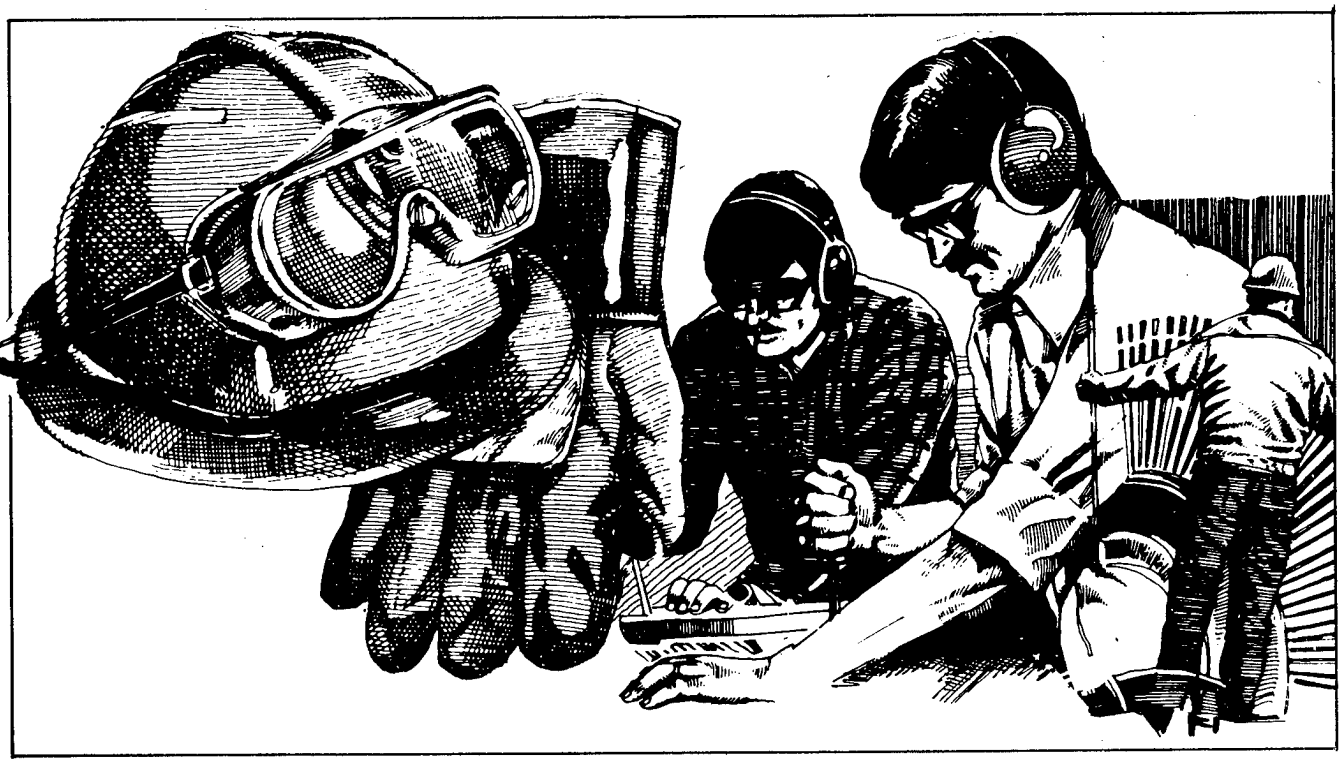
Hazard severity	Accident Probability A	B	C	D	E
I	1	1	2	3	5
II	1	2	3	4	5
III	2	3	4	5	5
IV	3	4	5	5	5

Chapter 15
Personal Protective Clothing and Equipment

Personal protective equipment (PPE) is the "last report" type of controls, only to be used where engineering controls cannot be instituted. Protective devices are also extremely important as a second line of defense against inadvertent or unexpected conditions. A maximum level of protection is required when the risk of exposure and the degree of hazard are unknown. Example: An employee dons a full-face airline respirator during the repair of a streamline suspected of containing asbestos. The employee does not expect that he will need this equipment; however, if asbestos is present, he is prepared and protected.

The user of personal protective equipment must be aware that the equipment does not eliminate the hazard. If the equipment fails, exposure will occur. To reduce the possibility of equipment failure, it must be properly fitted and maintained in a clean, serviceable condition.

Handing a man a respirator and telling him to use it is not only an ineffective technique but can be very dangerous. Using protective equipment requires hazard awareness and training on the part of the user. Selection of proper protection for a specific task or operation is extremely important. Equipment limitations and purpose must be considered in the selection process. Additionally, personnel requiring protection must be fitted with proper equipment. Under no circumstance should PPE be modified or removed even if uncomfortable. More times than none, equipment that is uncomfortable does not fit properly.



Matrix tables 15-1 through 15-4 prescribe PPE that some occupational specialties may require. Refer to OSHA standards collected in Title 29, Code of Federal Regulations 1910, for specific application of the appropriate PPE for the specific task.

Recommended References:

- DA Pam 385-3: Protective Clothing and Equipment
- Guidelines for Selection of Chemical Protective Clothing, American Conference of Governmental Hygienists
- Title 29, CFR 1910 - OSHA Standards

TABLE 15-1.--Protective Clothing and Equipment--DEH Supervisors

	Protection							
DEH Job Titles	Eye/ Face	Foot	Respiratory	Hand	Hearing	Body/ Torso	Head	From Falls
Ch, Environ-mental	*	*		*		*		
Ch, Bldgs and Grounds	*	*			*	*	*	
Ch, Carpentry/ Paint	*	*		*	*			
Ch, PM/Cust	*	*		*	*			
Ch, Metal Working	*	*		*	*			
Ch, Roads/RR	*	*		*	*	*	*	
Ch, Gnds Maint	*	*	*	*	*	*		
Ch, Pest Control	*	*	*	*	*	*		
Ch, Biologist	*	*	*	*	*	*		
Ch, Electric	*	*			*	*	*	
Ch, Electric Ext Elect Mt Ch, Sanitation A-16	*	*		*		*	*	*
Ch, Mech/Boiler Plant (1)	*	*		*	*	*		
Ch, Mech/Plumb-ing Steamfitting	*	*	*	*	*	*	*	
Ch, Utilities/ Ref/AC/Heat	*	*		*	*	*	*	
Ch, P&P	*	*	*	*	*	*	*	
Ch, P&D, Fire Station	*	*	*	*	*	*	*	
Ch, Housing	*							
Ch, Forestry	*	*		*	*			
Ch, Supply/ Storage	*	*		*				

NOTE: (1) Air-supplied respiratory equipment required.

TABLE 15-2.--Protective Clothing and Equipment--DEH Workers

DEH Job Titles	Protection							
	Eye/ Face	Foot	Respiratory	Hand	Hearing	Body/ Torso	Head	From Falls
Environmental Engineer	*	*		*		*		
Engineer	*	*			*	*	*	
Technician								
Painter	*	*	*	*	*	*		
Mason	*	*	*	*	*			
Plasterer	*	*	*	*	*			
Carpenter	*	*		*	*			
Sheet Metal Worker	*	*		*	*			
Motor Vehicle Operator	*	*		*	*	*	*	
Crane Operator	*	*		*	*	*	*	
Tractor Operator	*	*	*	*	*	*		
Gardener	*	*	*	*	*	*		
Pest Controller	*	*	*	*	*	*		
Biologist	*	*	*	*	*	*		
Eng Equip Oper	*	*	*					
Electrician	*	*		*		*	*	
Boiler Plant Oper	*	*		*	*	*		
Util Sys Rep Oper	*	*		*	*	*		
Phy Science Tech	*	*		*	*	*		
Pipefitter	*	*	*	*	*	*	*	*
Equip Mech	*	*	*	*	*	*	*	
Plumber	*	*	*	*	*	*	*	
Welder	*	*	*	*	*	*	*	
AC Equip Mech	*	*		*	*	*	*	
Heating Equip Mech	*	*		*	*	*	*	
Firefighter	*	*	*	*	*	*	*	
Warehouse Worker	*	*		*				
Forestry Tech	*	*		*	*	*		

TABLE 15-3.--Protective Clothing and Equipment--DIO Supervisors

DIO Job Titles	Protection							
	Eye/ Face	Foot	Respiratory	Hand	Hearing	Body/ Torso	Head	From Falls
Ch, Maint, Tac Wheel	*	*		*	*			
Ch, Maint, Stockroom (no supervisor)								
Leader, Maint, Spec Purp	*	*		*	*	*		
Leader, Maint, Weapons Opt Inst								
Rep Ldr	*	*						
Arty Rep Ldr	*	*		*	*	*	*	
Trainfire Tgt Ldr	*	*			*			
Leader, Maint, Com Veh	*	*		*	*	*		
Leader, Maint, QA	*	*			*	*		
Leader, Maint, Allied Trades								
Mach Ldr	*	*		*	*			
Welder Ldr	*	*		*	*	*		
Mgr, Sup/Svcs, Ammo		*		*				
Sup/Svcs, CIF (no chief)								
Sup/Svcs, Storage (no chief)								
Sup/Svcs, Nonperishable (TISA)	*							
Ldr, Sup/Svcs, Perishable (TISA)		*		*			*	
Ch, Trans, Rail/Tml Whse		*		*	*	*		
Ch, Trans, Maint	*	*			*			
Foreman, Exhb Mod Maker	*	*		*	*			
Leader, Commissary, Meat Dept	*	*		*	*	*		
Safety Mgr	*	*			*		*	
Mgr Bowling Alley		*			*			

TABLE 15-4.--Protective Clothing and Equipment--DIO Workers

DIO Job Titles	Protection							
	Eye/ Face	Foot	Respiratory	Hand	Hearing	Body/ Torso	Head	From Falls
Warehouse Forklift Op	*	*		*				
Autmv Mech	*	*		*	*			
Btry Repair	*	*		*	*	*		
Hvy Mol Eq Mech	*	*		*	*	*		
Arty Rep	*	*		*	*	*	*	
Trainfire Tgt Rep	*	*			*			
Radiator Repairman	*	*	*	*	*	*		
Fuel Dist Sys Worker	*	*		*	*			
Mat Sorter/ Class	*	*		*	*			
Brakeman		*		*	*	*		
Petrol Stor Sp	*	*		*	*			
Electronic Tech	*	*			*			
Telephone Mech	*	*		*	*	*	*	*
Cable Splicer	*	*		*	*	*	*	*
Telephone Lineman	*	*		*	*	*	*	*
Property Disp Spec	*	*		*	*	*	*	
Proj Equip Repair	*	*						
Woodcrafter	*	*		*	*			
Sign Painter	*	*		*	*	*		
Exhb Mod Maker-Metal	*	*		*	*	*		
Exhb Mod Maker-Plastics	*	*		*	*			
Laborer	*	*		*			*	
Maint Worker	*	*		*			*	
Meat Market Worker	*	*		*	*	*		
Training Inst (Auto)	*	*		*	*	*		
Training Inst (Woodworking)	*	*			*			
Vet Animal Tech				*		*		

Table 15-5.--Recommended Eye and Face Protection

Operation	Hazard	Protector
Acetylene welding	Sparks, flying particles, molten metal	Welding goggles
Buffing and grinding	Flying particles	Spectacles, goggles
Chemical Handling	Splash, acid burns, fumes	Goggles, face shield
Chipping	Flying particles	Spectacles, goggles
Electric welding	Sparks, intense rays, molten metal	Welding helmet
Furnance operations	Glare, heat, molten metal	Welding goggles, face shield
Laboratory	Chemical splash, glass breakage	Goggles, face shield with spectacles
Machining	Flying particles	Spectacles, goggles
Molten metals	Glare, heat, spark, splash	Welding goggles
Visiting	Flying particles	Spectacles

Adapted from United States Department of Labor, Occupational Safety and Health Administration, III, Construction Standards and Interpretations, p. 39.

Table 15-6.--Guide for Selection of Respirators

HAZARD	RESPIRATOR
Oxygen deficiency	Self-contained breathing apparatus. Hose mask with blower. Combination air-line respirator with auxiliary self-contained air supply or an air-storage receiver with alarm.
Gas and vapor contaminants immediately dangerous to life or health.*	Self-contained breathing apparatus. Hose mask with blower. Air-purifying, full facepiece respirator with chemical canister (gas mask). Self-rescue mouthpiece respirator (for escape only). Combination air-line respirator with auxiliary self-contained air supply or an air-storage receiver with alarm.
Gas and vapor contaminants immediately dangerous to life or health.	Air-line respirator. Hose mask without blower. Air-purifying half-mask or mouthpiece respirator with chemical cartridge.
Particulate contaminants not immediately dangerous to life or health.*	Self-contained breathing apparatus. Hose mask with blower. Air-purifying, full facepiece respirator with appropriate filter. Self-rescue mouthpiece respirator (for escape only). Combination air-line respirator with auxiliary self-contained air supply or an air-storage receiver with alarm.
Particulate contaminants immediately dangerous to life and health.	Air-purifying half-mask or mouthpiece respirator with filter pad or cartridge. Air-line or respirator. Air-line abrasive-blasting respirator. Hose mask without blower.
Combination gas, vapor, and particulate contaminants immediately dangerous to life and health.*	Self-contained breathing apparatus. Hose mask with blower. Air-purifying, full facepiece respirator with chemical canister and appropriate filter (gask mask with filter). Self-rescue mouthpiece respirator (for escape only). Combination air-line respirator with auxiliary self-contained air supply or an air-storage receiver with alarm.
Combination gas, vapor, and particulate contaminants not immediately dangerous to life or health.	Air-line respirator. Hose mask without blower. Air-purifying, half-mask or mouthpiece respirator with chemical cartridge and appropriate filter.

*"Immediately dangerous to life and health" is defined as a condition that either poses an immediate threat to life and health or an immediate threat of severe exposure to contaminants such as radioactive materials, which are likely to have adverse effects on health.

Source: U.S. Department of Labor, OSHA, Vol. III, Construction and Interpretation, p. 41.

TABLE 15-7.--Selection of Shade Numbers for Welding Filters

Welding Operation Shielded metal-arc welding	Suggested Shade Number
Shielded-metal-arc welding	
1/16-, 3/32-, 1/8-, 5/32 - diameter electrodes	10
3/16-, 7/32-, 1/4 - diameter electrodes	12
5/16-, 3/8 - diameter electrodes	14
Gas-shielded arc welding (nonferrous)	
1/16-, 3/32-, 1/8-, 5/32 - diameter electrodes	11
Gas-shielded arc welding (ferrous)	
1/16-, 3/32-, 1/8-, 5/32 - diameter electrodes	12
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding	
up to 1/8-inch	4 or 5
1/8-to 1/2-inch	5 or 6
over 1/2-inch	6 or 8

Source: U.S. Dept. of Labor, OSHA, Vol. III, Construction Standards and Interpretations, p. 40.

Chapter 16
Maintenance Activities

Accidents and injuries in maintenance activities get little attention and often little in the way of prevention because, looked at individually, they often seem to be isolated "bad luck" events. But looked at collectively, these accidents and injuries represent a big loss to the Army.

On-duty personnel injuries accounted for 12,500 of the more than 22,000 Army accidents in one 12-month period, 33 of the 438 deaths, and $33 million of the $218 million total cost. Almost one out of five of the on-duty personnel injuries happened to people performing maintenance activities. Accidents during maintenance activities are second only to combat soldiering activities in producing on-duty injuries to soldiers and are the number one producer of on-duty injuries to civilians.

Maintenance accidents, which have risen over the past 5 years, are a prime target when developing prevention programs because prevention of these accidents represents such a big payoff in combat readiness.

A study was made of selected Army maintenance accidents that occurred in wheeled and tracked vehicle facilities. These selected maintenance accidents involved on-duty soldiers and civilians injured while installing, removing, or modifying equipment.

Top Four Accident Causes

The study revealed that four factors are causing most of the accidents.

- Failure to follow procedures.
- Inadequate supervision.
- Inadequate written procedures.
- Insufficient or no unit training.

Top Seven Maintenance Problem Areas

Problem areas accounting for the largest portion of the accidents in maintenance facilities involve the following:

- Improper use of tools and equipment.
- Improper lifting.
- Hazardous actions.
- Inadequate security and inspection of equipment.

- Inadequate communication.
- Inadequate housekeeping.
- Failure to depressurize or disconnect components or equipment.

Vehicle/equipment Operations

Another problem area in maintenance units is vehicle operations. Because mechanics must operate the vehicles and equipment they maintain, maintenance personnel have the same problems as other AMV users. Common causes of vehicle accidents in maintenance units are:

- Inadequate driver training.
- Speeding.
- Fatigue.
- Following too closely.
- Improper ground guiding.

Accident Prevention Planning

Management must take the initiative in making safety just as much a part of being a mechanic as troubleshooting vehicles. How can you do this in your organization?

Identify the problems. Find out what causes the most injuries in organizations. Do this by answering the following questions.

- What kinds of accidents happen?
- How often do they happen?
- When do they happen?

Analyze the problems. Find the "why" behind the accident. For example, if a worker is injured while using a lifting device, it's not enough just to blame the accident on his failure to inspect the device before use. You have to find out why he didn't inspect it. Ask yourself the following:

- Was the injured worker trained in all SOPs?
- Were SOPs routinely enforced?
- Had the worker received training in the task he was performing when he was injured?
- Were all MWOs checked for compliance?
- Was the appropriate device used?

Prevent the problems. Determine what you can do as a superivsor to prevent the problems. Here's a short list of ideas to get you started.

- Ensure all personnel receive training on the contents of SOPs.
- Require workers to follow SOPs.
- Give additional training on nonroutine tasks.
- Cross-train mechanics.
- Train mechanics to take extra care with tasks that have a higher hazard.

Safe operations don't just happen. They result from careful planning. Develop your plan and put it to work. Then constantly analyze it. See how your mechanics respond to it. See if it reduces or gets rid of your safety problems. If it does, keep refining it to make it even more effective. If it doesn't, try a new plan. But in any case, remember--your safety plan should not be just temporary. Write it down and distribute copies to management. Keep it working.

Sample Prevention Plan

Problem. A maintenance company was losing a lot of work-hours to hand/finger injuries and back and abdominal strains. The mechanics were receiving these injuries during tactical exercises while changing large vehicle tires.

Analysis. Unit leaders found these accidents were caused by a combination of factors, not just one. Their analysis revealed that--

- The mechanics had a heavy workload.
- Eleven mechanics had been in the unit for less than 6 months.
- An unnecessary rush was placed on all maintenance practices while in a field environment.

Prevention plan. Unit leaders developed the following plan to solve the problem. The plan was to be given a trial during the next field exercise to see if it reduced mechanic injuries. If it did, it would be refined to improve results; if it didn't, a new plan would be developed.

- Increase training for mechanics on installation and removal of large vehicle tires.
- Train additional personnel (PLL clerks, TAMMS clerks, administrative personnel) to assist in the installation/removal of large vehicle tires.
- Prioritize field maintenance requirements to provide assistance to mechanics performing heavy lifting duties.
- Conduct training on proper lifting techniques and require two or more personnel to lift large tires.
- Provide safety equipment (gloves) to unit personnel and require their use during all lifting.
- Adopt a new approach to tactical training that stresses overall mission completion, not just the length of time it takes.
- Present awards to the maintenance section with the greatest contribution to the mission. Selection will consider injury rates as well as tactical skill.

TOP FOUR CAUSES OF MAINTENANCE ACCIDENTS

1. Failure to follow procedures

Shortcutting or disregarding established work procedures is the most frequent cause of accidents during installation, removal, and modification jobs. Mechanics may knowingly fail to use correct procedures because they are in a hurry to get the job done, because they do not understand the reasons for the work rules and the potential for injury, or because of a lack of supervision.

Using the wrong tools--lengths of pipe as extensions to increase leverage, screwdrivers as chisels, or hammers that are too heavy--is a common cause of maintenance accidents.

It's not enough to just write manuals and SOPs. They must be enforced. A "just get the job done and fast" attitude leads to taking shortcuts and accidents, injuries, and damaged equipment. It also produces a job that is neither "done" nor "fast." Many accidents happen when mechanics perform routine jobs that seem too simple to bother with safety precautions.

Actions to take: Supervisors--

- Require strict compliance with safe work procedures no matter how routine the task.
- Make sure all maintenance is done by the book.
- Allow no shortcuts and watch for unsafe acts and violations of procedures.
- Take promptly disciplinary action to correct violators.

2. Poor supervision

Frequently, supervisors do not fulfill their responsibilities. They permit the use of unsafe or incorrect procedures, allow shortcuts or fail to closely monitor personnel. Poor supervision is the result of management failure to take positive action when supervision breaks down.

All the written procedures in TMs and SOPs won't prevent a single accident unless the procedures are practiced. And they won't be practiced unless supervisors insist on it.

Actions to take: Supervisors--

- Be held accountable for your own unsafe actions as well as those of your subordinates.
- Ensure personnel are properly trained, then demand they do the job right.
- Set a good example of professionalism, competence, and safety discipline.
- Insist on compliance with established work procedures no matter how routine the job.
- Require the use of the right tool for every job.
- Make sure protective equipment is available and worn.
- Use only qualified personnel for maintenance jobs.
- Set realistic time goals. Place more emphasis on safe, correct performance than on meeting work deadlines.

3. Lack of written procedures

Insufficient written procedures show up in poorly written standing operating procedures and in vehicle technical manuals. This lack consists mainly of absent or incomplete procedures for certain maintenance tasks. SOPs are not periodically reviewed to keep them current. Failure to submit DA Form 2028: Recommended Changes to Publications and Blank Forms permits deficiencies in technical manuals to go uncorrected.

Voids in written procedures in manuals can be remedied using DA Form 2028 to submit recommended changes to publications. This is necessary if procedural steps are omitted or if a task is omitted.

Actions to take: Supervisors--

- Ensure all personnel know how to complete DA Form 2028.
- Supplement TM guidance with unit SOPs.
- Use safety information in DA Pam 750-35 as sample for organization maintenance SOP.
- Include requirements for personal protective equipment in SOPs.
- Review SOPs regularly to ensure they contain specific guidance

about the organization's maintenance tasks and ensure SOPs are updated periodically.

- Pay special attention to use of tools and equipment, communication, lifting, security and inspection of components, hazardous actions, depressurizing, and housekeeping.
- Spend time training and helping mechanics who may not have the experience or expertise to perform jobs safely without guidance.
- Use the safety checklist available from the local safety office or the maintenance safety checklist in DA Pam 385-1.

4. Insufficient or no organization training

Mechanics are often assigned jobs for which they either are not trained or have received insufficient training. This occurs when supervisors do not correctly assess training needs and develop and conduct training programs. Insufficient management emphasis on training increases this problem.

Actions to take: Supervisors--

- Assess training needs.
- Develop appropriate training programs.
- Conduct these programs.
- Hold refresher classes to update and strengthen training on maintenance tasks.
- Conduct training on organization SOP requirements.
- Have manuals and needed equipment and tools available.

TOP SEVEN MAINTENANCE PROBLEM AREAS

1. Improper use of tools and equipment

Hand tools

Most technical manuals specify the correct tool(s) for the job. TM 9-243, the manual on the care and use of hand tools and measuring tools, contains excellent safety information. But it takes more than manuals to use hand tools safely. It takes:

- Training
- Supervision
- Self-discipline

Management and team leaders train and supervise their personnel. Self-discipline results when a person knows how to do a job, knows the consequences of not following established procedures and is motivated to perform safely.

Four common, everyday tools--wrenches, hammers, pliers, and screwdrivers--cause a lot of maintenance injuries. Supervisors can:

- Require strict adherence to correct procedures.
- Ensure technical manuals are available and used.
- Discuss safety of hand tools.

Personal protective equipment

Protective equipment--safety goggles, gloves, shoes, and helmets--can do its job only if it is used. Too often protective equipment is not worn because the mechanic is in a hurry, doesn't see the need to wear it, or doesn't know it should be worn. Supervisors often do not ensure the equipment is available, or they knowingly allow maintenance personnel to do their jobs without wearing it.

One of the keys to eliminating on-the-job injuries is correct and consistent use of personal protective equipment. Some supervisors consider minor on-the-job accidents as routine, everyday occurrences that are to be expected. But in organizations where the use of personal protective equipment is considered routine, accidents are not.

Actions to take: Supervisors can--

- Provide personal protective equipment (see AR 385-32, DA Pam 385-3, and CTA 50-900) and require it be worn.
- Ensure equipment is readily available and clean.
- Teach personnel to regard personal protective equipment as tools of the trade, part of the job.
- Discuss use of protective equipment (use short safety session 3).

Jacks, hoists, lifts

Mechanical aids are needed for moving or holding heavy objects. Incorrect use of lifting devices causes loads to shift or fall, usually resulting in injuries to the operator. Three common errors associated with lifting devices are:

- Personnel do not use the correct jack, lift, or hoist for the job as specified in the appropriate vehicle technical manual.
- The lifting device, when required, has not been load-tested before use in accordance with TB 43-0142.
- The operator does not correctly inspect load security before and/or during the operation.

Most injuries are caused by failure to follow correct procedures.

Actions to take: Supervisors--

- Ensure all authorized jacks, hoists, lifts, and appropriate manuals and operating instructions are on hand and used correctly.
- Conduct unscheduled spot inspections to ensure compliance with safe operating techniques and procedures.
- Require compliance with TB 43-0142 and TM 38-70 to test and mark all lifting devices, to ensure equipment serviceability, and to conduct daily inspections.
- Hold personnel accountable for safe conduct on the job.
- Reward safe performance and compliance with procedures.
- Increase emphasis on training, performance followup, and safety.
- Discuss safe use of lifting devices (use short safety session 4).

2. Improper lifting

Personnel often lift repair parts, wheel assemblies, or other materiel incorrectly or fail to get help to do the job. Overexertion results in back, arm, and abdominal injuries. Shifting or falling parts and components cause face, hand, and leg injuries.

An estimated 20 percent of all maintenance injuries are caused by incorrect lifting. Supervisors are responsible for reducing these injuries.

DA Pam 385-8: Back Injury Prevention gives ways to prevent back injury.

Actions to take: Supervisors--

- Eliminate as much manual lifting from the job as possible.
- Require mechanical aids be used to minimize manual handling.
- Require physical conditioning of personnel.
- Conduct safe-lifting training.
- Supervise lifting tasks.
- Investigate back-injury accidents.

It is not enough to know how to prevent lifting injuries. Supervisors must motivate workers to accept their role in preventing such injuries. Do this through:

- Awareness. Be sure workers know there is a problem with back injuries and what they can do about it.
- Information. Tell them the causes. Let them know they can be affected.
- Connection. Show them how routine jobs can lead to injuries. Show the cause-and-effect relationship of work to injuries.
- Action. Teach, then practice safe lifting techniques.
- Discuss safe lifting techniques (use short safety sessions 5, 6, 7, and 8).

3. Hazardous actions

Mechanics often put themselves in wrong positions or use their hands or feet instead of mechanical help. Unstable and hazardous body positions and actions result in falls, back and limb injuries, fractures, and burns.

Actions to take: Supervisors--

- Strictly enforce correct maintenance techniques.
- Routinely check that maintenance is "by the book."
- Establish procedures that make a supervisor responsible for any substitution of tools or equipment.
- Give personnel credit for their good ideas. If they come up with a better tool or way of doing a job, help them change the publication or put in a suggestion through the incentive awards program.
- Discuss the hazards of mechanics putting themselves in the wrong position or of using their hands and feet for tools (use short safety session 9).

4. Inadequate security and inspection of equipment

Inadequate inspection of components, equipment, and work areas leads to hand injuries, burns, bruises, and falls. Mechanics often do not make sure components which have been repaired or installed are secure.

Actions to take: Supervisors--

- Ensure your SOP spells out the exact standards required.
- Have a checklist for setting up a maintenance job.
- Establish a procedure to spotcheck completed jobs.
- Instruct mechanics to look for potential hazards (use short safety session 10).

5. Inadequate communication

Mechanics often do not warn coworkers when they start a vehicle or operate equipment, and they fail to tell others of inoperable components or equipment.

Maintenance activities often assign more than one individual to a job, and such teamwork requires communication. Team members must communicate the intent of their actions as well as any hazards they discover.

Actions to take to improve safety communications: Supervisors--

- Establish "lock out" procedures or use "do not start" tags.
- Evaluate the ability of the maintenance team to work together effectively.
- Discuss the importance of communication (use short safety session 11).

6. Inadequate housekeeping

Mechanics frequently do not clear work areas before beginning work, they lay tools down and then stumble over them, and they try to hold slippery components. These work habits lead to injuries.

Good housekeeping is critical to preventing injuries in the maintenance shop. Basic requirements of maintenance facility housekeeping are:

- Proper storage of flammables.
- Allowing time at the end of the day for cleanup.
- Available supplies (rags for cleaning components, correct tools).
- Designated storage places for tools.
- Mechanics who have good tool habits (use short safety session 12).

7. Failure to depressurize or disconnect components/equipment

Maintenance jobs often involve systems that contain an energy source; e.g., hydraulic pressure, electrical energy, pressurized gas. These sources of energy have the potential for injury if not neutralized before maintenance.

Mechanics frequently do not release pressure on hydraulic fluid, or they do not disconnect battery terminals before performing maintenance on electrical systems.

Technical manuals are usually very clear where they provide the required before-work condition, e.g., turn turret power off before repairing turret.

Supervisors must make sure mechanics do not shortcut the procedures. If procedures don't exist, the organization SOPs should contain the guidance and a publication change recommendation should be submitted. As a minimum, two cautions are necessary around high energy source systems:

- Release pressure before repairing items where escape of air, water, oil, hydraulic fluid, or other fluids may cause injury.
- Remove the ground (negative-) battery cable before beginning repair work on components located in the engine compartment or on the electrical system (use short safety session 13).

SHORT SAFETY SESSION 1
USE OF HAND TOOLS

Fact: Hand tools cause a lot of maintenance injuries.

Safety points:

- Use hand tools correctly and only for the job specified. Check the technical manuals. They tell you which tools to use for each job. Don't use a screwdriver on components held in your hand. Don't pull knives toward you. Don't use a sledgehammer when a nail hammer is needed. If you use a socket wrench that is too big, you'll round off the corners of the wrench or nut. In an emergency, you've made yourself a problem.
- Keep each tool in its proper storage place. A tool is useless if you can't find it. The time is takes searching for a tool is wasted.
- Keep your tools clean and in good condition. Keep them free of rust, nicks, burrs, grease, dirt, and breaks.
- Never use damaged tools. A battered screwdriver can slip and spoil the screw slot or gouge the flesh out of your hand. A gauge strained out of shape will result in inaccurate measurements.
- Keep your tools within easy reach (but not where they can fall on the floor or in machinery). Don't place tools above machinery or electrical apparatus. A tool that falls into running machinery can cause lots of damage and injury.
- Keep your tool set complete. When you're not using a tool, put it in the toolbox. Lock and store the box in a designated area. Keep an inventory list in the box and check it after each job. This will help you keep track of your tools. Replace missing tools after your mandatory inventory or, better yet, as soon as you find one missing or defective.
- Look to TM 9-243 for proper hand tool usage. TM 9-243 contains information on hand tool safety, personal protective equipment, how to care for tools, and for what job each tool is designed.

SHORT SAFETY SESSION 2
HAMMERS AND THINGS

Fact: Four common, everyday tools--hammers, wrenches, pliers, and screwdrivers--cause a lot of maintenance injuries.

Safety points:

Hammers. Hammers are often used instead of the correct tool, or the wrong type hammer is used. Using the wrong hammer for a job can cause it to bounce off the equipment and cause injury. Poor hammer strikes cause back strain, cuts, bruises, and hand or head fractures.

- Never use a hammer with a loose head or a cracked handle.
- Do not use the handle as a pry bar or to knock sharp edges together.
- Inspect the faces of steel hammers for wear, dents, or chips.

• Wear eye protection and watch the fingers.

Wrenches. Mechanics sometimes use the wrong size or type of wrench or socket for the job. Even when they have the correct wrench or socket, they sometimes use it incorrectly (e.g., tool is not properly seated or fitted, rusted or tightly torqued nuts or bolts are loosened incorrectly, unauthorized extensions are added to handles for additional leverage). Using the wrong wrench or socket or using it incorrectly can result in its slipping or breaking, causing injuries. Overexertion can also cause strained torso muscles.

• Fit the proper socket to nuts or bolts.

• Never use "cheater bars" or extend handles in any way to increase leverage.

• Apply penetrating oil to rusted nuts and/or bolts and allow time for it to penetrate.

• Always pull wrenches.

Pliers. Pliers used as clamps can cause a load to fall and crush a finger. Mechanics sometimes use standard pliers for jobs that require brake-spring pliers, and the pliers slip or the brake spring recoils, causing an injury.

• Do not use pliers as a clamp or vise.

• Use the correct pliers for the job.

Screwdrivers. Screwdrivers are often used as levers, and metal chips and particles break off and hit the user in the eye.

• Do not use screwdrivers for prying, punching, chiseling, scoring, or scraping.

• Wipe grease and oil from handle before use.

• Do not carry a screwdriver in your pocket unless it has a pocket clip.

• Do not use screwdrivers near a live wire, to check a battery by arcing, or to determine if an electrical circuit is present.

• Do not hold the item being worked on in one hand while using the screwdriver with the other.

• Match the size of the screwdriver to the job and to the type of head on the screw.

SHORT SAFETY SESSION 3
USING PERSONAL PROTECTIVE EQUIPMENT

Fact: Personal protective equipment is required to protect personnel form on-the-job hazards that can't be controlled. It must be worn to provide protection.

Safety points:

Eye protection. Flying objects (especially from hand tool use), abrasive sheets, corrosive substances (solvents, battery acid), light or heat rays (infrared, ultraviolet), and splashing metals are causes of eye injuries in maintenance activities.

These hazards are always present during welding, cutting, soldering, chipping, grinding, and a variety of other operations. Wear welder's helmets, face shields, safety glasses, or goggles during these operations.

Welder's apron. When welding, always wear a leather welder's apron to prevent burns on the upper and lower torso of the body from flying sparks and welding slag.

Gloves. Hands are always getting hurt. Gloves will prevent many burns, cuts, blisters, and punctures. They'll also help you get a better grip on your job.

- General purpose gloves are for lifting heavy items or for handling rough, scaly, or splintery objects.
- Rubber gloves protect against acids, caustics, other chemicals, oils, and solvents. A specially designed rubber glove is used to protect against electric shock.
- Asbestos gloves and mittens protect against sparks, radiant heat, or hot objects.

Eye protection. Hearing loss is the Army's No. 1 occupational health injury.

- Equipment and power tools generate noise.
- M88A1 recovery vehicle (inside): approx. 95 decibels
  - APC: approx. 115 decibels.
  - Air wrench: approx. 107 decibels.
  - Grinder: approx. 92 decibels.
  - Rivet gun: approx. 110 decibels.
- Any noise above 85 decibels is hazardous. Exposure to hazardous noise for 5 years without hearing protection will produce a hearing loss similar to the hearing loss of a normal 60-year-old individual.
- Use proper hearing protection regularly.
- Wearing hearing protection reduces fatigue.
- Rule of thumb: If you can't carry on a normal conversation because of noise, use hearing protection.

Head protection. Helmet liners and hard hats provide on-the-job protection:

- From falling or flying objects.
- From impacts.
- To prevent your head hitting electrical cables or powerlines.
- To prevent getting your hair caught in moving or rotating machinery.
- To keep dirt and dust out of your hair.
- Always wear head protection when riding in a tracked vehicle or when operating construction equipment.

Foot protection. Injuries to the foot are painful and may result in permanent disability. Safety shoes give protection.

- Some safety shoes are designed to limit damage to toes from falling objects.
- Some safety shoes are designed for use where danger from sparking could cause an explosion.

Respiratory protection. Maintenance tasks such as spray painting or asbestos brake removal may require use of a respirator.

Different types of respirators should be used for protection against such hazards as dust, vapors, or lack of oxygen. For instance, in most cases, an NBC mask will not provide enough protection for operations involving these hazards and should not be used.

SHORT SAFETY SESSION 4
CORRECT USE OF LIFTING DEVICES

Fact: Incorrect use of lifting devices causes loads to shift and fall. Some maintenance personnel are not using jacks, hoists, and lifts correctly, are not loadtesting lifting devices, when required, before use, and are not inspecting load security before and during operation.

Safety points:

Jacks

- Check the load capacity before using to make sure the jack can support the load. Inspect jacks before and after each use. Remove from service if hydraulic fluid leaks are found. Keep jacks well lubricated at the lubrication points specified. Do not throw or drop a jack on the floor.
- Use on a level and clean surface. On an earth surface, set the jack on blocking that is at least twice the size of the jack. Level the blocking with shims. Use hardwood shims on the face of the jack to prevent metal-to-metal contact.
- Never get under any load supported solely by a hydraulic jack. Use jack stands when working under supported loads.
- Chock the wheels of all vehicles, put the transmission in the gear recommended by the TM, and check the parking brake.

Hoists

- Check the load capacity before using a hoist to make sure it can support the load.
- Inspect before and after each use. Pay special attention to load hooks, ropes, brakes, and limit switches. Look for wear, malfunction, damage, and proper operation of clutches and limit switches.
- Pick up a load only when it is directly under the hoist. Stay out from under raised loads. Use correct hand signals (FM 21-60). Do not lift, support, or otherwise transport people on hoists.
- Make sure you know where everyone is before moving the load.

TB 43-0142

Use this bulletin, which prescribes safety inspection and load testing of lifting devices. It gives load ratings, current inspection date, and testing requirements.

SHORT SAFETY SESSION 5
MOVE IT SAFELY

Fact: Too many maintenance workers lift and move parts and equipment wrong.

Safety points:

Correct lifting techniques could prevent many injuries. Here are some tips on how to lift the right way.

• Plan the move. Get help with heavy or awkward objects. Check before lifting to be sure the path is large enough and free of hazards. Check the object to be sure it is free of anything that will make it slippery. Determine where it will be gripped.

• Lift it. Crouch as closely as possible to the object. Get solid footing with feet 8 to 12 inches apart. Grip firmly, keeping fingers underneath the load whenever possible. Keep arms straight and back as straight as possible, and use leg muscles to lift. (This takes the strain off back muscles.) Lift gradually, avoiding jerky motions.

• Move it. Avoid twisting motions by shifting the feet. Keep a clear field of vision while carrying objects. Plan ahead on where to set the load if rests are needed.

• Put it down. Put things down by reversing the lifting methods. Bend knees while keeping the back straight and keep the load close to the body. Watch fingers and toes to avoid pinching them. Be sure the load is secure and that it won't fall, roll, tip, or otherwise create a hazard.

SHORT SAFETY SESSION 6
THINK AHEAD, THEN LIFT

Fact: Thinking before lifting can save a back or muscles from injury.

Safety points:

• Analyze your task. How much does the load weigh? Is the pathway clear? Is equipment available to help lift the load?

• Get help. If the load is too bulky or heavy, get help. Don't hesitate to ask someone for a hand--a little help could save a lot of pain.

• Find a better way. Arrange for mechanical aids such as barrel tilters, hand trucks, jacks, and wheelbarrows.

• Push, don't pull. You can push twice as much as you can pull, while running less risk of back strain.

SHORT SAFETY SESSION 7
TIRE REMOVAL THE EASY WAY

Fact: Removing and installing large tires on your own can be dangerous.

Safety points:

• TM 9-2320-209-10-4: Maintenance, Operator Level, 2 1/2-ton, shows one person removing/installing large tires (over 31 inches in diameter). That's wrong. It takes two people. Changes to future manuals will show two people doing the job.

• Trying to change those big tires alone can result in back, arm, and abdominal injuries due to overexertion. There is always the possibility of wheel components shifting or falling and crushing fingers and hands.

• Some large vehicle tires weigh as much as 190 pounds. Take the time to evaluate what equipment and personnel are required and available to do the job safely.

• If available, use (in accordance with the appropriate TM) a wheel lift truck to do the heavy work.

• If a wheel lift truck is not available, use two or more people to lift the tire. Always remember to place fingers and hands so they will not be injured if the tire slips or falls.

• Take the time to do the job safely and prevent the possibility of a disabling injury.

SHORT SAFETY SESSION 8
EXERCISE TO REDUCE BACK INJURIES

Fact: Back injuries account for one of every five maintenance accident injuries. Each year back injuries cost the Army more than $8 million.

Safety points:

• Every time you lift, sit, stand, or even lie down, you are using your back.

• The back is a powerful, yet delicate machine. It needs care and maintenance to keep it that way.

• You can care for your back by:

- Using mechanical aids to lift; getting help for large or heavy loads.
- Standing, sitting, and lying down with spine in balanced, neutral position.
- Exercising to gain back strength and flexibility.

SHORT SAFETY SESSION 9
BODY IN DANGER

Fact: Mechanics have been injured by putting their bodies in dangerous places and by substituting body parts for tools.

Safety points:

• Cheater bars. Using your body for leverage instead of getting the correct tool--plumbing pipe instead of the proper length wrench--is asking for trouble. Get the right wrench or tool; don't use cheater bars.

• Alignment tools. Fingers put through a hole to check alignment get cut off. Use an alignment tool to be sure a bolt is aligned.

• Human lifting device. Use the lifting device provided; don't be one. Using cinder blocks instead of jack stands can get you hurt.

• Being a buffer. The soldier who gets between two vehicles or vehicle parts makes a poor buffer. Stand beside, not between.

SHORT SAFETY SESSION 10
INSPECT AND BE SURE

Fact: Maintenance workers don't always secure loads or inspect components.

Safety points:

Inspection. Mechanics should look for potential hazards such as jagged edges, the need for special rust removing lubrication, the proper fit of tools and components, and any special tools the job might require. Inspect equipment and tools before the job to be sure they are in safe working order and have required inspections or tests. Be sure hand tools are checked in accordance with TM 9-243.

Premaintenance checks. Setting up to do the job is often as important as the job itself. Check the vehicle or piece of equipment to be maintained or used to be sure it has been properly prepared.

- Are applicable TMs available?
- Are tires chocked?
- Is the parking brake set?
- Is the transmission in park or neutral (depending on TM)?
- Are hoods/doors/hatches latched?
- Are the necessary conditions listed in the TM present?

Postmaintenance checks. Have a procedure for checking after the maintenance job is complete.

- Check for loose components.
- Account for all tools.
- Ensure all tools are clean before storing or turning in.
- Be sure all components are secure.

Tools. A place for everything and everything in its place is common sense in a maintenance facility. You cannot do an efficient, safe repair job if you have to stop and look around for each tool you need.

- Keep tools within easy reach and where they cannot fall on the floor or into machinery.
- Do not place tools above machinery or electrical apparatus.

Reference. Every maintenance shop is required to use AR 32-15: Classification and Inspection, 19 Aug 76. This regulation covers all the foregoing points and specifies exact inspection criteria.

SHORT SAFETY SESSION 11
TALK TO ME

Fact: What is said is not always what is heard or meant. Lack of specific instructions makes for misunderstandings and results in injuries.

Safety points:

- Be alert. Know where your coworkers are. Always give a "clear" warning and receive a response before starting or moving a

vehicle. Also, an "all clear" is needed when aligning components.

• Talk to others. Tell each other of dangerous situations you've encountered while working. If a component or tool is broken, let coworkers know. Don't let them be surprised and hurt.

• Know plan of action. Make sure everyone knows who is doing what and where. Tell others what you are doing. Work together.

• Pass the information. Keep everyone informed of problems, changes, requirements, and the meaning of the work terms to be used in work accomplishment.

SHORT SAFETY SESSION 12
A PLACE FOR EVERYTHING

Fact: Mechanics sometimes do not clear the work area before beginning work. They lay tools down and then stumble over them, and they try to hold slippery components. These habits lead to injuries.

Safety points:

• Keep it clean. This pertains to the work area, equipment, and tools.

• Tool accountability. If you can't find it, it may be in a dangerous place--near the fan belt--and then it will bite back.

• Wipe it up. Grease and oil have to be wiped up.

• Be aware of flammables. All flammable waste materials should be removed to a collection area outside shops and garages. Gasoline is not a cleaning fluid; but it sure burns, so don't use it as a cleaning solvent.

• Know safety equipment. Know where it is and what it is used for; e.g., first aid kits, goggles, earplugs.

• Keep it in place. Equipment and vehicles in a motorpool have their place; keep them in it. Don't block access routes.

SHORT SAFETY SESSION 13
DECOMPRESS OR DISCONNECT, PLEASE!

Fact: Failure to disconnect wiring and pressurized components leads to equipment damage and personnel injury.

Safety points:

• Fluid pressure. Release pressure before repairing items where escape of water, oil, hydraulic, or other fluids is possible.

• Air pressure. Release air pressure before demounting tires and servicing air brakes and compressors.

• Electrical wiring. Disconnect battery cables and electrical wiring before working on components.

SHORT SAFETY SESSION 14
REPAIR OF SPLIT RIM TIRES

Fact: Improper mounting or demounting of split rim tires can kill or cause serious injury.

Safety points:

- Always use a safety cage to inflate tires mounted on rims with demountable side ring flanges or lock rings.
- Never attempt to seat side ring flanges or lock rings during or after inflation. Improperly seated side ring flanges or lock rings could blow off.
- Never overinflate any tire to seat tire beads.
- There is only one approved way to inflate tires with side ring flanges or lock rings, and that is with an approved tire cage. Cages must conform to specifications in TM 9-2610-200-24 and TM 9-237. They must also be certified before use.
- Use only tools designed for tire mounting and demounting. Don't use pick-mattocks or sledgehammers for breaking down tires.
- When in doubt on what to do, ask your supervisor for guidance before you continue.
- Take a look at TM 9-243 for proper tool usage. It contains information on handtool safety, personal protective equipment, how to care for tools, and how to choose the right tool for the job.

Supervisor notes:

- Use command facility engineers to certify construction to all inflation safety cages.
- OSHA posters showing correct procedures must be displayed in all shops where mounting and demounting of split rim tires take place. Contact your local command safety office for information on obtaining these and other safety posters.

Readings

1. Ergonomics - The Long and Short of It, February 1986, National Safety and Health News

2. Protecting the Worker in Materials Handling, September 1985, National Safety and Health News

3. Administrating Personal Protection, March 1986, National Safety and Health News

4. National Safety Council, Second Edition, Supervisors Guide to Human Relations, Chapter 1, Responsibilities of the Supervisor

5. National Safety Council, 8th Edition, Accident Prevention Manual for Industrial Operations, Chapter 11, Human Behavior and Safety

References

1. Regulations
   . AR 385-10: Army Safety Program
   . AR 385-32: Protective Clothing and Equipment
   . AR 385-40: Accident Reporting and Records
   . AR 735-11: Accounting for Lost, Damaged or Destroyed Property

2. DA Pams
   . DA Pam 385-1: Unit Safety Management
   . DA Pam 385-5: Protective Clothing and Equipment
   . DA Pam 690-31: Supervisor Training Course
   . DA Pam 5-2: Improvement Tools for Soldier Managers

3. Occupational Safety and Health Act (OSHA)
   . 29 CFR 1910: Code of Federal Regulations
   . 29 CFR 1960
   . Public Law 91-596

4. National Safety Council, Seventh Edition, Accident Prevention Manual for Industrial Operations

5. National Safety Council, Fifth Edition, Supervisors Safety Manual

6. American Technical Society, Accident Prevention Manual for Training Programs

7. National Safety Council, Second Edition, Supervisors Guide to Human Relations

8. Miscellaneous U.S. Army Safety Center References

9. Federal Personnel Manual, Chapter 810, Injury Compensation, Oct 2, 1986

10. Supervisor Cassette Tapes (SAF-T-TAPES), International Loss Control Institute, Loganville, GA 30249

Appendix A
Model Policy on Light Duty for Injured Employees

1. Employees who are injured in the performance of duty and found to be temporarily physically unfit to perform their normal duties, but are able to perform light duty as determined by proper medical authority, will be given such duties by their supervisor under the following guidelines:

a. Light duty will be provided for the period specified by competent medical authority up to the first 30 days following medical determination that the employee can perform light work. Care should be used to select the nearest light-duty location.

b. If, after 30 days, the employee is still unable to resume the full duties of his assigned job, one of the following actions will be taken:

(1) If the employee can perform duties within his official position description with the exception of some duties such as lifting, climbing, stooping, bending, prolonged standing, etc., he will resume these duties with specified limitations. If this type disability extends beyond 6 months, the Civilian Personnel Office will be contacted to determine if some other appropriate action should be considered.

(2) If the employee cannot perform within his position description, an SF52 will be filled out detailing the employee within the organization to the same or lower grade up to 90 days, provided there is some type work he can perform. If no work is available within the organization, consideration will be given to detailing the employee to another organization. Such consideration will be in the best interest of the Government in terms of missions of both activities involved and cost of compensation benefits versus cost of detail. Thirty days prior to the expiration of the detail, a request for Commission approval to extend the detail will be submitted to the Civilian Personnel Office if it appears the employee will not be able to resume the duties of his position.

2. Before reporting for medical treatment, injured employees will be given CA-16 and DD Form 689 and advised to stress to the doctor the requirement for complete medical information.

3. When an employee must enter a leave status because no light duty is available or due to expiration of detail(s), a statement will be furnished the Civilian Personnel Office explaining why efforts (outlined above) to assign light duty were unsuccessful.

4. Injured employees will receive full and impartial consideration for details under this policy without regard to race, color, religion, national origin, sex, age, or any other discriminatory factors. Further, each unit shall use equally applied guidelines in determining if light duty or detail is given.

Appendix B
Supervisor Key Actions

- Support the Installation Safety Program. Refer to your local installation regulation.

- Support the Installation Workers' Compensation Program. Refer to your local installation regulation.

  - Acknowledge receipt of notice of CA-1 or CA-2 from employees. Complete side two of the forms and process to CPO (FECA Program Administrator and a copy to the Installation Safety Office) within 2 working days. Assist employees in initiating forms when no witness or no other person is able to act on their behalf.

  - Notify the occupational health staff when an employee incurs an injury or becomes ill during the nonduty hours of the Occupational Health Clinic.

  - Notify the occupational health staff when an employee sustains an injury or becomes ill and immediate transport to an emergency service is necessary.

  - Coordinate with the occupational health staff to arrange transportation for employees who prefer treatment at a private physician's office or a hospital when necessary.

  - Identify individuals who have demonstrated histories of misuse or abuse of the Workers' Compensation Program.

  - Ensure facts on compensation forms are properly investigated, fully documented, and accurately reported.

  - Coordinate with the installation Civilian Personnel Officer and FECA Program Administrator regarding claim controversions.

  - Accommodate workers with light-duty restrictions, if possible.

  - Notify the FECA Program Administrator when an employee returns to work after lost time.

  - Interface with the Employee Safety Committee. Refer to your installation regulation 10-1.

  - Conduct weekly safety and occupational health meetings.

  - Support the Commander's Safety Awards Program.

  - Perform job analyses.

  - Follow your installation regulation on physical limitation.

- Investigate accidents and complete the appropriate injury and accident reports.
- Establish accountability standards for subordinate supervisors.
- Provide employee education and training regarding health hazards in the workplace.

Appendix C
Safety Checklists

The U.S. Army Safety Center, Fort Rucker, Alabama, has published a "Safety Checklists" manual that provides a ready safety reference for most functions and tasks common to military and civilian operations within a command. Safety program administration requirements are also included in the manual. This checklist should be used in conjunction with DA Pam 385-1. Users are encouraged to add additional checklist items that cover their particular organizational needs.

Order "Safety Checklists" from Commander, U.S. Army Safety Center, ATTN: CSSC-M, Fort Rucker, Alabama 36362-5363, AUTOVON 558-2062/4806, commercial 205-255-2062/4806.

Appendix D
Ergonomics—
The Long and Short of It

Reprinted by permission of the
Managing Editor, National Safety
and Health News, February 1986

By James W. Lahey

Applied ergonomics uses measurements of human beings and other parameters in order to make the man-machine interface more workable.

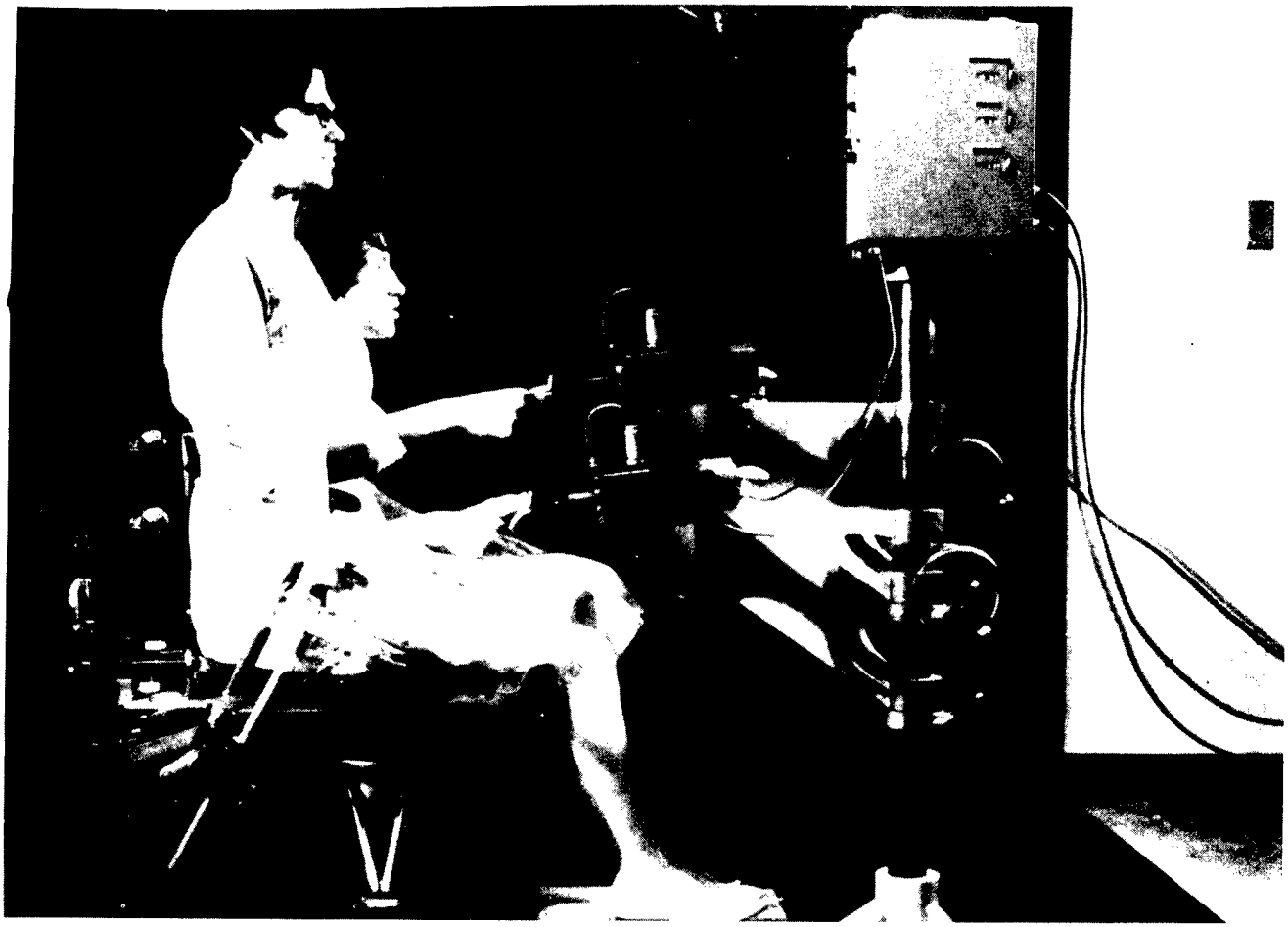
For example, the work station shown in the accompanying illustration was made to be adjustable so that it could be used by tall and small alike.

The *long and short of it* could also be applied to other parts of the man-machine interface, such as tools, work places, and equipment. Measurements are also used in testing and redesigning environments that may be too noisy, etc.

Hand tools It's been long recognized that some hand tools are as good at causing fatigue, soreness, carpal tunnel syndrome, etc., as they are at helping get the job done. The classic example is the pair of pliers that had to be used with the wrist held at an angle. It caused many wrist ills before it was decided to redesign it so that the wrist could be kept on the same plane as the forearm, removing the hazard.

Hand tool users are subject to five factors that can affect their comfort on a job.

They are:



- Static loading of arm and shoulder muscles;
- Awkward hand position;
- Pressure on the palm and fingers;
- Vibration and noise from power tool use;
- Pinch points with double handled tools.

Static overloading of muscles results when the arms have to be elevated or the tool held for long periods, such as in grinding operations.

It can result in problems in the shoulder, forearm, hand, and fingers. The problems could result in soreness and diminished capacity to do the job, tendonitis, tenosynovitis, bursitis, epicondylitis, carpal tunnel syndrome, or de-Quervain's syndrome.

Redesign of the tool or job, or both, could eliminate the need to hold uncomfortable positions for hours.

Awkward hand positions can result in soreness in the wrist and difficulty in keeping a grip on the tool. Assembly or maintenance tasks requiring such positions can, and should, be redesigned,

Pressure on wrists and joints can result in the pressure being transmitted to both the palm and fingers.

The tool can press into the palm at the base of the thumb, where blood vessels and nerves pass through the hands. The resultant pain and swelling, particularly when using high force tools such as pliers and riveters, could at least slow the worker down, if not incapacitate him. The best solution to this problem is to use pliers and other tools with handles that extend beyond the palm. Thus, the ends of the tools will not hit the palm at all.

Fingers that must constantly pull a trigger, move a slide switch, or steady a heavy tool, can give their owner some problems. The best way to handle this is to measure the forces involved and then keep them low. This can be done by enlarging the area over which the force is applied, so that the force per unit of area is reduced.

Vibration and noise are usually caused by chipping hammers and pavement breakers. Vibration, in combination with the weight of the tool, can cause white finger or Reynaud's syndrome. Newer designs have reduced vibration of these tools by significant percentages. In addition, some pavement breakers can be mounted on a power truck platform. Noise can usually be neutralised by personal hearing protection.

Pinch points in double handled tools can be dealt with by stops on the handles and adequate clearance between the handles.

Another factor in selecting tools is whether they can be used by left and right-handed people alike. Things to look for include:

- Are the switches and other controls near the center of the tool rather than to one side or the other?
- How is force applied?
- Can either hand hold or operate the tool?
- How is the force used?
- Can the tool be moved in the direction of force equally well by either hand?
- Is the workpiece equally visible when operating with the right or left hand?

More specifically, handles should be about five-inches-long with a minimum length (for most operations) of four inches. Add half an inch if the tool is to be used while wearing gloves. Diameters have the guidelines of 1.5 inch and a range of 1.25 to two inches. For precision jobs, the recommended diameter is 0.45 inch, with a range of 0.3 to 0.6 inch.

As far as handle span goes, the range in which most people should be able to develop maximum grip strengths is 2.5 to 3.5 inches. Handle span means the distance between the handles of a double-handled tool.

In addition:

- Handles should provide good electrical and heat protection;
- They should not have protruding sharp edges or corners
- A compressible gripping surface is best for a good grip;
- They should be hard enough that work particles or dirt cannot become imbedded.
- Handles should be impervious to oil, solvents, etc.
- Handles should not have a smooth or highly polished surface.

Switch and stop control design should pay attention to the center of gravity of the tool relative to its gripping and triggering requirements. The tool should also be stable during the job — sometimes a handle should be added to obtain this stability.

Tool weight and suspension will often determine how long a tool can be held, used, or manipulated. Generally speaking, a tool weighing more than five pounds and held out from the body for work, should be looked at by someone with knowledge of ergonomic design.

An ergonomic checklist for hand tools could ask are the tools:

- Operable with a straight wrist?
- Powered where feasible?
- Well-balanced and easy to hold?
- Counter-balanced if weight is excessive?
- Designed to give support to the guiding hand?
- Equipped with handles shaped to contact as much of the hand and finger as possible?

Office equipment and work space decisions will probably call for measurements also.

For example, a checklist for an ergonomically sound workplace could have questions such as:

- Is the height of the work surface adjustable for multiple operators?
- Does the seat have an adjust-

able height and backrest?

- Is the work space adequate for the smallest and largest worker for reach and clearance of head, arms, legs, and feet?

- Is the lighting bright and is the work area evenly lighted?

Most office workers do their jobs sitting down, and more of these seated workers are being equipped with Video Display Terminals (VDT). Here, safety can be linked with an ergonomic approach to work spaces and equipment for VDT operators.

Office Administration and Automation magazine reports a study that indicated:

"...workers using VDTs more than one hour per day reported twice as many complaints of neck and shoulder discomfort compared to co-workers that did not use VDT equipment. A comparision between VDT and non-VDT workers reported eye strain three times as often as compared to workers using conventional office equipment. VDT operators had higher rates of absenteeism, reported less job satisfaction than their co-workers, and entry-level positions had a high turn over rate, approaching 30 per cent a year."

The study then measured response to getting specialized new office furniture. Response was enthusiastic with workers even helping in the selection of furniture. Then performance after the change was measured.

Results were impressive. There were significant gains in error rates, and percentage of active work time. Absenteesim decreased. Incidents of backaches and other physical distress also declined.

IBM's *Ergonomic Handbook* gives some general ideas on what an ergonomically sound VDT work station would be like. It says:

"To allow for differences in height and body build, on some occasions it is also desirable to provide adjustable desks or terminal bases."

It goes on to say that an adjustable terminal base should include a height-adjustable VDT platform, a height adjustable sliding keyboard platform, and an optional tilt or swivel VDT platform.

VDT operators are not the only ones to have chairs and other furniture designed just for the job. A chair has also been designed for the use of surgeons during delicate microsurgery.

This piece of furniture, termed a "neutral posture" chair, is based on the position that astronauts found most comfortable for work under conditions of weightlessness. According to the supplier, "the neutral posture was found to be best for the lumbar curve. X-ray studies found that this position places the vertebrae equi-distant from each other, reducing pressure."

The chair also has adjustible features, such as:

- Seat pan height;
- Seat pan tilt;
- Four seat pan sizes;
- Backrest angle;
- Backrest height;
- Footrest height.

A survey conducted by the developers of the chair found "that a less fatiguing and more comfortable posture was obtained by surgeons using (it) as compared to the (traditional type)."

Environmental considerations, such as noise and other stresses in the workplace, also have their place in ergonomics. *Ergonomics Handbook* says:

"The conditions of the surroundings in which a tool or piece of equipment is used to perform a task can have a significant impact on the employee's ability to perform that task.

"Noise can be very distracting and prevent concentrated mental work. In extreme cases, it can also result in physical disorders."

The most common stresses that ergonomics works against are noise and lighting.

Safety professionals are accustomed to dealing with noise of an intensity that eventually destroys hearing. That is, noise above the level and intensity proscribed by *OSHAct* (85 dBA). Ergonomics deals with noise on a less intensive level — a level that interferes with comfort and speech rather than with the ability to hear.

The ergonomic approach deals with a measurement called preferred speech interference level (PSIL). This method uses the average sound pressure levels, in decibels, of the octave bands centered at 500, 1,000, and 2,000 Hz. Calculations indicate that a PSIL of 63 would require a raised voice to converse effectively six feet from another person People standing more than eight feet apart will have to raise their voices to converse at any ambient noise level of more than 60 dBA. When the noise reaches mandatory hearing protection level (85 dBA), the protection itself *could* reduce communication likelihood.

PSIL measurements also indicate the ease or difficulty of telephone conversations. For example: levels of 60 dB or less will give satisfactory results; 60 to 75, difficult; above 75, impossible, according to *Ergonomic Design for People at Work.*

Experience with the performance effects of noise indicates that noise with rhythmic patterns could improve performance of simple, repetitive tasks if the noise pattern synchronizes with the work pattern. Further, tasks that involve mental demands, complexity, and considerable detail are very likely to be interfered with by noise. Taking orders over the telephone is a good example of such a task, particularly if it involves using computer terminals to integrate product, pricing, billing, and shipping information. In addition, it has been found that the types of noise most likely to degrade performance include variability in level or content, intermittency, high-level repeated noises, frequencies above about 2,000 Hz, and any combination of these.

The effect of noise on produc-

tivity and safety probably will not be consistent because it can be affected by how much different individuals can concentrate on the task. This in turn is affected by how interesting the task is.

Dealing with noise and the comfort level will involve measurements of octave band analysis and possible intermittency, level and spectral variations, presence of narrow-band noise, task complexity, and mental demands of the job.

Just as with the control of dangerous noise, control of uncomfortable noise will involve:

- Reducing the level or altering the spectrum of the noise;
- Using sound barriers to reduce noise transmission;
- Absorbing incident or reflective noise.

Reducing vibration will also make use of existing techniques, such as:

- Mounting of equipment on springs or pads;
- Maintaining equipment;
- Changing materials;
- Modifing equipment speed, feed, or motion.

Illumination is a measure of the amount of light falling on, or incident to a task from ambient and local light sources. It is measured with an illumination (lux or footcandle) meter at the work surface. The farther from the source of light, the less the illumination will be. This measurement differs from the measurement of luminance, or reflected light. Luminance will not vary with the distance between the reflecting surface and the observer, and is measured with a photometer.

Too much or too little illumination or luminance will affect the efficiency of performance and worker safety.

Ways to improve the illumination of tasks include:

- Increase the contrast between the work surface and work piece;
- Increase the size of the smallest critical detail, such as type size;
- Arrange the job materials to be perpendicular to the operator's line of sight.

In working to find the optimum light level, the safety practitioner becomes involved with proper light levels for different tasks, selection of high-efficiency light sources; direct and indirect lighting, task lighting, minimizing glare, and special purpose lighting.

Proper light levels for different tasks involves measurement and manipulation of the relationship between amount of illumination and productivity. It also deals with levels of illumination and luminance. These involve working with supervisory personnel and lighting engineers.

Selection of high-efficiency light sources includes the factors of efficiency in lumens per watt, color rendering and perceived colors, and maintenance requirements.

Direct and indirect lighting deals with the quality of light on the workplace. For example, with direct lighting more light, or energy, is directed toward the task. Indirect lighting is less efficient in terms of lumens per watt, but provides less glare and more uniform light levels. Then, high intensity lights may make up the loss in lumen-per-watt efficiency.

Task lighting involves light patterns. For example, there will be calls for direct task lighting and for area lighting, depending on the job to be done. Supplementary lighting also is involved.

Minimizing glare involves working with the visual comfort probability (VCP) index, which is a measure that gives the percentage of individuals who would be expected to be visually comfortable at a given workplace. The VCP index should be at least 70 or higher. Achieving this usually means reducing glare.

Glare has to be reduced for general workplaces and also for specialized work stations, such as video display terminals (VDTs).

Glare is a particular problem to VDT operators. It can cause fatigue, aching muscles, eye problems, other discomforts, and annoyances. It usually comes from light fixtures within the operator's field of vision, daylight shining through windows, or light reflected from surfaces in the operator's work area.

Solving this problem includes VDT screens with an anti-reflection coating or the use of a polarizing filter over the screen. The angle of the filter is important. If the angle is correct, it will enhance the contrast on the screen. If it is incorrect, it will noticeably degrade image quality. Hoods are also used to reduce reflected glare at VDT workplaces.

Details on proper VDT use can be found in the National Safety Council's audio visual program: *Video Display Terminals...The Human Factor.* Stock No.15775-0000-0 (videocassette) or Stock No. 15775-0001-8 (16 mm film).

The long and the short of ergonomics is that by knowing, understanding, and using the principles, the workplace can become more comfortable and less hazardous. Ω

BIBLIOGRAPHY

Ergonomics Handbook. International Business Machines Corp., Old Orchard Rd., Armonk, NY 10504.

Human Factors Section, ***Ergonomic Design for People at Work.*** 1983. Eastman Kodak Co., Lifetime Learning Publications, 10 Davis Dr., Belmont, CA. 94002. Vol. I.

Ergonomics Checklist. 1983. National Safety Council, 444 N. Michigan Ave., Chicago 60611. Stock No. 15735.

Schneider, M. Franz, ***Why Ergonomics Can No Longer Be Ignored.*** Office Administration and Automation, Geyer-McAllister Publications, Inc., 51 Madison Ave., New York 10010.

Congleton, J.J., M.M. Ayoub, and J.L. Smith, ***The Design and Evaluation of the Neutral Posture Chair for Surgeons***. Box 9440, College Station, TX 77840.

Appendix E
Protecting the Worker In Materials Handling

Reprinted by permission of the
Managing Editor, National Safety
and Health News, September 1985

Material is handled between operations in every department, division, or plant of a company. It is a job that almost every worker in industry performs—either as his sole duty or as part of his regular work, either by hand or with mechanical help.

Mechanized material handling equipment is being used with increasing frequency. In many industries, material could not be processed at low cost if it were not for efficient mechanical handling. Although mechanical handling creates a new set of hazards, the net result (entirely aside from increased efficiency) is fewer injuries.

Just as all job safety analyses (JSAs) should contain the amount and extent of manual lifting involved in a particular position of employment, so should this requirement be considered in job selection and placement of employees. Pre-employment physical examinations can often identify those employees who are most likely to incur serious back injuries or hernias.

Areas that should be considered when reviewing materials handling are the work environment, the need for specific training, and proper material handling engineering.

Preventing Common Injuries

Handling of material accounts for 20 to 25 per cent of all occupational injuries—these injuries occur in every part of an operation, not just the stockroom or warehouse. On an average, industry moves about 50 tons of material for each ton of product produced. Some industries move 180 tons for each ton of product.

To gain insight into the materials handling injury problem, the safety professional should consider the following operating practices and management policies:

1) Can the job be engineered to eliminate manual handling insofar as possible?

2) Can the material be conveyed or moved mechanically?

3) In what way do the materials being handled (such as chemicals, dusts, rough and sharp objects) cause injury?

4) Can employees be given handling aids, such as properly sized boxes, adequate trucks, or hooks, that will make their jobs safer?

5) Will protective clothing, or other personal equipment, help prevent injuries?

These are by no means the only questions that might be asked, but they serve as a start toward overall appraisal and detailed inquiry. The largest number of injuries occur to fingers and hands. People need instruction if they are to learn the proper way to lift objects and to set them down. Training in safe work habits, breakdown and study of even the simplest job operations, and adequate supervision can help minimize these accidents.

General pointers that can be given to those who handle materials include:

1) Inspect materials for slivers, jagged or sharp edges, burrs, rough or slippery surfaces.

2) Grasp the object with a firm grip.

3) Keep fingers away from pinch and shear points, especially when setting down materials.

4) When handling lumber, pipe, or other long objects, keep hands away from the ends to prevent them from being pinched.

5) Wipe off greasy, wet, slippery, or dirty objects before trying to handle them.

6) Keep hands free of oil and grease.

In most cases, gloves, hand leathers, or other hand protectors should be used to prevent hand injuries. Extra caution must be used when working near moving or revolving machinery.

In other instances, handles or holders can be attached to objects themselves, such as handles for moving auto batteries, tongs for feeding material to metal-forming machinery, or wicker baskets for carrying control laboratory samples.

Feet and legs sustain a major portion of materials handling injuries—the greater percentage occurring to the feet. Workers should be instructed to wear foot protection, such as safety shoes equipped with metatarsal guards.

The eyes, head, and trunk of a

body can also be injured. When opening a wire-bound or metal-bound bale or box, a person should wear eye protection equipped with side shields as well as stout gloves, and take special care to prevent the ends of the bindings from flying loose and striking the face or body. The same precaution applies to handling coils or wire, strapping, or cable. In many cases, special tools are available to safely cut bands, strapping, and the like. Workers should always read the labels on packages for special instructions.

If material is dusty or is toxic, the person handling it should wear a respirator or other suitable personal protective equipment.

Lifting by hand Physical differences make it impractical to establish safe lifting limits applicable to all workers. A person's height and weight, although important, do not necessarily indicate lifting capability, because some small, thin individuals can handle heavier loads than some tall, heavy persons. A job safety analysis and medical recommendations should also be used when establishing lifting standards.

Correct position of feet One of the causes of muscle injury, particularly to the back, is the loss of balance due to working with the feet too close together. Lifting off the ground, pushing and pulling, or reaching (and in many instances overreaching) may cause an off-balance body condition. A common reaction to this condition is a stiffening of muscles in the lower limbs and back.

In the kinetic method, however, the feet are correctly positioned with one placed in the proposed direction of movement and the other in a position where it can give thrust to the body. The worker can decide whether he prefers the forward foot to be his left or right. Following is a description of the kinetic method of lifting.

Straight back and bent knees A straight back is not necessarily a vertical back. In the kinetic method, the back is often inclined, particularly when lifting weights from the ground, but the inclination should be from the hips so that the normal curvatures are maintained. This normally curved spine is termed a "straight back."

With "straight back lifting" the spine is fairly rigid (nonmedically speaking) and the pressure on the lumbar intervertebral disks is evenly distributed. When lifting with the back bent, the spine forms an arc, with the result that the lower back muscles are subject to strain causing an uneven pressure on the disks.

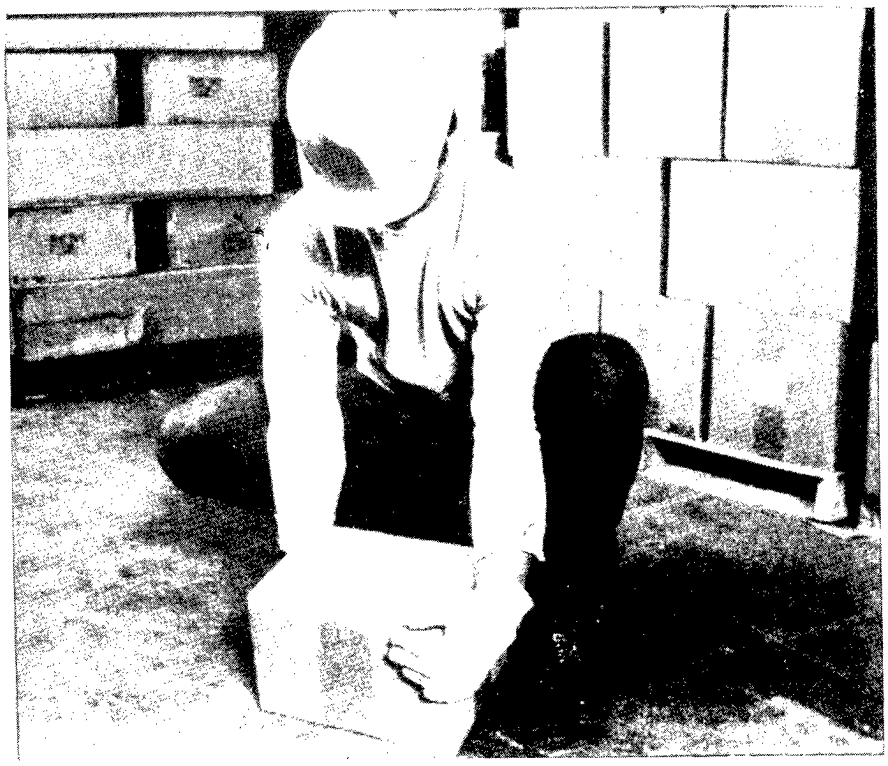
In addition to the risk of intervertebral disk lesions, lifting an object with the back bent and the legs straight imposes excessive stress on the muscles of the back for two reasons. First, the back must be inclined at a greater angle to the vertical for the hands to reach the object. Because the "effective weight" (the object plus the upper part of the worker's body) increases rapidly as this angle is increased, a much greater effort is required to raise the back to its vertical position. Secondly, muscular effort is required to straighten the spine.

When a weight is properly lifted from the ground, with maximum effective use of the legs, the back is straight but inclined forwards. As the lift proceeds by the extension of the knees, the back returns to the vertical position.

The position of the feet and the flexion of the knees are the key factors for maintaining a straight back.

Load close to the body While lifting and carrying weights, the worker should keep the load close to the body. To do this, the arms should be close to the body and remain straight whenever possible. Flexing the elbows and raising the shoulders imposes unnecessary strain on the upper arm and chest muscles.

Correct grasp An insecure grip may be caused by taking the load on the finger tips, thus creating undue pressure at the ends of the digits and strain to certain mus-



Wearing gloves and grasping a load at opposite corners, this worker can use his bent knees to lift. Note the chin is tucked in to help straighten the spine during the process.

cles and tendons of the arm. Because greasy surfaces often prevent a secure hold, surfaces should be wiped clean. The use of suitable gloves should also be considered.

Chin in Raising the top of the head and tucking the chin in straightens the whole spine, not merely the neck. This position automatically raises the chest and the shoulders for more efficient arm action.

Use of bodyweight Employing the correct positioning of the feet and the flexion and extension of the knees, the weight of the body can be effectively used to push and pull objects and to initiate a forward movement, such as placing an object on a shelf or walking.

When lifting an object from the ground, the thrust from the back foot, combined with the extension of the knee joints, will move the body forwards and upwards, and for a brief period it will be off balance. However, it is immediately countered by bringing the back leg forward, as in walking, but by this time the lift is completed. This forward movement of the body results in a smooth transition from lifting to carrying.

Team lifting and carrying When two or more people carry one object, they should adjust the load so that it rides level and so that each person carries an equal part of the load. Test lifts should be made before proceeding.

When two people carry long sections of pipe or lumber, they should carry them on the same shoulder and walk in step. Shoulder pads will prevent cutting of the shoulders and reduce fatigue.

When a gang of workers carries a heavy object such as a rail, the supervisor should make sure that proper tools are used. He should direct the work; frequently, a whistle or direct command can signal "lift," "walk," and "set down." The key to safe gang carrying is to make every movement in unison.

In this team lift, bent knees indicate that the workers have used their legs to help raise the load, not their backs.

Handling specific shapes The best way to handle boxes and cartons is to grasp the alternate top and bottom corners and to draw a corner between the legs.

Sacked materials are also grasped at opposite corners. Upon reaching an erect position, the worker should let the sack rest against his hip and belly and then swing the sack to one shoulder.

As the sack reaches his shoulder, he should stoop slightly and put his hand on his hip, so that the sack rests partly on the shoulder and partly on the arm and back. The other hand should be holding the sack at the front corner. When the sack is to be put down, it should be swung slowly from the shoulder until it rests against the hip and belly. While the sack is being lowered, the legs should be flexed, and the back kept straight.

Barrels and drum Those who handle heavy barrels and drums require special training. A barrel is generally less hazardous to handle than a drum because the shape of the barrel aids in unpending it. Because the weight and contents of a barrel or drum may vary greatly, special attention should be given to these factors.

Frequently, only one person is available to handle a drum, in which case it is better to wait for help or use mechanical assistance. A commercially available drum tilter equipped with wheels is commonly used. An extension handle provides control and leverage during the tilting operation. The wheels allow the tilted drum to be transported short distances more readily. Another commercial device is a two-wheeled dolly equipped with large rubber tires that is gaining popularity due to the ease of tilting and transporting.

If it is necessary to roll a barrel or drum, the worker should push against the sides with the hands. To change direction of the roll, he should grip the chime rather than kick the drum. A clamp device for carrying a drum is available.

To lower a drum or barrel down a skid, the drum should be turned and slid endwise. Rolling a drum or barrel up a skid takes two persons, who should stand outside the skid, not inside the rails nor below the drum or barrel being raised or lowered.

If drums or barrels are to be handled on an incline or skid, ropes or other tackle should be used to control their motion. The drum or barrel should be snubbed with a rope, one end of which is securely fastened to the platform

from which the drum or barrel is to be lowered. The rope should then be passed around the barrel or drum, and the operator, keeping a firm grip on the free end, can gradually lower the load.

Sheet metal usually has sharp edges and corners and should be handled with leather gloves, hand leathers, or gloves with metal inserts. Gauntlet-type gloves or wristlets will give added protection to wrist and forearm. Bundles of sheet metal should be handled with power equipment. A sheet metal "grab" can be purchased.

Flat glass should be handled by persons equipped with gloves or hand laps, wrists and arms should be protected with leather cuffs and safety sleeves. The worker should wear a leather apron, leggings, and safety shoes with metatarsal guards. Unless the glass plates are small, the worker should carry only one at a time and walk with care. The plate should be lifted carefully and carried with its bottom edge resting in the palm (turned outward) and the other hand holding the top edge to steady it. Glass plate should never be carried under the arm because a fall might break the glass and sever an artery.

To transport larger glass plates over any distance, handling equipment should be used. Plate glass must not be carried in such a manner that it could bend.

Larger flat glass should be handled by equipment specifically designed for that purpose. Equipment such as cranes equipped with vacuum frames. C-frames or spreader bars, and special wagons or dollies normally is used to transport heavy glass. If large plates must be transported by hand, two workers wearing safety hats, safety sleeves, cuffs, gloves, and safety shoes should be assigned to the job.

Long objects Long pieces of pipe, bar stock, or lumber should be carried on the shoulder, with the front end held as high as possible to prevent striking other employees, especially when going around corners. Workers should wear shoulder pads for this operation.

Irregular objects present special problems. Often the object must be turned over or up on end, so that the best possible grip can be secured. If the worker questions his ability to handle the object, because of either its weight or shape, he should get help.

Scrap metals In a scrap storage area, the best possible housekeeping practices should be observed. Irregularly shaped, jagged pieces may be tangled in such a way that strips or pieces may fly when a piece is removed from a pile. Workers, therefore, should be provided with goggles, leather gloves or mittens, safety shoes, safety hats, and protection for the legs and body.

Workers should be cautioned against stepping on objects that may roll or slide.

Heavy, round, flat objects (such as railroad car wheels or tank covers) can be rolled by hand only with considerable danger even to skilled personnel. The operation requires careful training and exacting precautions. It is preferable to use a hand truck or power equipment designed for the purpose.

Heavy rolls can be safely secured and handled by specially designed devices.

Machines and other heavy objects Manual movement of heavy machinery and equipment requires special skill and knowledge.

Only general safety principles for such jobs can be suggested. Each one presents its own problems and requires careful study and thorough planning. Some companies build scale models of the machines and the blocking, jacks, rollers, and other equipment to be used and then work out the procedure in miniature.

In all cases, the safe floor load limits for areas over which the machine or part will move, as well as for the place in which it is to be installed or stored, should be determined.

Blocking and timbers should be selected with great care. They should be of hardwood, preferably oak, and of the proper sizes to allow the machine to be safely blocked or cribbed as it is raised or lowered. Blocking with wood that has rounded corners or shows signs of dry rot should not be used.

For sufficient strength, cribbing should have a safety factor of at least four. The natural tendency to underestimate the load should be guarded against.

Cribbing must be placed on a foundation in such a manner that it can be removed readily as the machine is lowered.

In handling materials, a variety of hand-operated accessories can be used. Each tool, jig, or other device should be kept in good repair and used only for the job for which it is designed.

Hooks The worker should be trained to use hand or packing hooks in such a manner that they will not glance off hard objects with possible injury to himself or others. If a hook is to be carried in the belt, the point should be covered.

Hook handles should be of hardwood and in good condition. Hooks for handling logs, lumber, crates, boxes, and barrels should be kept sharp and inspected daily and before each use.

Bars The principal hazard in the use of a crowbar is slippage. A dull, broken crowbar is more likely to cause injury than a sharp one. The point or edge should have a good "bite." The worker should be positioned to avoid falls or pinched hands if the bar slips or the object moves suddenly—he should never work astride it. Hands and gloves should be dry and free of grease or oil.

Crowbars not in use should be stored so that they will not fall or cause a tripping hazard.

Ordinary crowbars should not

be used to move cars on steel rails. Car movers that do not readily slip are available. When two persons are needed to move a car, two car movers should be used. Each person should operate a mover.

Rollers Heavy, bulky objects must often be moved by means of rollers. The principal hazard is that the fingers or toes may be pinched or crushed between a roller and the floor. Rollers should extend beyond the load to be moved and be sufficiently strong. Rollers under a load should be moved with a sledge or bar, not with the hand or foot.

Jacks When a jack is used, the capacity plate or other marking on the jack should be checked to make sure the jack can support the load. If the identifying plate is missing, the maximum capacity of the jack should be determined and painted on the side. If a properly rated jack is used, it should not collapse under the load.

Jacks should be inspected before and after each use. Any sign of hydraulic fluid leakage is sufficient reason to remove the jack from use.

A heavy jack is best moved from one location to another on a dolly or special hand truck. If it has to be manually transported, it should have carrying handles, and at least two workers should form a team to move it. The operating handle should never be left in the socket while a jack is being carried, because it may strike other workers.

Workers should make certain that jacks are well lubricated, but only at points where lubrication is specified, and should inspect them for broken teeth or faulty holding fixtures. A jack should never be thrown or dropped upon the floor; such treatment may crack or distort the metal, causing the jack to break when a load is lifted.

It is important that the floor or ground surface upon which the jack is placed is level and clean and that the safe limit of floor loading capacity is not exceeded. If the surface is earth, the jack base should be set on substantial hardwood blocking (at least twice the size of the jack), so that it will not turn over, shift, or sink. If the surface is not perfectly level, the jack may be set on blocking, leveled by substantial shims or wedges placed so securely that they cannot be crushed or forced out of place.

To prevent the load from slipping, no metal-to-metal contact should be permitted between the jack head and the load. A hardwood shim, longer and wider than the face of the jack head, should be placed between the jack head and the contact surface of the load. Two-inch wood stock is suitable for this purpose.

"Extenders" of wood or metal should never be used. Instead, either a larger jack should be obtained or higher blocking that is correspondingly wider and longer should be placed under the jack.

All lifts should be vertical, with the jack correctly centered for the lift, the base on a perfectly level surface, and the head with its shim bearing against a perfectly level meeting surface. When an emergency requires that the lifting force be applied at an angle, extra precautions must be taken, including:

1) A base of blocking, securely fastened together and to the ground, to make an immovable surface at right angles to the lift for the jack base to sit on;

2) Cleats on the blocking to prevent shifting of the jack base;

3) A meeting surface at right angles to the direction of the lift for the jack head with its shim to bear against;

4) Props or guys to the load to prevent its swinging sidewise when lifting begins.

When a jack handle is placed in the socket, the worker should make sure that the area is clear and that there is ample room for an unobstructed swing of the handle before he applies pressure. A faulty movement in the load may cause the handle to pop up and strike another worker. The person operating the handle should stand to one side so that, if the handle kicks, it will not catch him in the body or face.

After the load is raised, metal or heavy wooden horses or blocking should be placed under it for support in case the jack should let go. A raised load should never be allowed to remain supported only by jacks. The handles of the jacks should be removed immediately and placed out of the way to prevent workers from tripping over them.

When releasing a jack, the worker should keep all parts of his body clear of the movement of the handle.

Hydraulic jacks may settle after raising a load. It is, therefore, especially important to place blocking under a load that has been raised by such jacks.

Screw jacks have a tendency to twist when a heavy load causes the floating head of the jack to bind. The base of a screw jack should be anchored as securely as possible, so that the jack base will not twist and slip out from under the load when force is applied on the bars to raise the screw.

To raise a large piece of equipment with screw jacks, two or more jacks should be used. The load should be equally distributed on each jack. Each jack should be raised a little at a time to keep the load level and the strain equal on each screw jack head. Special signals are required to verify that all jacks are rising uniformly.

Workers using jacks should wear safety shoes and instep-guard protection, because jack handles may slip and fall or parts of machinery or equipment may become loose and drop while the load is being lifted or shifted. Wiping material should be furnished to jack operators to remove oil from their hands and from the jack handles, so that they will always have a firm grip.

Oil that has collected in the bases of equipment or machines to be jacked should be removed before the operation is begun, to prevent spillage when the equip-

ment or machines are tilted. Spillage of residual oil should be wiped up immediately.

When a jack begins to leak, malfunction, or show any signs of defect, it should be removed from service, repaired, and tested under load before being returned to service.

Handtrucks, dollies, and wheelbarrows Many special types of handtrucks and dollies are available, such as two-wheeled, flat, platform, refrigerator, appliance, box, special racks or dollies, and lift trucks. Trucks can be purchased or designed for objects of various sizes and kinds. Operators should wear gloves and safety shoes.

Two-wheeled trucks and wheelbarrows should be equipped with knuckle guards to protect against the jamming of hands against door frames or other obstructions.

Some two-wheeled trucks have brakes so that the worker need not hold the truck with a foot on the wheel or axle. Most commonly used trucks do not have brakes.

To reduce the hazard to toes and feet, wheels should be as far under the truck as possible. Wheel guards can be installed on many types trucks.

Tongues of flat trucks should be provided with counterweights, springs, or hooks to hold them vertical when not in use. If this is not possible, workers should be trained to leave handles in such a position that they will not be a tripping hazard.

Equipment should be inspected daily and kept in good repair. Repair and maintenance records should be kept to describe the condition of each piece of equipment. Axles should be kept well greased.

The type of truck most suitable for the work at hand should be used. No one truck is suitable for handling all types of material.

Two-wheeled trucks look deceptively easy to handle, but there are safe procedures that must be followed.

1) Tip the load to be lifted forward slightly, so that the tongue of the truck goes under the load.

Handles on this two-wheel truck curve into the center so the worker's hands are not jammed against obstructions in passing.

2) Push the truck all the way under the load to be moved.

3) Keep the center of gravity of the load as low as possible. Place heavy objects below lighter objects. When loading trucks, truckers and loaders should keep their feet clear of the wheels.

4) Place the load well forward so the weight will be carried by the axle, not by the handles.

5) Place the load so it will not slip, shift, or fall. Load only to a height that will allow a clear view ahead.

6) When a two-wheeled truck or wheelbarrow is loaded in a horizontal position, raise it to traveling position by lifting with the leg muscles and keeping the back straight. Observe the same principle in setting a loaded truck or wheelbarow down—the leg muscles should do the work.

7) Let the truck carry the load. The operator should only balance and push.

8) Never walk backwards with a hand truck.

9) For extremely bulky items or pressurized items, such as gas cylinders, strap or chain the item to the truck.

10) When going down an incline, keep the truck ahead so that it can be observed at all times.

11) Move trucks at a safe speed. Do not run. Keep the truck constantly under control.

Four-wheeled truck operation follows rules similar to those for two-wheeled trucks. Extra emphasis should be placed on proper loading, however. Four-wheeled trucks should be evenly loaded to prevent their tipping. Four-wheeled trucks should be pushed rather than pulled, except for a truck that has a fifth wheel and a handle for pulling.

Trucks should not be loaded so high that operators cannot see where they are going. If there are high racks on the truck, two men should move the vehicle—one to guide the front, the other to guide the back. Handles should be placed at protected places on the racks or truck body, so that passing traffic, walls, or other objects will not crush or scrape the operator's hands.

General precautions Handlers of two- and four-wheeled trucks should be made aware of three main hazards: running wheels off bridge plates or platforms, colliding with other trucks or obstructions, and jamming their hands between the truck and other objects.

Workers should operate trucks at a safe speed and keep them constantly under control. Special care is required at blind corners and doorways. Properly placed mirrors can aid visibility at these places.

Pallets are constructed of paper, wood, glass fiber, and plastic. They should always be kept in good condition and repair. The best way is to have a systematic inspection, repairing those that can be repaired and getting rid of those that cannot.

Pallets that are not in use should not be left scattered around because of the tripping hazard that they present. When not in use, pallets should be stacked, but never on end or higher than 12 pallets. Ω

Appendix F
What You Should Know About Administrating Personal Protection

Reprinted by permission of the Managing Editor, National Safety and Health News, February 1986

By Bruce J. Srachta

The elimination of hazardous conditions in the work place is a primary goal and responsibility of industry. Eliminating a hazard, rather than having to use personal protective equipment, is the first choice.

For those hazards that defy elimination through engineering design, guards, ergonomics, or limiting worker exposure, the industrial safety practitioner must rely on workers using personal protective equipment (PPE) along with a positive attitude toward safety to guard them against injury and ill health.

Administrating a Program Once the need for personal protective equipment is established, the safety professional is often faced with the problem of getting the worker to abide by the rules and wear the proper equipment.

The Ontario Division of Inco Metals Company offers several suggestions on how to ensure that employees wear personal protective equipment that is vital to their well being. They suggest:

1) Have a published company policy regarding protective equipment. Consult employees when formulating this policy and obtain their support. Communicate the policy to all employees.

2) Inform your people, in plain understandable language, of hazards to their well being and of the company's efforts to eliminate those hazards. They must feel that the company considers their well being to be of primary importance. Answer all of their questions fully and frankly.

3) Include the company's safety policy and regulations in the training program for new employees. It is important that they understand the reasons for wearing personal protective equipment.

4) Provide good quality, comfortable personal safety equipment. Where necessary, have it fitted to the employee by a trained person. Make every effort to resolve any problem cases that may occur.

5) Try to minimize the financial burden to the employees. Consider subsidizing the cost of safety equipment. This will help to control the quality of equipment used, reduce the cost to the employee, and show the company's concern for the safety of its employees.

6) Gradually introduce a mandatory protective equipment program. First, state the intention, set the target date for compliance, then allow the workers a period to become accustomed to wearing the equipment. Publicize

Monitoring the noise exposure of employees is just as important as assessing the exposure in the first place. Here a hygienist uses a sound level meter to determine the ambient noise level in the area of the worker's ears. Note: worker is already wearing a personal noise dosimeter to take a time-weighted average over an eight-hour work day. And the worker is wearing muff-type hearing protection.

the beneficial effects of the plan through employee publications and bulletin boards. After the program is introduced, firmly enforce the use of personal protective equipment as a required condition of employment.

7) Management and supervision must set an example by carefully complying with all regulations of wearing personal protective equipment.

8) Some exemptions may be required. Allow plant managers to decide what occupations, if any, should be exempted, while maintaining general compliance with the company poilcy.

9) Make the wearing and proper use of personal protective equipment an important part of the in-plant safety program and public advertising. Pressure from an employee's loved ones can be a compelling, persuasive force when the decision to wear or not wear the equipment is made.

At Universal Foundry, Oskosh, WI, company policy dictates the wearing of required personal protective equipment as a condition of employment.

Failure to comply with this policy results in the issuance of a safety violation citation to the employee involved. Progressive disciplinary action may follow culminating in scheduled unpaid time off and even termination of employment.

They believe management must set an example for hourly workers. Therefore, any management personnel found disobeying safety rules receives notification of the infraction with a carbon copy being sent to the immediate boss or plant manager.

Either departmental safety representatives (hourly personnel) or management personnel may cite an employee for failing to obey mandatory safety and health rules.

Selection and Fitting The selection and fitting of personal protective equipment is most important, and is the responsibility of management. It is of no value to employees if devices are not fitted correctly or worn. Universal Foundry trys to have an acceptable selection of approved or certified personal protective equipment available in its stockroom at all times.

Occasionally an employee asks to use something other than the equipment provided. Safety personnel will then work with that employee to provide for personal needs while meeting the job requirement and the applicable regulations.

Example: If an employee with a full beard is the successful bidder for a job requiring him to wear personal protection (half mask), he would be told he must shave his beard to allow a perfect seal between the mask and his face or bid for another job where his beard won't interfere with required protection. He is encouraged to ask questions and the reasons behind the need to remove his beard are explained to him.

The employee is reminded that he must wear the required personal protective equipment properly or he will receive a safety violation citation.

Employees who oppose mandatory personal protective equipment involving *OSHAct*, are shown a copy of the applicable section from the *Federal Register*. They are told that "*OSHAct* basically is a labor law designed for the protection of the worker; both management and workers must abide by these federal regulations. If you want the regulations changed, write your congressional representative."

Frequently, films, posters, and group training sessions are used at Universal Foundry to teach employees how to use personal protective equipment correctly.

Occasionally employees test new items and state their prefer-

Matching the personal protective device to the hazard is an important aspect of administering a personal protective program. Shown are three types of airline respirator systems (left to right): supplied-air hood, half-mask continuous flow respirator, and full face-piece pressure demand respirator. (Photo: Courtesy of Willson Safety Products.)

ences prior to the purchase of new items. Employee input is considered valuable, but ultimately the final decision is management's responsibility at Universal Foundry.

The company has found that when employees help clean and maintain personal protective equipment usually much less damage to the equipment occurs.

Outside expertise is available to employers when they are selecting personal protective equipment. Among those sources are the National Safety Council, Workers' Compensation insurance carriers, state hygienists, safety supply vendors, local industrial safety councils, and similar industries.

During plant inspections at Universal Foundry, safety personel ask department supervisors and hourly employees about personal protective equipment. These are the persons who really know the jobs. Their candid comments may result in having a knowledgeable vendor visit the job site in order to find a specific protective item that answers the employees' needs.

There are specific operations, programmed or emergency, during which personal protective equipment is required to prevent injury. Following are 10 points to consider when selecting and using personal protective equipment as described in the book *Occupational Safety Management and Engineering** by Willie Hammer.

1) First choice should be given to eliminating the hazardous environment, rather than using personal protective equipment. *OSHAct* stresses this.

2) Approved protective equipment and devices suitable for specific hazards that might be encountered during the operations should be available and employed. No supervisor should permit an operation to be conducted unless the equipment and devices are in proper working order and used as stipulated.

3) Only protective and rescue equipment approved or certified for the purpose by responsible agencies and in accordance with *OSHAct* standards and other applicable safety criteria should be used. Managers should ensure that procedures are available for the supply, maintenance, and operation of the equipment, and that all personnel are proficient in their upkeep and operation.

4) The locations of first aid, emergency, and personal protective equipment must be easily accessible and readily distinguishable. Equipment should be stored as close as practical to the possible point of use. Operating procedures should identify the equipment stored and its location. Inspections should be made periodically to make sure that stipulated items are present. Unauthorized persons removing, tampering with, using, or damaging this equipment should be disciplined.

5) No person should enter a hazardous environment without prescribed protective equipment, use poorly fitted or defective equipment, remove the equipment while in the hazardous environment, or remain in the hazard area in the protective equipment if it is damaged or faulty.

6) All persons must be familiar with the capabilities, limitations, and proper methods of fitting, testing, using, and caring for protective equipment. Managers should ensure that courses of instruction are provided to familiarize personnel with equipment, especially new types. Supervisors should schedule practice sessions or have training units conduct sessions to maintain user proficiency.

Barrier creams are useful when gloves cannot be used as hand protection. They can also be used in addition to wearing gloves. Training and supervision will assure that they are used as directed. (Photo: Courtesy of Airwick Professional Products, Inc.)

7) Devices should be available to detect, warn, and protect against an impending or existing dangerous condition. That equipment should be used to evaluate atmospheres that might be toxic, flammable, or explosive, or in which excessive levels of radiation, heat, pressure, noise, or other hazard might exist, and to appraise personnel of the status of such conditions or when control of the hazard is lost. Equipment provided should be adequate for detecting the hazard under conditions other than normal for the operating environment.

8) Detection and warning equipment should be maintained in a state on which operations and readings are dependable and accurate. To do this, they should be tested and calibrated periodically.

9) Detection and warning equipment should be installed, maintained, adjusted, or repaired only by personnel trained and assigned for the purpose. Warnings should be posted against other persons tampering with, inactivating, or damaging this equipment.

10) Operating procedures should specify actions that personnel should take in time of danger or when a warning signal indicating danger is heard. Managers should also prescribe and ensure that exercises are conducted to maintain proficiency in these procedures.Ω

* Hammer, Willie, ***Occupational Safety Management and Engineering***. Third Edition, 1985. Prentice-Hall, Inc., Englewood Cliffs, NJ 07632. pp. 93-95.