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Safety
SAFETY REGULATION

Supplementation of this regulation is prohibited without prior approval from
Headquarters, USAFACFS.

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CHAPTER 1

GENERAL

1-1. SUMMARY. This regulation provides policy, defines responsibilities, prescribes criteria, and outlines guidance for the development, implementation and evaluation of the U. S. Army Field Artillery Center and Fort Sill (USAFACFS) Accident Prevention Program.

1-2. APPLICABILITY. This regulation applies to all elements of the USAFACFS, and U.S. Army Reserve and Army National Guard units supported by USAFACFS. Tenant commands and activities may establish host tenant agreements to cover specific issues necessary to implement their accident prevention programs in accordance with requirements unique to their Major Army Commands (MACOMs).

1-3. PURPOSE. To establish policies, assign responsibilities, and provide procedures for implementing, managing, and conducting the USAFACFS, Safety and Occupational Health (SOH) Program in accordance with federal law and Army regulations.

1-4. REFERENCES. The minimum required and related publications are listed below. Regulations must be available or accessible.

- a. CFR 1960.58 (Program Elements)
- b. DoDI 6055.1 (Safety & Occupational Health Program)
- c. FM 100-14 (Risk Management)

- d. AR-385-10 (Army Safety Program)
- e. AR 385-40 (Accident Reporting and Records)
- f. DAP 385-40 (Army Accident Investigation and Reporting)
- g. AR 385-64 (U.S. Army Explosives Safety Program)
- h. TRADOC Reg 385-2 (TRADOC Safety Program)
- i. FORSCOM Reg 385-1 (FORSCOM Safety Program)

1-5. EXPLANATION OF ABBREVIATIONS AND TERMS. Explanations of abbreviations and terms used in this publication are in appendix A.

1-6. POLICY. The command's policy is to minimize accidents by maintaining safe and healthful work environments, using all material and equipment in accordance with current safety standards and regulations, conducting safety awareness training, and requiring participation in and active enforcement of the USAFACFS SOH Program at all levels of the command.

1-7. RESPONSIBILITIES.

a. USAFACFS Commander, as the Installation Senior Safety Officer (ISSO), will provide the leadership and necessary resources to fully implement and administer all aspects of the USAFACFS SOH Program.

b. Commanders and directors will--

(1) Appoint, in writing, a Collateral Duty Safety Officer (CDSO) and NCO. Provide a copy of the appointment orders to the Installation Branch Safety Office (IBSO), and schedule the CDSO and NCO to attend the first available collateral duty course after appointment.

(2) Maintain safe operations and practices and prevent accidents within their respective areas.

(3) Enforce safety work procedures, good housekeeping practices, and personal protective equipment (PPE) use.

(4) Administer proper corrective action for violation of safety and health rules.

(5) Ensure thorough training in proper job procedures and safety practices for all employees.

(6) Administer expeditious investigation and reporting of all accidents in accordance with AR 385-40.

(7) Ensure all personnel assigned to medical surveillance and training programs attend all appointments and scheduled classes.

(8) Promptly abate all safety and health deficiencies.

(9) Include safety standards in supervisors' performance appraisals.

(10) Budget and fund for safety supplies, equipment, and training.

(11) Devote a portion of their bulletin board to prominent display of safety and occupational health materials. Strategically place safety posters throughout the area. Some posters are available from the IBSO. Use posters **designed by members of the unit** and oriented toward unit needs whenever possible. These are normally more effective than stock posters. Replace posters frequently. They lose their effectiveness rapidly.

(12) Maintain a reading file of available safety literature. Include items such as safety standing operating procedures, bulletins, newsletters, memorandums, pamphlets, and other safety correspondence that applies to the organization.

(13) Post DD Form 2272 and DA Form 4755 in each workplace in the location where personnel notices are usually placed. These posters explain employee rights and responsibilities under Public Law 91-596.

(14) Establish and implement procedures for an awards program (see appendix B).

(15) Develop a Unit Safety Standard Operating Procedures (see appendix C).

c. Installation Branch Safety Manager (IBSM) will--

(1) Develop mishap prevention and loss control measures and programs.

(2) Prepare specific activity safety rules and regulations for approval and issue by the commander.

(3) Organize, coordinate, and conduct safety inspections, surveys, and workplace monitoring programs to identify violations, hazards, and deficiencies in the operations of facilities and equipment.

(4) Conduct safety and mishap investigations and studies, analyze reports of injuries or illnesses and property damage to identify causal factors and determine trends, and initiate program improvement action.

(5) Maintain complete and accurate records on the mishap, injury, and occupational illness experience, and fulfill all reporting requirements.

(6) Record safety and health violations and deficiencies, recommend corrective actions, and conduct follow-up inspections.

(7) Maintain liaison with plan and design officials on the adequacy of tools, equipment, facilities, designs, plans, and specifications from the safety and health standpoint, and integrate safety precautions into all plan and design efforts.

(8) Develop, coordinate, and conduct safety training and education. Conduct activity training programs, required specific safety refresher training and, where conditions warrant, specialized training.

(9) Provide consultation service, advice, and guidance to all activity organizational elements and levels of supervision covering technical aspects of safety, principles of hazard recognition and control, and application of safety principles as they relate to employees and the workplace.

(10) Coordinate the preparation of the activity's annual safety program budget.

(11) Serve as the technical authority in the procurement of approved PPE and as coordinator for all facets of the personal protection, noise control, and sight conservation programs.

(12) Analyze investigation reports of accidents (regardless of who makes the investigation) and make recommendations to the commander for corrective action.

(13) Establish written goals and objectives for the command's SOH program and continued evaluation of program performance.

(14) Implement a hazard reporting system that provides employees with a method of reporting unsafe or unhealthful conditions.

d. First-line supervisors will--

(1) Ensure the safety of all military and civilian subordinates within their department, ensure the safe condition of the work area, and enforce safety rules and regulations.

(2) Correct, eliminate, or report all unsafe, unhealthful working conditions within their areas.

(3) Provide appropriate safety and/or PPE (e.g., clothing, goggles, masks, etc.) when employees face potentially hazardous conditions.

(4) Investigate all accidents involving bodily injury, no matter how minor, record damage to property and equipment, and submit the appropriate accident forms to the Installation Safety Office (ISO).

(5) Arrange immediate medical care and attention for employees injured on the job.

(6) Implement all Federal and DA rules and regulations.

(7) Conduct and document monthly safety inspections within your departments, correct deficiencies, and maintain property and equipment in safe operating condition at all times.

(8) Ensure compliance with all safety training and medical surveillance programs and require strict adherence to all schedules and appointments.

(9) Document all safety, fire, and occupational health training provided to employees.

e. Soldiers and civilian employees will--

(1) Immediately report all occupational injuries or illnesses, no matter how minor, and report for medical treatment, as soon as possible.

(2) Abide by all verbal or written safety rules given by a supervisor and/or safety professional.

(3) Accomplish work in a manner that will assure your own and other employees' safety and health.

(4) Report all unsafe or unhealthful working conditions to your supervisor.

(5) Use and maintain all personal protective clothing and equipment specified for the safe performance of your duties.

(6) Report to all medical examinations and training appointments as scheduled.

CHAPTER 2

RISK MANAGEMENT

2-1. PURPOSE. This chapter establishes requirements for training safety measures for the USAFACFS. All USAFACFS units must assess and control the risk associated with all potentially hazardous operations IAW FM 100-14, FM 101-5, DA Pam 385-1, and TRADOC Reg 385-2, and will use the risk management process.

2-2. GENERAL. Leaders at every level must be aware of correct safety procedures during training. Conduct and document risk management training annually. Subordinates follow and learn from the actions of leaders in the performance of their duties. Safety is no exception. Soldiers develop a "sixth safety sense" after being exposed to repetitive words and deeds that reflect leader's safety awareness and concern. Moreover, soldiers be aware that you are accountable for accidents when you fail to exercise prudent caution or fail to accomplish a task in which you are trained or instructed. There is no choice between safety and realism. Safety always prevails.

2-3. RISK MANAGEMENT. Leaders at all levels utilize risk management procedures to integrate safety into planning and implementation phases of all operations to effectively accomplish the mission and provide protection against accidental losses of personnel and equipment.

2-4. RISK ACCEPTANCE AUTHORITIES.

a. Risk acceptance authorities are established as follows:

- (1) Extremely High Risk - Commanding General, USAFACFS.
- (2) High Risk - General Officers, Brigade Commanders.

(3) Moderate Risk – Battalion Commanders, Battalion CSMs, and NCOA Commandant.

- (4) Low Risk – Battery Commanders.

b. Below are examples of risks:

- (1) Extremely High Risk – Air Assault Operations.

(2) High Risk – Live Hand Grenade Training, Convoy Live Fire, Fire and Movement, and Infiltration Courses.

(3) Moderate Risk – Defensive Fire, Treadwell Tower, Reflexive Fire, Redleg Challenge Exercise, Liberty City, and FTX.

- (4) Low Risk – Combat Condition Course, Bivouac, and Fast Tracker Training.

CHAPTER 3

HAZARD COMMUNICATION PROGRAM

3-1. PURPOSE. To provide guidelines and assign responsibilities for the implementation of 29 CFR 1910.1200, Occupational Safety and Health Administration

(OSHA) Hazard Communication Standard (HCS), at USAFACFS subordinate commands and tenant activities.

3-2. SCOPE.

a. This program applies to all USAFACFS military and civilian personnel and tenant activities who work with chemicals/hazardous materials (HMs) or who must routinely pass through or work in areas that use HMs as part of the operations.

b. This program does not apply to contract workers working in government facilities. Contractors must receive the material safety data sheet (MSDS) from the manufacturer or importer for the HMs they may encounter while working in Army facilities, and provide MSDSs of the HMs they use on Army facilities to the cognizant contracting office.

3-3. POLICY. USAFACFS provides a safe and healthful workplace for its personnel and fully implements the DOD & OSHA, HCS. Accordingly, supervisors warn personnel, working with or exposed to HMs in the workplace, of the health hazards of these chemicals and the protective measures available through--

- a. Container labels and warning tags.
- b. MSDSs.
- c. Inventories of workplace HMs.
- d. Documented training.
- e. Written programs.

3-4. RESPONSIBILITIES.

a. USAFACFS Commander is responsible overall for the Installation Hazard Communication Program (HCP) and has authority to make the decisions necessary to ensure the success of the program.

b. Commander/director of each organization appoint, in writing, a hazardous communications program manager who will--

- (1) Attend the hazardous communication "Train the Trainer" course.
- (2) Provide overall program management that includes establishing plans, policies, coordination, and procedures for the effective implementation of the HCP.
- (3) Provide technical guidance and coordinate formal training programs from the Reynolds Army Community Hospital (RACH) Occupational Health and the IBSO.

(4) Assess compliance with program requirements.

c. MEDDAC, Preventive Medicine will--

(1) Assist the IBSO by providing technical guidance upon request and participating in formal training programs.

(2) Evaluate MSDSs of "new" material to minimize the addition of HMs to the command's supply system.

(3) Conduct hazard evaluation and identify HMs in the workplace and the employees covered by the program. An industrial hygienist will conduct and document the evaluation, which must include--

(a) Identification of HMs that are physical or health hazards. Exclude from the assessment, items such as hazardous waste (HW), drugs, food, tobacco, and common consumer products (household detergents, typing correction fluid, etc.), if other regulations cover them or they are used in the same manner as in typical consumer applications.

(b) Identification of employees potentially exposed to the HM. Potential exposure situations could occur during normal work activities, nonroutine tasks, and accidental spills.

d. Installation Contracting Office (ICO) will incorporate clauses in contracts that require contractors to comply with DOD & OSHA standards as well as provide MSDSs of HMs they intend to use on projects.

e. Directorate of Logistics (DOL) will forward a copy of each MSDS, provided by vendors, to MEDDAC Preventive Medicine for review and approval.

f. Directorate of Public Works (DPW) will ensure proper identification and marking of piping systems, equipment, and storage tanks containing HM.

g. Civilian Personnel Advisory Center, (CPAC) will assist in identifying civilian employees requiring training as required by law or for the success of the command's HCP.

h. Installation Branch Safety Office has oversight and monitors the HCP.

i. Commanders, directors, and supervisors will appoint a HM/HW manager who develops, implements, and maintains a written HCP for their workplace in accordance with 29 CFR 1910.1200. A sample written program is at appendix D.

j. Army military and civilian employees will--

- (1) Use and handle HMs safely and in accordance with manufacturer's specifications.
- (2) Use engineering controls, protective equipment, and safe procedures to prevent HM mishap.
- (3) Obtain supervisor's approval prior to introducing new HMs into the workplace or changing operations or procedures using HMs.
- (4) Participate in all training designed to fulfill the requirements of this program.

CHAPTER 4

RESPIRATORY PROTECTION PROGRAM

4-1. PURPOSE. To implement the command's Installation Respiratory Protection Program (IRPP) as required by AR 11-34, and 29 CFR 1910.134(c).

4-2. SCOPE. This applies to all units assigned or attached to USAFACFS elements.

4-3. POLICY. USAFACFS has a commitment to provide a safe and healthy workplace for its personnel and to fully implement a respiratory protection program. Command provides respiratory protection equipment, at no cost, to personnel for protection against chemical and other respiratory hazards when the following conditions exist.

- a. Engineering and/or administrative hazard controls are not feasible.
- b. Development of hazard controls is pending.
- c. Short-term, nonroutine operations for which engineering and/or administrative hazard controls are not feasible.
- d. Emergency situations (e.g., spill response, damage control, etc).
- e. At the request of an employee.

4-4. GENERAL. Safety and health standards establish permissible exposure limits (PELs) for airborne concentrations of potentially hazardous dusts, fumes, mists, and vapors. When engineering controls are not feasible, or as an interim step, implement a respiratory protection program governing respirator selection, use, maintenance, and release of appropriate respirators to employees.

4-5. RESPONSIBILITIES.

a. USAFACFS Commander has overall responsibility for the IRPP, and has full authority to make necessary decisions to ensure the success of the program. Commander appoints an Installation Respiratory Protection Program Manager (IRPPM) and an Installation Respirator Specialist (IRS).

b. The IBSM is the IRPPM. IRPPM coordinates all aspects of the IRPP and advises USAFACFS Commander of the actions required to ensure the success of the program.

c. The Installation Commander designates the IRS. The IRS will--

(1) Train or ensure that training of supervisors and workers is accomplished and perform required fit testing.

(2) Coordinate annual program evaluations to ensure--

(a) Use of engineering and administrative alternatives when possible.

(b) Issuance of respirators and respirator cards after determining that all requirements for medical evaluations, training and fit testing are met.

(c) Local respiratory protection managers, respirator users, and their supervisors receive annual respiratory protection training.

(d) Maintenance of records pertaining to respirator training, fit testing, and employee exposures are maintained IAW AR 25-400-2.

(3) Repair and dispose of respirators and maintain necessary levels of spare parts.

(4) Coordinate with fire department to conduct monthly inspections of emergency use respirators and Self Contained Breathing Apparatus (SCBAs). The IRS maintains records of these inspections IAW AR 25-400-2.

(5) Establish the procedures for monitoring the breathing quality for air-supplied respirators.

d. Only ICO will purchase respiratory protection equipment approved by the National Institute of Occupational Safety and Health (NIOSH).

e. DOL and other supply representatives will issue only American National Standards Institute (ANSI) or Mine Safety and Health Administration (MSHA) approved respiratory protection equipment or NIOSH approved equipment.

f. DPW will--

(1) Install and maintain breathing air systems capable of providing Grade D breathing air where required.

(2) Maintain compressed air breathing system alarms in an operable manner.

(3) Implement a schedule of routine maintenance for servicing and inspecting airline purification panels and changing filters and cartridges as necessary.

g. The Fire Department will--

(1) Provide training for firefighters using Respiratory Protection Equipment (RPE) and respirator specialists in coordination with the Installation Respirator Specialist ISO and Preventive Medicine Service as outlined in AR 11-34. Training includes the following:

(a) Handling, use, and maintenance of respirators.

(b) Respirator selection based on the contaminant in the atmosphere and the appropriate protection factor to include the approval of Industrial Hygienist of a selected respirator and cartridge.

(c) Records management.

(d) Medical and safety aspects of the program.

(e) Fitting and testing of respirators.

(f) Coordinating with respirator specialists to inspect monthly the emergency use respirators and SCBAs.

(g) Being available for emergency situations where a SCBA would be required to enter a contaminated atmosphere.

h. Installation Branch Safety Manager will--

(1) Evaluate, annually, the RPP IAW CFR 1910.134 and review SOPs during the annual Standard Army Safety and Occupational Health Inspections (SASOHI).

(2) Perform work site inspections to determine the type of RPE best suited for the task involved. IBSM requests the Industrial Hygienist perform surveys where personnel suspect there is hazards to health.

(3) Conduct random inspections to ensure respirator specialists maintain records of monthly inspection conducted on emergency use respirators and SCBA.

i. MEDDAC, Preventive Medicine will--

(1) Conduct a medical examination/evaluation on personnel who are identified to wear a respirator. Contact the Occupational Health (OH) clinic for an appointment.

(2) Notify the IRPPM and CPAC when an employee is unable to pass a medical examination.

(3) Provide technical guidance and actively assist the IRPPM in meeting program-training requirements.

(4) Assist the IBSM in reviewing the RPP and conducting on site evaluations.

(5) Provide training to the IRS.

j. CPAC will--

(1) Refer personnel considered for employment, requiring the use of RPE, to the OH Clinic for a pre-employment physical examination.

(2) Assist installation managers in reassigning employees required to wear RPE, who are unable to do so properly, as determined by the OH Clinic.

k. Commanders, directors, and supervisors appoint a unit respiratory protection manager who will--

(1) Ensure a Health Hazard Assessment is conducted and posted, of existing, new, or modified operations, regarding respiratory protection.

(2) Fund and issue RPE to personnel who have successfully completed medical and fit testing requirements.

(3) Ensure workers use respirators IAW this regulation and local SOPs

(4) Ensure all respirator users and their supervisors receive annual respirator training.

(5) Ensure scheduling of medical examination for all respirator users as required for that specific hazard(s). Ensure scheduling of fit-tests by the IRS.

(6) Coordinate with the IRS, who shall ensure that employees using a tight-fitting face piece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT) prior to initial use of the respirator, whenever a different respirator face piece (size, style, model, or make) is used and at least annually thereafter.

(7) Maintain all records pertaining to respirator training, fit-testing, employee exposures to respiratory hazards such as welding fumes and HM/HW spills IAW AR 25-

400-2.

(8) Inspect and document the respirators used in routine situations before each use and during cleaning, for emergency use, at least monthly, and IAW the manufacturer's recommendations for use. In addition, inspect the SCBA monthly.

(9) Develop, implement, and maintain a respiratory protection program standing operating procedure. A sample standing operating procedure is at appendix E.

(10) Maintain respirators and replace deteriorated respirators, as needed.

(11) Ensure employee performance standards reflect safety and the use of PPE.

(12) Coordinate employee fitting for corrective lenses for use inside full face-piece respirators to assure proper vision.

I. Respirator users will--

(1) Fit-check respirators before each use and use respirators in accordance with this instruction.

(2) Ensure the respirator is fully functional at all times and report any problems involving the use of respirators to the supervisor.

(3) Inspect and repair respirators prior to use, and clean and disinfect respirators after use.

(4) Comply with the requirements of this instruction. Failure to comply may result in administrative action.

4-6. RESPIRATOR SELECTION. Order only NIOSH approved respirators.

4-7. RESPIRATOR USE.

a. Use only NIOSH approved RPE.

b. Do not make modifications or substitutions to the respirators.

c. Only the person fit tested for the respirator may use it.

d. Do not fit individuals with interfering facial hair for respirators.

e. Do not wear contact lenses with the respirator.

f. Inspect the respirator per manufacturer's instructions before donning.

g. Perform a respirator fit-check per manufacturer's instructions when donning a respirator.

h. Upon detecting an odor from the work process, developing difficult breathing, or suspecting a leak, while using a respirator, leave the work area without delay. Do not reenter until you have resolved the problem, either by replacing cartridges, restoring airflow, or other means, as necessary.

i. When temporarily removing respirators during breaks in work operations, move away from the work area to prevent worker exposure and to keep the inside of the respirator face-piece clean. Protect respirators from contamination before redonning.

j. Clean, disinfect, and return respirators to the storage facility after each use.

4-8. RESPIRATOR INSPECTION. Respirator users inspect all respirators in accordance with manufacturer's instructions.

4-9. RESPIRATOR CLEANING AND DISINFECTING. Clean and disinfect respirators after each use.

4-10. RESPIRATOR STORAGE.

a. Store clean respirators in sealed plastic bags, away from sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Keep the storage area clean and sanitary.

b. Store respirators in such a way as to prevent crushing that can result in deformation of the face-piece or exhalation valve.

4-11. REPAIR AND MAINTENANCE. The IRS will--

a. Perform respirator assembly and repair, as authorized.

b. Not attempt to replace components or to make adjustments or repairs beyond the manufacturers' recommendations or with parts from different manufacturers.

4-12. MEDICAL EXAMINATIONS.

a. A physician or occupational health nurse, under the direction of a physician, must medically evaluate all respirator users to ensure that they can wear a respirator and perform the required work without adverse health effects.

b. An optometrist must fit users of prescription eyewear with respirator spectacles when the users wear full-face respirators.

4-13. TRAINING. The IRS or unit respiratory protection program managers will--

a. Instruct and train respirator users and their supervisors in the proper use of respirators and users limitations.

b. Include the following in annual training:

(1) Types of hazardous atmospheres and their effects on worker health.

(2) Respirator selection.

(3) Respirator use and limitations.

(4) Respiratory Protection Program requirements.

(5) Respirator inspection procedures.

(6) Respirator donning and fit-testing procedures.

c. Provide and document effective training to employees who are required to use respirators as mandated by the standard. The training must be comprehensive, understandable, and recur annually as required by the standard and more often, if necessary.

4-14. FIT-TESTING. IRS/local respiratory protection managers conduct fit testing IAW AR 11-34 and 29 CFR 1910.139 and manufacturers instructions, only after OH approval.

4-15. PROGRAM EVALUATION. USAFACFS respiratory program manager or IRS will conduct an annual program evaluation to determine program effectiveness using the Respiratory Protection Program Inspection Guide and take appropriate actions to correct any discrepancies.

CHAPTER 5

CONFINED SPACE ENTRY PROGRAM

5-1. PURPOSE. To implement the USAFACFS Confined Space Entry Program as required by AR 385-10 and 29 CFR 1910.146.

5-2. SCOPE.

a. This program applies to all military and civilian units assigned or attached to USAFACFS with personnel required to enter a permit required, confined space to include aircraft fuel cells.

b. This program does not apply to contractors or contract workers working in

government facilities. Contractors must, however, be informed of known permit spaces and permit space entry requirements, any identified hazards, the Army's experience with the space, and precautions or procedures to be followed when in or near permit-required spaces.

5-3. POLICY. USAFACFS must provide a safe and healthful workplace for its personnel and must fully implement the OSHA, Confined Space Entry Program. Accordingly, USAFACFS, who have personnel working in permit-required confined spaces, must be made aware of the confined space hazards through a training program provided at no cost. Personnel must receive PPE and any other equipment necessary for safe entry.

5-4. RESPONSIBILITIES.

a. Commander, USAFACFS, has overall responsibilities for the Confined Space Entry Program and has full authority to make necessary decisions to ensure the success of the program.

b. Other responsibilities are outlined in the USAFACFS Confined Space Entry SOP.

5-5. BASIC PROGRAM ELEMENTS. Basic program elements and procedures of confined space entry are outlined in the USAFACFS Confined Space Entry SOP.

CHAPTER 6

HAZARD IDENTIFICATION AND ABATEMENT

6-1. SUPERVISOR RESPONSIBILITIES. Supervisors will--

a. Assess the workplace to determine if hazards are present, or are likely to be present, which necessitates the use of personal protective equipment (PPE). For PPE requirements refer to, USAFACFS Regulation 385-10, chapter 9.

b. Brief workers on hazards associated with the work place and work area.

c. Keep workers apprised of new workplace hazards or changes to existing workplace hazards.

d. Know what safety regulations pertain to their work area.

e. Ensure employees follow proper work practices and procedures.

f. Conduct periodic safety inspections of their workplace.

g. Ensure common use personal protective equipment is available at the work

place or site.

h. Abate the hazards identified until permanent control measures can be implemented.

i. Brief all affected personnel on the situation.

j. When applicable, complete a work order (DA Form 4283).

k. Bring all "safety" or "fire code violations" that require a work order to correct/repair, to the Installation Branch Safety Office where they will assign the work order a Risk Assessment Code (RAC). Assign a document number to the DA Form 4283 prior to bringing it to the IBSO.

6-2. EMPLOYEE RESPONSIBILITIES. All employees/soldiers survey your workplace, during normal duty, for safety hazards. Notify supervisors immediately of hazards that are identified. Comply with the established PPE requirements of the workplace.

6-3. HAZARD REPORTING. Establish procedures for employee reports of hazards IAW 29 CFR 1960.28 and 29 CFR 1960.46. Any employee can report an unsafe condition by using the following methods:

a. Complete a DA Form 4755.

b. Call in to the IBSO.

6-4. INSPECTIONS. Unit safety representatives conduct quarterly inspections of low hazard areas. You can print out a low hazard checklist from the Fort Sill Safety Office Intranet page (<http://155.219.113.9/agency/safety/index.htm>). Low hazard areas are the unit offices and/or barracks. Forward one copy of each low hazard inspection to the IBSO.

CHAPTER 7

RADIATION PROTECTION AND RADIOACTIVE MATERIAL CONTROL PROGRAM

The Fort Sill Radiation Safety Program is codified in USAFACFS Regulation 385-11. The Director of Logistics administers the Radiation Safety Program through the Fort Sill Radiation Safety Officer and is committed to the operating philosophy of maintaining occupational radiation exposure as low as is reasonably achievable.

CHAPTER 8

TACTICAL SAFETY PROGRAM

8-1. PURPOSE. To provide safety guidance and procedures for tactical operations

within USAFACFS in order to reduce to an absolute minimum, the hazards encountered during tactical training.

8-2. SCOPE. These procedures apply to all active duty and reserve units and activities while participating in tactical operations within USAFACFS.

8-3. POLICY. Commanders have the ultimate responsibility for the personnel and equipment under their command. Leaders and supervisors are specifically responsible for the personnel and equipment in their charge. All personnel have the moral responsibility to take prudent actions to avoid losses due to accidents. Everyone has the authority to stop an unsafe act that is not a mission-specific necessity.

8-4. GENERAL. Accidents and injuries increase during tactical operations. An analysis of accidents, through lessons learned, show a pattern of recurrence in certain types of accidents. Lack of sleep, failure to follow established procedures, failure to enforce the procedures, hasty decisions made due to OPTEMPO pace, all contribute to accidents during tactical operations.

8-5. RISK MANAGEMENT. Decision-makers at every level will employ the risk management process, as specified in of AR 385-10, paragraph 2-3d, to avoid unnecessary residual risk to missions, personnel, equipment and the environment. After the commander has made the risk decisions, integrate into operations plans (OPLANs), OPORDs, SOPs, and rehearsals. Soldiers, down to the lowest level, need to know and understand the hazards you face and take control measures to implement. For further information on Risk Management or risk management publication references, see USAFACFS Reg 385-10, chapter 2.

8-6. FIELD SPACE HEATERS.

a. References.

- (1) TRADOC Regulation 385-2, TRADOC Safety Program.
- (2) AR 600-55, Motor Vehicle and Equipment Operator Selection Training, Testing and Licensing.
- (3) TM 10-4500-200-13, Heaters Space: Radiant Type.
- (4) TM 9-4520-257-12&P, Operators and Units Maintenance Manual Heater, Space, Radiant, Large (H-45).
- (5) Ground Precautionary Message (GPM-SSCOM-97-01, Fuel Fired Space Heaters.
- (6) Procure and use only heaters authorized for Army use by U.S. Army Soldier Biological and Chemical Command (SBCCOM). Obtain information regarding these

heaters on the SBCCOM website <http://www.sbccom.army.mil/products/field/index.htm>.

(7) Space Heater Medium (H-45). The 45,000 BTU heater, designed to heat GP series tents, replaces the Potbelly heater, uses no electrical power, burns all liquid fuels as well as solid fuels. NSN: 4520-01-329-3451.

(8) Space Heater Arctic. The 22,000 BTU heater, designed to heat 5-10 man arctic tents, replaces the Yukon heater, uses no electrical power, burns all liquid fuels as well as solid fuel. It has a telescoping stack that stores inside the heater. NSN: 4520-01-444-2375.

(9) Commercially Procured Space Heaters. Do not use commercially procured space heaters on Fort Sill for use in Army field training or operations.

b. Responsibilities.

(1) Field space heaters will be set-up by competent individuals familiar with leak test procedures. Only personnel trained, tested, and licensed IAW AR 600-55, chapter 6, can operate heaters. The responsible unit fire or safety representative inspects each heater before use.

(2) Set-up, fuel, use, and maintain heaters in accordance with applicable TM. Use only fuels approved for use and specified in the applicable TM.

(3) Modifications to heaters, not approved by modification work order (MWO) or safety-of-use messages, are not authorized.

(4) Do not use nonvented heaters. Vent heaters to the outside of the tent, structure, or shelter using the vent stack provided with the heater.

(5) All heaters are equipped with an emergency fuel shutoff.

(6) Set up heaters on a firm level fireproof base located in a marked area free of clothing or combustible material.

(7) Place a fire watch on duty any time solid or liquid fueled heaters are in use. Instruct fire watch on procedures for fire fighting, with appropriate extinguishing agent, and early recognition signs of carbon monoxide (CO) poisoning.

(8) Do not operate heaters while unattended.

(9) If the fuel tank is a separate component of the space heater, locate it on the outside of the tent or shelter.

(10) Do not use CO detectors outdoors. CO detectors are not designed or proven for outdoor use and do not have a means for calibration. CO detectors used in an

outdoor environment provide a false sense of safety and cannot provide early warning.

c. Health Effects from Heater Pollutants.

(1) Carbon Monoxide. The silent killer, it strikes with little or no warning. Exposure to carbon monoxide (exhaust gas) can result in headache, nausea, dizziness, weakness, confusion, drowsiness; symptoms are sometimes confused with the flu. High concentrations may cause coma, brain damage, or death.

(2) Nitrogen Dioxide. It irritates the skin and the mucous membranes in the eye, nose, and throat. In addition, nitrogen dioxide may increase susceptibility to disease such as bronchitis. People with respiratory disease including bronchitis, asthma, and emphysema are especially sensitive. Low to moderate concentrations may only cause a slight irritation. High concentrations cause burning and pain in the chest, coughing, and shortness of breath.

(3) Respirable particulates. If released from incomplete combustion, can lodge in the lungs. These particles may contain carcinogenic compounds. Low to moderate concentrations as well as high concentrations can irritate or damage lung tissue.

8-7. SEVERE WEATHER. All guidance on severe weather information, as it pertains to Fort Sill, can be found in the Fort Sill Severe Weather OPLAN that is ANNEX H to the USAFACFS Emergency Preparedness Plan.

a. Poor driving conditions, primarily snow and ice, can prevail during the winter months; therefore, the winter operating period requires additional precautions for safe operation of motor vehicles. Directorate of Emergency Services (DES), Military Police (MP) determines classification of roads during snow and ice conditions. Road conditions are classed: Green, Amber, Red, and Black. The Fort Sill Severe Weather OPLAN describes each road classification. Movement of tactical convoys and vehicles should remain with the commanders of major subordinate units based upon road classification and unit SOPs. Dispatch TMP vehicles IAW DOL SOPs. Each unit must develop a severe weather warning/action plan for field operations.

b. Extreme High Temperatures. Refer to the Severe Weather OPLAN, GTA 5-8-12, and TB MED 507.

c. Extreme Cold Temperatures. Refer to the Severe Weather OPLAN, GTA 5-8-12, FM 21-10, and FM 21-11.

8-8. TENTS.

a. Set up tents, for billeting personnel and storing unit equipment and supplies, in rows with a 2-meter clearance on all sides. Keep a 9-meter clearance between a double row of tents and any other row of tents with frames.

- b. Set up tents away from roads and trails. Do not cross tent ropes.
- c. Choose or create tent areas level and free of potholes, sharp rocks, and other hazards.
- d. Do not locate POL storage areas within 50 meters of tents. Store single cans of fuel at least 50 feet from the tent. When possible, locate POL storage areas at a lower elevation than bivouac areas to prevent fuel leaks from drawing towards the tents.
- e. Plan and establish walking paths between tents.
- f. Ensure camouflage nets do not touch space heater stovepipes in tents.
- g. Roll back and secure stovepipe flaps before stoves are operated.
- h. Soldier Crew Tents pose a hazard in that the fabric does not breathe. All windows and flaps must be open to provide adequate ventilation. If windows and flaps are closed, it is possible to use all oxygen contained in the tent, especially during sleeping hours, resulting in death.

8-9. CAMOFLAGUE. Do not use plastic poles used with camouflage screen systems and support systems when ice or snow is anticipated. The maximum column weight of plastic poles is 200 pounds. Do not mix plastic with aluminum support pole sections. Do not stack the support poles more than four high. Inspect the poles and the joined sections prior to installation to ensure no cracks or other damage. Install replacement pole when necessary

8-10. FIELD MESS.

a. General. Safety considerations and layout for field mess operations are in FM 10-23. Commanders brief mess personnel on safety guidance in FM 10-23, chapter 12, and this publication. Safety guidance includes proper operating procedures for M2 burner units, storing flammable liquids, and controlling ignition sources. Soldiers change your clothes before igniting burners if you have spilled fuel on your clothing while refueling any type of equipment described in b through d below.

b. M2 Burner Units. Only properly trained and licensed (AR 600-55) mess personnel may operate M2 burner units (TM 10-7360-204-13&P). Soldiers operating M2 burners will--

- (1) Ensure fuel tanks are at least 50 feet from open flames or other flammable sources before filling them.
- (2) Store burner fuel (gasoline) at least 50 feet outside of kitchen enclosures.
- (3) Not fill a tank while a flame is burning or when a burner is hot.

(4) Wipe up spilled fuel immediately.

(5) Not operate a burner when the pressure gauge reaches or exceeds 25 pounds per square inch or is in the "red" area.

(6) Not release fuel tanks until the burners have cooled (escaping gas vapor can ignite).

(7) Not tighten joints while a burner is operating.

8-11. SLEEPING AREAS/CREW REST. Sleep deprivation is a contributing factor in many accidents. Soldiers who are sleep deprived do not think clearly, plan effectively, or follow procedures correctly. There is a 25% decline in effectiveness for every 24 hours without sleep. Symptoms of sleep deprivation include extreme sleepiness, lapses in attention, irritability, susceptibility to accidents, and decreased attention to self-care. Provide all personnel with adequate rest to be able to perform at reasonable levels. Commanders must include rest cycles for soldiers and leaders to prevent fatigue-induced mistakes. The following is a general guide for work and rest cycles:

a. Prepare for deployment to different time zones by changing work and sleep periods to match the new theatre of operation.

b. Quality of sleep is as important as quantity. Conditions that improve the quality of sleep include sleeping from 2400-0600, mild temperatures, darkness, quiet, space to lie down, and a padded surface to sleep on.

c. Personnel need 6 to 8 hours of sleep per day to maintain optimal performance. You can maintain alertness from 2 to 4 days with 4 to 5 hours of sleep per day. Performance degrades rapidly after 4 hours of sleep deprivation.

d. Unit SOPs include recovery procedures for sleep deprivation. Personnel require 12 hours of sleep/rest (at least 8-10 hours of sleep) after 36-48 hours of sleep loss. Personnel need 2 to 3 days of sleep/rest (8-10 hours of sleep per day coupled with light duty) to restore optimum performance after 72-96 hours of sleep loss.

e. The need for sleep increases between the hours of 0200 and 0600 and again from 1500 to 1800. Negative changes in attention and reasoning occur during these periods.

f. Designate and mark troop-sleeping areas. Know where your troops are when working with tracked vehicles. At a minimum, tracked vehicle crews use a front and rear ground guide when moving vehicles in restrictive terrain, tactical assembly areas, and when dismounted troops are close by. Do not sleep under vehicles. Do not sleep in parked vehicles with the vehicle engine, heater, or any mounted combustible engine running.

8-12. TACTICAL VEHICLE OPERATIONS. References.

a. AR 55-162, Permits for Oversized, Overweight, or Other Special Military Movements on Public Highways in the United States.

b. AR 385-55, Prevention of Motor Vehicle Accidents.

c. AR 600-55, The Army Driver and Operator Standardization Program.

d. FM 55-15, Transportation Reference Data.

e. FM 55-30, Army Motor Transport Units and Operations.

f. FM 21-305, Manual for the Wheeled Vehicle Driver.

g. FM 21-306, Track Combat Vehicle Driver Training.

h. FM 55-312, Military Convoy Operations in the Continental United States.

i. USAFACFS Reg 385-1, Safety Post Range Regulation.

j. AR 385-64, U.S. Army Explosives Safety Program

k. Ground guides are required as per AR 385-55, appropriate TM and unit SOPs. Some vehicles may require multiple ground guides.

Note. AMV refers to Army motor vehicles (wheeled) ACV refers to Army combat vehicle (tracked) and Army tactical vehicle refers to both types.

8-13. CONVOY OPERATIONS. Convoy operations greatly increase the possibility of a motor vehicle accident. Tired operators, attempting to maintain convoy integrity, and intermixing with other traffic are just some of the contributing factors, refer to AR 385-55, paragraph 2-6. The convoy commander is responsible for the safe movement of the convoy. To do this, he/she must be capable of positively controlling the convoy's movement. This can be done by--

a. Communications equipment among the vehicles, ensuring each vehicle has a properly trained, equipped and supervised crew, and leading from the front in the absence of radios or other means of controlling the march.

b. Enforcing speed limits, march intervals, crew uniform, and seat belt usage. It also requires the ability to stop the march if an unexpected hazard is encountered, along the route. References are FM 55-30 and AR 385-55.

c. Maintaining a safe distance during convoy operations, refer to FM 55-15, FM

21-305. Vehicle technical manuals provide guidance on individual vehicles. For guidance on safe driving operations of Army motor vehicles to include--continuous driving, rest breaks, meal breaks, use of headphones, consumption of alcoholic beverages and eating and smoking while driving, see AR 385-55, chapter 26 and AR 55-30.

d. Using TB9-639, Passenger-Carrying Capacity of Tactical and Administrative Vehicles Commonly Used to Transport Personnel for guidance on troop carrying capacities of vehicles. Heavy winter clothing and field gear worn or carried by drivers and passengers reduces the number of persons that can safely ride in a vehicle cab or driver compartment.

f. Not transporting soldiers in the same vehicle with flammable/combustible materials or hazardous cargo or in the last vehicle in a convoy.

g. Prohibiting soldiers from riding on cargo in cargo areas of wheeled vehicles (soldiers are not transported in any trailer, van, no exceptions). Soldiers sit on seating platforms or individual seats.

8-14. VEHICLE ANTENNAS. Give drivers of vehicles equipped with radio antennas, special instructions on the hazards of fire or electrocution from antennas contacting overhead electrical power lines. Tie down antennas for all vehicles, both tracked and wheeled, to a height considered safe for highway or cross-country travel to avoid contact with power lines. Antennas should be no more than 13 feet and no less than 8 feet off the ground. Blunt the end of antennas with an antenna tip assembly (FSN 5820-437-2353) for the AS 1729 or AT-912 and (FSN 5985-930-7223) MS 118A. Secure antennas under the clip and clipped from below in the quick release position.

8-15. PREVENTIVE MAINTENANCE CHECKS AND SERVICE (PMCS). Preparing vehicles and soldiers for movement is a leader responsibility. The objective of preventive maintenance is to avert equipment failure by finding and fixing minor problems before major defects occur. The battery/company commander is responsible for preventive maintenance on all organic equipment. Platoon leaders, aided by platoon sergeants and squad leaders, are responsible to the company commander, for supervising preventive maintenance, providing technical advice and assistance to operators performing preventive maintenance, and reporting required repairs that are beyond the scope of preventive maintenance. The equipment operator is responsible for doing the required preventive maintenance on his/her equipment. Army wheeled vehicles are equipped with and drivers use chock blocks (AR 385-55, para 2-16) when parked on inclines or when maintenance is being performed. If chock block pairs have not been issued, they may be made locally using 8-inch wood stock cut at 45-degree angles. Use chock blocks in pairs, placing one block in front of and one block behind the tire being chocked. Reference FM 55-30 and AR 385-55, section II.

8-16. VEHICLE ROLLOVERS. Vehicle rollover can be a tragic occurrence, resulting in equipment damage, personnel injury, or even death.

- a. Remind drivers of conditions that lead to rollovers. Approaching curves too fast and driving too fast on wet or icy roads.
- b. Conduct rollover drills. The Army now has rollover drills for the Bradley Fighting Vehicle systems. The emergency procedures are listed in a "Ground Precautionary Message" (GPM), GPM-00-005, Implementation of Crew Drill, Bradley Rollover Procedures"
- c. Ensure equipment is secured inside vehicles to prevent injury from falling objects in the event of a rollover.
- d. Remind drivers to slow down for rough terrain, limited visibility, and inclement weather.
- e. Plan vehicle moves to avoid steep slopes and narrow roads and trails.
- f. Require drivers to give special care to operator-manual tire, track, and suspension checks.
- g. Caution drivers to make wide turns at slow speed to maintain vehicle control.
- h. Ensure that personnel wear hearing protection as required by the type of vehicle.
- i. Post personnel along roadways to warn approaching traffic when the vehicle is halted or disabled in a location that might obstruct traffic.

8-17. GROUND GUIDES. Use ground guides when backing wheeled vehicles. AR 385-55 contains ground-guiding standards. Ground guides will not stand between the vehicle being guided and another object where an inadvertent engine surge or momentary loss of vehicle control could cause injury or death.

- a. The vehicle driver will stop the vehicle immediately if--
 - (1) He or she loses sight of the ground guide.
 - (2) The ground guide is standing dangerously between the vehicle and another object.
 - (3) The ground guide will not walk backwards or stand in the vehicle tracks.
- b. The wheeled vehicle drivers will follow procedures for determining clearance when ground guides are not available. In emergencies, when a ground guide is not available (for example, in the civilian domain), wheeled vehicle drivers will--
 - (1) Dismount.

- (2) Walk completely around the vehicle to verify clearance.
- (3) Select a ground reference point that can be seen from the cab of the vehicle.
- (4) Mount the vehicle and ensure the ground reference point can be seen from the cab of the vehicle.
- (5) Sound the horn.
- (6) Back to the preselected ground reference point.
- (7) Repeat the process, as necessary, until the desired vehicle position is obtained.

c. Follow procedures for ground-guiding engineer vehicles operating at supervised or controlled access construction sites. Before starting vehicle engines, drivers of graders, bulldozers, and other engineer vehicles will--

(1) Walk around the vehicle to ensure the area is free of obstructions. Ground guides are not required to back engineer equipment operating at supervised or controlled access construction sites.

(2) Sound the vehicles horn before backing or ensure the automatic backup alarm (OSHA 1926.601) is operational.

d. Drivers of engineer vehicles operating outside supervised or controlled access construction sites use the standards and number of ground guides required for vehicle types in OSHA 1926.601 and AR 385-55.

8-18. NIGHT VISION DEVICE OPERATIONS. Operating vehicles at night under total blackout, blackout lights, or using night vision devices (NVDs) raises the risk factor even higher. Units must develop thorough driving training programs to adequately prepare drivers for completing the mission under these conditions. Drivers of wheeled vehicles will not wear mission-oriented protective posture (MOPP) masks or night vision goggles on public roads and access roads that lead to and from training areas during training. For further guidance refer to USAFACFS Regulation 385-1 and AR 600-55.

8-19. USE OF SAFETY EQUIPMENT. All personnel operating or riding as a passenger in an Army motor vehicle will wear seat belts when sitting in seats in which seat belts have been installed. The vehicle operator is responsible for informing passengers of the seat belt requirement. Personnel operating or riding in Army tactical vehicles while operating in the training areas will wear Kevlar helmets. Ensure wheeled vehicle tailgates are locked in the up position. If installed, secure restraining straps, extending across rear cargo beds, before vehicle movement. For further guidance refer to AR 385-55, paragraph 2-16.

8-20. ENVIRONMENTAL STRESS DURING COLD WEATHER OPERATIONS. See appendix F.

8-21. PREVENTION OF HEAT INJURIES. See appendix G.

8-22. SAFETY PROCEDURES FOR TACTICAL WATER OPERATIONS. See appendix H.

CHAPTER 9

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

9-1. PURPOSE. To implement the USAFACFS PPE Program as required by AR 385-10 and 29 CFR 1910, Subpart I 132, 133, 134, 135, 136, 137, 138, and 1910.95.

9-2. SCOPE. This instruction applies to USAFACFS military and civilian personnel and tenants with safety ISSAs with USAFACFS.

9-3. POLICY. USAFACFS will provide a safe and healthful workplace for its personnel. USAFACFS will take engineering controls and administrative actions to eliminate the work and/or health hazards. Where this is not possible, prescribed PPE, at no cost to the employee, will be provided for protection against hazards. Provide PPE when the following conditions exist:

- a. Engineering and/or administrative hazard controls are not feasible.
- b. Development of hazard controls is pending.
- c. Short-term, nonroutine operations for which engineering and/or administrative hazard controls are not feasible.
- d. Emergency situations (e.g., spill response, damage control, etc). The use of PPE is mandatory when prescribed by supervisory personnel and qualified safety and health personnel and when operating conditions present work hazards and health risks.

9-4. GENERAL. Hazard awareness, training, supervisory accountability, and equipment availability are major elements of an effective PPE program. Initial evaluations identify workplace hazards and the equipment needed to protect employees against those hazards. Concerned management must use these evaluations to formulate standing operating procedures for employees and then train them to understand the purpose and limitations of PPE. Finally, supervisors are held accountable for employees' testing, use, and maintenance of PPE to protect themselves against workplace hazards.

9-5. RESPONSIBILITIES.

a. The IBSO is designated the PPE program manager for USAFACFS. The program manager will coordinate all aspects of the PPE program and will advise USAFACFS commander to ensure the success of the program. Furthermore, the program manager will--

(1) Coordinate workplace health hazard evaluations and medical monitoring requirements with MEDDAC Preventive Medicine.

(2) Monitor workplaces for PPE Program compliance using the Personal Protective Equipment Checklist. To assist personnel, a copy is located at appendix I.

(3) Ensure that users request appropriate items (respirators and chemical resistant suits and gloves) intended specifically for the operation.

b. MEDDAC Preventive Medicine will--

(1) Conduct evaluations of workplaces to identify PPE requirements.

(2) Determine if workers assigned to tasks requiring the use of PPE are physically and psychologically able to perform work while wearing prescribed PPE. Review the medical status of the PPE user during annual physical examinations.

(3) Prescribe specifications of PPE being purchased.

c. DOL will--

(1) Obtain the prescribed specifications of the PPE being purchased from MSA or NIOSH.

(2) Maintain common PPE items such as coveralls, safety belts, and other items that are listed in DA Pam 385-3.

d. ICO will purchase only PPE that meet OSHA, American National Standards Institute (ANSI), and/or NIOSH.

e. CPAC will provide assistance in identifying civilian employees who require PPE to perform their job as required by law.

f. Commanders, directors, and supervisors will--

(1) Implement policies and procedures to ensure personnel are apprised of workplace hazards and accessibility of the PPE required for their specific operations.

(2) Implement policies that support efforts to ensure compliance with the prescribed procedures for the use and maintenance of PPE. Provide procedures for counseling and disciplinary action for--

- (a) Employees who repeatedly do not wear required PPE or who operate equipment without proper safeguards in place.
- (b) Supervisors who do not enforce the use of required PPE and equipment safeguards will receive a counseling statement.
- (3) Identify positions in operations that require the use of PPE, type of PPE and ensure job descriptions identify PPE requirements (see appendix J).
- (4) Budget for, purchase, and provide personnel with appropriate/approved PPE for tasks/operations. Coordination with MEDDAC Preventive Medicine is required prior to any purchases.
- (5) Formulate standing operating procedures on PPE use and maintenance and ensure personnel understand and comply with prescribed procedures.
- (6) Provide training on PPE use and maintenance and maintain records on training and issue.
- (7) Inspect equipment to ensure safeguards (e.g., blade guards, noise control devices, ventilation systems, etc.) are operating and properly maintained.

g. Both military and civilian employees will--

- (1) Comply with the provisions of AR 385-10, this regulation, instructions provided by their supervisors, the IBSO, and MEDDAC Preventive Medicine regarding the use and care of PPE.
- (2) Wear and provide normal maintenance for PPE provided by their supervisors to prevent injuries and illnesses.
- (3) Not modify or alter issued PPE.
- (4) Report hazards and defective equipment to their supervisors.

9-6. ARMY-FUNDED PPE.

a. Supervisors will requisition, store, and issue PPE deemed necessary to prevent work-related injuries and illnesses at no cost to employees. Items made available include, but are not limited to--

- (1) Eye protection.
- (2) Protective headgear.

- (3) Hearing protection.
- (4) Respiratory protection equipment.
- (5) Gloves (to include chemical resistant gloves).
- (6) Footwear.
- (7) Torso clothing such as Ty Vec.

b. The Army funds purchase of standard and nonstandard items (e.g., safety harnesses, lineman belts, lineman's gloves, etc.) for issue to personnel as authorized by Common Table of Allowances (CTA) 8-100, 50-900, 50-909, 50-970; DA Pam 385-3, AR 385-10, Section 7903 of Title 5, USC, Section 19 of the 1970 OSHA Act, and Public Law 91-596.

c. Maintain the floor of every workroom, so far as practicable, in a dry condition. Where wet processes are used, maintain drainage and false floors, platforms, mats, or provide other dry standing places, where practicable, or provide appropriate waterproof footwear. The commander/director or the IBSO may furnish items not considered PPE, but equipment for protection against inclement elements or operations peculiar to the occupation, if they determine the items are necessary to prevent accidents, injuries, illnesses, or diseases, and that the government will benefit from the action.

9-7. EMPLOYEE-OWNED PPE. USAFACFS prohibits use of employee-owned PPE in the workplace.

9-8. PPE ISSUE, CONTROL, USE, AND MAINTENANCE.

a. Supervisors will maintain control over the issue, use, and maintenance of all workplace PPE. They are also responsible for the sanitation of all common use PPE.

b. Supervisors should issue PPE to employees for their own use, whenever possible and provide training. Employees will be responsible for the sanitation and maintenance of all government-issued PPE.

c. Employees who deliberately damage, alter, or fail to use required government-furnished PPE to prevent exposure to hazards related to operations in the workplace will receive disciplinary action in accordance with AR 690-700.

CHAPTER 10

AVIATION ACCIDENT PREVENTION PROGRAM

10-1. PURPOSE. To establish the Aviation Accident Prevention Program for the USAFACFS. This program assigns responsibilities, outlines policies and procedures for

the prevention, investigation, and reporting of aircraft mishaps.

10-2. SCOPE. This publication is applicable to all units and personnel assigned, attached or operating at Fort Sill.

10-3. POLICY.

a. Aviation mishap prevention is a command responsibility. Commanders will ensure compliance with safety requirements.

b. Passengers transported in military aircraft, regardless of rank or position, will not overrule the judgment of the designated pilot-in-command. No training mission is of sufficient importance to warrant unnecessary risk to the aircraft or the passengers.

10-4. RESPONSIBILITIES. The Installation Aviation Safety Officer (IASO) is responsible for the aviation safety management within USAFACFS. The IASO areas of responsibility include Henry Post Army Airfield (HPAAF), all stage fields, heliports, aviation training areas, aviation safety education, and the commander's aviation pre-accident plan implementation and quarterly rehearsal. Aviation Safety Issues that need to be submitted outside USAFACFS (i.e., MACOM, U.S. Army Safety Center) need to be addressed through IASO, Airfield Operations Division, [DPTMS](#).

10-5. PROCEDURES. Policies and procedures pertaining to the USAFACFS Accident Prevention Program are located in the USAFACFS Regulation 385-95, USAFACFS Pam 385-95, USAFACFS Reg 385-3, and HPAAF SOP.

CHAPTER 11

LOCKOUT/TAGOUT PROGRAM

11-1. PURPOSE. This chapter requires that units/directorates establish a lockout/tagout program to prevent personnel injury or damage to machines or equipment from uncontrolled release of stored energy.

11-2. EXPLANATION OF TERMS.

a. Affected Employees. Employees who operate machines or equipment.

b. Authorized Employees. Those trained and certified maintenance and servicing personnel who conduct service and/or maintenance on machines or equipment that produce energy sources.

c. Incidental Employees. An employee who, under normal circumstances, would not be in an area where a system is under lockout and tagout but is required to enter or pass through such an area.

d. Lockout. The preferred method of isolating machines or equipment **is** from energy sources. Lockout is the placement of a locking device that physically holds an energy control point, such as a switch, lever, or a valve handle in the off position and makes it impossible to operate or release its energy.

e. Tagout. The placement of a tag on an energy-isolating device indicates that the equipment controlled by the device is being serviced/maintained and will not be operated. Each activity/shop will maintain a log to identify equipment tagged out, the date tagged out, the person applying the tag, and the date the tag was removed.

11-3. RESPONSIBILITIES. Commanders and directors will be responsible for implementation of the lockout/tagout program. Commanders/directors will--

a. Identify all energy producing machines and equipment that require lockout/tagout procedures. Examples are clearing blocked or jammed mechanisms, performing maintenance on equipment with hydraulic, pneumatic or metallic, electrical circuits, and electronic devices.

b. Develop a lockout/tagout training program for authorized employees to include certification, documentation, and file.

c. Establish lockout/tagout standing operating procedures for machines and equipment.

d. Ensure authorized employees comply with OSHA 29 CFR 1910.147.

e. Provide locking devices, locks, and tags to authorized employees. Issue one key and lock and another key at the higher-level headquarters.

11-4. TRAINING. Provide and document training to ensure that the purpose and function of the hazardous energy control procedures are understood. Supervisors will train employees in the knowledge and skills required for the safe application, usage, and removal of energy controls.

a. Train each authorized/affected employee in the recognition of hazardous energy sources, the type and magnitude of energy available in the workplace, and the methods and means for energy isolation and control.

b. Instruct each authorized/affected employee in the purpose and use of the energy control procedures.

c. No incidental employee will restart or reenergize a machine or equipment that has been locked out.

d. Supervisors conducting training for authorized employees ensure compliance with OSHA 29 CFR 1910.147 standard, and that specific requirements of the equipment

or material manufacturer are taught. As a minimum, address the following:

- (1) An explanation of the Energy Control Standard.
- (2) Guidelines on when to use lockout/tagout.
- (3) The recognition of hazardous energy sources.
- (4) The application of energy controls.
- (5) The removal of lockout/tagout devices.

(6) The lockout/tagout procedures that involve more than one person, work shift change, special situations, and use of contractor.

(7) Provide training when new employees are assigned, change in machine, equipment or process that present a new hazard, and when a new energy control procedure or standard is established.

(8) Document and certify, in writing, all training. Include each employee's name and the dates of training.

11-5. ORGANIZATION STANDING OPERATING PROCEDURE FOR

LOCKOUT/TAGOUT. Authorized employees will notify all affected employees of intent to initiate lockout/tagout procedures prior to service or maintenance. Ensure that no person is exposed before disconnecting any energy sources.

a. Operate energy isolating device (switch, valve, or other mechanism) to isolate the machine/equipment from its energy source. Stored energy, such as in springs, elevated machine members, rotating fly wheels, hydraulic systems, and air, gas, steam, or water pressure accumulators must be dissipated or restrained by methods such as repositioning, blocking or depressurizing.

b. Lockout and tagout the energy isolating devices. Any equipment not capable of being locked will use a lockout system that can be directly attached or installed. Each person working on the system will install his/her own lock and tag.

c. Install locks that are durable and applicable for the type of machine/equipment used.

d. Install tags directly, or as close as safely possible, to the energy-isolating device. Position the tag so that it is immediately obvious to anyone attempting to operate the device. Attach tags with self-locking, plastic electrical ties, or metal ties for heat producing machine/equipment. Ensure the name, date, and unit or organization of the person who installed the lockout device is written on the tag, and only that person will remove the lock. The only exception is that if there is an accident, provide the

investigator a key to the lock.

e. Use the normal operating controls to make certain the equipment will not operate. Caution: Return operating controls to "neutral" or "off" position after the test. The equipment is now locked out and tagged out.

f. Before restoring machines/equipment to normal production operations ensure it is safe to operate. Make a final inspection, checking the equipment and surrounding area, to ensure that there are no obstructions or incomplete work, and that personnel are physically clear of the machine/equipment. Remove all tools from the machine/equipment, reinstall the guards, and remove all locks and tags. Notify personnel that the locks and tags were removed and the equipment is in service.

g. Operate the energy isolating devices to restore energy to the machine/equipment.

CHAPTER 12

EXPLOSIVES SAFETY

12-1. PURPOSE. To establish an USAFACFS Explosives Safety Program and to provide implementing instructions regarding program requirements, actions required, responsibilities, and to implement the USAFACFS Explosives Safety Program.

12-2. SCOPE. The policies and administrative procedures contained in this regulation apply to all military and civilian personnel, units or activities assigned or attached to USAFACFS.

12-3. POLICY. USAFACFS is committed to providing a safe and healthful workplace for its personnel by keeping personnel exposure to explosives to an absolute minimum.

12-4. GENERAL. AR 385-64 and DA Pam 385-64 govern the conduct of munitions operations. Conduct operations on Navy or Air Force installations IAW Navy or Air Force explosive safety standards.

12-5. RESPONSIBILITIES.

a. Director of USAFACFS Safety will--

(1) Serve as the command's point of contact for all explosive safety actions.

(2) Ensure preparation and annual renewal of explosive licenses.

(3) Ensure site plans/safety submissions of new and revised storage facilities are thoroughly staffed within the organization and in accordance with AR 385-64. Ensure all exposures, military, and civilian, are indicated on the site plans.

(4) Coordinate and process requests for explosive safety waivers/exemptions.

(5) Thoroughly staff explosive safety actions prior to forwarding to HQ, USAFACFS, to ensure clear definition of operational needs, and that the actions will satisfy projected requirements.

(6) Ensure annual inspections of all ammunition operations are being conducted.

(7) Ensure ammunition activities involving transportation and storage of ammunition are being monitored for compliance with applicable explosive safety regulations.

(8) Forward requests for explosive safety waivers/exemptions and site plans/safety submissions through command channels to appropriate action office at major command level.

(9) Ensure quantity-distance (QD) arcs are being annotated on USAFACFS master planning maps.

b. Directorate of Logistics will--

(1) Ensure ammunition operations are being conducted in accordance with licensed and applicable explosive safety requirements.

(2) Ensure the Munitions Branch, Quality Assurance Specialist Ammunition Surveillance (QASAS), coordinates with the IBSO on conditions that require license modification, Department of Defense Explosive Safety Board (DDESB) submissions, etc.

(3) Provide technical assistance from QASAS concerning all explosive safety issues.

(4) Provide the following items for review during explosive safety inspections.

(a) An explosive safety report and lot locator.

(b) The latest lightning protection/ground system inspection report.

(c) Copies of work orders for corrections of safety deficiencies.

c. Unit commanders will--

(1) Ensure soldiers receive training in the proper use and safety handling of ammunition.

(2) Ensure the vehicle used to transport ammunition meets all DOD and DOT requirements for movement over public roads.

(3) Ensure that only qualified personnel repack ammunition to guarantee that ammunition is packed to meet all shipping and storage requirements.

(4) Properly block, brace, or otherwise secure the ammunition load in the transport vehicle to prevent movement under all normal conditions.

(5) Locate and store ammunition at appropriate sites at the training areas.

(6) Ensure soldiers know the safety procedures to follow in the event of an accident or malfunction involving ammunition.

(7) Ensure the ammunition is right type for its intended use and has been approved as being safe for firing over soldier's heads.

(8) Ensure there is no unnecessary handling of ammunition, to include only opening the amount of ammunition required to meet training requirements.

(9) Ensure soldier awareness of restrictions and prohibitions are specified in the range standing operating procedures.

12-6. TRANSPORTATION OF AMMUNITION. The following is mandatory anytime ammunition is removed from authorized storage locations, to include exercises.

a. Avoid areas of dense population/congestion. Do not park vehicle in these areas or on public parkways for any reason, except for mechanical breakdown. Guard vehicles hauling ammunition at all times after leaving the Ammunition Supply Point (ASP).

b. Give drivers special instructions such as: requirements for marking/ placarding, mechanical condition, route of travel, and refueling. Inspect all trucks using DD Form 626 (Motor Vehicle Inspection) and DD Form 836 (Special Instructions for Motor Vehicle Drivers).

c. Ammunition Transportation Routes

(1) This information is provided to inform units training on Fort Sill of the routes that are authorized for transporting ammunition from the Ammunition Supply Point (ASP) to the East and West Range training areas. These are the only designated routes for vehicles transporting Hazard Class 1.1 and 1.2 ammunition. You may transport limited quantities of Hazard Class 1.3 and 1.4 ammunition on alternate routes to meet mission requirements (i.e., storage in unit arms rooms where permitted by regulation).

(2) Routes from ASP to the East Range.

(a) Primary Route. Depart the ASP through the West exit and continue straight on the howitzer trail leading to Tower Two Road. Turn right on to the howitzer trail parallel to Tower Two Road. Turn right on Artillery Ridge Road. Turn left on to the howitzer trail between the Military Working Dog Training Area and the Regional Confinement Facility. Turn right at the first "Y" intersection in the howitzer trail. Follow the howitzer trail to Currie Road. Turn left on Currie Road. Follow Currie Road to Bateman Road to White Wolf Bridge. Cross White Wolf Bridge and immediately turn left on to Punch Bowl Road. Turn right onto the howitzer trail that runs parallel to Apache Gate Road and proceed to Knob Hill howitzer trail. Turn right on Knob Hill howitzer trail and cross Apache Gate Road to Knob Hill Road. Follow Knob Hill Road to Quinette Road. Turn left on Quinette Road and proceed to East Range training areas.

(b) Alternate Route. Depart ASP through the East exit and continue right on Hirsch Road to the howitzer Trail and turn left. Continue on howitzer Trail to I 44 under pass to Berry Road. Turn left on Berry Road to Hoyle Bridge low water crossing (**Do Not Cross Hoyle Bridge**). Use this route only when you cannot use the primary route.

(3) Routes from ASP to the West Range. Depart the ASP through the West exit and continue straight on the howitzer trail leading to Tower Two Road.

(a) To travel to the southern section of the West Range. Turn left onto the howitzer trail parallel to Tower Two Road. Turn right on the first howitzer trail and cross Tower Two Road. Follow the howitzer trail to Mow-Way House. Continue to McKenzie Hill Road. Turn right on McKenzie Hill Road. Proceed to the southern section of the West Range.

(b) To travel to the northern section of the West Range. Turn right on to the howitzer trail parallel to Tower Two Road. Proceed to the northern section of the West Range. Units may also use the route designated in paragraph (2) above with the following modifications. After the sentence "Cross White Wolf Bridge and immediately turn left on to Punch Bowl Road" the directions read "Follow Punch Bowl Road to the West Range training areas."

(4) Vehicles departing the ASP from the North Gate/Ammunition Holding Area will go north on Hanson Road to Artillery Ridge Road.

(a) To travel to the East Range turn right on Artillery Ridge Road. Following the direction from Artillery Ridge Road as written above in paragraph (2).

(b) To travel to the southern section of the West Range turn left on Artillery Ridge Road. Turn left on the howitzer trail parallel to Tower Two Road. Continue straight on the howitzer trail and turn left on the howitzer trail prior to Minor Road. Follow the howitzer trail to Mow-Way House. Continue to McKenzie Hill Road. Turn right on McKenzie Hill Road. Proceed to the southern section of the West Range.

(c) To travel to the northern section of the West Range turn left on Artillery Ridge Road. Turn right on the howitzer trail parallel to Tower Two Road and proceed to the northern section of the West Range. Units may also turn right on Artillery Ridge Road and use the route designated in paragraph (2) above with the following modifications. After the sentence "Cross White Wolf Bridge and immediately turn left on to Punch Bowl Road" the directions read "Follow Punch Bowl Road to the West Range training areas."

(5) Units leaving the ranges with live ammunition will follow the routes in reverse. The above route restrictions do not apply to vehicles returning residue, except as noted in the Post Range Regulation, USAFACFS Reg 385-1, paragraph 4-6.

d. Commercial ammunition carriers entering the post.

(1) Primary Route. Apache Gate and park in the vehicle inspection area until cleared by ASP personnel. Upon the completion of the inspection the vehicle continue straight on Apache Gate Road to Currie Road. Follow Currie Road to Searight Road and turn left. Turn left on Hirsch Road. Follow Hirsch to Burrill Road. Turn right on Burrill Road. Follow Burrill Road to the Van Gate entrance to the ASP. Turn right at the Van Gate entrance. The Van Gate entrance to the ASP is across from the water tower east of Babcock Road.

(2) Alternate Route. Enter 52nd Street Gate and Continue on Mow Way Road and turn left on Tower Two Road. Continue 1.2 miles and turn right on the road leading to the ASP West Gate.

12-7. DDESB SUBMISSIONS. Prepare site plans/safety submissions in accordance with AR 385-64 and DOD 6055.9-STD. Submit site plans/safety submissions for projects to include--

a. New constructions or modification of facilities for ammunition and explosive activities.

b. Facilities not involved with ammunition and explosives that are located within the explosives hazards circle zone.

12-8. AMMUNITION STORAGE IN UNIT ARMS ROOM. Do not use unit arms rooms in troop buildings to store class 1.1 or 1.2 ammunition. Comply with procedures in USAFACFS Circular 700-00-02, Storage of Training and Ceremonial Ammunition in Arms Rooms, to obtain approval to store limited quantities of class 1.3 and 1.4 ammunition, which you can store at these locations, for alert and security purposes consistent with mission requirements. All arms rooms will have a current explosive license approved by Installation Branch Safety Manager.

12-9. INSPECTIONS.

a. Inspect all ammunition storage sites at least annually. Ensure what is actually stored is in accordance with license issued.

b. Ensure storage compatibility is correct.

(1) Verify QD separation requirements stipulated in license.

(2) Evaluate storage facilities to include adequacy of earth cover on magazines, barricades, and condition of lightning protection/grounding system and ventilators.

c. Ensure inspection reports are maintained IAW AR 25-400-2, and you have listed outstanding deficiencies on an abatement program.

12-10. WAIVERS/EXCEPTIONS. AR 385-64 provides definitions and procedures for obtaining a waiver or exception. Submit all requests for waivers or exceptions through command safety channels to Cdr, USAG, ATTN: IMSW-SIL-PL. DPTMS will coordinate waiver/exemption requests with the IBSO. Commander, USAFACFS will grant waivers.

12-11. FIELD STORAGE. Ensure that explosives stored temporarily in a field environment are in accordance with AR 385-64 and DA Pam 385-64.

CHAPTER 13

ACCIDENT REPORTING AND INVESTIGATION

13-1. GENERAL. Accident reporting and investigation will be in accordance with AR 385-40, DA Pam 385-40, TRADOC Reg 385-2, and this regulation.

13-2. RESPONSIBILITY. Commanders and supervisors experiencing the accident will ensure prompt notification to the IBSO.

13-3. ACCIDENT REPORTING AND RECORDING. All categories of Army accidents, on-and-off duty, involving Army operations, personnel, or materiel are reportable. Record certain classes of accidents on DA Form 285 (U.S. Army Accident Report) or DA Form 285-AB-R (U.S. Army Abbreviated Ground Accident Report (AGAR)), as prescribed in AR 385-40 and per the instructions on the form. Accident class definitions are described in AR 385-40, paragraph 2-2. DA Forms 285 and DA Forms 285-AB-R are available electronically on Formflow. Units will report/investigate all accidents unless, otherwise, notified by the IBSO.

a. On-Duty Accident Requirements.

(1) Immediately notify the IBSO of all fatal and serious accidents, in accordance with below procedures. Report all accidents, resulting in property damage, immediately to the IBSO. Provide information as requested on the attached DA Form 7306-R

(Telephonic Notification of Ground Accident) worksheet.

(a) Installation Operations Center (McNair Hall, Bldg 455).

1 During duty hours: 442-3241/3242.

2 Nonduty hours: 442-4912.

(b) Installation Branch Safety Office.

1 During duty hours: 442-4701/4215/4466.

2 Nonduty hours: 442-4912.

(2) Report all accidents resulting in a soldier being given restricted activity light duty, or placed on a profile using DA Form 285-AB-R (AGAR) to the Installation Safety within 10 workdays of the accident occurrence. Report on-duty civilian injuries and illnesses IAW USAFACFS Pam 690-15. Attach additional information to the AGAR.

b. Off-Duty Accident Requirements.

(1) Immediately notify the IBSO of all fatal off-duty accidents involving military personnel in accordance with procedures in subparagraph 13-3(1)(b)2. These accidents require you to submit a completed DA Form 285-AB-R to the IBSO within 10 workdays of the accident occurrence.

(2) Report all military accidents resulting in lost time on DA Form 285-AB-R within 10 workdays of the accident occurrence.

c. Immediately report all accidents involving munitions, chemical agents, radiation, or equipment that may cause adverse publicity to the command or the Army, to the IBSO through the appropriate command channels.

13-4. INVESTIGATION PROCEDURES.

a. On all other military injuries (on- or off-duty) and military property damage accidents, resulting in \$2,000.00 or more, prepare and forward a DA Form 285-AB-R to the IBSO through command channels within 10 workdays of the occurrence.

b. Take preliminary accident site procedures in accordance with DA Pam 385-40, paragraph 2-2.

CHAPTER 14

HEARING CONSERVATION PROGRAM

14-1. PURPOSE. To implement the USAFACFS' hearing conservation program as required by AR 40-5 and 29 CFR 1910.95 c through o and DA Pam 40-501.

14-2. SCOPE. These procedures apply to all military and civilian personnel who are exposed to hazardous noise within the USAFACFS.

14-3. POLICY. USAFACFS has a commitment to provide safe and healthful workplace for its personnel and to fully implement a hearing conservation program. The command will provide hearing protection, at no cost, to personnel for protection against occupational noise exposure.

14-4. GENERAL. Safety and health standards establish permissible noise exposure limits, whenever noise exposure equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or equivalently, a dose of fifty percent.

14-5. RESPONSIBILITIES. USAFACFS Commander is responsible overall for the Installation Hearing Conservation Program and has the authority to make the decision necessary to ensure the success of the program. The Hearing Conservation Officer will manage and coordinate all aspects of the hearing conservation program.

14-6. PROCEDURES. All polices, procedures and responsibilities pertaining to the USAFACFS Hearing Conservation Program are outlined in USAFACFS Regulation 40-557-1 and in DA Pam 40-501, The Army Hearing Conservation Program.

CHAPTER 15

MOTOR VEHICLE ACCIDENT PREVENTION PROGRAM

15-1. PURPOSE. To establish responsibilities and procedures for carrying out the USAFACFS Motor Vehicle Accident Prevention Program as required by DoDI 6055 and AR 385-55.

15-2. SCOPE. This program applies to all military and civilian personnel assigned or attached to USAFACFS elements.

15-3. GENERAL. Army motor vehicle (AMV) and privately-owned vehicle (POV) accidents constitute one of the Army's most repetitive causes of fatalities and serious injuries. While commanders and supervisors do not control POV operators similar to those operating AMVs, there are numerous areas of influence, which you may use to reduce manpower losses. You can reduce potential of injury and property damage by applying command direction in three primary areas: AMV driver selection, driver training, and vehicle inspection.

15-4. RESPONSIBILITIES.

a. Commanders at all levels will ensure that--

(1) Procedures are prescribed for the safe operation of AMVs, Army combat vehicles (ACV), material handling equipment (MHE), and POVs on and off Army installations and contractor vehicles on-post.

(2) Vehicle operations and maintenance are carried out in accordance with Army publications and technical manuals. Base documentation of inspections on Federal Highway Safety Program Standards (HSPS).

(3) Motor vehicle activities and accident data are collected, analyzed, and evaluated to identify where we can focus efforts on accident prevention.

(4) High quality personnel are selected for testing and training.

(5) Supervision of Army drivers is maintained.

(6) On-post roads and trails are maintained at a level that will permit safe vehicle operations.

(7) Training, education, and motivation programs dealing with POVs are developed and applied.

b. Commanders will base their traffic safety programs on Highway Safety Program Standards (23 CFR 1230). The minimum requirements for these standards are outlined in AR 385-55, appendix B. In addition to helping develop programs, commanders should use the Highway Safety Program Manuals published by the U.S. Department of Transportation, National Highway Traffic Safety Administration, 4007th Street SW, Washington, DC 20590.

15-5. OBJECTIVES.

a. The AMV safety objective is to provide training and guidance to operators of all AMVs, combat vehicles, and materiel handling equipment to enable them to safely transport personnel and property by motor vehicle with the least possible risk.

b. The POV safety objective is to provide personnel with training and guidance to reduce their risk of death or injury from POV accidents.

15-6. PREVENTION OF ARMY MOTOR VEHICLE ACCIDENTS. Most Army motor vehicle accidents are caused by driver error. Proper selection, training, and supervision of drivers will help to prevent these errors and produce safe driving behavior.

a. Select, train, test, and license drivers according to ARs 385-55, 600-55, and 190-5; USAFACFS Supplement 1 to AR 190-5, AR 600-55; and FMs 21-17 and 55-355.

b. Commanders ensure that Army or General Service Administration (GSA) motor vehicle drivers and other Army equipment operators receive training and education that meet the requirements of--

(1) Drivers Education (HSPS No 4), AR 385-55, appendix B.

(2) Accident Avoidance Class. Give all operators of Army or GSA vehicles classroom instructions in accident avoidance as soon as possible after entry into government service and every 4 years thereafter. All army motor vehicle operators 25 years of age or younger, regardless of rank, are required to attend the Accident Avoidance Class given by the Fort Sill Education Center, Building 3281, as part of their licensing procedure.

(3) USAFACFS Supplement 1 to AR 600-55, Licensing Requirements. All military and civilian personnel required to operate the following type government-owned tactical and nontactical wheeled motor vehicles are required to study the Army Commercial Drivers License (ACDL) Program as a guide for safe and efficient operation of military vehicles:

(a) Wheeled motor vehicles with a gross vehicle weight rating (GVWR) of 10,000 pounds or heavier.

(b) Emergency type vehicles (i.e., military police patrol vehicles, ambulances, or fire fighting vehicles) regardless of their GVWR.

(c) Vehicles that are designed to transport 16 or more passengers including the driver, or is used to transport hazardous materials requires the vehicle to be placarded under Hazardous Materials Regulations (49 CFR part 172).

(4) Department of the Army (DA) Technical Manuals and Field Manuals containing procedures to follow in selecting, training, examining, licensing, and supervising vehicle drivers or equipment operators.

15-7. UNSAFE OPERATIONS. The operation of any Army or GSA, motor vehicle in an unsafe mechanical condition or in an unsafe manner is prohibited. Such mechanical conditions include, but are not limited to--

a. Improper functioning of lights, windshield wipers mirrors, or other safety equipment.

b. Broken, cracked, or frost/ice/snow-covered windshields.

c. Failure to use safety equipment.

15-8. DA FORM 348 (EQUIPMENT OPERATOR'S QUALIFICATION RECORD).

Include the following information, as a minimum, on DA Form 348.

- a. Accident avoidance training and date.
- b. Safety awards.
- c. AMV accidents.
- d. Civilian and military traffic points and citations.
- e. Operator's training completed.
- f. Vehicles authorized.

15-9. INVESTIGATING AND REPORTING ACCIDENTS.

a. Investigate and report Army motor vehicle accidents in accordance with AR 385-40 and AR 190-5. The Provost Marshal and the IBSO should coordinate to ensure completeness of accident reports and to avoid duplication of efforts.

b. Commanders responsible for motor vehicle operations will ensure that--

(1) Investigative procedures reveal operator task errors, management or supervisory errors, equipment failures, and environmental factors causing or contributing to the accident. As an aid to AMV accident investigation, SF 91 (Operator Report of Motor Vehicle Accident) should be available to operators.

(2) Systems defects causing or contributing to these factors are identified and corrected. AMV accident reports nonuse or failure of installed restraint systems contributing to injury to Army personnel and recommend remedial measures.

15-10. MOTIVATING SAFE PERFORMANCE.

a. Commanders will--

(1) Consider assigning designated drivers and alternate drivers to vehicles. This practice fosters "pride in ownership" and designates responsibility for operator maintenance.

(2) Annually recognize vehicle operators, who maintain outstanding safe driving records, and units with outstanding records. Use DA Form 1117 (Certificate of Merit for Safety), DA Form 1119-1 (U.S. Army Safety Award), or other forms of recognition. Other incentives for safe driving performance are as follows.

(a) The Driver and Mechanic Badge for military and civilian personnel as prescribed in AR 600-8-22.

(b) The National Safety Council Safe Driver Award for Army civilian personnel who drive AMVs within the United States.

(c) Suggestions, superior accomplishments, and honorary awards as prescribed in AR 672-74.

(d) Consideration of an individual's superior driving record when assigning vehicles, routes, and duties.

b. Supervisors of AMV operations will--

(1) Set standards of performance for vehicle operations to ensure continuity, safety, consistency, and clarity so drivers are aware of and understand their responsibilities.

(2) Periodically assess driver performance and use incentives to reward drivers with good driving records. Subject drivers failing to maintain good-driving records to remedial and disciplinary measures when appropriate.

15-11. SAFE DRIVING OPERATION.

a. Do not assign drivers to drive an AMV for more than 10 continuous hours, nor will the combined duty period exceed 12 hours in any 24-hour period with out at least 8 consecutive hours of rest.

b. If more than 10 hours are needed to complete operations, assign a qualified assistant driver to each vehicle.

c. Drivers will take 15-minute rest breaks every 2 to 3 hours of driving or every 100 to 150 miles, whichever occurs first. During these breaks, drivers will inspect their vehicles and ensure equipment and cargo is secure. Take 1-hour meal breaks. Commanders may require additional rest periods based on local conditions or for specific missions or operations. They should do so whenever operators can be expected to encounter unusually poor weather or road conditions, when hazardous materials are being transported, or operators will be involved in prolonged or unusually difficult exercises or operations.

d. The use of headphones or earphones while driving Army motor vehicles (two or more wheels) is prohibited; however, this prohibition does not negate the requirement for wearing hearing protection where conditions require their use. (See TB Med 501, Hearing Conservation.)

e. Drivers will not consume intoxicating beverages during the 8 hours prior to scheduled duty or during their normal duty shift.

f. Drivers will not eat, drink, or smoke while the vehicle is in motion. Smoking

reduces night vision.

15-12. VEHICLE SAFETY STANDARDS.

a. Before vehicle dispatch, commanders or their representatives will ensure that drivers perform before, during, and after operation checks, to prevent the following conditions:

(1) Improper functioning or adjustment of steering, lights, windshield wipers, horns, warning signals, side or rearview mirrors, restraint systems, and other safety devices. Ensure restraint systems are readily available for use by both the driver and passengers.

(2) Improper condition of windshields, windows, mirrors, lights, reflectors, or other safety devices that are broken, cracked discolored, or covered with frost, ice, snow, dirt, mud, or grime.

(3) Defective, inoperable, or out of adjustment brakes or parking brakes. Vehicles with defective brakes or parking brakes are not mission-capable (NMC) until repaired. When vehicles, with braking conditions, are moved for maintenance, tow them using a tow bar.

(4) Leaks. Vehicles with any Class III gasoline, diesel, oil, or water leaks will be NMC until repaired.

(5) Any condition likely to cause injuries to personnel or failure of a component. Examples are tires that are excessively worn, deeply cut, or have exposed cords, cracked wheel hubs, worn or frayed tie down straps or personnel restraint systems, torn sheet metal with exposed sharp edges, damaged or missing exhaust pipe shields, and leaks from exhaust systems.

(6) Improperly secured loads.

(7) Vehicle loaded beyond design load limits.

(8) Unsafe transport of personnel.

b. Driver training courses and driver performance evaluations will include safety aspects of driver maintenance.

c. Commanders determining that an AMV accident was caused by design or component failure will submit appropriate reports per AR 385-40 and DA Pam 738-750.

d. Operators are responsible for bringing any vehicle shortcoming to the supervisor's attention. Further, do not operate vehicles with conditions outlined in a (1) through (8) above unless authorized by the unit commander.

e. Commercial type passenger carrying AMVs built to manufacturers' specifications and purchased, leased, or rented by the Army are required to meet all applicable requirements of the Federal Motor Vehicle Safety Standards (FMVSS).

f. Nondevelopmental item (NDI) vehicles built to government-modified manufacturers' specifications will also meet applicable requirements of the FMVSS unless you obtain a written waiver from Commander, U.S. Army Safety Center.

g. Foreign built commercial vehicles purchased for use outside the continental United States (CONUS) and U.S. territories and possessions will meet all applicable safety requirements of the country in which they are registered or assigned. Prior to procuring foreign built commercial vehicles, commanders of (outside the continental United States (OCONUS) major Army commands will review the motor vehicle safety standards for acceptability. The review will include all standards applicable to the make, model, and year of manufacture for each type vehicle to be procured.

h. Tactical and combat vehicles are exempt from FMVSS; however, their design characteristics will comply with the intent of those standards except when compliance would degrade essential military capabilities. Commanders responsible for establishing design characteristics will follow DOD Military Standard.

i. Equip all Army vehicles, other than those listed in e, f, and g above, with restraint systems, unless you obtain a waiver from the U.S. Army Safety Center or HQDA, DAPE-HRS.

j. Equip all Army vehicles, in which the normal structure of the vehicle will not protect the driver and passengers during rollover, with a rollover protective structure that conforms to applicable Society of Automotive Engineers standards, unless you obtain a waiver from the U.S. Army Safety Center or HQDA (DAPSHRS).

k. Provide tactical and combat design wheeled vehicles, undergoing developmental testing, with appropriate restraint system/rollover protective structures for protecting test participants, even if the protective devices are not a user requirement.

15-13. PREVENTION OF PRIVATELY-OWNED VEHICLE ACCIDENTS.

a. POV accidents most often occur off-duty and off-post, outside the presence of Army supervision. Commanders can provide direct influence through information, motivation, and guidance given to POV operators before they leave Army control. These efforts will be on a cost-effective basis within the overall accident prevention program.

b. Soldiers have a duty to avoid unnecessary injury by using safety devices and equipment. When a violation occurs, commanders should consider a full range of possible actions before selecting the appropriate courses of action to deal with the

violation. Such actions include, but are not limited to, suspension or loss of on-post driving privileges, removal of the vehicle from the installation, and additional training in the particular aspect of the safety violation.

c. National Safety Council statistics have consistently shown that the use of restraint systems may reduce by 50 percent or more the chance of death or serious injury in an automobile accident and may prevent injury during sudden braking. In addition, using the restraint system may prevent accidents by assisting the driver in maintaining control of the automobile.

15-14. REQUIREMENTS FOR POV ACCIDENT PREVENTION. Most Army personnel killed or injured in POV accidents are involved in single-vehicle accidents at night as a result of excessive speed, alcohol or other drug use, or fatigue. Commanders will ensure that other factors, listed in AR 385-55, and accidents that apply to their individual unit, are identified. Commanders will at a minimum direct their POV safety and accident prevention programs (2 or 4 wheeled) include the following.

a. Command Emphasis. Positive leadership at all levels is imperative. Leader emphasis on POV safety must be unrelenting. Junior officers and NCOs see their soldiers everyday. They should know where their soldiers go, what they do, and assert positive influence on how, when, and where they operate their POVs.

b. Driver Training. Commanders will insure soldiers 26 years of age and under attend the Driver's training within 60 days of being assigned at Fort Sill unless they can provide documentation showing they have already received the training.

c. Discipline. Junior leaders work with their soldiers daily and know them well. Soldiers sometimes telegraph signals that translate later into accidents. Negative behavior such as traffic offenses, alcohol abuse, misconduct, and poor performance often are indicators of potential POV accident victims. Identify "at risk" soldiers; counsel them; take proactive measures to modify their risk behavior.

d. Risk Management. Use risk management. Identify hazards associated with POV operations, assess the hazards, and make decisions to control them, implement the controls, and supervise execution. Use the Risk Assessment and Control Options Program for POV Operations (commander, leaders and individual assessments) and the POV Risk Management Tool Box. These programs provide a comprehensive set of tools and controls that have proved successful throughout the Army. The IBSO can assist in obtaining these programs.

e. Standards. Set high and unmistakable standards and enforce them. Follow the army regulatory traffic standards and be uncompromising on the use of **seatbelts** and **motorcycle safety equipment**, (AR 385-55 and AR 190-5). Educate soldiers on the risks of **speed, fatigue**, and use of **alcohol**. Conduct mandatory POV safety inspections and random roadside checks. Emphasize the use of designated drivers for social events.

f. Provide Alternative. Provide alternatives for soldiers to driving POVs by scheduling activities on post to keep soldiers on post and off the road. Keep gyms, recreation centers, and other places soldiers use off-duty open later. These same measures also can provide alternatives to alcohol use. Look for transportation alternatives and promote their use. Prominently post public transportation schedules and when possible, use Morale, Welfare and Recreation (MWR) services to provide buses or vans to transport soldiers to the places they go when off-duty. Arrange reduced hotel rates in nearby communities to encourage soldiers to remain overnight on weekends and stay off the highways late at night.

g. Commanders Assessment. Following every fatal and serious injury POV accident, commanders will conduct an assessment of the accident with the involved soldier's chain of command to determine what happened, why it happened, and how we could have prevented it. Implement corrective and preventive measures and publicize lessons learned.

h. Other Considerations. The above listed are the minimum standards for the model POV safety program, other considerations are--

- (1) Causes of Army POV accidents.
- (2) Emotions are accident causation.
- (3) How to avoid a collision with another vehicle.
- (4) Pedestrian safety precautions.
- (5) Driver's view of motorcycling.

15-15. MOTORCYCLE TRAINING AND OPERATION. Motorcycle riders operate motorcycles in accordance with DoDI 6055, AR 190-5, 385-55 and USAFACFS Supplement 1 to AR 190-5, Motor Vehicle Traffic Supervision.

15-16. PREHOLIDAY POV INSPECTIONS.

a. Commanders will inspect POVs of military personnel prior to 3-day holidays or longer and also prior to a soldier taking leave or pass if driving over 250 miles to his/her destination. Soldiers not on leave but driving over 250 miles must get an extended mileage pass from their commander.

- b. Recommend inspecting the following items:
- (1) Proper functioning of restraining devices.
 - (2) Tire tread depth.

- (3) Lights, horn, windshield, and windshield wipers (operation and efficiency).
- (4) Emergency Brake.
- (5) Properly inflated spare tire with functioning jack system.
- (6) Emergency warning kit or road flares.
- (7) Proof of insurance, valid drivers license, and current registration.

CHAPTER 16

OCCUPATIONAL VISION PROGRAM

16-1. PURPOSE. To implement a comprehensive Occupational Vision Program that is applicable to all Military and Civilian personnel of this installation as required by AR 40-5, TB MED 506, and CFR 1926.102.

16-2. SCOPE. The ability to use one's vision effectively and with safety depends upon an efficient vision program that includes--

- a. Periodic determination of employees' (civilian and military) visual capacity and referral of those with defective vision for professional eye care.
- b. Determination of visual acuity necessary for a particular occupation, and utilization of this determination for job placement.
- c. Insuring that adequate lighting is available for each occupational activity.
- d. Insuring the availability and utilization of both environmental and personal measures necessary for maximal eye safety.
- e. Continuity health education program pointing out the benefits of the Occupational Vision Program and stimulation cooperation of all concerned.

16-3. GENERAL.

- a. The prevention of eye injury is much more profitable than its treatment by any known medical or surgical means.
- b. Commanders at every echelon insure that safety or other technically qualified personnel are used to determine inherent and manmade hazards to the eye are analyzed at each physical operation. Standing operating procedures will reflect the result of such operating analyses by including a mandatory requirement for the use of protective clothing and equipment, including safety spectacles (prescription and plane) or full face shields as appropriate to prevent injury. Use absorptive lenses for specific

operations where excess light is not readily controlled, such as welding operations. Conduct continuous studies to maintain maximum safety standards.

c. Furnish to military and civilian personnel items of protective clothing and equipment that are required to comply with safety regulations and procedures. The cost of personal safety equipment will be borne by the installation or activity to which these personnel are assigned.

d. A desire for eye protection and a will to wear industrial safety glasses will be stimulated among personnel by an educational program to include informal discussion, educational films, and the use of posters. Safety awards may increase motivation. Consider habitual nonuse of safety glasses and safety precautions in eye-hazardous areas as grounds for disciplinary action.

e. Contact lenses themselves do not provide eye protection in the industrial sense. Do not wear them in a hazardous environment without appropriate covering safety eyewear.

f. Identify all personnel having useful vision in only one eye and ensure they wear industrial thickness lenses regardless of job assignment. Since protective lenses being provided are still subject to breakage, do not take unusual risks.

g. Conduct laser operations IAW USAFACFS Reg 385-1.

16-4. RESPONSIBILITIES.

a. Commanders and directors are responsible for the establishment and implementation of occupational vision and health activities at all levels.

b. Supervisors, both military and civilian, will—

(1) Assure that personnel in occupations associated with hazardous areas of duties are provided with and instructed in the proper use of eye protective equipment while in eye hazardous areas.

(2) Identify by name to Preventive Medicine personnel exposed to eye hazard and ensure they receive vision screening at least once every 2 years.

(3) Ensure personnel receive and properly use eye protection while in eye hazardous areas. Do not leave the use of protective equipment to the discretion of the individual users.

(4) Provide adequate illumination in the workplace.

(5) Ensure contact lenses are not used during exposure to eye hazardous chemicals or air contaminants and not worn when using a respirator.

(6) Ensure hazard evaluations and illumination surveys are conducted when operational changes warrant.

(7) Take appropriate disciplinary action on personnel who knowingly and repeatedly violate the provisions of this section.

(8) Ensure that all personnel having useful vision on only one eye are identified and wear industrial safety glasses regardless of job assignment.

(9) Inspect and test eye wash stations weekly. Flush them for a maximum of 3 minutes to eliminate the potential of eye infection during emergency use.

(10) Ensure that individuals working in identified eye hazard areas are scheduled and report for annual eye examinations.

(11) Use portable eyewashes only in facilities without plumbing. Use only pressurized metal eyewashes. Do not put into service any portable eyewash until approved in writing by the IBSO.

(12) Inspect portable eye washes and showers for proper operation monthly and document the inspections IAW AR 25-400-2.

(13) Designate and label specific areas where the use of eye protection is required IAW AR 385-30.

c. The IBSO will--

(1) Advise commanders/directors on the Occupational Vision Program.

(2) Promote compliance with the Occupational Vision Program.

(3) Conduct surveys to ensure compliance with the Occupational Vision Program.

(4) Inform commanders and supervisors of personnel who knowingly violate provisions of this program.

d. Preventive Medicine will--

(1) Make eye examination appointments for civilian personnel working in eye hazardous areas requiring safety glasses.

(2) Assist the IBSO in promoting compliance with the Occupational Vision Program and provide training on the effects of poor illumination, eye injury prevention, and the proper use, care, and storage of personal protection.

e. MEDDAC will--

(1) Provide eye examinations to military and civilian personnel who require safety glasses.

(2) Fit safety glasses.

f. Individuals will--

(1) Report for all scheduled medical examinations.

(2) Comply with the requirements for the use and maintenance of eye protection.

16-5. MATERIALS AND SERVICES.

a. Commanders/supervisors will complete a properly funded purchase request and forward it to the Chief, MEDDAC, Logistics Division, Medical Supply, Fort Sill, Oklahoma for procurement of safety glasses.

b. PM will schedule individuals for appointments for eye examinations and fitting for safety glasses.

c. Limit personnel to one pair of prescription glasses annually unless--

(1) Glasses are broken as a result of an occupational operation.

(2) Corrective lens prescription changes.

(3) Approved by the Chief of Optometry.

(4) Assigned duties require tinted lenses for outdoor use.

CHAPTER 17

ERGONOMIC PROGRAM

17-1. PURPOSE. Refer to AR 40-5 and DA Pamphlet 40-21 for the policies, responsibilities, and procedures for identifying, evaluating, and controlling specific ergonomic problems.

17-2. SCOPE. This program applies to all elements of USAFACFS and tenant activities.

CHAPTER 18

CHEMICAL HYGIENE PLAN (LABORATORY)

18-1. GENERAL.

a. The Chemical Hygiene Plan (CHP) establishes the minimum regulatory requirements for safe use of hazardous chemicals in the laboratory. Minimize chemical exposure through the use of engineering controls, work practices, and protective equipment and clothing.

b. This CHP applies to all chemical laboratories within USAFACFS and Fort Sill including all tenant activities.

c. It is prudent to minimize all chemical exposures. Few laboratory chemicals are without hazards; therefore, a cardinal rule when working with chemicals is to avoid skin contact.

d. Avoid underestimation of risk. Regard substances of no known significant hazard as being potentially hazardous and take special precautions. Assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are toxic.

e. Provide adequate ventilation for all laboratories. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices.

f. Do not expose laboratory personnel to airborne concentrations that exceed the Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) for a specific compound or mixture. A list of PELs and TLVs is found in 29 CFR part 1910-1000, subpart Z.

18-2. REFERENCES.

a. Occupational Safety and Health Administration's Hazard Communications Standard (29 CFR 1910).

b. DOD Instruction 6060.5, Hazardous Material Information.

18-3. RESPONSIBILITIES.

a. Activities/directorates with laboratories will appoint a Chemical Hygiene Officer (CHO).

b. Chemical Hygiene Officer will--

(1) Develop a CHP and implement guidance for handling hazardous chemicals in the laboratory IAW 29 CFR 1910.1450. The IBSO and Preventive Medicine Service prior to approval will review program.

(2) Review the CHP at least annually and revise the document as necessary to reflect current regulatory practice.

(3) Review SOPs for all laboratory operations using hazardous chemicals.

(4) Conduct pre-operational surveys of all new laboratory operations using hazardous chemicals.

(5) Request annual surveys from Preventive Medicine Service.

(6) Maintain an inventory of chemicals routinely used in the laboratory and of chemicals that are stored. The inventories should reflect quantity estimates and location of storage.

(7) Provide training to all employees on the hazards associated with the laboratory operations and maintain records of such training IAW AR 25-400-2.

(8) Maintain MSDSs for all chemicals on the chemical inventory. The MSDSs should be available so employees have easy access to them.

c. Preventive Medicine Service will--

(1) Provide guidance on hazardous waste handling and disposal.

(2) Conduct inspections of all laboratories where hazardous waste is generated or stored.

(3) Review CHPs and SOPs for all laboratory operations using hazardous chemicals.

(4) Review plans and specifications for all laboratory construction to ensure industrial hygiene and environmental regulatory requirements are met and pollution abatement measures are included.

(5) Conduct annual industrial hygiene surveys in laboratories where hazardous chemicals are used IAW AR 40-5 and TB Med 503.

(6) Maintain the Health Hazard Information Module (HHIM) database for all laboratories IAW AR 40-5 and TB Med 503.

(7) Conduct air sampling of laboratory operations where there is a reasonable probability that employee exposure exceeds the action level for a chemical (29 CFR 1910.1045 and AR 40-5).

(8) Conduct replacement, reassignment and periodic job-related medical surveillance for military and civilian employees potentially exposed to hazardous chemicals (AR 40-5).

d. Installation Branch Safety Office will conduct periodic safety inspections of all laboratories.

e. Supervisors will--

(1) Ensure an SOP is prepared for all laboratory operations using hazardous chemicals.

(2) Ensure laboratory personnel receive job-related medical surveillance as identified by the Preventive Medicine Service.

(3) Ensure personnel working with hazardous chemicals are trained on the health and safety aspects of their jobs.

(4) Ensure personnel have received hazard communication training IAW 29 CFR 1910.1200.

(5) Ensure personnel are provided and have received adequate training in the use of protective clothing and equipment necessary for the operations.

(6) Perform daily inspections of laboratory operations using hazardous chemicals to insure compliance with the SOP, the CHP, and applicable regulations.

(7) Ensure hazardous waste handlers receive annual hazardous waste training.

f. Laboratory personnel will--

(1) Plan and conduct laboratory operations using hazardous chemicals in accordance with procedures found in the SOP, the CHP, and applicable regulations.

(2) Report hazardous conditions, exposure, or abnormal circumstances associated with an operation to their supervisor.

(3) Report for any job-related medical surveillance examinations.

(4) Manage laboratory waste in accordance with applicable environmental regulations.

g. Handle acutely toxic compounds, carcinogens and reproductive toxins using the special procedures found in 29 CFR part 1910.1450.

18-4. INVENTORIES.

a. Make available inventories for each room where chemicals are stored or handled. The room custodian will maintain the inventory of the chemical name, quantity, container type, storage code, date received and expiration date (if applicable).

b. Keep available inventories current and provide to the Installation Branch Safety Office and Preventive Medicine.

c. Maintain copies of the inventories for a single laboratory building in a central location(s) accessible to fire fighters or other response personnel in the event of an emergency.

d. Make available MSDS for each chemical on the inventory for workers in the laboratory.

18-5. PROTECTIVE CLOTHING AND EQUIPMENT. Make available the following protective clothing and equipment in each laboratory:

a. Protective apparel compatible with the required degree of protection for substances being handled.

b. An easily accessible drench-type safety shower and eyewash. Design and installation will comply with ANSI Standard Z358.1 (latest edition).

c. A fire extinguisher.

d. Make available nearby a respiratory protection, fire alarm, and telephone for emergency use. Selection and use of respirators will be in accordance with AR 11-34 and TB MED 502.

e. Other items designated by the laboratory supervisor.

18-6. AIR MONITORING. Conduct air monitoring when there is reasonable probability that employee exposure exceeds the action level for a chemical (29 CFR 1910.1045 and AR 40-5).

18-7. INFORMATION AND TRAINING.

a. Provide personnel with information and training to ensure they are apprised of chemical hazards in the laboratory. Provide the following health and safety information:

(1) Contents of the OSHA Laboratory Standard and its appendices.

(2) Location and availability of the CHP.

(3) PELs for OSHA regulated substances.

(4) Signs and symptoms associated with exposure to hazardous chemicals used in the laboratory.

(5) Location and availability of reference material including MSDSs.

b. Train personnel handling hazardous chemicals. Training will include the following:

(1) Details of the CHP.

(2) Methods and observations that may be used to detect the presence of hazardous chemicals.

(3) Physical and health hazards of chemicals used in the laboratory.

(4) Measures personnel can take to protect themselves from these hazards including use of engineering controls, work practices and personal protective equipment.

18-8. MEDICAL PROGRAM. Establish regular medical surveillance to the extent required by regulations. Consult the Preventive Medicine Services 458-2430/2431.

a. Routine surveillance. Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult the Preventive Medicine Services 458-2430/2431, to determine on an individual basis whether a regular schedule of medical surveillance is necessary.

b. For emergencies, seek first aid assistance at the hospital emergency room.

18-9. SPILLS AND ACCIDENTS.

a. Establish a written emergency plan and communicate it to all personnel; it should include procedures for ventilation failure, evacuation, medical care, reporting, and drills.

b. There will be an alarm system to alert people in all parts of the facility including isolation areas.

c. Develop a spill control policy and include consideration of prevention, containment, cleanup, and reporting. Refer to the internal SOP.

d. Carefully analyze all accidents or near accidents with the results distributed to all who might benefit.

18-10. WASTE DISPOSAL PROGRAM.

a. Handle and dispose of laboratory wastes in accordance with applicable federal, state, and local environmental regulations and policies.

b. Handle and store chemicals in such a way that their identity is retained from initial receipt or production to use or ultimate destruction whenever feasible. When chemicals are combined and become part of a laboratory waste mixture, maintain a record of all chemicals in the mixture.

c. Maintain MSDSs on all chemicals wastes and provided to the Property Disposal Officer or the Environmental Engineer when turned in.

18-11. LABORATORY EMERGENCY PROCEDURES.

a. Emergency Plans. Prepare a written emergency plan for laboratory buildings, which includes the following elements:

(1) Evacuation Procedures. Establish primary and alternate routes as necessary and communicated to personnel. Designate outside assembly areas.

(2) Shutdown Procedures. Document in SOPs instructions for shutting down equipment or apparatus in the event of an emergency.

(3) Return Procedures. Develop procedures to ensure personnel do not reenter the laboratory before the emergency is over.

b. Fires. Laboratory personnel will not attempt to extinguish large fires. Take the following steps:

(1) Confine the fire by closing the hood sash or laboratory doors and fire doors as appropriate.

(2) Extinguish the fire directing the discharge at the base of the flames.

(3) If you cannot control the fire, evacuate the area and contact the Fire Department.

c. Ventilation Failure.

(1) Terminate operations in a safe manner in the event of a low flow condition or complete ventilation failure.

(2) Personnel will not re-enter the laboratory until ventilation has been restored for at least 30 minutes.

(3) In cases where the operation could not be terminated and there is a reasonable probability that the laboratory atmosphere is unsafe, air monitoring may be necessary before re-entry.

18-12. RECORDS.

a. The using section will maintain inventory and usage records for high-risk substances IAW AR 25-400-2.

b. Preventive Medicine Service in accordance with the requirements of state and federal regulations will retain medical records IAW AR 25-400-2.

18-13. EMERGENCY WARNINGS.

a. Telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers.

b. A label showing contents of containers (including waste receptacles) and associated hazards.

c. Location signs for safety showers, eyewash stations, other safety and first aid equipment, exits, and areas where food and beverage consumption and storage are permitted.

d. Warnings at areas or equipment where special or unusual hazards exist.

18-14. BASIC RULES AND PROCEDURES FOR WORKING WITH CHEMICALS.

The basic rules and procedures for working with chemicals are found in 29 CFR 1910.1450, appendix A.

18-15. SAFETY RECOMMENDATIONS. The above rules do not include those, which are directed primarily toward prevention of physical injury rather than toxic exposure. However, failure of precautions against injury will often have the secondary effect of causing toxic exposures.

CHAPTER 19

RECREATIONAL SAFETY

19-1. GENERAL. As leaders, one of our primary concerns must be the safety of our soldiers, their families and civilian employees. The majority of recreational related accidents occur on weekends and holidays. The major causes stem from a disregard to know safety precautions, drugs, and alcohol, unintentional water entries, or swimming in unauthorized areas. The mission is to prevent these accidents from happening. The keys to success are heightened command emphasis, education, and vigorous enforcement of recreational safety. The information provided in this chapter is provided to assist in this effort.

19-2. PURPOSE. To acquaint Fort Sill personnel and military family members with some of the natural hazards existing in the Fort Sill and Lawton area.

19-3. VENOMOUS ARTHROPOD. The following are some of the important poisonous arthropods (insects and insect-like animals), which you may encounter in this area.

a. Centipede. A segmented, worm-like creature with from 15 to more than 100

pairs of legs. Each segment has one pair of legs (in contrast to the harmless millipede, which has two pairs of legs per segment). It lives under logs, boards, rocks, and in dwellings where it can gain entrance. It is provided with poisonous claws located behind the mouth and connected to large poison glands. The bite is painful, much like the sting of a bee, but otherwise is not serious. For treatment, use cold compresses and seek medical assistance.

b. Scorpion. A small (2 or 3 inches long), crab-like creature with a five segmented "tail" (post-abdomen) terminating in a bulbous sac with a prominent stinger. It is nocturnal, hiding during the day beneath loose stones, boards floors, and debris. Some scorpion stings produce fatalities, especially in children. Submersion of the injured part in ice water, or use of an ice pack, is recommended while medical assistance is being sought. Keep the patient quiet and apply a tourniquet, above the sting, if possible. Do not perform incision or suction.

c. Tarantula Spider. A very large, hairy spider. About 30 species live within the limits of the United States, mostly here in the Southwest. The bite of any of our southwestern tarantulas is entirely harmless. The bite has been described as "painful as a couple of pin stabs," and has essentially the same effect. Cleansing of the wound is all that is needed.

d. Black Widow Spider. An average sized spider with a shiny black body. Usually has distinctive red or orange hourglass marking on the **UNDERSIDE** of the abdomen. However, the exact design may vary, with occasionally two or more distinct triangles or blotches, sometimes only an irregular longitudinal area. Found in darker corners of barns, stables, shacks, outdoor latrines, woodpiles, basements, etc. Symptoms include severe abdominal pain with "board-like rigidity of the abdominal muscles. An occasional fatality has been reported. The only first aid measure to be taken is cleansing of the bitten area, keeping the patient as quiet as possible and obtaining medical aid at once.

e. Brown Recluse Spider. This spider has an oval body with eight legs. It is light yellow to medium brown in color and has a distinctive mark shaped like a fiddle (violin) on its back. Its body is from 3/8 to 1/2 inch long, 1/4 inch wide, and 3/4 inch from tip to tip. It prefers dark places where it is seldom disturbed. Its bite produces an almost painless sting, which you may not notice at first. Shy, it bites only when annoyed or surprised. Left alone, it will not bite. Keep patient quiet and seek medical aid at once.

19-4. NUISANCE INSECTS.

a. Bloodsucking Conenose Bug. Also known as "Mexican Bedbug," "triatoma," or "Reduviid bug." It is 1/4 to 3/4 inches long, dusty black in color, with some red areas on the edges of the wings. May be found in bedclothes. Inflicts a painless bite, and the evidence of bloodletting is found later. Some people, however, develop a severe allergic reaction, with burning pain, itching, and swelling at the site of the bite, and hives over the entire body. In case of such a reaction, seek medical attention immediately.

b. Mites or Chiggers. These tiny arthropods are about 1mm long, and are barely visible to the naked eye. They are bright red in color, and can be found almost anywhere in temperate climates. The mite clings to the skin, or hair follicles, and injects a digestive fluid into the skin, which causes a localized itching. The bites are not dangerous, but sometimes itching continues for 4 to 7 days. The best preventive measures to be taken are the use of repellents and a strong detergent soap. Take a shower, immediately, after being around any type of high vegetation.

c. Biting Flies. Also known as deer flies and sheep flies. They range from 1 to 2 inches in length. Their color varies from yellow to green to black, and they are found most commonly in wooded areas, or around bodies of water. They inflict a very painful bite, which will usually have a mild itching sensation. Repellents are again the best preventive measure.

19-5. STINGING INSECTS. The stinging insects belong to the order Hymenoptera. Those present in this area include bees, wasps, and ants.

a. Bees. Both honeybees and bumblebees are found in this area, and inflict painful stings. The honeybee leaves her sting in the wound, but the bumblebee does not. Thus, the latter can sting repeatedly. If a sting apparatus is found in the wound, one can assume that a honeybee did the stinging. The pain is due to the injected venom. The severity is greatly increased in the case of multiple stings. It has been estimated that the lethal dose for an adult is 500 bee stings within a short time. Tolerance to bee stings, however, may develop in those long exposed to stings. This tolerance disappears when exposure is discontinued.

b. Wasps. The term "wasp" generally includes wasps, yellow jackets, and hornets. These insects build their nests of "paper" (wood pulp) or mud, and are found beneath leaves, on porches, and in outbuildings, shrubbery, trees, and holes in the ground.

c. Ants. Certain species of stinging ants are quite formidable because of the danger of mass attack by hordes of these ants. In this area, you may encounter the red harvester ant. They have a vicious sting, and readily attack small animals and man if the unwitting victim disturbs their low, bare, mound-like nests. For example, a small pig may walk leisurely upon an ant mound and suddenly begin to kick and squeal as a result of an attack of ants rushing from their underground nest. The animal will usually topple over with outstretched legs, and death quickly follows. It can be seen that small children would be in great danger if similarly exposed.

d. Reactions to Stings. Three general types of reactions to insect stings have been described. The names given to these reactions were coined by John A. Flumo, U.S. Department of Agriculture, and are--

(1) Hymenopterism Vulgaris. There is pain, redness, and swelling at the site of the sting. The severity of these manifestations varies from species to species. The

pain, redness, and swelling may last for only a few minutes, or may persist for up to a few days. This reaction is not serious and subsides without treatment, although an ice pack may be used. It is not necessary to consult with a physician.

(2) Hymenopterism Intermedia. This type of reaction includes considerable swelling beyond the actual site of the sting (e.g., an entire arm). The symptoms last for several days. If the insect has stung the tongue, neck, or throat, there may be enough swelling to impair breathing or swallowing. Obtain medical aid if this reaction occurs.

(3) Hymenopterism Ultima. This reaction is also known as anaphylactic shock. It may result from only one sting. The patient goes into shock quite rapidly, the breathing is shallow, pulse and heartbeat are faint or undetectable, sweating occurs, and the patient loses consciousness. The body may break out in hives. A physician is needed at once, because this reaction is often fatal, sometimes in a matter of minutes.

NOTE: The last two reactions indicate that the person is allergic to the venom of the stinging insect. The occurrence of a Hymenopterism Intermedia reaction may mean the patient is likely to demonstrate Hymenopterism Ultima in the future, perhaps with the very next sting. The particular type of insect causing the reaction should be strictly avoided, and desensitization injections of an antihistamine are recommended.

e. Preventive Measures.

(1) If nests of wasps, bees, or ants are found in the Fort Sill area, do not disturb them. Contact DPW Pest Management Branch (442-5723).

(2) Rapid disposal of garbage (especially fruit) around quarters, yards, and picnic areas is very important because some types of wasps and bees are drawn to this sort of garbage. Watermelon seems especially attractive to yellow jackets. Use the refuse facilities provided in public parks, and few people realize that this procedure may be a matter of life or death.

19-6. VECTORS OF DISEASE. Certain insects, while not themselves poisonous, may carry diseases to man. Some important ones in the Fort Sill area are--

a. Ticks. The Black Legged or Deer ticks and/or dog ticks can spread Lyme disease and carries the organisms that cause Rocky Mountain Spotted Fever (RMSF), as well as Colorado Tick Fever. These diseases usually occur from spring through early fall. Wear high boots and keep socks outside trouser legs when walking through known tick-infested areas, especially thick woods and high grass. Apply repellents (DEET) to exposed skin and permethrin, where available, or DEET to clothing. Before retiring at night, and after leaving a tick-infested area, carefully search your body and clothing for the tiny, flat, leathery insects. (When gorged with blood, they are a good deal larger, perhaps the size of a bean.) If the tick has already embedded its mouthparts in the skin, remove it immediately with fine-tipped tweezers by grasping the tick as close to your skin as possible and gently pulling straight out. Do not squeeze the

tick's body as this may inject fluid into you! Wash the bite area of skin and apply antiseptic. Common symptoms of Lyme disease are: ringed-shaped rash, flu like symptoms and arthritis, later the disease affects joints, heart and nervous system. Common symptoms of RMSF are: spotted rash, high fever, chills and severe headache. Take note that it is important to remove the mouthparts with the tick.

b. Mosquitoes. In this area there are three species of mosquitoes, which can transmit encephalitis (an inflammation of the brain), although in recent years there has been no outbreak of the disease. There are also two species, which are capable of transmitting malaria. Aside from the characteristic biting annoyance, these are the only two potential dangers. The use of screens, bed nets, insect repellent, rolled-down cuffs, and buttoned-up collars will provide a significant amount of protection.

c. Rodent Fleas. Plague is transmitted by the bite of a flea from a wild rodent (Squirrel, rat, etc.). Avoid handling wild rodents, either dead or alive. However, if you must handle them, use gloves and insect repellent.

19-7. BATS AND WILD ANIMALS.

a. Bats. In this vicinity, some bats are carriers of rabies. Most of these carriers eventually become ill and die. When a bat is found ill with rabies, it may look dead, but "come to life" when disturbed. You may find such a bat on the ground, and in post swimming pools. However, if a bat is found alive and "roosting" somewhere (e.g., on a porch), it is best not to disturb it, chances are it is not infected. If a sick or dead bat is found, notify DPW Fish and Wildlife. They will pick it up and deliver it to the Post Veterinarian for laboratory examination. Anyone picking up a bat should use heavy gloves and should place it in a paper sack. Inexperienced persons should not attempt collection of such specimens. Repeat: Unless you are experienced, **do not attempt to capture bats or other wild or stray animals.** Some of the sick or dead bats collected at Fort Sill have been rabid.

b. Wild Animals. Many wild animals can transmit rabies through a bite or scratch from an infected animal. Beware of capturing "pets" or playing with squirrels, chipmunks, prairie dogs, raccoons, mice, etc. If an animal is found that appears to be ill or dead, follow the same guidelines given for bats. In case of animal attack, the victim should report immediately to a medical treatment facility for evaluation and possible treatment. Apprehend the animal, if possible, and take precautions to protect yourself from injury. In the event the animal is slain, leave the head intact and immediately contact the veterinary activity.

19-8. VENOMOUS REPTILES. There are only four poisonous snakes found in the United States. However, all four of these reptiles inhabit Oklahoma. Despite this fact, outings can be safely made if one has a small knowledge of the nature and habits, and a great respect for these reptiles.

a. Rattlesnakes. There are five species of rattlesnakes in Oklahoma. They are pit

vipers so called because of a small deep pit found between the nostril and eye on each side of the head) and possess a distinctive rattle at the end of the tail. The rattlesnake family is one of the most poisonous of the North American snakes, second only to the Western Coral Snake. A brief description of the habits and most prominent types of rattlesnakes found in Oklahoma are as follows:

(1) Western Diamondback. This is thought to be the most dangerous of all its family, probably because it is the largest and the most aggressive. It is recognized by a diamond pattern on its back and is usually found in and around rocky areas.

(2) Timber Rattlesnake. This snake has color phases from yellow (when young) to almost black. It inhabits rocky ledges, mountains, wooded areas, and swamp edges.

(3) Massasuaga. Distinguish this small, brownish rattlesnake by the square like dark blotches on its back. However, some are almost black, and entirely blend with the background. They prefer edges of streams, ponds, marshes, and low, damp places.

b. Cottonmouth. The Cottonmouth is the largest pit viper without a rattle. It is a heavy, thick snake with indistinct black bands, although the young are brilliantly marked with dark bands on reddish brown. In Oklahoma, they are found in the eastern and southern parts of the state around water.

c. Copperhead. This is a smaller snake compared to the Rattlesnake and the Cottonmouth, and you can recognize it by its dark cross-bands enclosing light areas on its sides, and its coppery brown head. Although this snake is small, and its venom is the least toxic, it is nevertheless the best concealed in its surroundings, and accounts for many of the snakebite cases. The copperhead inhabits woody, Rocky Mountains, and hillsides, but often moves to the lowlands in the summer.

d. Western Coral Snake. This is the smallest poisonous snake in the United States, but its venom is the most toxic. Fortunately, it is very shy, and delivers its venom not by fangs as the others, but delivers its venom by chewing with its teeth until the skin is broken. It is brightly banded in a sequence of black-yellow-red-yellow, and so on, for its entire body. Western Coral snakes live underground in fields or around water.

e. Preventive Measures. When in the field, camping, fishing, or hunting, the best preventive measure against snakebite is to be aware of areas likely to be infested by snakes and to exercise caution when walking. If these signs are present little precautions are taken, there is very little danger of snakebite.

f. First Aid for Snakebite. The current policy of the Surgeon General, Department of the Army, on snakebite is that only medically trained personnel using surgical instruments should attempt incision and suction of the wound. Snakebite kits are no longer items of issue. Therefore, the Surgeon General has stated that nonmedical personnel should take only the following measures to aid a snakebite victim:

- (1) Within practical limits, achieve immediate, absolute immobilization of the affected part in position below the level of the heart. Keep the patient quiet.
- (2) Place an improvised, lightly-constricting band (tourniquet) 2 to 4 inches closer to the heart than the site of the bite, and reapply the constricting band ahead of the swelling if it progresses up the arm or leg.
- (3) If the bitten person stops breathing, start prolonged mouth-to-mouth artificial resuscitation, immediately.
- (4) Get assistance from the nearest medical source or transport the patient to a medical facility, as soon as possible.
- (5) Do not administer morphine, alcohol, or ice packs.
- (6) If possible, kill the snake that bit the patient and bring it to the medical source, with the patient, for positive identification of the snake.

19-9. POISONOUS PLANTS.

a. Castor Beans. Castor Beans are a large rapid-growing, ornamental plant. It has clusters of large five-to-eleven cleft leaves, producing clusters of greenish-red berries at the top of tall, spike-like stems. Resulting seed capsules contain very poisonous silvery mottled seeds. Juice of the berries can also cause dermatitis.

b. Daphne. The Daphne is an ornamental bush, with fragrant white or lilac-colored flowers, and scarlet fruits. Some species are evergreen. The bark, leaves, and fruit are poisonous. This hardy shrub grows from three to nine feet tall, and is common along the roads.

c. English Ivy. The black berries produced by the evergreen vine are toxic, as well as the leaves cause a skin eruption or a reaction in some individuals. The English Ivy is often used for ornamental purposes, and usually has three to five lobes per stem.

d. Larkspur (Delphinium). The bulbs, seeds, and leaves of this common flower are poisonous.

e. Jimson Weed. Also known as "stink weed" because of the disagreeable odor of its foliage and roots. It has white trumpet shaped flowers, and produces a large, spiny seed capsule in the fall. All parts of the plant (leaves, flowers, seeds, and roots) contain poisonous substances. Fatal cases have been reported, especially in children, after ingestion of parts of the plant.

f. Oleander. This shrub is not native, but is common in Oklahoma, especially as an ornamental plant. It frequently grows to 15 feet in height. The dark green, leathery

leaves are evergreen, and occur in whorls of three. The flowers are borne in large showy clusters of red, white, or yellow. All parts of this plant are poisonous. Children have died from nibbling the blossoms, leaves, and twigs. Meat roasted on oleander sticks becomes toxic. The honey produced from the nectar of its blossoms is lethal. Contact with the leaves, bark, or sap can cause dermatitis. Even the smoke from burning oleander cuttings or leaves is quite irritating.

g. Milk Weed. This weed has thick, broad leaves, a large, pithy stem, and white to purple blossoms growing from the top of the stem in a cluster resembling an inverted umbrella. The milky sap may cause skin eruption. Most generally found in over grazed pastures or fields during hot, dry seasons. It contains seeds in a thick pod.

h. Poke Weed. It has small clusters of white flowers and produces dark purple berries in the autumn. The large root is poisonous, as are the berries. The seeds also contain a toxic substance. It is common throughout the state, except in the Panhandle section. Found in small clearings and at the edge of wooded areas.

i. Poison Sumac. It is a coarse shrub 2 to 6 feet high. The leaf is composed of seven leaflets. The fruit is a long cluster of dry berries. As in the case of poison ivy and poison oak, the wax on the foliage, flowers, and fruits is poisonous to most skins. Also, it should be noted that the fumes from burning these three plants may also be toxic, and you should avoid it.

j. Poison Oak. This is a short, woody shrub about one foot high, with a velvety stem, and variously lobed leaves that are fuzzy beneath (suggesting oak leaves). It is found in dry areas.

k. Poison Ivy. A cluster of three shiny leaves on a typical ivy stem. The larger climbing branches have many aerial roots. Produces clusters of small whitish berries. Can cause severe skin eruptions. Generally found in cool, shady places near creeks and brush.

l. Water Hemlock. Looks similar to the common parsley, and grows in damp, moist areas. The stems and leaves contain some poison, but the large rootstock, which contains air cavities, is the most toxic of all.

m. Wild Iris. Contact with leaves or roots may cause skin eruptions. Ingestion of parts of the plant may cause diarrhea.

n. Wisteria. This is a common flowering vine on trellises and porches, with blue flowers in pendant clusters. The seeds and seedpods are extremely poisonous.

o. Other plants, which are poisonous if eaten, are--

(1) Wild mushrooms.

- (2) Seedpods of the Cherry Laurel.
- (3) Leaves and twigs of the Boxwood.
- (4) Blossoms of the Gloriosa Lily.
- (5) Blossoms of the Autumn Crocus.
- (6) Blossom of the Tiger Lily.
- (7) Roots of Lily-of-the-Valley.
- (8) All parts of the Nightshade.

(9) Many garden bulbs and seeds. (Some of these bulbs and seeds have been treated with poisonous chemicals to prevent deterioration and insect damage, but even untreated materials may be harmful.)

p. Most plant-poisoning cases involve young children who are often attracted to colorful flowers and shiny berries and seeds. Symptoms may include abdominal pain, vomiting, convulsions, marked dilation of the pupils, and unconsciousness.

q. If you suspect poisoning from eating a portion of one of the poisonous plants described, induce vomiting immediately by placing a finger in the victim's mouth and gently pressing on the back of the throat. If unsuccessful, give large quantities of warm salt water or soapy water. However, do not waste time, get the patient to a physician immediately.

r. You can prevent almost all plant poisoning. Learn to identify poisonous plants in your vicinity, whether on post or while camping. Keep young children away from these plants, and point out their dangers to older children. If one comes in contact with plants, such as poison ivy, which can cause skin irritation or blistering, thoroughly wash the exposed skin surface as soon as possible with soap and water. Beware of clothing, which may also have absorbed some of the irritating sap. See a physician if a skin eruption does develop.

19-10. WATER SAFETY. There is a constant need to be alert to the hazards found while you are participating in water sports. Primarily people who disregard known safety precautions cause water-related accidents. Ensure your soldiers and their family members/friends understand the importance of safety, when dealing with water-related activities. The general rules outlined below will assist in making water sports a means of enjoyment without tragedy. Water survival training is at appendix K.

a. Swimming. As the temperature rises, it encourages an increasing use of nearby lakes. This increases the water accident potential of this installation. Drowning is the second leading cause of death for people aged 1 to 24 and the seventh leading

cause of death for adults over age 24. Use common sense and good judgment when swimming, abide by the following rules, and prevent accidents.

(1) Never enter the water unless you can swim or float. Learn to swim for your own protection and the protection of others.

(2) Never swim alone. Use the buddy system. Try to swim in supervised areas only.

(3) Never dive into unfamiliar water without first determining that no dangerous obstacles are present in the area. Obey "No Diving" signs. A general rule is to enter feet first into water rather than head first if you don't know the dept. In addition, learn correct dive techniques from a qualified instructor. Swim close to the shore.

(4) Swim only in areas protected by authorized lifeguards and suitable lifesaving equipment. The difference in water temperature of large bodies of water may be sufficient to cause distress and cramps. Trouble can develop from being in water that is too cold for too long a period of time.

(5) Never drink alcohol and swim. Alcohol speeds up the loss of body temperature in cold water.

(6) Know your ability and stay within your limitations. Don't try to keep up with a stronger skilled swimmer or encourage others to keep up with you. Do not swim so long that you become tired or chilled. Watch out for "dangerous too's" -- too tired, too cold, too far from safety, too much sun, too much strenuous activity.

(7) Do not swim immediately after eating; give your food time to digest. In general, you do not have to wait an hour after eating before you may safely swim. However, if you have had a large meal, it is wise to let digestion get started before going swimming.

(8) Do not engage in horseplay around swimming areas at any time.

(9) Do not swim in unauthorized areas. Bodies of water on the Fort Sill military reservation and the Wichita Mountains Wildlife Refuge are off-limits for swimming unless a lifeguard is present and on duty. Likewise, rafting or wading is unauthorized on bodies of water on the Fort Sill military reservation unless attended by a qualified lifeguard. NOTE: This does not preclude wading by personnel participating in authorized hunting or fishing activities.

(10) Portable wading pools, on the reservation, will be under the constant surveillance of an adult member, of the owner's family, when filled. Drain when not in use!

(11) In the event of a water emergency or drowning, remove the person from the

water, check for consciousness and breathing. If the person is not breathing, open the airway and attempt rescue breathing. If air does not go in, give abdominal thrusts, for both children and adults, to clear the airway. Once the airway is clear, provide rescue breathing or CPR as needed. Remember the Red Cross safety training tips, **Check-Call-Care; Check** the scene to ensure it's safe, **Check** the victim, **CALL** 9-1-1 and **Care** for the person until help arrives.

b. Boating.

(1) Check the weather before you set out in your boat. Each summer, numerous fatal boating accidents occur when forecasted strong winds swamp small pleasure boats.

(2) Carry a Coast Guard-approved life preserver for each person aboard. Off-post, insist that passengers wear their life preservers, especially the children and nonswimmers. On-post, all boat occupants will wear life preservers at all times. The strap-on type is preferred.

(3) Load the boat and seat passengers properly before getting underway. Never overload the boat.

(4) Always carry a paddle or oar and provide the necessary running lights for nighttime operation; also, a flashlight, anchor, tool kit, first aid kit, bail bucket, some spare parts, and include a Coast Guard approved fire extinguisher in the boat.

(5) Use only approved safety gas cans to carry extra gasoline. Do not smoke while refueling cans or motor tanks. Gasoline at temperatures above 140F will cause low-density plastic containers to disintegrate.

(6) Never stand or permit standing in your boat unless you are sure it is large enough and stable enough to do so safely. Wear light, rubber-soled shoes rather than brogans or boots. Besides being better to prevent slipping, they allow for easier swimming in an emergency.

(7) Do not disturb persons who are fishing; steer clear of them.

(8) Give sailboats, canoes, and rowboats the right-of-way. Your wake may upset them.

(9) Never motor through areas where there are swimmers.

(10) Keep an eye on the weather and get to shore before a storm breaks.

(11) Know the general rules for barometer and wind observations. They are as follows:

- (a) Wind from an easterly direction, barometer falling: foul weather on the way.
- (b) Wind shifting to westerly direction, barometer rising: clearing, fair.
- (c) Steady or slowly rising barometer: settled weather.
- (d) Slowly falling barometer: unsettled or wet weather.
- (e) Rapidly rising barometer: clear and windy.
- (f) Rapidly falling barometer: storm coming.
- (g) Learn to handle your boat by practicing near shore in quiet, shallow water. Know the rules of right-of way, channel markings, anchorage, and use of lights.
- (h) Always instruct at least one other person on board how to operate the boat.
- (i) Below is the USAFACFS Safety Checklist and Fact Sheet on boating safety:

USAFACFS SAFETY CHECKLIST AND FACT SHEET	
Family Accident Prevention Program	
Recreational Boating	By Installation Branch Safety Office (IBSO)
Safety Briefing	Conduct a preboarding and underway safety briefing that includes but not limited to, boarding procedures, fire extinguisher use, boat flotation, skipper duties, navigation rules, alcohol facts, weather signals, and emergency procedures, (e.g., bad weather, capsized, calls for help and person overboard). Also conduct a maintenance check of the boat and boats motor before getting underway.
Trouble	For a swamped or capsized boat get on or near the boat if possible, but stay with the boat, it will float. When calling for help raise and lower your arms slowly. If a person should fall overboard throw him or her a personal flotation device (PFD). Never remove and throw your own PFD. Circle and approach from upwind, shut off the motor and extend an oar or line to the overboard person.
Float Plan	Tell someone where you are going and when you will return and give a description of your boat as well as passenger information and other identifying information to make finding your boat easier, should the need arise.
Weather	Check weather and water conditions before leaving shore. Take a reliable radio and monitor V.H.F or a.m. stations to get the most updated weather report while on the water. When storms are in the area, a.m. radios will crackle with static. If caught in foul weather, don life jackets, reduce boat speed and

	weight, and head for shore. Steer the bow into the waves at a slight angle. Seat passengers low and near the center of the boat. If the engine fails, anchor from the bow or stream a sea anchor.
Fuel	Ensure you have enough fuel. Use the “one-third rule” in fuel management. Use one-third of the fuel to go out, one-third to return and maintain one-third in reserve. Also take the proper refueling precautions.
Tools and spare parts	Carry a few tools and some spare parts and learn how to make minor repairs. A great many rescue cases are caused by minor breakdowns, which the operator should have been able to repair.
Life Jackets	Personal Floatation Device. Oklahoma State Law requires one wearable PFD aboard for every passenger. Ensure they are accessible and encourage everyone to wear their lifejacket. Set an example by wearing yours. The operator of a vessel less the twenty-six feet in length, while under way, shall require each passenger 12 years or younger to wear a PFD. Any person operating or manipulating a personnel watercraft, water skis, sailboard or similar device shall wear a PFD. Over eighty percent of the people who drown in boating accidents were not wearing a PFD.
Safety Equipment	In addition to having a lifejacket for each person, you should also carry a fire extinguisher approved for a motor boat, flares, a foghorn or whistle, a strong flashlight, a first –aid kit and a bailing bucket. Recreational boats must also display required navigation lights at all times between sunset to sunrise and during daylight periods of reduced visibility.
Loading the Boat	Check the capacity plate to determine the load limits. Although there might be seats enough for four, many small boats will only carry two or three people. The load makes a critical difference in the stability of a small boat. Overloaded boats overturn. Distribute the load evenly—side to side and fore and aft. If motor, fuel tank and operator are aft, load the rest of the gear toward the front. The larger and heavier the boat, the less effect passengers and cargo have on stability. One person, in a large boat, affects stability a lot less than in a canoe, for example. When boarding step into the center of the boat and ensure lines are secure. Hand gear into the center of the boat.
Getting Underway	Start slowly, watching out for other boats. Keep all passengers seated and in the center of the boat if possible. While under way observe other boats to avoid accidents and if needed stop to help others. Stay seated and operate at safe speeds, no clowning around. Never leave the boat unattended. Know and adhere to the boating signs and navigation rules.
Alcohol and Drugs	Operating a boat while intoxicated is illegal and it is extremely

	dangerous. Alcohol and drugs reduce judgment and the ability to react. The sun, wind, vibration and noise increase the debilitating effects of alcohol and drugs. More than half of boating deaths are alcohol related. Operating a boat while intoxicated is illegal and subject to a \$1,000.00 fine with increased penalties for causing injury or death. Alcohol and water do not mix!
Hypothermia	Hypothermia occurs when the body loses heat faster than it can produce it. That causes a drop in core temperature. Hypothermia is believed to be the cause of half of all boating deaths. If you fall overboard, immediately get back in or climb onto the overturned boat. Don't remove clothes. Clothing, even while wet, will retain some body heat. Symptoms are continual shivering, poor coordination, slowing of pace, increasingly numb hands and feet, slurred and slow speech, decreased attention span, or personality changes. Seek professional medical care as soon as possible. Remove wet clothes and dress victim in layers of dry clothing or blankets.
Boating Accidents	Boatmen are duty-bound to aid any distressed craft. This is not only a maritime tradition, but also a federal requirement.
Boating Fatalities	Capsizing or falling overboard causes most fatalities and usually is due to operator error and lack of boating education. Most of these boats are less than 16 feet in length.

c. Boat Trailer - Towing and Launching.

(1) Match the trailer to your boat and vehicle. Ensure that the trailer weight capacity is greater than the combined weight of the boat, motor, and equipment. Your boat should be supported structurally as evenly across the hull as possible. The trailer should be long enough to support the whole length of the boat but short enough to allow the lower unit of the boats engine to extend freely. The tow vehicle must be capable of handling the weight of the trailer, boat, and equipment, as well as the weight of the passengers and equipment, which will be carried inside.

(2) Allow for extra room when passing due to boat weight and length.

(3) Use a safety chain between vehicle and trailer.

(4) Make sure that trailer tires are good, and that wheels are in alignment.

(5) When launching your boat, follow these simple directions:

(a) Use a guide to assist you in backing.

(b) Back slowly at a right angle to the launching site. Remember that when you want the rear of the trailer to turn in one direction, steer your vehicle the opposite way.

(c) If a launching ramp is not available, select a sloping spot hard enough to give your tires a lot of traction.

(d) When you are a few feet from the water's edge, remove boat tie downs, tilt the motor up, and unlock the winch. Be sure drain plugs are installed and tight.

(e) Back again until trailer wheels are in the water and the boat is partially afloat. Keep the rear wheels of the tow vehicle out of the water. Set the parking brake, place tire chocks behind rear wheels, and put the vehicle in park (automatic) or in gear (standard), and turn ignition off. Give the boat a firm push down the trailer.

d. Water Skiing. Water Skiing is an easy sport to learn. Most instructors feel that in 1 solid hour of practice, the beginner should have completely mastered the fundamentals, which are, starting, landing, turning, and crossing the wake. Water skiing is also a safe sport, if a few basic rules are kept in mind.

(1) The beginner should know how to swim, or at least be able to jump into deep water without panicking. Always wear a Coast Guard approved PFD designed for water skiing. Ski belts are **not** recommended. This applies to both swimmers and nonswimmers.

(2) The boat driver should turn off the engine when a skier is in the water near the boat.

(3) Allow no one to sit on the side of the boat.

(4) Each boat must be able to maintain a 200-foot wide "ski corridor" (100 feet on either side of the boat). Do not follow another boat or skier closer than 200 yards.

(5) Do not clown around on the skies or in the boat.

(6) Do not come into shore so fast that you will not be able to stop.

(7) Beginners should take it easy. The faster the boat is traveling, the harder the water will be when the skier falls.

(8) Towlines should be either twisted manila hemp or braided or twisted polyethylene, 75 feet in length.

(9) Communication is probably the most important factor in water skiing. Know and use signals.

(10) Do not leave or enter the boat from the rear with the engine running.

(11) Powerboats towing water skiers should have at least two people aboard, one to operate the boat and one to maintain visual communication with the skier.

(12) Water skiers must prove swimming ability before water skis are issued or used.

(13) **Never** ski after dark. It is hazardous and illegal. Any boat traveling fast enough to tow a skier is traveling too fast to navigate safely at night.

e. Fishing. Although fishing looks much safer than some other water sports, more than half of the fatal water-related accidents involve fishermen.

(1) Excitement brings fishermen to their feet and this unexpected movement by one person can pitch another overboard or swamp the boat. Usually you can land a fish while sitting. If you must stand to keep a line from fouling, a companion should stay seated and keep the boat on an even keel.

(2) When you are alone in a boat, it is easy to lose your balance while moving forward to drop or hoist anchor. Step on the boat bottom amidships, not on the seat. Keep low with one hand on the gunwale.

(3) Avoid precarious reaching and balancing to get unhooked after a bad cast. A sudden movement, a hard turn, accidentally putting the engine in reverse, hitting a rock or snag, all make standing risky anytime.

(4) Sit down to pull a starter rope. If you stand and the expected engine compression is not there, over you go. You should tune a hard starting engine. It may let you down with darkness or a storm coming.

19-11. PROCEDURES FOR HUNTING. Procedures for hunting are outlined in USAFACFS Reg 200-1 and USAFACFS Cir 200-97-1. The USAFACFS Circular is updated yearly to set forth the procedures and dates for hunting and guidelines for fishing.

19-12. HUNTING SAFETY. Adhere to the following 11 basic rules for safe gun handling:

a. Treat every gun as if it was loaded. Never take anyone's word that the gun is empty.

b. Always point the gun muzzle in a safe direction. Never aim at anything you don't intend to shoot.

c. Be sure of your target, never shoot at unidentified noises; wait until the whole animal or bird is visible.

d. Know the correct way to carry your gun; under arm shoulder cradle and with both hands. Make sure that the safety is on, the trigger finger is outside trigger guard, and the muzzle is in a safe direction and under control.

e. Keep the safety on or the chamber unloaded until ready to fire, and keep your finger out of the trigger guard.

f. Check bore frequently through the breach end to be sure it is clear of foreign objects before loading, and frequently while hunting.

g. Agree beforehand on the area or sector each hunter will cover.

h. Be sure the action is open when handing a gun to another person or when stopping to eat, chat, or rest.

i. When duck hunting, from a boat, two hunters should face in opposite directions. Never lay a loaded gun on bottom of a boat.

j. When hunting in a group, no hunter should carry his/her gun pointed toward another person.

k. Unload before crossing a fence or obstruction.

19-13. FIREWORKS SAFETY. Refer questions concerning fireworks guidance to Directorate of Public Safety (DPS).

19-14. RUNNING AND JOGGING SAFETY. Refer to USAFACFS Supplement 1 to AR 190-5 for running and jogging safety.

19-15. BICYCLE SAFETY.

a. All bicyclists on Fort Sill will wear an approved bicycle safety helmet. The helmet must meet or exceed the American National Standards Institute or the Snell Memorial Foundation Standards for bicycle helmets. Fort Sill instituted this requirement on 1 August 1995. It is in effect for all military, civilians and family members operating a bicycle on Fort Sill.

b. Equip all bicycles operating on the roadways of Fort Sill during the hours of darkness (dusk and dawn) or limited visibility with an operational headlight and place reflective markings, front and rear. Markings may be either reflective paint or tape not less than 4 inches in length. It is required that bicyclist wear a reflective vest or other apparel that will enhance their visibility at night.

c. Bicyclist will keep to the right side of the roadway as practicable, use hand and arm signals to warn others of their intent to stop or turn, never ride between two lanes of traffic and obey all traffic signals, signs and devices. When dismounting to make turns,

rules pertaining to pedestrians apply.

d. Bicyclists are prohibited from wearing sound producing earphones or headphones while using installation streets or roads. This also applies to in-line skaters and skate boarders.

19-16. OTHER RECREATIONAL ACTIVITIES. Contact one or more of the following facilities to obtain safety tips and information on other recreational activities such as, hiking, camping, fishing, canoeing, scuba diving in-line skating, basketball, tennis and other related activities:

Wichita Mountain Wildlife refuge, 429-3222	Fish and Wildlife Branch, 442-4324/3314
Outdoor Adventure Center, 355-8270	Youth Services Center, 442-6745
DES Bicycle Squad, 442-5947	DES Crime Prevention, 442 4967
Red Cross, Pool, Life guarding and Water Safety, 355-2480	Installation Branch Safety Office, 442-4215/4466

CHAPTER 20

BLOODBORNE PATHOGENS EXPOSURE CONTROL PLAN

20-1. PURPOSE. The Exposure Control Plan (ECP) is implemented to meet the letter and intent of the OSHA Bloodborne Pathogens Standard. OSHA has enacted this standard to reduce occupational exposure to Hepatitis B Virus (HBV), Human Immunodeficiency Virus (HIV) and other bloodborne pathogens. Acquired Immunodeficiency Syndrome (AIDS) and Hepatitis B merit serious concern for workers occupationally exposed to blood, other potentially infectious materials, and certain other body fluids that contain bloodborne pathogens such as the HIV, and the HBV.

20-2. SCOPE. The ECP applies to all Fort Sill military and civilian personnel.

20-3. POLICY. USAFACFS will provide a safe and healthful environment by eliminating or keeping exposure hazards to an absolute minimum.

20-4. RESPONSIBILITIES. Commander, USAFACFS, has overall responsibilities for the Bloodborne Pathogens ECP and has full authority to make necessary decisions to ensure success of the plan. Other responsibilities are outlined in the USAFACFS Bloodborne Pathogens Exposure Control Plan.

20-5. PROCEDURES. All information pertaining to exposure control is outlined in the USAFACFS Bloodborne Pathogens ECP.

CHAPTER 21

BRANCH PROPONENCY SAFETY PROGRAM

21-1. PURPOSE. To implement Training and Doctrine Command (TRADOC) policies and responsibilities for Branch Safety Proponency which focuses on the integration of safety into all TRADOC mission domains, e.g., Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities (DOTMLPF).

21-2. SCOPE. This program applies to all organizations, directorates, staff offices/departments, and personnel involved in the development, execution, and assessment of United States Army Field Artillery School (USAFAS) mission functions.

21-3. OBJECTIVES. The objectives of this program are to integrate safety in each phase of the Systems Approach to Training (SAT) and Combat Developments process. Specifically, to identify hazards and risks up front, eliminate or control hazards through engineering and training, track residual hazards, analyze branch accident experience, and work lessons learned back into the development and training processes. These actions are being implemented to enhance the Army's Combat mission by providing safer equipment, doctrine that incorporates risk management to preserve assets, and soldiers with a conscientious sense for safety and the necessary knowledge to prevent accidental losses.

21-4. RESPONSIBILITIES.

a. Commandant will--

(1) Embed safety in school curriculum, branch training, and branch unit operations.

(2) Assign responsibilities and establish effective procedures and policies to integrate safety into DOTMLPF by, incorporating safety requirements into the Combat Developments, Manpower and Personnel Integration (MANPRINT), SAT, and systems integration processes.

(3) Require coordination of USAFAS DOTMLPF, Field Artillery regulations, and Standard Operating Procedures safety issues with the IBSO for review.

(4) Ensure stand-alone safety instruction is conducted in Leader Development, and other selected USAFAS courses.

(5) Designate risk acceptance decision authority consistent with the level of risks being accepted for training related hazards.

(6) Have signature authority for the TRADOC position on high-risk USAFAS classroom and field training.

b. Installation Branch Safety Manager will--

(1) Be the single focal point for artillery safety matters with staff oversight authority

for the integration of safety in USAFAS DOTMLPF products.

(2) Assume responsibility for coordination of the development and operation of the Installation Branch Safety Program.

(3) Be the subject matter expert and technical advisor to the commandant and staff for risk management, Branch Safety Proponency, and leader development safety awareness training.

(4) Establish goals, plans, and objectives for the program in conjunction with USAFACFS.

(5) Review and validate Risk Assessment for lesson plans developed by the school. As a minimum, reviews all extra high and high-level risk courses and training.

(6) Maintain coordination with the USAFAS Directorates and the Branch Liaison Office in the United States Army Safety Center (USASC).

(7) Track action responsibility within USAFAS to resolve branch safety issues and corrects safety deficiencies in DOTMLPF.

(8) Assist and provide safety information on risk management, branch-unique hazard recognition, and accident prevention to evaluators, school instructors, cadre, and combat/training developers.

(9) Coordinate branch safety issues, accident experience data, and lessons learned with material developers, USASC, HQ TRADOC, and appropriate school elements for their input and use.

(10) Assist in dissemination of branch safety Essential Elements of Information (EEI) (e.g., accident trends, specific MOS safety issues, risk management).

(11) Assist USAFAS in implementing the TRADOC resident Hazard Communication (HAZCOM) training program to students as required.

c. Futures Development Integration Center will--

(1) Provide for system safety and health hazard representation to SSWG's, MJWG's and Test Integration Working Groups (TIWG's).

(2) Provide expertise to reduce or eliminate hazards on developing systems using appropriate feeder information from other sources concerning malfunctions, improvement reports, and deficiencies on existing systems.

(3) Develop policies and procedures for the integration of safety into MANPRINT, organizations, and materiel development processes.

(4) Ensure that USAFAS' SSRA position for each proponent system is developed and signed by the designated signature authority for the combat developer.

(5) Coordinate with Futures Development Integration Center on documents and issues that relate to safety and health issues with the IBSO.

(6) Ensure that the IBSO is furnished with copies of all appropriate documents (e.g., draft and final copies of System Safety Management Plan (SSMP), Mission Need Statement (MNS), Initial Capabilities Document (ICD), Capability Development Document (CDD), COEA, TEMP, SSRA's, SAR's, Test Reports, Test Incident Reports (TIR's), and Independent Evaluation Reports (IER's)).

(7) Require project officers to coordinate with IBSO concerning integration of system safety engineering into all appropriate documents.

(8) Develop appropriate safety and health hazard lessons learned from existing fielded and developmental systems. Submits information to the Center for Army Lessons Learned (CALL), MANPRINT, and USASC systems for use by the first unit equipped with the new system and all current/future user commands.

(9) Approve the adequacy of solutions to acquisition safety problems.

(10) Execute, as applicable, USAFAS responsibilities for paragraphs 4m, 4n, 4o, and 4t(4) of AR 385-16, as the combat developer and user test agency.

(11) Develop consolidated school positions on SSRA's for proponent materiel systems; includes a statement on the acceptability of residual risks and operational safety constraints and makes other recommendations.

(12) Request User Test Safety Releases from TECOM for TRADOC sponsored Concept Evaluation Program, Customer Tests, Non-Materiel Force Development Tests and Experimentation User Tests. Provide a Safety Release Recommendation to TECOM for the above tests. For local informal tests, experiments, appraisals, demonstrations, etc., involving troop units, obtains a safety release from IBSO prior to pretest 133 troop training. Address safety and health issues in the Test and Evaluation Reports written or reviewed by the school.

(13) Initiate necessary Material Changes to improve safety and health aspects of proponent systems. Provide a position on acceptability of residual hazards.

d. Directors/commanders of USAFAS Training Activities will--

(1) Integrate safety and standards/requirements, precautions, countermeasures, and lessons learned into course of instruction, lesson plans, POI's, and appropriate literature.

(2) Ensure that training developers and instructors receive information on MOS specific hazards, and training on risk assessment techniques.

(3) Perform safety risk assessments during the SAT design, development, and implementation phases. Assign a risk assessment rating (Extremely High, High, Moderate, or Low) to every lesson plan using, and coordinate high-risk ratings with the IBSO. Maintain a copy of the assessment form in the class Visitor's Folder with the original in the class Vault File. Delete all high-risk training tasks that are nonessential for attainment of the training objective.

(4) Ensure lesson outlines contain clear guidance for both instructors and students regarding the conduct of potentially hazardous training.

(5) Train to standard in accordance with approved curriculum, and ensure that adequate instructors and safety observers, consistent with risk, are present at training sites.

(6) Include a stand-alone block of safety instruction in leader development courses. Instruction should include an overview of the Army Safety Program, risk management, and MMOS specific safety concerns.

(7) Conduct an evaluation of each course annually to ensure that task specific safety precautions are incorporated and addressed. Use risk management to identify those phases/tasks, which have moderate, high or extremely high residual risk, and implement appropriate measures to control risk.

(8) Integrate safety and occupational health requirements into training guidelines, techniques, curriculum, and new equipment training.

CHAPTER 22

COLLATERAL DUTY SAFETY PROGRAM

22-1. PURPOSE. The use of collateral duty safety officers (CDSOs) is mandated as a means to increase the overall scope of the unit's safety program. Thus providing commanders and supervisors at all levels with a safety resource to assist in the oversight of their safety program. The specific requirements for selection and training of CDSOs are outlined in AR 385-10, TRADOC Reg 385-2, and FORSOM Reg 385-1.

22-2. SCOPE. This program applies to all units on Fort Sill, to include military and civilian personnel. Appoint CDSOs, in writing, at each level of the command through company level. Forward written appointment orders to the Installation Branch Safety Office within 1 week of appointment. Assign Safety officers/NCOs as CDSOs for a minimum of 1 year. Rank requirements are listed in AR 385-10. All CDSOs will receive an orientation briefing by the unit commander/director and must attend the Fort Sill, Unit

Safety Officer Course, which is administered by the Installation Safety Branch Office.

22-3. RESPONSIBILITIES. CDSOs serve as the commander's primary advisor for all matters concerning safety/accident prevention. Conduct safety committee meetings quarterly and record minutes of each meeting.

a. The role of the CDSO is largely dependent on the commander/supervisors direction, but will include the requirements of TRADOC 385-2 to include--

- (1) Accident investigation, recording and reporting IAW AR 385-40.
- (2) Safety training and safety briefings for employees.
- (3) Conducting and documenting inspections and surveys.
- (4) Distributing safety literature.
- (5) Quarterly Safety committee meetings.
- (6) Safety and occupational health bulletin boards.
- (7) Safety publications library.

(8) Risk assessment codes for fire prevention, safety and health related work orders.

b. CDSOs will conduct and document quarterly "low hazard inspections" of barracks and administrative workplaces. Forward one copy of each inspection to the Installation Safety Office. A member of the Installation Safety Branch Office will accompany the unit CDSO on one quarterly low hazard inspection each year.

c. Inspect each unit/directorate in its entirety at least annually using Standard Army Safety and Occupational Health Inspection procedures.

CHAPTER 23

UPDATING PROCEDURES

UPDATING PROCEDURES. The USAFACFS Safety and Occupational Health Program consists of subprograms. Furthermore, Federal and Army safety regulations undergo frequent revisions and additions. Accordingly, the proponent will provide subprograms as chapters, as they become available.

APPENDIX A

ABBREVIATIONS

ACDL	Army Commercial Drivers License
ACV	Army Combat Vehicle (Tracked)
AGAR	Army Abbreviated Ground Accident Report
AIDS	Acquired Immunodeficiency Syndrome
ALARA	As Low as Reasonably Achievable
AMV	Army Motor Vehicle (Wheeled)
ANSI	American National Institute Standards
ANSI	American National Standards Institute
AR	Army Regulation
ASP	Ammunition Supply Point
BDO	Battle Dress Over Garment
BDU	Battle Dress Uniform
BRM	Basic Rifle Marksmanship
CALL	Center for Army Lessons Learned
CDSO	Collateral Duty Safety Officer
CFR	Code of Federal Regulations
CHO	Chemical Hygiene Officer
CHP	Chemical Hygiene Plan
CO	Carbon Monoxide
COEA	Cost Operational Effectiveness Analysis
CONUS	Continental United States
CPAC	Civilian Personnel Advisory Center
CPR	Cardiopulmonary Resuscitation
DA	Department of the Army
DAP	Department of Army Pamphlet
DDESB	Department of Defense Explosive Safety Board
DOC	Directorate of Contracting
DOD	Department of Defense
DODI	Department of Defense Instruction
DOL	Directorate of Logistics
DOT	Department of Transportation
DPW	Directorate of Public Works
DTLOM	Doctrine, Training, Leader Development, Organization Design
ECP	Exposure Control Plan
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FM	Field Manual
FMUSS	Federal Motor Vehicle Safety Standards
FORSCOM	U.S. Army Forces Command
GPM	Ground Precautionary Message
GSA	General Services Administration

GVWR	Gross Vehicle Weight Rating
HAZCOM	Hazard Communication
HBV	Hepatitis B Virus
HCP	Hazard Communication Program
HCS	Hazard Communications Standard
HHIM	Health Hazard Information Module
HIV	Human Immunodeficiency Virus
HM	Hazardous Material
HPAAF	Henry Post Army Airfield
HSPS	Highway Safety Program Standards
HW	Hazardous Waste
IASO	Installation Aviation Safety Officer
IER	Independent Evaluation Report
IRPP	Installation Respirator Protection Program
IRPPM	Installation Respirator Protection Program Manager
IRS	Installation Respirator Specialist
ISSA	Interservice Support Agreement
IBSO	Installation Branch Safety Office
LAW	Light Antitank Weapon
LBE	Load Bearing Equipment
LLRP	Long Life Ration Packet
MACOM	Major Command
MANPRINT	Manpower and Personnel Integration Material Requirement
MHE	Material Handling Equipment
MJWG	MANPRINT Joint Working Group
MNS	Mission Need Statement
MOPP	Mission-Oriented Protective Posture
MOS	Military Occupational Specialty
MP	Military Police
MRE	Meal Ready to Eat
MSDS	Material Safety Data Sheet
MSHA	Mine Safety & Health Administration
MWO	Modification Work order
MWR	Morale, Welfare, & Recreation
NBC	Nuclear, Biological & Chemical
NBS	National Bureau of Standards
NCO	Noncommissioned Officer
NCRP	National Council on Radiation Protection
NDI	Non Developmental Item
NIOSH	National Institute of Occupational Safety & Health
NMC	Not Mission Capable
NRC	Nuclear Regulatory Commission
NVD	Night Vision Device
OCONUS	Outside the Continental United States
OPLAN	Operations Plan

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OPORD	Operation Order
ORD	Operational Requirement Document
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PFD	Personal Flotation Device
PM	Preventive Medicine
PMCS	Preventive Maintenance Checks & Service
POI	Program of Instruction
POL	Petroleum, Oil, and Lubricant
POV	Privately Owned Vehicle
PPE	Personal Protective Equipment
QASAS	Quality Assurance Specialist Ammunition Specialist
QD	Quantity Distance
RAC	Risk Assessment Code
RACH	Reynolds Army Community Hospital
RCW	Ration Cold Weather
RMSF	Rocky Mountain Spotted Fever
RSO	Radiation Safety Officer
SAR	Safety Assessment Report
SAT	System Approach Training
SBCCOM	U.S. Army Soldier Biological & Chemical Command
SCBA	Self Contained Breathing Apparatus
SOH	Safety and Occupational Health
SOP	Standing Operating Procedure
SPF	Sun Protection Factor
SSMP	System Safety Management Plan
SSRA	System Safety Risk Assessment
SSWG	System Safety Working Group
TDA	Table of Distribution & Allowance
TEMP	Test & Evaluation Master Plan
TIR	Test Incident Report
TIWG	Test Integration Working Group
TLV	Threshold Limit Value
TM	Tech Manual
TMP	Transportation Motor Pool
TOE	Table of Organization & Equipment
TRADOC	U.S. Army Training and doctrine Command
TWA	Time Weight Average
USAFACFS	U.S. Army Field Artillery Center and Fort Sill
USAFAS	U.S. Army Field Artillery School
USASC	U.S. Army Safety Center
WBGT	Wet Bulb Globe Temperature

APPENDIX B

FORT SILL SAFETY AWARDS PROGRAM

B-1. PURPOSE. This appendix establishes the USAFACFS Safety Award Program. It prescribes policies, procedures, and prerequisites for qualification and recognizes and rewards organizations and individuals for accident free accomplishment of their missions. It also recognizes and rewards them for making significant contributions to the USAFACFS accident prevention effort. The program is designed to instill a sense of pride and accomplishment in organizations and individuals for promoting safety.

B-2. APPLICABILITY. This program is applicable to all personnel assigned or attached to Fort Sill, to include Army Reserve and Army Guard organizations and individuals.

B-3. REFERENCES.

- a. AR 385-10, The Army Safety Program.
- b. AR 672-74, Army Accident Prevention Awards Program.
- c. AR 600-8-22, Military Awards.
- d. AR 672-1, Award of Trophies and Similar Devices in Recognition of Accomplishments.
- e. TRADOC Regulation 385-2, TRADOC Safety Program.
- f. FORSCOM Regulation 385-1, Forces Command Safety Program.

B-5. RESPONSIBILITIES. USAFACFS Commander is responsible overall for the installation Safety Awards Program and has the authority to make the decisions necessary to ensure the success of the program. Commanders and directors at all levels establish and implement procedures for the awards program.

B-6. POLICY.

- a. The safety awards program recognizes units, activities and individuals who make significant contributions to the accident prevention effort. Awards are an essential part of an effective accident prevention program. The use of incentives in an accident prevention program is effective in motivating individuals to work safer and accept less risk.
- b. This appendix lists awards under four general categories based on who approves the award. They are MACOM or Higher Unit Safety, MACOM or Higher Individual Safety, USAFACFS, and Unit. Table 1 is a quick reference for all awards listed.

B-7. PROCEDURES.

a. Organizations, battalion size or equivalent, establish procedures to implement this program. Organizations will recognize and reward subordinate elements and individuals for noteworthy contributions in accident prevention, safety and risk management.

b. Approval for Army safety awards is based on overall safety records and presented in accordance with the criteria established in AR 672-74. Submit all safety awards through the Installation Safety Office for review. Commanders/directors should present local safety awards to individuals and groups where merited.

c. It is contrary to DA policy to approve duplicate awards for the same event. Therefore, the individual initiating the award must decide which type of recognition would be the most appropriate, a safety award, or another form of recognition, such as a medal or performance award.

d. If you need unit accident statistics or further information about awards, contact the Installation Safety Office.

B-8. MACOM OR HIGHER UNIT ARMY SAFETY AWARDS. Recipients for unit accident prevention awards are TOE or TDA detachment through installation. The following MACOM or higher unit safety awards are available:

- a. Director of Army Safety Award (IAW AR 672-74).
- b. U.S. Army Award of Excellence in Safety (IAW AR 672-74).
- c. Army Accident Prevention Award of Honor in Safety (IAW AR 672-74).
- d. Army Accident Prevention Award of Accomplishment in Safety (IAW AR 672-74).
- e. Commander's Special Safety Award (IAW AR 672-74).

B-9. MACOM OR HIGHER INDIVIDUAL SAFETY AWARDS. Recipients are U.S. Army soldiers and DA civilian employees. The following MACOM or higher individual safety awards are available:

- a. Chief of Staff, Army, Award for Excellence in Safety (IAW AR 672-74).
- b. U.S. Army Safety Guardian Award (IAW AR 672-74).
- c. Director of Army Safety Special Award of Excellence (IAW AR 672-74).
- d. Command Sergeant Major Safety Achievement Award (IAW TRADOC Reg

385-2).

- e. TRADOC Certificate of Achievement in Safety (IAW TRADOC Reg 385-2).

B-10. USAFACFS COMMANDER'S AWARDS. Unit safety awards serve to encourage and reward safe individual and collective behavior. The USAFACFS Commander has two awards to recognize units and individuals for outstanding accident prevention efforts and acts on Fort Sill.

- a. USAFACFS Commander's Protect the Force Award (USAFACFS Reg 385-10). Units, which experience no recordable accidents or DUIs during a 180-day period, are eligible for a USAFACFS "Protect the Force Award."

- (1) Individuals, including government contractors and family members, making significant contributions to safety are also eligible for the USAFACFS Commander's "Protect the Force Award." Anyone can nominate a deserving individual through his or her supervisor, chain of command, or installation safety office. The Installation Safety Office certifies eligibility and forwards nominations to the USAFACFS Commander for approval.

- (2) Recipients are awarded a certificate and given a 1 day training holiday.

- b. USAFACFS Commander's Annual Safety Performance Award (USAFACFS Reg 385-10). The unit or activity demonstrating the most improved safety record and best overall accident prevention program.

- (1) The nominating unit submits a completed "safety program evaluation" (see paragraph F-12). In addition, the nominating unit submits a memorandum for the award through the parent unit or directorate, through the installation safety office, to the USAFACFS Commander for approval and presentation of the award.

- (2) Submit the nomination requests to the Installation Safety Office (Bldg 2587), no later than 1 November of each year. The award request should address the positive efforts of units or activities in regards to safety performance and safety programs. Recipient organizations receive a certificate and a 1-day training holiday.

B-11. UNIT COMMANDER'S/DIRECTOR'S SAFETY AWARD PROGRAM.

- a. Commanders at all levels will recognize safe performance displayed by individuals and units under their command. Commanders and directors have several options available to recognize safe performance within their organizations.

- b. The following awards are initiated and approved by the unit commander/director.

- (1) Unit Commander's Safety Award Program, criteria listed in unit SOP.

(2) U.S. Army Motor Vehicle Driver Safety Award IAW AR 672-74, chapters 3-5.

c. In addition to the awards listed above, commanders/directors may present U.S. Army Safety Certificates or create their own incentive awards. Examples of achievements may be personnel actions that eliminate or reduce high-risk behavior in the unit, outstanding safety ideas, or safest section/platoon. Commanders/directors sign the certificates (available through normal publication supply channels) citing the contribution for which the award is given.

d. Commanders/directors should use their own incentives to promote risk management in their organization. Examples of incentive awards commanders/directors could use are.

- (1) Three or four day pass/time-off awards.
- (2) Unit coins.
- (3) Special benefits (individual parking place, section recognition).
- (4) Promotional items such as savings bonds, coffee mugs, hats, shirts, etc.
- (5) COOP recognition or awards.

**B-12. SAFETY PROGRAM EVALUATION CRITERIA FOR USAFACFS
COMMANDER'S ANNUAL SAFETY PERFORMANCE AWARD.**

a. Safety Program.

- (1) Is the commander's/director's safety philosophy letter published and posted?
- (2) Is the unit safety SOP published and distributed?
- (3) Are all the required safety references on hand or available?

b. Designated Safety Representatives.

- (1) Are the unit safety officers/noncommissioned officers appointed on orders?
- (2) Has the installation safety office trained the unit safety officers or noncommissioned officers?

c. Commander's Safety Goals and Objectives.

- (1) Are the safety goals clearly established in writing?

(2) Are the safety goals realistic?

(3) Are the safety goals being managed?

d. Proactive Accident Prevention Programs.

e. Training Standards and Enforcement.

(1) Are all unit personnel informed, in writing, as to how to report hazards and safety violations and are they encouraged to do so?

(2) Is risk analysis and management emphasized, required, and enforced?

(3) Is risk management integrated in all written operational procedures?

f. Accident Investigation. Are accident investigations conducted in accordance with AR 385-40 and DA Pam 385-40?

g. Accident Reporting. Is the unit reporting all accidents in accordance with AR 385-10, AR 385-40, and USAFACFS Reg 385-10?

Table 1: SAFETY AWARDS MATRIX

TITLE	RECEIPIENTS	ELIGIBILITY	IINITIATOR	APPROVER	AWARD
Director of Army Safety Award	Detachment thru Installation	IAW AR 672-74 Significant improvement	Unit Commander or Unit Safety Manager	Director of Army Safety 1 Dec each year	DA Form 5757
U.S. Army Award of Excellence in Safety	Detachment thru Installation	IAW AR 672-74 Zero A-C accidents for 3 years	Unit Commander or Unit Safety Manager	MACOM CDR	Plaque
Army Accident Prevention Award of Honor in Safety	Detachment thru Installation	IAW AR 672-74 Zero A-C accidents for 2 years	Unit Commander or Unit Safety Manager	MACOM CDR	DA Form 5758
Army Accident Prevention Award of Accomplishment in Safety	Detachment thru Installation	IAW AR 672-74 Zero A-C accidents for one year	Unit Commander or Unit Safety Manager	MACOM CDR	DA Form 5775
Commander's Special Safety Award	Detachment thru Installation	IAW AR 672-74 Accident free major exercise or 1 year accident free	Unit Commander or Unit safety Manager	MACOM Safety Director	DA Form 5776
Chief of Staff, Army, Award for Excellence in Safety	Military and DA civilian employees	IAW AR 672-74 Significant contributions to Army accident prevention	Brigade or higher Commander or Installation safety manager	Chief of Staff Army 1 Dec each year	Plaque
U.S. Army Safety Guardian Award	Military and DA civilian employees	IAW AR 672-74 Individual action in emergency situation	Unit Commander or Unit Safety Manager	Director of Army Safety	DA Form 5777 And Guardian lapel pin
Director of Army Safety Special	Military and DA civilian	IAW AR 672-74	DASAF	DASAF	Plaque

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Award of Excellence	employees	Exemplary leadership in the safety field			
U.S. Army Motor Vehicle Driver Safety Award	Military and DA civilian employees	IAW AR 672-74 See requirements of chapters 3-5	Unit Commander or representative	Unit Commander or Director	DA Form 1119 and 1119-1
Unit Commanders Safety Award Program	Military and DA civilian employees	IAW AR 672-74 And unit SOP	As per unit SOP	Unit Commander or Director	DA 1118, DA 1119, DA 1119-1
USAFACFS Commander Protect the force award	Unit, individuals, military, civilian, contract civ or family members	IAW USAFACFS Reg 385-10	Anyone can nominate thru Supervisor, Chain of command, or ISO	USAFACFS CDR	Certificate of Achievement DA 2442 and 1 day training holiday
USAFACFS Commander Annual Safety Performance award	Unit or Activity	IAW USAFACFS Reg 385-10	Unit Commander	USAFACFS CDR	Certificate of Achievement DA 2442 and unit 1 day training holiday
CSM Safety Achievement Award	CSM	IAW 672-74 Contributed to readiness of the Army	Installation Commander	TRADOC CSM And TRADOC DIR	Silver cup retained at installation HQ And trophy
TRADOC Certificate of Achievement in Safety	Individual or Det thru installation	IAW TRADOC Reg 385-2	Unit Commander	TRADOC CDR	TRADOC Certificate

APPENDIX C

EXAMPLE OF UNIT SAFETY PROGRAM STANDING OPERATING PROCEDURE (SOP)

C-1. WRITTEN SAFETY SOP. Commanders at every level will establish and maintain a continuing, comprehensive and aggressive accident prevention program throughout their units. SOPs need not be lengthy, but must be, as a minimum in accordance with AR 385-10, paragraph 2-2.

C-2. SAMPLE SAFETY SOP.

a. Purpose. To ensure a continuing, aggressive preventive safety program throughout the unit.

b. References. AR 385-10, AR 385-40, AR 385-55, USAFACFS Reg 385-10, and TRADOC Reg 385-2.

c. Scope. This SOP outlines the organization of the unit safety program and the responsibilities of personnel implementing that safety program.

d. Objective. The objective is to improve the effectiveness of the unit by minimizing personnel injury and equipment losses.

e. Responsibilities. The commanding officer is responsible for assuring the accident prevention program meets the requirements of current regulations. The following personnel are responsible as indicated:

(1) Collateral Duty Safety Officer/NCO will--

(a) Attend the Collateral Duty Safety Course taught by ISO.

(b) Ensure the Material Safety Data Sheets are on hand for all hazardous chemicals used in the workplace.

(c) Ensure all personnel are briefed on the hazardous materials their job requires them to use IAW USAFACFS Reg 385-10.

(d) Establish and maintain a unit safety bulletin board containing current safety literature and information.

(e) Make regular inspections of the unit and initiate action to correct the discrepancies detected. Document inspections and send a copy forwarded to the ISO.

(f) Investigate or coordinate the investigation of accidents occurring within the unit. Prepare accident reports when appropriate. Contact the ISO (or host Safety Office) for

technical assistance, when necessary.

(g) Establish and maintain an accident case file for all accidents during the current and previous calendar year IAW AR 25-400-2.

(h) Conduct periodic safety briefings for personnel. Present initial safety briefing to newly assigned personnel.

(i) Brief the commander regularly on the status of the unit accident prevention effort.

(2) The unit commander will—

(a) Assure newly assigned personnel report to the unit Safety Officer/NCO for safety orientation.

(b) Establish, in writing, a safety SOP for specific operations. Enforce the procedures established.

(c) Integrate current safety requirements into all activities and plans.

(d) Assure training of personnel is adequate for safe operation of equipment to avoid injury or equipment loss.

(e) Assure necessary protective equipment and clothing is available, as required, for daily operations.

(f) Attend the First Sergeant and Commander's Orientation within 30 calendar days of assignment

(g) Control the use of hazardous chemicals to ensure safe use and disposal.

(h) Ensure all unit members are familiar with the hazards of their workplace, such as the hazardous materials used there.

(i) Review accident reports.

(3) The unit motor officer/NCO will--

(a) Ensure unit drivers are trained before licensing for operation of military vehicles.

(b) Conduct safety briefings to unit drivers.

(c) Establish safe operating procedures for motor pool operations and provide enforcement measures.

(d) Ensure that personnel operating military vehicles have completed the Motor Vehicle Accident Prevention Course.

(e) In the absence of a motor officer/NCO, the unit commander will appoint someone to perform the above duties.

f. Accident Reporting. Report all accidents to the supervisor. Pending the arrival of the Collateral Duty Safety Officer/NCO, the supervisor of the injured person will begin the investigation to determine why the accident happened. The supervisor will complete the DA Form 285 AB-R, when required. The Safety Officer will check for completion and accuracy before forwarding to the commander, who will forward to the ISO.

g. Unit Safety Committee. The unit safety committee will consist of all members of the unit staff, to include the safety officer and will operate in conjunction with regularly scheduled staff meetings. Problems concerning safety will be discussed and resolved during these meetings. The Safety Officer will provide documentation of actions as needed.

h. Safety Awards. Personnel who actively support and contribute to the unit safety program will receive special recognition. Leaders will identify supervisors, drivers, and other individuals, who are deserving, and recommend them for recognition and award as appropriate. An awards committee, comprised of the Collateral Duty Safety Officer, XO, and CSM will establish criteria and type of awards to recognize individuals or subunits/divisions/branches.

C-3. AS APPROPRIATE THE SOP WILL ALSO ADDRESS THE FOLLOWING AREAS/PROGRAMS.

- a. Confined Space Entry.
- b. Respiratory Protection.
- c. Hearing Conservation.
- d. Lockout/Tagout Procedures.
- e. Risk Management.
- f. Protective Clothing and Equipment Use.
- g. Convoy Procedures.
- h. Range Safety.

APPENDIX D

SAMPLE FORMAT FOR THE HAZARD COMMUNICATION PROGRAM

D-1. GENERAL. In order to comply with 29 CFR 1910.1200, the following written Hazard Communication Program (HCP) is to be implemented for Brigade and Directorate HCP Managers. All Brigade and Directorate HCP Managers will keep the originals on file. All personnel will use it. The HCP manager is responsible for ensuring the program is current and enforced. Provide a copy of this program to an employee upon hiring and to any employee upon request. The HCP manager will be contacted when a copy of the program is needed. Keep the program updated when new chemicals or hazards are introduced into the working environment and review it annually. The HCP manager will check all chemical purchase requests to be sure a statement requesting an MSDS appears on the purchase request before being processed.

D-2. CONTAINER LABELING.

a. Supply receiving person is responsible for all containers of hazardous chemicals and materials entering the workplace and will assure that the chemical containers are properly labeled with the following:

- (1) Chemical name.
- (2) Hazard warnings.
- (3) Name and address of the manufacturer, importer, or responsible party.

b. Do not use container(s) of hazardous material(s) until it has been checked by supply receiving person for proper labeling and that an MSDS is either accompanied the product, or is already on file. If you will transfer the hazardous material or chemical to a separate container, the person responsible for HAZCOM will ensure that the new container is properly labeled (i.e., that all secondary containers are labeled with an extra copy of the original manufacturer's label or with generic labels that have a block for identity and blocks for the hazard warning). The only exception to secondary labeling is when hazardous materials are transferred from a labeled container to a portable container that is intended only for the immediate use by the employee who performs the transfer. The HAZCOM manager and/or Safety Officer will review the labeling system annually and update the labels as required. The person responsible for HAZCOM will ensure that the pipe(s) are labeled and identified properly. The HCP manager will also inform employees of the hazards associated with chemicals contained in pipes within the work areas.

D-3. MATERIAL SAFETY DATA SHEETS (MSDS).

a. The HCP manager and/or Safety Officer will be responsible for obtaining and maintaining the MSDS system for each organization. The HCP manager will review incoming data sheets for new and significant health/safety information and ensure that the new information is given to the affected employees. The HCP manager will keep copies of all MSDSs and will review them annually for accuracy and completeness of each MSDS. The MSDS system shall include--

(1) A current master inventory list of all MSDSs, indexed by numerical number, to the MSDS referenced on the inventory list.

(2) The identity used on the MSDS will be the same as used on the container label.

b. The MSDS must include eight basic groups of information and must have all spaces completed and be written in English. The eight groups are--

(1) Manufacturer's Information. This section lists the name, address, and phone number of the chemical manufacturer and the date the MSDS was prepared. Also, this is where you should look for an emergency phone number when you need more information.

(2) Hazardous Ingredients. This section tells you the common name and chemical identity for every hazardous ingredient. This section also lists the safe exposure limit, threshold limit values, and permissible limits for hazardous ingredients

(3) Physical and Chemical Characteristics. The information in this section helps you identify a chemical by its physical form, color, and odor. Refer to this section when you need to know how a chemical behaves.

(4) Fire and Explosion Hazard Data. The information in this section lists the temperature at which a chemical will ignite and any unusual fire or explosion hazards. Listed are methods to extinguish the chemical if it catches fire.

(5) Reactivity Data. The information in this section tells you whether or not a chemical will react with itself or with other materials.

(6) Health Hazards. This section tells you how the chemical may affect you. Also, it lists how the chemical enters your body, as well as the symptoms of an overexposure and any medical conditions that may worsen due to exposure.

(7) Precaution for Safe Handling and Use. The information in this section tells you the steps you should follow to prevent accidents. This section also includes the manufacturers recommended methods for spill clean-up and waste disposal.

(8) Control Measures. This section describes necessary restrictions, such as local exhaust and general ventilation, refrigeration, and personal protective equipment. Refer

to this section for the personal hygiene and work practices that prevent injuries.

c. The HCP manager keeps the originals on file IAW AR 25-400-2. The MSDS is part of the program for use by employees. Each HCP manager keeps a current and up-to-date copy of the program on file. Do not use new chemicals until an MSDS has been obtained.

D-4. EMPLOYEE TRAINING AND INFORMATION.

a. Before starting work, the respective supervisor/foreman of a new employee will go over their copy of the HCP and each MSDS applicable to their job. (Specify methods to be used, i.e., handouts, videotapes, etc.). Before using any new chemical, inform all employees of its use, instruct employees on safe use, and train employees on hazards associated with the new chemical. All employees will attend additional training, as appropriate, to review the HCP and MSDS. Appropriate library reference materials are discussed during the training session(s). The minimum orientation and training for a new employee must include--

- (1) An overview of the requirements contained in the HCS, 29 CFR 1910.1200.
 - (2) Chemicals present in workplace operations and this office.
 - (3) Locations and availability of the written HCP.
 - (4) Physical and health effects of the hazardous chemicals listed on the inventory list of this program.
 - (5) Methods and observation techniques used to determine the presence or release of hazardous chemicals in the work area.
 - (6) How to lessen or prevent exposure to these hazardous chemicals through control/work practices and PPE.
 - (7) Steps taken by IBSO to lessen or prevent exposure to the chemicals listed on the inventory list.
 - (8) Emergency procedures to follow if exposed to any chemicals.
 - (9) Location of MSDS file and location of hazardous inventory list.
- b. Prior to a new chemical hazard being introduced into any section of the workplace, each employee is informed and trained as outlined above and/or as outlined on the attached Employee Training Guidelines by the HCP manager who is responsible for ensuring the availability of the MSDS on the new chemical(s) prior to use.

c. After attending the training class, each employee signs a form to verify that they

attended the training, that the written HCP was made available for review, and that he/she understands the HCP.

d. Before entering an establishment, each employee will ascertain the hazards and then take appropriate action for protection. If the employee has any question about what protection they need, they will contact the HCP manager immediately.

D-5. INVENTORY LIST OF HAZARDOUS CHEMICALS. The following is a list of the hazardous chemicals used in this workplace. Further information is available from the MSDS attached with this program and from the HCP manager. The HCP manager will keep the originals on file.

MSDS INDEX No.	HAZARDOUS MATERIAL
1	(Name of material, etc.)

D-6. NONROUTINE TASKS.

a. Before any nonroutine task is performed, advise employees that they must contact (name or title of HCP manager) for special precautions to follow. The HCP manager shall inform any other personnel of potential exposure. (No nonroutine tasks are known to exist at the time of preparation of this program.) (Include this statement if applicable; otherwise delete.)

b. In the event nonroutine tasks are required due to potential exposure of personnel, the HCP manager will provide the following information about the activity as it relates to the specific chemicals, expected to be encountered:

- (1) Specific chemical name(s) and hazard(s).
- (2) PPE required and safety measures to be taken.
- (3) Measures that have been taken to lessen the hazards include ventilation, respirators, presence of other employee(s), and emergency procedures.

D-7. OTHER PERSONNEL EXPOSURE. Contractors are responsible for providing their own HCP.

APPENDIX E

**SAMPLE RESPIRATORY PROTECTION PROGRAM WORK STANDING
OPERATING PROCEDURE FORMAT**

E-1. REFERENCE. Respiratory Protection Program Instruction.

E-2. ACTIVITY. DOL Shop 5.

E-3. OPERATION. Flame cutting, arc welding, hazardous material use, hazardous waste management, and asbestos.

E-4. RESPIRATOR SPECIFICATION. Half-mask, air-purifying respirator, with combination cartridge, for dust, mist, fumes, and organic vapor.

E-5. RESPIRATOR USAGE.

a. Obtain new cartridges from your supervisor/respirator program manager. Be sure to get your correct size.

b. Inspect respirator for defects.

c. Don respirator, making sure no interfering facial hair (unshaven beards, long sideburns) protrudes between your face and the respirator face-piece.

d. Perform a positive and/or negative pressure fit-check to ensure that you have a good face-to-face-piece seal.

e. Leave the work area to check and readjust your respirator and/or change your cartridges whenever you notice odor or breathing resistance.

f. Clean, maintain, and properly store your respirator after each use.

g. Do not wear contact lenses while on duty during operations. Use prescription glass insert.

Responsible Person: John Doe
(Safety Monitor/Supervisor)

Prepared By: John Doe, Jr.
(Supervisor)

Approved By: Fred Smith
(Director)

APPENDIX F

ENVIRONMENTAL STRESS DURING COLD WEATHER OPERATIONS

F-1. HISTORY. History is filled with examples of the significant impact of cold on military operations. Among U.S. Army and Army Air Corps troops, there were over 90,000 cold injuries requiring medical treatment during World War II, and another 10,000 during the Korean War, accounting for 10% of all casualties experienced during these conflicts. Given that the average, air temperature recorded, when cold injuries were experienced during World War II was 30°F (-1°C), and that temperatures this low are experienced over about 60% of the earth's surface, leaders must appreciate cold weather effects on soldier health and performance. Prevention of cold injuries is the responsibility of commanders at all levels.

F-2. COLD WEATHER.

a. During cold weather, the environment can directly affect an individual's health and performance. Cold can lower body temperature, resulting in cold injuries and impaired performance. Moreover, cold weather is often accompanied by wind, rain, snow and ice, which can worsen the effects of cold, as well as contribute to injury and performance impairments. Cold weather can, in turn, influence soldier health and performance. Food and water problems are common during cold weather, since requirements are high and supply is difficult. Cold weather contributes to increased disease and nonbattle injury, since maintaining proper field sanitation and personal hygiene is difficult; sick and injured individuals are susceptible to cold injuries, and the use of indoor stoves may lead to burns or suffocation. Operational problems often arise in cold weather. Heavy clothing restricts movements, equipment often malfunctions, travel can be difficult, cold weather clothing and NBC protective clothing and equipment are difficult to integrate, and fogging and freezing of eyepieces and windows occur.

b. While cold make military tasks more difficult, it does not make them impossible. Viewing cold as a challenge to be overcome is the key to the positive attitude required to successfully complete the mission.

F-3. SUSTAINING HEALTH DURING COLD WEATHER.

a. Cold. Heat flows from places with high temperatures to those with lower temperatures. When a person is surrounded by air or water having a lower temperature the body will lose heat. If heat escapes faster than the body produces heat, body temperature will fall. Normal body temperature is 98.6°F (37°C), and if body temperature falls much below this, performance decrements and cold injuries can result.

b. How Cold Affects the Body.

(1) The colder the surrounding temperature is, the greater the potential for body heat to escape. When the skin is exposed to cold, the brain signals the blood vessels in the skin to tighten, and blood flow to the skin decreases. This is the body's attempt to prevent heat inside the body from being carried to the skin where it will be lost. However, due to reduced blood flow to the skin, the skin temperature falls.

(2) When cold exposure lasts for more than an hour, cooling of the skin and reduced blood flow to the hands leads to blunted sensations of touch and pain and loss of dexterity. This can impair ability to perform manual tasks and lead to more severe cold injuries, since symptoms may go unnoticed.

(3) Nonfreezing cold injuries can occur when conditions are cold and wet (air temperatures between 32° and 55°F or 0° to 13°C) and you cannot keep hands and feet warm and dry. The most prominent nonfreezing cold injuries are **chilblain and trench foot**.

(a) Chilblain is a nonfreezing cold injury which, while painful, causes little or no permanent impairment. It appears as red, swollen skin, which is tender, hot to the touch and may itch. This can worsen to an aching, prickly (pins and needles) sensation and then numbness. It can develop in only a few hours in skin exposed to cold.

(b) Trench foot is a very serious nonfreezing cold injury which develops when skin of the feet is exposed to moisture and cold for prolonged periods (12 hours or longer). The combination of cold and moisture softens skin, causing tissue loss and, often, infection. Untreated, trench foot can eventually require amputation. Often, the first sign of trench foot is itching, numbness or tingling pain. Later the trench foot shows a distinct "water-line" coinciding with the water level in the boot. Red or bluish blotches appear on the skin, sometimes with open weeping or bleeding. The risk of this potentially crippling injury is high during wet weather or when troops are deployed in wet areas. Soldiers wearing rubberized or tight-fitting boots are at risk for trench foot regardless of weather conditions, since sweat accumulates inside these boots and keeps the feet wet.

(4) Freezing cold injuries can occur whenever air temperature is below freezing (32° F, 0°C). Freezing limited to the skin surface is **frostnip**. When freezing extends deeper through the skin and flesh, the injury is **frostbite**.

(a) Frostnip involves freezing of water on the skin surface. The skin will become reddened and possibly swollen. Although painful, there is usually no further damage after rewarming. Repeated frostnip in the same spot can dry the skin, causing it to crack and become very sensitive. It is difficult to tell the difference between frostnip and frostbite. Frostnip should be taken seriously since it may be the first sign of impending frostbite.

(b) Skin freezes at about 28°F (-2°C). As frostbite develops, skin will become numb and turn to a gray or waxy-white color. The area will be cold to the touch and

may feel stiff or wood-like. With frostbite, ice crystal formation and lack of blood flow to the frozen area damages the tissues. After thawing, swelling may occur, worsening the injury.

(5) Body temperature falls when the body cannot produce heat as fast as it is being lost. This can result in **Hypothermia**, which is a life threatening condition in which deep body temperature falls below 95°F (35°C).

(a) Generally, deep body temperature will not fall until after many hours of continuous exposure to cold air, if the individual is healthy, physically active, and reasonably dressed. However, body temperature can fall even when air temperatures are above freezing if conditions are windy, clothing is wet, and/or the individual is inactive.

(b) Hypothermia can occur rapidly during cold water immersion (1 hour or less when water temperature is below 45°F or 7.2°C). Immersion in water considered even slightly cool (60°F [15.5°C]), can cause hypothermia, if the immersion is prolonged for several hours.

(c) Hypothermia is a medical emergency. Untreated, it results in death. Hypothermia may be difficult to recognize in its early stages of development. Things to watch for include unusually withdrawn or bizarre behavior, irritability, confusion, slowed or slurred speech, altered vision, uncoordinated movements, and unconsciousness. Even mild hypothermia can cause victims to make poor decisions or act drunk (e.g., removing clothing when it is clearly inappropriate).

(d) Hypothermia victims may show no heart beat, breathing or response to touch or pain when in fact they are not really dead. Sometimes, the heart beat and breathing of hypothermia victims will be so faint that it can go undetected. If hypothermia has resulted from submersion in cold water, cardiopulmonary resuscitation (CPR) should be initiated without delay. However, when hypothermia victims are found on land, it is important to take extra time searching for vital signs to determine whether CPR is really required. Hypothermia victims should be treated as gently as possible during treatment and evacuation, since rough handling can cause life-threatening disruption in heart rate. All hypothermia victims, even those who do not appear to be alive, must be evaluated by trained medical personnel.

(6) Susceptibility to cold injury (nonfreezing, freezing or hypothermia) is affected by many factors.

(a) Poorly conditioned soldiers are more susceptible to cold injury. They tire quickly and are unable to stay active to keep warm as long as fit soldiers.

(b) Dehydration increases susceptibility to cold injury.

(c) Fat is an excellent insulator against heat loss. Therefore, a very lean person may be more susceptible to the effects of cold, if clothing is inadequate or wet and/or the individual is relatively inactive.

(d) Persons over 45 years of age may be less cold tolerant than younger persons, due to the decline in physical fitness that often occurs with aging. This emphasizes the importance of physical fitness training, particularly for older soldiers.

(e) Alcohol, and to a lesser extent caffeine, cause the blood vessels in the skin to open which may accelerate body heat loss. Also, alcohol and caffeine both increase urine formation, leading to dehydration, which can further degrade the body's defenses against cold. Most importantly, alcohol blunts the senses and impairs judgment, so the individual may not feel the signs and symptoms of developing cold injury.

(f) Nicotine decreases blood flow to the skin, therefore smoking or chewing tobacco increases susceptibility to frostbite.

(g) Inadequate nutrition, illness, and injury compromise the body's responses to cold and the ability to recognize and react appropriately to the symptoms or developing cold injury.

(h) In foxholes or small vehicle crew compartments, movement is very restricted and soldiers must often remain inactive, which can greatly increase risk of cold injury.

(i) Individuals who have experienced a cold injury in the past are at greater risk of experiencing another cold injury than other soldiers.

(j) When the face and other exposed skin areas are covered by camouflage paint, it is difficult to see the changes in skin color, which signal the early development of frostbite.

(7) For a given air temperature, body heat loss is accelerated by wind.

(a) Wind increases heat loss from skin exposed to cold air, in effect, lowering the temperature. The wind-chill index integrates wind speed and air temperature to provide an estimate of the cooling power of the environment and the associated risk of cold injury. The wind chill is the equivalent still-air (i.e., no wind) temperature at which the heat loss through bare skin would be the same as under the windy conditions. Tab A depicts the Equivalent Chill Temperature for different wind speeds and air temperatures.

(b) Wind chill temperatures obtained from weather reports do not take into account man-made wind. Man-made winds worsen the wind chill effect of natural wind. Individuals riding in open vehicles or exposed to propeller/rotor-generated wind, can be subject to dangerous wind chill, even when natural winds are low.

(8) Water will cause body heat loss much faster than air of the same temperature.

(a) When clothing becomes wet due to snow, rain, splashing water, or accumulated sweat, the body's loss of heat accelerates. For example, when air temperature is 40°F (4.4°C), heat loss in wet clothing is double what it is in dry clothing.

(b) Swimmers and persons working or wading in water can lose a great deal of body heat even when water temperatures are only mildly cool. Closely watch individuals working in cold water or while entering water, since sudden plunging into cold water can produce irregular heartbeats, gasping, and hyperventilation, which could cause inhalation of water, heart failure, and drowning.

(9) Metal objects and liquid fuels that have been left outdoors in the cold can pose a serious hazard. They can conduct heat away from the skin very rapidly. Fuels and solvents remain liquid at very low temperatures and become supercooled. Skin contact with fuel or metal at below freezing temperatures can result in nearly instantaneous freezing. Fuel handlers should use great care not to allow exposed skin to come into contact with spilled fuel or the metal nozzles and valves of fuel delivery systems.

c. Minimizing Effects of Cold on the Body.

(1) Cold weather clothing systems are designed to change with the wearer's needs. Cold weather clothing protection is based on the principles of insulation, layering and ventilation. By understanding these principles, soldiers can vary their clothing to regulate protection and stay comfortable.

(a) Insulation depends on the clothing thickness, properties of the garment material, and the amount of air trapped within the garment. When clothing is dirty the material tends to be packed down, which compromises insulation.

(b) Wearing clothing ensembles in multiple layers allows the wearer to adjust the amount of insulation as changes in the environment, workload, or individual preferences dictate. Wearing layered clothing is especially important for soldiers whose duties require them to frequently move in and out of heated shelters, or to periodically undertake vigorous physical activity.

(c) Physically active people can sweat even in extremely cold weather. Sweat will be able to evaporate if clothing allows for ventilation. Proper clothing will be made of material that water vapor can pass through, and will allow the wearer to unzip and open the clothing periodically to increase ventilation. If sweat cannot evaporate, it will accumulate, wet the clothing, and compromise insulation. Additionally, sweat evaporation will be compromised when clothing is dirty.

(2) Because cold weather clothing is heavy and cumbersome, it greatly increases the energy required for physical activity.

(a) The increased effort can result in overheating and sweating especially during hard work, and can contribute to increased fatigue.

(b) Minimize perspiration buildup by opening clothing and removing layers during heavy work and scheduling frequent short rest breaks.

(3) Wind chill temperatures are widely reported by television and radio meteorologists, but they really only estimate the danger of cooling the *exposed* flesh of *inactive* persons. Windproof clothing greatly reduces wind chill effects. Rather than cancel outdoor training, at some arbitrary temperature limit or modify training and increase safety surveillance as the weather becomes more severe, and the danger of tissue freezing increases, as indicated in the cold weather training guidelines on page 23 of this appendix.

(4) The U.S. Army has several heaters for use inside tents during cold weather. Refer to chapter 8, paragraph 8-6 for correct heater to use.

(5) Shelter from weather is critical. The standard shelter is the tent, but you can construct improvised shelters (snow caves, snow trenches, lean-to's etc.) from local materials.

(6) The recommended sleeping system is the Extreme Cold Weather Sleeping Bag (NSN 8465-01-033-8057), on top of a polyfoam sleeping mat (NSN 8465-01-109-3367).

(a) Layers of tree boughs or mats under the sleeping bag help prevent heat loss to the ground. Shake out the sleeping bag, before using, to add loft or air to the lining, which improves its insulation.

(b) In tents, soldiers should sleep in long underwear and socks with all other clothing hung up to dry. In improvised shelters, remove only boots and the outermost clothing layer. Place clothing under the sleeping bag where it can add insulation without accumulating moisture from the body. Remove ice from vapor barrier boots. Wipe them dry on the inside, and allow them to air out, before putting them on again. In extreme cold, wear a balaclava or some other head cover while sleeping to protect the ears, neck, and face. You may wear the arctic mittens, on your feet, while inside the sleeping bag to help keep the feet warm. Do not put your head inside the sleeping bag, since moisture from breathing will accumulate in the bag.

(c) Air out the sleeping bag as often as possible to evaporate moisture.

(7) Keep feet, hands, and exposed skin dry. Feet are particularly vulnerable and extra foot care is required for cold weather operations. You should wash and dust your feet with a dry, antifungal powder (NSN 6505-01-008-3054) daily. Change socks whenever they become wet from exposure to rain, snow, or sweat. This may require

changing socks at least 2-3 times daily. Air dry extra socks and carry them under BDUs to warm.

(8) Humans protect themselves from cold, primarily, by avoiding or reducing cold exposure, using clothing and shelter. When this protection proves inadequate, the body has biological defense mechanisms to help maintain correct body temperature. The body's internal mechanisms to defend its temperature, during cold exposure, include vasoconstriction and shivering. When these responses are triggered, it is a signal that clothing and shelter are inadequate.

(a) Vasoconstriction is the tightening of blood vessels in the skin when it is exposed to cold. The reduced skin blood flow conserves body heat, but, as described earlier, can lead to discomfort, numbness, and loss of dexterity in hands and fingers, and eventually cold injuries.

(b) Cold triggers shivering. Shivering increases internal heat production, which helps to offset the heat being lost. Internal heat production is also increased by physical activity, and the more vigorous the activity, the greater the heat production. In fact, heat production during intense exercise or strenuous work is usually sufficient to completely compensate for heat loss, even when it is extremely cold. However, high intensity exercise and hard physical work are fatiguing, can cause sweating and cannot be sustained indefinitely. Moreover, most military occupational activities are less vigorous than high intensity exercise, so internal heat production will probably not be adequate to offset heat loss.

(c) Minimize the risk of cold injuries in fighting positions, sentry points and observation points by placing pads, sleeping bags, tree boughs, etc., inside these positions to allow occupants to insulate themselves from the ground or snow.

(9) Humans do not acclimatize to cold weather nearly as well as they can acclimatize to hot weather, although repeated cold exposure does produce what is referred to as habituation. Proper training before deploying into cold weather regions is more important for prevention of cold injuries than repeatedly being exposed to cold temperatures.

d. Sun, Wind, Rain, Snow, and Low Humidity. Besides cold temperatures, you can encounter other environmental stressors during cold weather operations. For example, you may conduct winter operations, in the coastal regions of the eastern United States, during periods of near freezing temperatures, rain and wind. You may encounter heavy snow, during winter operations, in areas of northern Europe and America, and throughout the year in mountainous regions. In desert, arctic, and high altitude regions, very low temperatures are often accompanied by high winds, low humidity, very bright sun, or a combination of those conditions. The influence of wind and rain on the severity of cold stress has been discussed in the last section. However, sun, wind, snow, rain, and low humidity each present environmental health threats in and of themselves.

e. Understanding the Problems.

(1) Exposure of unprotected skin and eyes to sunlight may cause sunburn and snow blindness.

(a) The threat of sunburn and snow blindness depends on the intensity of sunlight, not the air temperature.

(b) Snow, ice, and lightly colored objects reflect the sun's rays, increasing the potential for injury.

(c) Sunburned skin will appear red, hot to the touch, possibly swollen and blistered, and will be painful.

(d) Solar radiation can "sunburn" unprotected eyes resulting in snow blindness. Sunburned eyes are painful. There is often a gritty feeling, profuse tearing, blurred vision, and headache.

(e) Sunburn and snow blindness can last hours to days and can cause temporary combat ineffectiveness.

(2) Cold weather is often accompanied by winds and low humidity.

(a) Wind blown debris entering the eyes can lead to eye irritation, injury, and infection.

(b) Low humidity and windy conditions cause drying of the lining (mucous membranes) of the nose, mouth, and throat causing nosebleeds, sore throat and minor respiratory difficulties. Low humidity and wind can dry and cause chapping of the skin, increasing the sensitivity to sunburn and chaffing.

(3) Working in snow, ice, or mud is very strenuous. Building fighting positions and moving troops requires more time and physical effort.

f. Coping with the Problems.

(1) Prevent overexposing skin and eyes to solar radiation and wind.

(a) Using sunscreen, which contains para amino benzoic acid (PABA) or other chemicals capable of blocking ultraviolet radiation (at least 15 Sun Protection Factor) and covering exposed skin will prevent most sunburns. In cold weather, use alcohol free sunscreen lotion (Sunscreen Prep, NSN 6505-01-121-2336).

(b) The use of protective eye wear (Sunglasses, Polarized, NSN 8465-00-161-9415) or goggles that block at least 90% of ultraviolet radiation helps to prevent snow

blindness. Not all commercially available sunglasses block enough solar radiation to protect against snow blindness.

(c) Prevent chapped lips and skin by using of lip balm (Cold Climate Lipstick, Antichap, NSN 6508-01-277-2903) and limiting exposure of skin to the environment. Skin moisturizing lotion may help the skin retain water.

(d) Covering the nose and mouth using a balaclava or scarf will limit the drying of mucous membranes.

(2) Building defenses in hard frozen ground may require engineer support in the form of heavy equipment for digging and plowing.

g. Food and Water During Cold Weather Operations. Although warm clothing and proper shelter are the first line of defense in protecting against the effects of cold weather, adequate food and water consumption are also important. Food and water requirements of soldiers are high during cold weather operations and the effects of dehydration and inadequate diet are as serious as in hot climates.

h. Understanding the Problems.

(1) Soldiers often become dehydrated during cold weather operations.

(a) Dehydration increases susceptibility to cold injuries.

(b) Dehydration reduces work capacity, appetite, alertness, and can lead to medical problems such as constipation, kidney disorders, and urinary infections.

(2) The body's requirement for water is high during cold weather operations.

(a) Even in cold weather, sweating can contribute to body water losses. Heavy clothing can cause overheating, especially during heavy work, which in turn leads to sweating. In cold dry conditions, sweat may evaporate readily without the individual sensing it.

(b) Unless water intake equals body water losses, dehydration will result.

(3) Soldiers involuntarily reduce their fluid intake during all field operations, but especially during cold weather.

(a) Because field rations contain less water than garrison food, soldiers take in less water with the food they eat, and they usually do not drink enough to compensate.

(b) Most people do not feel thirsty until they are already significantly dehydrated, and thirst may even be less noticeable in cold than in hot weather.

(c) When weather is particularly cold and/or rainy, many soldiers purposely allow themselves to become dehydrated to avoid having to leave comfortable shelter to urinate outdoors.

(d) When temperatures are extremely low, water in canteens and bulk supply containers may freeze, restricting water availability.

(4) Water consumption requirements are more difficult to predict for cold weather operations than hot, because the effects of the environment are greatly modified by an individual's own bodily responses, the workload, and the amount of clothing worn. This individual variability affects the amount of water required to maintain proper hydration.

(5) Caloric requirements of soldiers are 25 to 50% higher during cold weather operations than in warm or hot weather.

(a) Soldiers expend more energy during cold weather, due to wearing heavy cold weather gear and the increased effort required for working or walking in snow or mud or for preparing positions in frozen ground.

(b) The body uses more calories keeping itself warm when the weather is cold which also contributes to the increased energy requirement.

(6) Ensuring that soldiers in the field receive adequate amounts of **hot** rations is a major challenge for leaders during cold weather operations, especially when soldiers are not stationed close to field feeding facilities or kitchens, where rations can be heated and kept warm.

(7) Other field feeding problems often arise from freezing of rations and a lack of readily available liquid water to rehydrate dry ration components.

(a) The most common individual ration soldiers receive during cold weather operations is the Meal-Ready-To-Eat (MRE). Soldiers must eat four standard MREs per day, to supply the necessary calories, during cold weather, if no other rations are provided. The MREs include liquid containing components, which can freeze during cold weather operations. You can keep them warm by carrying them inside your clothing.

(b) Two other individual rations that U.S. soldiers may receive during cold weather operations are the Ration, Cold Weather (RCW) and the Long-Life Ration Packet (LLRP). Soldiers must eat one RCW per day or three LLRPs per day to obtain the necessary calories during cold weather operations.

(c) Even when troops in the field are served hot rations, meal items, which are not normally heated (e.g. milk, juice, fruit cocktails, etc.), can freeze making it difficult to serve and consume these items.

i. Coping with Food and Water Problems.

(1) Soldiers must drink even when they are not thirsty. Leaders should establish a program of regularly scheduled enforced drinking. A general recommendation for soldiers participating in cold-weather operations is to consume about a half a quart (half a canteen) of water with breakfast, lunch, dinner and before going to sleep at night, with an additional half quart drunk every hour during the workday (more if the work is strenuous enough to cause the individual to sweat) for a total of at least 5-6 quarts (5 liters) per day.

(2) Monitor hydration status by noting the color and volume of a soldier's urine.

(a) Soldiers should be taught that the lighter the urine color, the better; and that **dark urine is a sure indicator that soldiers should increase fluid consumption.**

(b) Squad leaders should attempt to monitor urine color of squad members. This is easiest if the ground is snow covered or frozen and a specific site is designated for squad members to urinate. The appearance of a dark yellow stain will be noticeable. Even if you cannot identify the particular individual, the squad leader can intensify efforts to encourage all squad members to increase fluid consumption.

(3) In extremely cold weather (below -10°F [-23°C]), standard issue canteens and the 5-gallon metal water containers can freeze.

(a) It may be possible to wear the canteen or a spare water bottle inside one's clothing, perhaps tied by a string around the neck. Keep spare canteens inside heated vehicles or tents.

(b) Keep, at least, one full 5-gallon water container per squad thawed at all times. When that container begins to be dispensed, bring another full container inside for thawing. It can take several hours to thaw these containers in heated vehicles or tents.

(4) Do not use unmelted snow and ice for water.

(a) Eating snow and ice irritates the mouth, wastes body heat, and if enough is consumed, your body temperature can be lowered.

(b) When snow or ice is the only available source of water, thaw it before consuming. Do not consider melted snow and ice as potable water, until appropriately purified.

(5) There may be no better investment for the health, strength, and morale of troops participation in cold-weather operations than to provide ample amounts of hot palatable food supplemented with warm beverages. Proper prior planning is critical to successfully ensure that food is still hot when received by the individual soldier.

(a) When soldiers are cold, they will naturally consume more food and beverages if served hot. Therefore, providing hot food and beverages offsets the usual reduced consumption in the field, helps to warm the soldier and improves morale.

(b) Individuals can obtain the 25-50% extra calories needed per day, during cold weather, by eating a “normal” breakfast, lunch, and dinner, and then supplementing with frequent snacks throughout the day.

(c) It is a good idea to save food items issued with regular meals so you can eat them as between meal snacks. Keep items such as MRE pouch bread, granola bars, candies, cookies, crackers, cheese, and peanut butter spreads in your pocket, handy for frequent snacking.

(d) A good tip for soldiers participating in cold weather operations is to eat a large snack before bed at night. This will help keep the individual warmer during sleep, which prevents shivering and allows sounder, more restful sleep.

(e) There are many “old soldier’s” tales concerning the best foods to eat during cold weather, but most soldiers simply need to eat larger amounts of a balanced diet than they do in garrison. Soldiers who must hike, ski, or snowshoe for very long distances will benefit by concentrating on eating more starchy foods such as crackers, potatoes, cereals, bread, and noodles.

(6) Whenever possible, shelter latrines, to protect users from the wind and rain. Soldiers are less likely to restrict food and fluid intake, if they can use the latrines without being overly exposed to the elements.

j. Wounds, Disease, and Nonbattle Injuries. Cold weather seriously degrades medical operations in the field. Combat casualties are more susceptible to cold injuries, and at the same time the cold weather can constrain field medical treatment and evacuation. Furthermore, the incidence of disease and nonbattle injuries is increased during cold weather operations.

k. Understanding the Problems.

(1) Cold weather seriously affects care of battle casualties.

(a) Medical equipment, medications, and medication containers (e.g., IV containers, drug ampules) may freeze. Administration of intravenous medications or fluids is difficult in subfreezing temperatures due to freezing of solutions in lines or containers. Cold weather clothing can make it more difficult to check the casualty for wounds and initiate treatment.

(b) Shock may develop more rapidly and more severely when casualties are exposed to cold weather. Blood loss and shock increase susceptibility to frostbite and

hypothermia. Sick or injured persons are often unable to sense the development of frostbite.

(c) Evacuation procedures may require modification. Litter bearers fatigue quickly in snow, ice, or mud, slowing evacuation and putting the rescuers at risk of overexertion and cold injury. Road conditions may limit mobile ground transport. Weather conditions limit air evacuation. Open vehicles and aircraft can create tremendous wind chill requiring measures to protect patients from cold injury during transport.

(2) The widespread use of stoves and heaters in tents, shelters, and vehicles during cold weather operations poses a risk of fires, burns, and injuries from exhaust fumes.

(a) Burns result from contacting hot surfaces, fires, or explosions of stoves and fuel sources. Improper fueling and lighting techniques, or inadequate ventilation can result in the accumulation of flammable fumes into the tent or shelter. When ignited, these gases may cause potentially fatal fires.

(b) "Tent eye" is an inflammation and irritation of the eyes caused by exposure to fuel fumes which can accumulate in poorly ventilated shelters. Rubbing "itchy" eyes can subsequently lead to eye infection.

(c) Carbon monoxide (CO) is a poisonous gas which cannot be seen or smelled, and is found in exhaust from stoves and vehicles. CO can build up in closed spaces without being noticed. Soldiers seeking shelter from the cold in poorly ventilated shelters or vehicles with the engine idling often become victims of CO poisoning. Early signs of CO poisoning are headache, confusion, dizziness, or drowsiness. The lips and skin can become bright red. Victims will lose consciousness, and eventually die. Any person found unconscious in a closed tent or vehicle should be suspected of possible CO poisoning.

(3) Proper field sanitation is very difficult to maintain during cold-weather operations. However, poor sanitation will lead to outbreaks of disease. Frequent close contact with others in shelters, combined with increased individual susceptibility, also contributes to the spread of disease.

(a) Digging latrines and garbage pits can be difficult or impossible when the ground is frozen and covered with snow and ice.

(b) Soldiers are not inclined to walk far to use the latrine or garbage pit when it is cold outside.

(c) Improper food storage or garbage disposal will attract wildlife which can destroy clothing and equipment and bring disease.

(d) The limited availability of hot water and the discomforts associated with undressing in the cold may discourage soldiers from maintaining proper personal hygiene.

(e) It is difficult to maintain dish or hand washing water hot enough to keep it sanitary in cold weather, which can contribute to the spread of disease.

(f) Untreated drinking water obtained by melting snow and ice can contain disease.

(4) Accidents due to soldiers slipping and falling, and vehicular accidents will be more frequent during cold weather operations.

(a) Paths, walkways, and roads are frequently muddy or frozen. Heat escaping from the entrances of tents and buildings can cause cycles of thawing and freezing of the ground surface, which makes these areas particularly hazardous.

(b) Fatigue, the hobbling effect of clothing, and the effect of hoods and hats on vision and hearing also contribute to accidents and falls.

k. Avoiding the Problems.

(1) Keep liquid medications and medical equipment from freezing.

(a) Store medications and medical equipment in heated areas of vehicles and shelters whenever possible.

(b) Medical personnel can carry some liquid medications inside their clothing, where body heat will prevent freezing. Individual soldiers can carry IV fluid bags (with required tubing attached by tape) inside their clothing.

(c) Make extra clothing and blankets available, for use by patients, during treatment and evacuation, especially when their clothing has become torn or soaked in blood. Check patients, awaiting treatment and evacuation, for cold injuries frequently.

(2) Proper precautions prevent injuries associated with use of stoves and heaters.

(a) Permit only properly trained soldiers to set up, light, refuel, and maintain stoves.

(b) When a stove is being used, post a fireguard, prohibit horseplay in the tent, and keep the tent doorway clear, to allow easy escape.

(c) Keep the stovepipe clean and tall enough to draft properly. Ensure air intake, to the stove, is unobstructed.

(d) Do not seal shelters and tents, so tightly, that ventilation is completely blocked.

(e) Do not permit sleeping in running vehicles. When vehicles are parked for long waits, occupants should ensure exhaust pipes are not blocked, by snow banks, and keep a window slightly opened.

(3) The principles of proper field sanitation are the same as in warm weather (FM 21-10-1), but their application during cold weather may require some modification of procedures.

(a) Locate latrines and garbage pits at **minimum** allowable distances from the food service sites (100 yards [90 meters], downwind) and unit water supply (100 feet [30 meters]). Clear snow and ice from paths leading to these areas making them more accessible. Provide latrines with as much shelter as possible. Commanders should prohibit indiscriminate waste disposal, and insist that soldiers use only properly designated latrine and garbage areas.

(b) Snow and ice covering the ground may disguise the natural slope, and extra attention is required to ensure drainage from latrines and garbage pits is away from living areas. Freshly fallen snow can hide ice patches or other hazards.

(c) If the ground is too frozen to dig latrines and garbage pits, employ above ground container (such as an empty MRE box lined with a plastic bag) to collect refuse. Ensure these containers are clearly marked to indicate the contents for proper disposal. Urinals can be cut into snow walls outside the bivouac.

(d) Leaders should provide warm water frequently to encourage personal hygiene. Soldiers should wash hands, feet, face, and groin daily, whether or not heated water is available. During training exercises lasting several weeks, commanders should consider whether the health (and morale) benefits or arranging for troops to leave the field briefly, for a break at a heated shower site, might outweigh the temporary suspension of a realistic training scenario.

(e) Food handlers should wash hands before serving and wear serving gloves, when serving rations. Maintain larger stocks of large sizes of food serving gloves for food handlers to wear over glove liners when they are serving food outdoors.

(f) Chlorine or iodine purification of cold water requires twice the usual amount of chemical and an extra 15 minutes waiting period before the water is safe to drink. You should add flavor enhancers just before consuming the water.

(4) Remove snow from the ground before tents are set up. Mark slippery paths and walkways with warning signs, and sand, salt, ashes or straw should be spread to increase traction.

F-4. SUSTAINING PERFORMANCE DURING COLD WEATHER.

a. Soldier Tasks. Clothing and equipment malfunctions occur more often during cold weather. Simply wearing bulky cold weather clothing restricts peripheral vision, movement, coordination, and manual dexterity. In combination, these effects can adversely impact on the ability of soldiers to satisfactorily perform various aspects of their tasks.

b. Appreciating the problems.

(1) The properties of materials used to make the clothing and equipment are altered by low temperatures. Rubber, plastic, other manmade fabric and materials and even metal can become brittle and break more easily when cold. Zippers will freeze and break rendering garments unusable.

(2) Moisture condensation is a common source of problems during cold-weather operations.

(a) Moisture from sweat or breathing can become trapped in clothing or sleeping bags, condense and degrade insulation.

(b) Condensation accumulates inside tents when they are occupied. This adds to the weight and makes it more difficult to pack and move them later.

(3) Restricted visibility during cold weather operations hampers many soldier tasks and, particularly, compromises operation of vehicles or weapon systems.

(a) Cold eyeglasses, goggles, and eyepiece sights fog over easily when warm moist breath passes over them or when the wearer comes in from cold to warmed areas. If this condensation freezes, it is difficult to remove.

(b) Hoods, balaclavas, and other cold weather headgear can restrict vision, particularly peripheral vision.

(c) Depth perception is reduced when air temperature is below 0F (-18C) and/or wind speed is over 10 mph. Visual acuity is reduced when air temperature is below -20F (-29C) and/or wind speed is over 20 mph. These effects become particularly significant for viewing distances greater than 20 ft (6 meters).

(d) Fog, rain, and blowing snow further restrict visibility. Ice fog is an unusual condition, which occurs when the air temperature is extremely low (usually -40F), and moisture arises from burning of fuels in engines, stoves, and firing weapon systems. The fog is produced when the moisture is trapped under a layer of cold air and wind is not present to disperse it.

(4) Weapon use in extreme cold creates problems that can affect the health and performance of the operators.

(a) Hangfires are more frequent, especially when the weapon has not recently been fired, due to effect of cold temperatures on ammunition burning. The M72 Light Antitank Weapon (LAW) is particularly susceptible to hangfires in the cold.

(b) Backblast danger area is doubled for the LAW and tripled for the Dragon.

(5) Metal can be dangerous to touch (contact frostbite) in extreme cold. Also, moisture will condense on cold metal exposed to heat. Unless removed, it will freeze upon being returned to the cold, and it can eventually lead to rusting. This is especially a problem with individual weapons.

(6) Wearing gloves and mittens causes a significant loss of manual dexterity.

(a) Conventionally sized toggle switches, push buttons, and control knobs, are difficult to operate when wearing gloves or mittens.

(b) The decreased dexterity might encourage individuals to remove these protective items while working. However, removing the gloves will allow the fingers to cool and reduce blood flow to the hands, which will, in turn, eventually degrade manual dexterity.

(c) Blowing warm breath into mittens or gloves can cause the hands to become even colder. Air from the lungs contains moisture, which will condense on the hands and wet the inside of the hand wear, contributing to further hand cooling.

c. Optimizing Ability to Perform Soldier Tasks.

(1) Whenever possible, avoid using clothing and equipment not specifically designed or tested for use in cold weather. Do not force frozen or stuck parts to move when they are cold. Lubricate zippers with wax.

(2) Avoid problems resulting from moisture trapped in clothing.

(a) Avoid overdressing, and remove clothing layers upon entering heated areas from the outside.

(b) Dry clothing by hanging in the updraft of the tent to minimize condensation accumulation of moisture.

(3) Compensate for decreased visibility by increasing vigilance and slowing down. Avoid placing troops near traffic areas during periods of low visibility. Use antifogging compounds on eyeglasses and goggles.

(4) Increase backblast areas and warm weapons by firing at a slow rate at first to minimize the chance of a hangfire or other malfunction.

(5) To avoid condensation on small arms and ammunition, do not bring inside warm areas, unless outside storage and security is not practical.

(a) If weapons are brought inside, cover and place near the floor to minimize condensation.

(b) Clean and dry weapons after warming and before returning to the cold.

(6) For tasks requiring manual dexterity, you can wear commercially available light weight polypropylene glove liners beneath heavier gloves or mittens. You can then remove the bulky outer glove to perform a task. Periodically, replace the outer glove to allow the fingers to rewarm.

(7) You may divide many tasks into shorter segments to allow rewarming breaks.

(a) Brief rewarming periods, in a heated shelter, or even time spent with the gloves replaced, may maintain sufficient manual dexterity that the task can be completed.

(b) It may be necessary to complete the task using a two team approach. One team works while the other rewarms.

(c) Recommend planning work to avoid extended periods of inactivity (e.g., in formation or awaiting transportation) while troops are outside in the cold.

(8) With practice, soldiers will learn to compensate for the effects of gloves and other cold weather clothing on manual dexterity, movement, and performance of various tasks.

d. Nuclear, Biological and Chemical (NBC) Operations.

(1) Wearing NBC individual protective clothing and equipment during cold weather operations increases the risk of injuries due to cold, and even heat stress.

(2) NBC protective clothing can restrict the blood flow to the fingers and areas of the face, increasing the susceptibility of these areas to frostbite and limiting the ability to visually inspect for signs of cold injury.

(3) When mask carriers are worn outside the clothing at below freezing temperatures, donning the cold mask can cause a contact freezing injury, especially at the points where exposed rivet heads contact the face.

(4) Wearing the impermeable NBC protective Battle Dress Overgarment (BDO) over heavy cold-weather clothing creates the unexpected situation where heat exhaustion becomes a real possibility for soldiers working hard, even in cold weather.

The added insulation and decreased ventilation of NBC protective clothing can result in heavy sweating and wetting of the clothing during hard work, eventually degrading cold protection.

e. Minimizing Effects of Cold on NBC Operations.

(1) Practice integrating NBC protective clothing with cold weather clothing. Units may require some adjustments to procedure.

(a) Generally, the BDO is worn outside the cold weather clothing, therefore, it may be necessary to remove insulating clothing layers before putting the BDO on to prevent overheating.

(b) It may be necessary to add additional clothing layers over the BDO after it is donned, if changes in weather or activity warrant additional warmth. However, any garment worn over the BDO will become contaminated during chemical exposure and you will have to discard and replace with new issue clothing (leader should anticipate this by having replacement clothing supplies on-hand).

(c) Vapor barrier boots or issue overboots are authorized replacements for chemical protective boots.

(d) Chemical protective gloves are worn underneath cold weather gloves and/or mittens. Individuals whose tasks require a high degree of manual dexterity may be unable to wear cold weather gloves or mittens over the rubber gloves. In this case, polypropylene glove liners worn beneath the protective gloves may provide some protection from the cold for brief periods.

(2) Using the protective mask during cold weather requires some procedural modification.

(a) Before deploying, cover rivet heads inside the mask with adhesive tape to prevent contact frostbite. Install M3/M4 winterization kits on chemical protective masks when temperatures are below 23°F (-5°C). This kit contains an ice particle prefilter fitted over inlet valves to prevent frost from accumulating on the inlet caps. It also includes two inlet valves and two nose cup valves of a softer rubber, which does not become hard and brittle in the cold.

(b) When it is cold, normally don the protective mask. However, clearing the mask the usual procedure of quickly exhaling maximally will fog the lens. Instead, exhale steadily and slowly.

(c) The M6A2 hood should not cover the mask voice meter outlet valve when the temperature is below freezing. Pull the hood voice meter outlet valve assembly cover open below the voice meter outlet valve assembly cover to allow moisture to escape.

(d) To prevent the outlet valve from freezing and sticking to the seat, lift the outlet valve cover and rotate the disc while exhaling.

(e) In extreme cold weather (0°F), wear mask carriers under your parka to keep the mask warm and flexible enough to provide an adequate seal. Practice, donning the mask when the carrier is worn under the parka.

(f) CAUTION! Do not adjust the harness straps on the mask too tight. This will reduce blood flow to the skin of the head and face and can cause frostbite.

(g) Wipe the mask thoroughly dry after use to remove condensation which could freeze inside.

(3) Protect nerve agent antidote and anticonvulsant autoinjectors from freezing.

(a) Do not carry autoinjectors in the external pocket on the BDO when the temperature is below freezing. Place them in an inner pocket where body heat will keep them warm. Tie a string to the autoinjector, and threaded through the outer layers of clothing and tie it to an outside pocket or belt. You can rapidly extract the autoinjector from within the clothing, by pulling the string (practice this).

(b) Frozen autoinjectors are still useable after being thawed if they do not appear broken or cracked.

f. Leadership Challenges During Cold Weather Operations. The principles of leadership are unaffected by the weather, but challenges for leaders, can be profound during cold weather. To accomplish their mission, leaders must contend with not only the enemy soldier, but also the stress of the environment. The preceding sections have focused on the effects of cold weather on the soldier's biological functioning. However, the stress of cold can also adversely affect attitudes and morale, and leaders must recognize and cope with these effects to maintain their unit's effectiveness.

(1) Many soldiers come from regions where winters are not severe, and few have experience in living outdoors during cold weather. Initially, these soldiers may lack confidence in their ability to cope with and survive in cold weather.

(2) The cold can seem inescapable. Even when soldiers are able to stay warm, the effects of cold are felt in awkward cold weather clothing, confinement to small shelter and problems with vehicles and equipment. These effects can lead to anger, frustration and depression, which can be intensified by fatigue, periods of isolation, and shortened daylight hours.

(3) When conditions are extremely cold and soldiers have been out for a long time, the need to stay warm tends to become the individual's most important concern.

(a) Soldiers may appear confused or forget how to do things they are trained to do.

(b) Some soldiers may attempt to shirk their duties in order to avoid the cold and stay warm.

(4) The need to wear multiple layers of clothing or remain bundled in sleeping bags and blankets when it is cold, combined with extended periods of darkness, can intensify the sense of isolation soldiers often experience when they are separated from home, family, and friends. Some individuals respond to these feelings by “huddling up” to keep warm and withdrawing within themselves away from the unit. This will lead to mental sluggishness, increased susceptibility to cold injuries, and degraded individual effectiveness, unit discipline, and cohesion.

g. Positive Leadership and the Right Attitude.

(1) Leaders are responsible for prevention of cold injury among their troops.

(a) Susceptibility to cold injury varies considerably. Safe exposure times for different soldiers, exposed to the same cold-weather conditions, also varies considerably.

(b) Newly assigned individuals, who have little or no cold weather training or experience, often sustain cold injuries.

(c) Individuals with considerable cold weather experience (often those in leadership positions) can become nonchalant or desensitized to the threat of cold injury. Leaders must be alert for carelessness even in soldiers experienced in cold weather operations.

(2) Soldiers need to be taught **when it is cold, tasks may be more difficult, but not impossible**. This knowledge comes from confidence in their abilities to survive and perform their mission during cold weather.

(a) Leaders can build this confidence in their soldiers by having them practice tasks and survival skills in the cold, and by conducting cold weather training exercises.

(b) After several weeks of training and experience in cold weather, most soldiers learn to cope fairly well.

(c) Leaders must be alert to avoid the common trap of allowing cold weather training exercises to become a camping trip. If this occurs, soldiers will become distracted from accomplishing their mission. Leaders must remind soldiers that their job is to fight, and the purpose of the training exercise is to teach them how to carry out their mission under cold weather conditions.

(3) A positive “can do” attitude helps in coping with cold weather problems. Leadership must be aggressive and emphasize personal example to demonstrate that cold conditions are bearable.

(a) Emphasize direct supervision.

(b) Ensure duties are properly performed and work is equitably distributed among all unit members.

(c) Be alert for individuals who have withdrawn from the group. Leaders should talk to their troops and encourage them to talk among themselves. Use the buddy system to maintain communication and to watch for cold injuries.

(d) Keep soldiers busy and physically active.

(e) Use hot food to improve morale.

(f) Allow soldiers more time to accomplish tasks and discretion regarding how to do them. However, do not allow them to use the cold as an excuse for failing to carry out orders, complying with unit SOPs, or properly performing their duties.

F-5. PREPARATION FOR COLD WEATHER OPERATIONS.

a. Units preparing for deployment to cold weather regions must **anticipate the effects of the environment** on the functioning of the individual as well as the unit.

b. Units deploying to cold weather regions should conduct training for their soldiers on basic winter skills and cold-weather survival.

(1) It is especially important that soldiers practice wearing the cold weather clothing to ensure that the fit is correct and the individual knows how to wear the gear.

(2) Soldiers should practice performing duties while wearing cold weather clothing, since this gear restricts movement considerably. It is also important that soldiers practice donning individual NBC protective gear, while wearing cold weather clothing.

c. Winter operations are physically demanding and troops must be in peak physical condition.

(1) Units identified for future deployment, should immediately optimize their physical training program, and spend more time training outdoors to accustom individuals to the effects of cold.

(2) Do not halt outdoor training when temperatures are cold. Rather than restrict outdoor activities at certain preselected temperatures, commanders should establish programs in which increasingly protective countermeasures (clothing, surveillance) are

initiated as conditions become colder. Such programs build soldiers' confidence in their ability to complete their missions, regardless of weather. Cold weather training guidelines located on page 23 of this appendix shows recommended guidance for conducting, modifying, restricting, or canceling training according to wind chill conditions.

d. Each soldier must have an individual cold weather survival kit as shown on page 22 of this appendix and all required cold weather clothing in proper working condition.

e. In addition to conducting training to help soldiers prepare to operate and survive under cold weather conditions, unit leaders should anticipate how the disruption of normal unit procedures due to weather conditions will affect unit operations.

(1) Identify unit members who have previously experienced cold injuries. These soldiers should receive intensive retraining in cold injury prevention, and you should monitor them closely while deployed.

(2) Establish a buddy system within the unit to increase unit cohesion and minimize the sense of isolation. A buddy system will also help to monitor for signs of cold injury among unit members.

(3) Review and modify field sanitation procedures as necessary, when weather conditions are extreme. Aspects requiring particular reemphasis include placement and maintenance of latrines, water purification, and sanitary food handling.

(4) Anticipate supply difficulties, and stockpile emergency stores of critical items. During cold weather operations, units need more of the larger sizes of NBC protective clothing, since soldiers wear NBC clothing over multiple layers of bulky cold weather clothing. Develop storage and transportation procedures for food and water, which prevent freezing and establish measures for thawing frozen supplies. Set up procedures for keeping rations hot until received by individual soldiers in the field.

(5) Establish safety SOPs for personnel traveling, by vehicle, away from the unit's bivouac site. At a minimum, these SOPs should require all vehicle occupants to have their sleeping bag, extra clothing, and individual survival kit with them whenever they leave the unit area. Your SOPs should also designate what actions personnel should take, in case their vehicle is disabled or the driver becomes lost.

F-6. FURTHER COLD WEATHER INFORMATION. For classes, training aids or information on cold weather injury prevention, contact Preventive Medicine at 442-3175/2820.

F-7. COLD WEATHER INFORMATION SOURCES.

a. Department of the Army, FM 31-70, Basic Cold Weather Manual.

- b. Department of the Army, FM 31-71, Northern Operations.
- c. Department of the Army, FM 31-72, Mountain Operations.
- d. Department of the Army, FM 21-10, Field Hygiene and Sanitation.
- e. Department of the Army, FM 21-11, First Aid for Soldiers.
- f. Department of the Army, TC 21-3, Soldiers Handbook for Individual Operations & Survival in Cold Weather Areas.
- g. Department of the Army, TB MED 81, Cold Injury (Under Revision, To be released as TB MED 508).
- h. U.S. Army Northern Warfare Training Center, Fort Greely, Alaska, Winter Operations Manual.
- i. Department of the Navy, FM 7-32, Small Unit Leader's Guide to Cold Weather Operations.

APPENDIX G

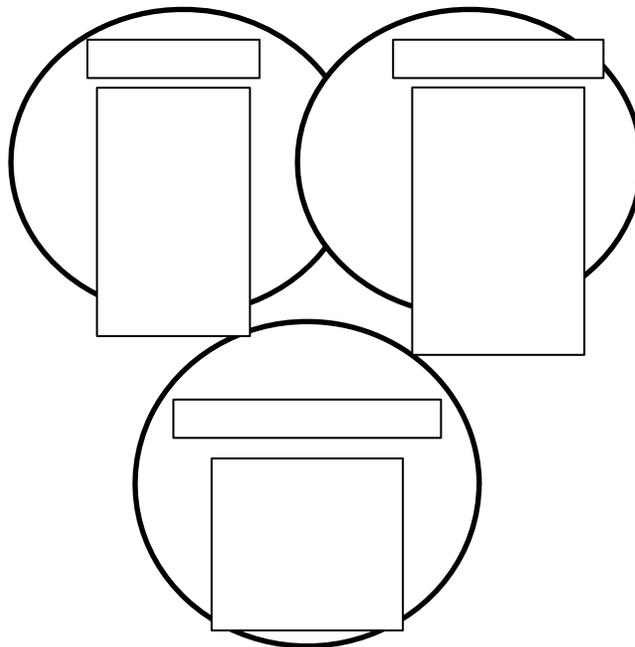
PREVENTION OF HEAT INJURIES

G-1. HISTORY.

a. The history of warfare is proof of the devastating effect a lack of preventive medicine measures in the field can have on an army. Of all the environmental factors working against field forces, heat is the most lethal. In the 1967 Egyptian-Israeli conflict, there were approximately 20,000 Egyptian deaths due to heat when the Israelis severed the Egyptians supply lines. In all U.S. conflicts, 20% of casualties admitted to hospitals have been combat-related. The remaining 80% have been due to disease and nonbattle injuries. For example, in 1982, 35 U.S. military personnel conducting peacekeeping operations in the Sinai required intravenous fluid replacement as a result of dehydration.

b. During hot weather operations, a soldier is dependent upon evaporative cooling, or sweating, as the sole means for maintaining proper core body temperature. However, this internal temperature regulation is influenced by four primary factors: sweat rate, ambient temperature, relative humidity, and the soldier's hydration level. When these factors combine and adversely impair a soldier's ability to thermoregulate, the result is catastrophic: **Severe Heat Injury!** Commanders must, therefore, accommodate the physiological limitations of their soldiers by incorporating heat injury prevention in their operational and logistical plans.

THE SOLDIER, THE MISSION, AND THE ENVIRONMENT



c. Humans have well defined physiological mechanisms to counteract rises in body temperature from either internal heat production or environmental heat stress. These mechanisms support our need to maintain a narrow range of body temperatures for optimal function and performance (97°F to 100°F).

d. The direct transfer of heat energy to the environment occurs by radiation and conduction. Radiative transfer occurs between the body surface and all other sources of radiant energy. Conductive transfer occurs by direct contact between the body surface and other materials including air, water or ground. Both, radiative and conductive heat transfer, move heat energy between the body surface and some other material. Convection augments conductive heat transfer. Conduction occurs between two materials in direct contact. Conduction will stop when the two materials in contact reach thermal equilibrium. Convection prevents thermal equilibrium from developing by constantly replacing at least one of the materials. For example, convection replaces air warmed by conduction, while in contact with the skin surface with air not yet warmed, so heat transfer can continue. The rate of heat transfer by conduction/convection and radiation is dependent on the difference in temperature between the body surface and the materials or radiating surfaces on the environment. Furthermore, the two routes of direct energy exchange (radiation and conduction/convection) between the body surface and the environment are two-way streets. If the body surface is warmer than the environment, the body will lose energy to the environment. However, very warm air or surfaces will transfer heat on the body by conduction/convection; and sunlit surfaces or sky will transfer heat on the body by radiation.

e. Maintenance of body temperature requires the amount of heat energy in the body to remain constant. Under the circumstances, when internal heat production exceeds the capacity of direct routes of heat transfer to dissipate it, an additional means of heat transfer, evaporation of sweat, comes into play. Heat energy is then dissipated to the environment either directly from the warmed skin surface by conduction/convection and radiation or by evaporation of sweat.

f. Sweating is primarily controlled by the center nervous system. Core temperature increments detected by thermosensitive neurons in the hypothalamus stimulate increases in skin blood flow and sweating when core body temperature rises. Conversely, when core body temperature falls, skin blood flow decreases and returns back to the internal organs. Physical work causes an increase in cardiac output and the redistribution of blood flow toward the working muscles and away from the internal organs. If an elevation in core temperature also occurs, then additional portion of the cardiac output is directed to the skin for thermoregulation and organ flow is further reduced. Maintenance of effective circulating volume is essential to permit adequate muscular, organ, and thermoregulatory blood flow. High sweat rates will quickly compromise blood volume. Furthermore, when the environment is sufficiently hot to cause heat gain by the direct transfer routes, sweating is the only thermoregulatory mechanism available to control body temperature. Consequently, the dehydrated soldier has less ability to maintain body temperature in the heat and is more susceptible to severe heat injury.

REMEMBER

Soldiers cannot reduce thermoregulatory water requirements, by water deprivation, during training. Acclimatization does not reduce water requirements. Commanders must understand and recognize the logistical and operational implications.

g. Soldiers are optimally capable to manage heat stress when they are fully hydrated, physically fit, acclimatized, well nourished, and well rested. In order for soldiers to avoid becoming a heat casualty, soldiers need to drink enough water to replace what they lose. In hot environments, soldiers, normally, do not drink enough water to voluntarily maintain hydration. Thirst is not stimulated until there is a 1-2% drop in blood plasma level. Consequently, soldiers will maintain themselves at a level that is 1-2% dehydrated relative to their usual state. If soldiers are to fully replace the water they lose in their daily activities and eliminate voluntary dehydration, they must understand the need to drink even though they are not thirsty. However, even in the face of a clear understanding of the importance of water and hydration soldiers may decide that the inconveniences created by water consumption creates problems that outweigh the importance. For example, soldiers may not drink before going to sleep to avoid having to wake up and dress in order to urinate or they may not drink before convoys if no rest stops are planned. Unit leaders must reinforce hydration by planning for all aspects of adequate hydration, elimination as well as consumption. During hot weather, water losses can reach 15 liters/day/soldier. Complete replacement requires realistic estimates of potable water requirements (bathing as well as drinking), an adequate water logistic system and soldiers who understand and act on their water requirements. Leaders must enforce water-drinking discipline and, if necessary, incorporate forced hydration.

Note: There is no advantage to commercial electrolyte beverages (i.e., Gatorade™) beyond their palatability, which may encourage drinking. They should not be the sole source of fluid consumption as they cause dehydration to occur.

CONSEQUENCES OF DEHYDRATION

Long term, mild dehydration is associated with renal stones and urinary tract infections, severe constipation, and rectal afflictions. Short term, mild dehydration (2-3% of body weight) reduces physical capacity and heat tolerance. As dehydration progresses, cognitive function deteriorates and both thermoregulation and physical capacity become comprised resulting in heat illness and potential death.

h. Aerobic fitness provides the cardiovascular reserve to maintain the extra cardiac output required to sustain thermoregulation, muscular work and vital organs in

the face of heat stress. In addition, regular strenuous aerobic physical training will provide a small degree of heat acclimatization.

i. Regardless of their physical condition; however, soldiers who are required to deploy on short notice to hot environments will arrive incompletely acclimatized. Adequate acclimatization will require several days to achieve. During this initial acclimatization period, provide soldiers copious quantities of water and carefully supervise them to prevent excessive heat exposure. If possible, regulate work tasks using work-rest cycles tailored to the soldier's physical capacity.

j. In the first few days of acclimatizing, sweat salt conservation will not be fully developed. Salt depletion is a risk if soldiers are exposed during this time to sufficient heat or work stress to induce high sweating rates, particularly if ration consumption is reduced. Avoid salt depletion by having soldiers **lightly** salt their food for the first few days in a hot environment. Acclimatization should eventually eliminate the need for salt supplementation.

k. The requirements of military operations frequently means lack of sleep and missed meals. These factors reduce thermoregulatory capacity and increase the risk of heat injury. Recommendation to planning staffs should emphasize the importance of adequate sleep and food to reduce the likelihood of heat casualties.

l. The skin is a vital thermoregulatory organ. Sunburn and the other skin diseases of hot environments reduce the ability of the skin to thermoregulate. Prevent sunburn by adequate clothing, shade, and sunscreens. Skin diseases are best prevented by adequate hygiene. Commanders and logisticians must understand the importance of functioning skin and provide adequate water for washing.

G-2. THE MISSION.

a. The physical exertion required to accomplish a mission is an important determinant of heat stress. Marching speed and route, load carried, work tasks required, and terrain covered will affect internal heat production.

b. The level of MOPP required, to accomplish the mission, affects heat strain in two ways. First, MOPP gear, particularly the over boots, adds to the work of movement and increases internal heat production during the performance of a task. Second, the battle dress over garment and hood encapsulate and effectively isolate the soldier from the environment. Consequently, the soldier creates his/her own microenvironment within the chemical protective uniform. The air trapped in the uniform is warmed by the skin and saturated with water vapor from sweat, so that the soldier's immediate environment becomes extremely hot and humid. The only opportunity to moderate the heat and humidity inside the uniform is to transfer it through the fabric, the type of transfer the uniform is designed to prevent.

G-3. THE ENVIRONMENT.

a. The environmental heat stress to which soldiers will be exposed must be known if effective preventive measures are to be taken. Measure it in circumstances as close as possible to those in which the troops will be operating. It can vary tremendously over short periods of time and space and in unpredictable ways. For example, on a sunny, calm day, an open field may have the greater heat stress, than an adjacent forest. However, on a windy, cloudy day the forest may have the greater heat stress. Heat stress indices calculated for a whole post or region are only general guides. Particularly when conditions seem extreme, on site measurements are essential. There is no substitute for knowledge of local conditions.

b. The U.S. Army has adapted the Wet Bulb Globe Temperature (WBGT) Index as the standard metric for environmental heat stress and is available in the federal supply system (NSN 6665-00-159-2218). There are four environmental characteristics (all are taken into account by the WBGT) that influence heat stress: the air temperature, the solar (or radiant heat) load, the dew point temperature, and the wind speed.

c. Absolute air temperature or dry bulb is measured by a shaded thermometer to avoid any effect of radiant heat. By itself, it is a relatively small contributor to heat stress. It is weighted at 10% in the calculation of the WBGT Index.

d. Solar load can be an important contributor to heat stress. Under severe conditions, full sun on bare skin can add up to 400 watts to an individuals heat load. Solar load is measured by the Black globe thermometer and is weighted at 20% in the WBGT Index calculation.

e. Humidity determines the rate at which sweat can evaporate and is the principal component of the WBGT Index. The rate of sweat evaporation is determined by the difference between water vapor pressure at the skin surface and in the ambient air, which are measures of absolute humidity. The relative humidity, which is a measure of the saturation of ambient air with water vapor, does not determine the rate of sweat evaporation. The important point to remember is that a change in air temperature alone does not change the absolute humidity of the air. That is, the rate of sweat evaporation and cooling will not change just because air gets warmer or cooler.

f. The temperature recorded by a wet bulb thermometer provides the measure of absolute humidity for the WBGT Index. A wet bulb thermometer is a shaded standard thermometer whose bulb is surrounded by a wet cotton wick and exposed to moving air.

g. The cotton wick cools as water evaporates from it. The rate of evaporation depends on the absolute humidity of the ambient air and is speeded by air movement. The cooling effect of evaporation brings the temperature, reported by the thermometer, below that of the ambient air. Drier air means greater cooling effect and lower wet bulb temperature. And in contrast, if the air is completely saturated with water vapor, so that no evaporation is possible, then the wet bulb thermometer will not be cooled below the temperature of the ambient air. In this case, the dry bulb and wet bulb temperatures will

be the same. The wet bulb temperature is the most important component of the WBGT Index, befitting the thermoregulatory importance of evaporation in hot environments, and is weighted at 70% in the WBGT Index.

G-4. HEAT ILLNESS. There are three distinct, clinical types of heat injuries: heat cramps, heat exhaustion, and heat stroke. They produce distinctive signs and symptoms, which should be immediately recognizable in order to provide proper care and attention for the soldier. Ensure all soldiers, supervisors, and nonsupervisors are familiar with the treatment measures for these conditions. In addition, there are numerous minor heat illnesses that, if not treated properly, can lead to the more severe heat injuries of heat cramps, exhaustion, and stroke.

G-5. HEAT CRAMPS.

a. Heat cramps are caused by excessive loss of salt from the body. They are intensely painful cramps involving the muscles of the arms, legs, and the abdomen. They may occur alone or in the presence of heat exhaustion. The skin is cool and sweating is profuse. Extreme thirst may or may not be present.

b. Treatment includes moving the soldier to a cool and/or shady area and loosening clothing. Next, slowly give large amounts of cool water. Watch the soldier and continue to give water if the soldier will accept it. If cramping continues, seek more definitive treatment.

G-6. HEAT EXHAUSTION.

a. Heat exhaustion is the most commonly encountered form of heat illness and is the result of excessive loss of salt and water. It occurs when cardiac output is insufficient to meet the competing demands of thermoregulatory skin blood flow, skeletal muscle blood flow, and blood to the vital organs. By definition, heat exhaustion is a functional illness and is not associated with evidence of organ damage.

b. Signs and symptoms include profuse sweating with pale, moist, cool, skin, headache, weakness, dizziness, and/or loss of appetite; heat cramps may or may not be present; nausea (with or without vomiting), urge to defecate, chills, rapid breathing, tingling of the hands and feet; mental acuity is usually normal.

c. Treatment consists of moving the soldier to a cool and/or shady area and loosening clothing. Elevate the soldier's legs. Pour water on the soldier and fan to expedite the evaporative cooling effect. Have the soldier drink at least one full canteen of water. Keep the soldier under constant supervision until the symptoms dissipate or until medical aid arrives. If symptoms continue, seek medical attention.

G-7. HEATSTROKE.

a. Heat stroke is the result of the body's heat regulatory mechanism shutting down and the main avenue of heat loss (cooling by evaporation of sweat) is blocked. **Heat stroke is a medical emergency and the mortality rate is very high.** Early signs of heat stroke include headache, dizziness, delirium, weakness, nausea, vomiting, and excessive warmth. In the early stages, the skin is usually hot red and dry. However, sweating may be present. A soldier may first progress through heat cramps or heat exhaustion. On the other hand, the onset of heat stroke may occur quite suddenly with collapse and loss of consciousness. Coma and convulsions may also occur. The most significant sign of this injury is a high body temperature, over 106°F. The soldier's condition deteriorates rapidly; therefore, treatment must begin immediately.

b. Immediate treatment includes activation of emergency medical services and evacuation to a medical facility, and to reduce the body temperature as soon as possible. Move the soldier to a cool, shady area, and remove clothing. Start cooling immediately by immersion in water or pouring water on the body and fanning. Massage the extremities and skin. Elevate the soldier's legs and, if conscious, have the soldier slowly drink one full canteen of water.

IMPORTANT

The soldier with heat stroke requires early evacuation to medical facilities with intensive care capabilities. Start active cooling immediately and continue during evacuation.

c. One attack of heat stroke makes soldiers susceptible to a second attack. In addition to possible long term neurological, liver, and kidney damage, soldiers should avoid a second exposure to hot weather conditions. They should receive profiles restricting heat exposure until clinical recovery is complete and their heat tolerance has been evaluated.

G-8. MILIARIA RUBRA/PROFUNDA. Also known as prickly heat, miliaria rubra/profunda is a skin eruption that is caused by sweat glands becoming clogged with debris. As sweating increases, the rash will worsen. Therefore, as the skin cannot fully participate in thermoregulatory sweating, the risk of heat illness is increased in proportion to the amount of skin surface involved. Treat by cooling and drying the affected skin. Full recovery takes approximately 7-10 days.

G-9. HEAT SYNCOPE. Heat syncope or "fainting" is caused by pooling of blood in the extremities resulting in a loss of blood to the brain (i.e., during long periods of standing). If this occurs during or after work in the heat, or after more than 5 days of heat exposure, this should be considered evidence of heat exhaustion and the appropriate treatment.

G-10. HEAT EDEMA. Mild edema, or swelling, is occasionally seen during the early stages of heat exposure. In the absence of other disease, this condition is of no significance and is self-resolving.

G-11. SUNBURN. Sunburn reduces the thermoregulatory capacity of the skin. Prevent sunburn needs by insisting on the use of adequate sun protection (minimum Sun Protection Factor (SPF) 30). When it does occur, keep effected individuals from significant heat strain until the burn has healed. Rule of Thumb: 1 day of limited duty for every 10% of body surface burned.

G-12. SPECIAL NOTE ON TRAINEES.

a. Trainees are particularly susceptible to heat illness during basic training in hot weather. A number of reasons for their susceptibility are related to their rapid transition from civilian life to a demanding schedule of physical and military training. First, they are neither acclimatized to heat on entry nor as physically fit as fully trained soldiers. They need to become fit in a short time and, so, quickly begin strenuous exercise. Second, they commonly suffer sleep loss and dehydration. Third, contagious febrile illnesses are common. Finally, they are unfamiliar with heat illness and do not recognize the early signs and symptoms of heat illness nor understand the importance of early, prompt treatment.

b. Heat illness can occur in any component of basic training. However, certain activities are associated with the highest risk. Those activities are road marches, unit runs (including morning PT), evening parades, and basic rifle marksmanship (BRM).

c. Recruits doing road marches and unit runs have very high-sustained rates of internal heat production and muscular work. They usually develop temperature elevations and, after 30-60 minutes, significant dehydration. Both temperature elevation and dehydration are aggravated if they begin their exercise dehydrated (starting just after waking up without directed rehydration) or if they are wearing MOPP gear. The combined elevated temperature, muscular work, and dehydration lead to an extremely high risk for potential heat exhaustion and heat stroke.

G-13. MINIMIZING HEAT CASUALTIES IN OPERATIONS.

a. All soldiers, leaders, supervisors, and nonsupervisors must know the steps they need to take in order to minimize the risk of heat illness. They must understand the importance of hydration, nutrition, and skin hygiene. They must know that although thirsty = dehydrated, dehydrated does not = thirsty. Train soldiers to recognize the signs and symptoms of heat illness, in their buddies, as well as the basics of buddy aid. Staff must understand the critical importance of water for the unit so they can incorporate adequate water logistics and management. Their plan must not add impediments to water discipline. Planners must incorporate the degrading effect of heat in their operational schedules by adding rest and hydration stops. Leaders must understand the nature and the magnitude of the threat that heat stress presents to their units, so they can emphasize the importance of required countermeasures. Small unit leaders must know the techniques for managing work in the heat and understand the guidelines for water replacement and work-rest cycles.

b. Water should be kept as cool as possible. Flavoring the water, without compromising potability, will increase intake. Monitor sick call for the appearance of minor heat illnesses, which are a precedent for more severe heat injuries. Discourage skin exposure to the sun. In addition to heat stress, exposed skin will become sunburned and reduce the ability of the skin to thermoregulate. Finally, ensure adequate sleep and that meals are consumed. Reducing either one will significantly reduce thermoregulatory capacity.

G-14. FURTHER INFORMATION. Successful prevention of heat injuries is the key and is more important than their treatment. For further information, classes, training aids, and/or information on heat injury prevention, contact Preventive Medicine Activity at 442-3175/5403.

G-15. KEY POINTS AND REMINDERS FOR SOLDIERS.

- a. Drink water to replace water.
- b. Use commercial electrolyte beverages (Gatorade™) sparingly.
- c. Protect your skin. It's a vital organ in the heat.
- d. Caring for your skin is more than just for comfort or aesthetics.
- e. Use sunblock, minimum SPF 30.
- f. Minimize the amount of exposed skin by wearing your uniform properly.
- g. Unblouse your boots when necessary.
- h. Use the buddy system.
- i. Know the signs and symptoms of and how to treat heat injuries.
- j. Eat all scheduled meals.
- k. Do not rely on pogy bait.
- l. Follow work rest cycles when the tactical situation allows.

APPENDIX H

SAFETY PROCEDURES FOR TACTICAL WATER OPERATIONS

H-1. For tracked vehicles in amphibious crossings of large bodies of water (e.g., lakes or wide rivers), use a rescue boat with two qualified lifeguards (American Red Cross Senior Certificate or equivalent). When swimming in bodies of water that are muddy or when the depth of water is such that you cannot see the bottom, it is specified in the local SOP that you provide three certified divers instead of two lifeguards. Equip boats with life-ring, rope (3/8" or 1/2") and boat hook and position downstream from the crossing site at the appropriate distance according to the velocity of the current.

H-2. Make an on-site physical reconnaissance before amphibious operations to determine suitable entrances and exits, maximum allowable water current velocity for the operation, streambed conditions, and depths for vehicle swimming/fording procedures. Complete a risk assessment based on vehicle characteristics, limitations for entering and leaving the water, degree of embankment slope, and speed of vehicle for safety considerations. Additional procedures relating to amphibious operations are as follows:

a. Ensure entrance and exit lanes are properly marked with flags, engineer tape, poles, or luminous markers. Use easily identifiable floating objects to mark crossing lanes.

b. Set up stringent controls for crossings during periods of reduced visibility, including blackout conditions, to prevent over concentration of vehicles at entrances and exits. Supply directional lights on the shore to prevent driver disorientation. Have emergency lighting, such as a tank spotlight or position enough vehicles with headlights beamed on the water surface, for contingencies.

c. Select an assembly area, conduct precrossing checks and predipping of all vehicles and equipment, before any vehicle enters the water.

d. Designate a qualified crossing control officer to aid the commander in the orderly movement of vehicles. Each crossing unit will maintain contact with the control officer.

e. Brief all personnel on emergency evacuation procedures and proper weight distribution. Rehearse these procedures before entry into the water until all individuals are thoroughly skilled. All vehicle crews will conduct two exit drills on dry land.

f. Supply all personnel with PFDs, prechecked for serviceability by vehicle commanders, before the operation. Driver and vehicle crewmembers will wear type V PFDs during vehicle swim operations in calm water. Personnel will wear PFDs at all times while the vehicle is underway in the water. Do not inflate PFDs while personnel are inside the vehicle.

g. Ensure personnel do not wear load bearing equipment (LBE) or overshoes, while the vehicle is in the water.

h. Attach a tow cable to the top of each vehicle. Attach a suitable lightweight floating device (capable of raising the rope to the water surface) to the free end of the cable, to serve as a buoy marker for a sunken vehicle.

i. Position qualified personnel and adequate equipment near the crossing site to assist in recovering stalled or sunken vehicles.

j. If a vehicle is completely immobilized, but not sinking, the driver will place the controls in neutral, the driver and crew will climb out of the vehicle, stay on top with PFDs inflated, and await rescue. The crew should immediately evacuate a sinking vehicle.

k. If a vehicle is to swim a body of water during an exercise, "predip" it not more than 24 hours before the exercise. If any maintenance/repair procedure is performed on any portion of the vehicle, which provides floatation/water tight integrity, repeat the "predip."

H-3. The following procedures apply for personnel crossing streams where the current or depth of stream presents a possible drowning hazard.

a. Identify the weak and nonswimmers, before the training. Place weak and nonswimmers between strong swimmers for the water crossing.

b. Select a strong swimmer as the lead person to cross the body of water.

c. Place a cross-stream safety line of buoyant (3/8" or 1/2") material downstream and anchor, if necessary, according to width or current of stream.

d. Position a rescue boat equipped with life ring, safety line, and boat hook manned by two qualified lifeguards or strong swimmers (capable of saving possible drowning victims) downstream from the crossing site.

e. Limit nonbuoyant loads to be carried on person during crossing to 25 pounds and sling over one shoulder only during the actual crossing. Push or pull heavier loads across on lines and buoyant materials.

f. Use type I PFDs whenever fast or rough water conditions exist. Use type V PFDs in calm or slow water.

H-4. The following procedures apply to rafting and bridging operations.

a. All personnel involved in rafting or bridging operations will wear type I or V

PFDs. This includes safety personnel, erection crews, boat operators, and crews crossing on rafts. Dismount crews of vehicles crossing on rafts, issue them PFDs and walk them onto the raft. Dismounted crews will remain with their vehicles. All personnel except the driver will dismount when crossing completed bridging. Personnel crossing completed bridging do not require PFDs.

- b. At least one safety boat will be on site at all times.
- c. Do not operate a raft or boat immediately upstream of a floating bridge, anchor cable, pier, or other obstacle.
- d. Do not load river crossing equipment in excess of the capabilities published in appropriate field and technical manuals.
- e. Ensure lines to the powerboats, anchor lines, and shorelines are in good condition and are a minimum of 3/4 of an inch in diameter.
- f. Do not allow loose lines to trail in the water from the bridge, raft sections, or boats.
- g. Keep all lines neatly coiled and stowed when not in use.
- h. Do not cast off rafts until boat motors are running.
- i. Wheeled vehicles will have windows on both sides down while moving onto or off rafts. Tracked vehicles will have hatches open.
- j. Track commanders/squad leaders will take a head count of personnel upon boarding and exiting the raft.
- k. Personnel will not wear MOPP gear during rafting operations.
- l. Medics, with ambulance and resuscitation equipment, will be on site at all times.
- m. Rafting on debris-laden streams is extremely dangerous, because floating logs, trees, brush, and ice may puncture and sink pontoons or foul propellers. If possible, steer the raft to avoid debris. Station additional personnel equipped with boat hooks or axes, on all rafts in debris-laden streams, to push or cut debris from the raft. Outboard motor operators must be prepared to stop motors and change shear pins in the event propellers become fouled. Personnel will remain ready to cast anchors in case of motor failure.
- n. When loading vehicles, place them as far downstream on the deck as possible; this gives maximum freedom at the bow. After the completion of loading, you may cast loose the shorelines.

o. Driver responsibilities.

(1) Use vehicles' low gear. Engage all wheels on four wheel-drive vehicles while crossing bridges and rolling on/off of rafts.

(2) Drive vehicles on the raft slowly and steadily.

(3) Follow directions given by the OIC or the NCOIC of the raft.

(4) Leave brakes on and motor running at all times. Stay in the driver's seat.

(5) Start forward gently on signal from OIC or NCOIC at raft unloading point. Completely exit the area to allow all vehicles to clear raft rapidly.

(6) Crossing units have heavy recovery capability, on site, during the crossing. Ensure the recovery vehicle is one of the first vehicles to cross.

p. Use authorized signals per TM 5-210 in all operations. Post the signals in use at the operator's position, at signal control points, and at such other points as necessary to properly inform those concerned. Where manual (hand) signals are used, designate only one person to give the signals to the operator. Position this signalman clearly visible to the operator at all times. Use only fully qualified personnel as signalmen. Provide a signalman whenever the point of operation is not in full and direct view of the machine or equipment operator.

q. Make illumination equipment available for night operations. As a minimum, floodlights and flares on safety boats and vehicle lights on banks are required. Additionally, attach chemical illumination lights to all PFDs.

r. Rough water reduces load capacity of rafts and complicates handling. Operation of rafts in rough water requires additional precautions as follows:

(1) Never permit the initial load to be a capacity load. First cross a test load of half capacity to check that the equipment is operating properly. Repair any faulty equipment before continuing crossing operation.

(2) When using bridge-erecting boats, pull all lines taut with block and tackle or other mechanical means.

(3) Make allowances for reduced freeboard due to wave action.

(4) Type I or V PFDs must be worn.

s. Take the below actions following a sinking. Commanders will--

(1) Effect immediate rescue of personnel.

- (2) Recover the vehicle.
- (3) Impound the vehicle and place under guard.
- (4) Not change any control setting or otherwise alter the condition of the vehicle.
- (5) Complete a technical inspection in addition to other required investigations. Report equipment malfunctions.
- (6) Evacuate the vehicle to the appropriate facility at the completion of the investigations.
- (7) Have the maintenance unit refloat the vehicle using appropriate procedures and TMs before releasing the vehicle to the using unit.
- (8) Make appropriate accident reports in accordance with applicable accident reporting procedures.

APPENDIX I

PERSONAL PROTECTIVE EQUIPMENT CHECKLIST

- I-1.** Do supervisors provide PPE and training to all personnel in the use and maintenance of PPE?
- I-2.** Do supervisors ensure issued PPE are regularly maintained and properly stored?
- I-3.** Are the following personnel wearing safety eye wear?
- a. Welders/metal workers.
 - b. Painters/chippers/grinders.
 - c. Fuel handlers.
 - d. Maintenance workers.
 - e. Carpenters/woodworkers.
 - f. Tactical vehicle/heavy equipment operators.
 - g. Pest controllers.
 - h. Electricians.
 - i. Mechanics/repairmen.
 - j. Warehousemen.
- I-4.** Are workers requiring corrective safety lenses scheduled for examination with MEDDAC?
- I-5.** Do the following personnel wear safety footwear?
- a. Electrical workers.
 - b. Mechanics (all).
 - c. Carpenters.
 - d. Heavy equipment operators.
 - e. Warehouse workers.

- I-6.** Do all PPE used, meet NIOSH, ANSI, and/or MSA standards?
- I-7.** Is there an established written policy for requisitioning PPE?
- I-8.** Do industrial hygiene or safety personnel evaluate the workplace to determine required PPE at the request of commander/supervisor?
- I-9.** Does the supervisor enforce use of issued PPE, by personnel, and written policies support this requirement?
- I-10.** Are PPE use requirement is in job descriptions and listed as a condition of employment?
- I-11.** Is PPE maintained and stored in a clean and serviceable condition?
- I-12.** Where feasible, are hazards eliminated, through engineering or management controls, before PPE issued?
- I-13.** Are personnel advised of job hazards, required PPE, and their limitations?
- I-14.** Does supervisor maintain training records IAW AR 25-400-2?
- I-15.** Do eye protectors conform to ANSI Z87.1-1987 and the following performance standards?
 - a. Provide adequate protection against the particular hazards of the workplace.
 - b. Fit properly and cause minimal discomfort.
 - c. Are durable, easily cleaned, and labeled.
- I-16.** Are contact lenses worn in conjunction with safety goggles or face shields in designated eye hazard operations?
- I-17.** Are unvented safety goggles used in high dust and chemical vapor operations?
- I-18.** Are only plastic frames used in electrical/electronic and flammable/explosive operations?
- I-19.** When the entire face needs protection from metal sparks, chemical splash, etc., are face shields used?
- I-20.** Is welding shield headgear kept clean, correct filter lenses installed, and cover plates changed/maintained?
- I-21.** Does head protection conforms to ANSI standards and the following performance

requirements?

- a. Constructed of lightweight, nonconductive, fire and water-resistant material.
- b. Issued to and used by personnel in designated job descriptions and operations to protect from electrical, bump, and falling object hazards.
- c. Meet ANSI Z89.1, class A and Z89.2, class B standards when used in electrical hazard areas.
- d. Hat/cap suspension units showing evidence of cracks, tears, frays, or other signs of deterioration are replaced.
- e. Hats/caps with cracks of any size are replaced.

I-22. Does foot protection conform to ANSI Z41.1, 1987 standards and the following performance requirements?

- a. Issued to and used by personnel in designated job descriptions and operations to protect from falling objects hazards.
- b. Requirements for nonconductive, nonsparking, or nonskid soles are considered when selecting foot protection for use in electrical, chemical, or slip hazard sites.
- c. Conductive shoes for explosive items are cleaned and tested annually and personnel are not permitted to wear wool, silk, nylon, or rayon socks/hose with shoes.

I-23. Is appropriate apparel worn for protection from heat, chemicals, or similar hazards, specifically?

- a. Boots of rubber, vinyl, plastic or other synthetic material provided for personnel working in wet processes.
- b. Rubber or synthetic coveralls/aprons provided for protection against corrosives.
- c. Specific flame retardant clothing provided for protection in hot work operations such as welding.
- d. Rubber or synthetic gloves provided for protection against the harmful effects of solvents, corrosives, and other workplace chemicals.
- e. Gloves are intact and checked/tested before use. Electricians' gloves must be nonconductive and tested every 3 months.

I-24. Is light-reflecting material worn on clothing for better visibility during roadwork and after dark?

I-25. Are approved safety belts, harnesses, and climbing equipment, with lifelines, available and used for--

- a. Work in high places where an employee can fall 6 feet or more.
- b. Confined spaces.

I-26. Are harnesses, belts, and lifelines rated with 5,400 pound breaking strength?

APPENDIX J

OPERATIONS REQUIRING PERSONAL PROTECTIVE EQUIPMENT

J-1. RECEIVING AND LOADING OPERATIONS.

a. Mandatory PPE.

(1) Safety shoes.

(2) Leather gloves.

b. Conditionally Mandatory PPE.

(1) Hard hat (in designated hard hat areas and when in the proximity of overhead operations).

(2) Safety glasses (in designated eye hazard area, removing, banding, dusty conditions).

(3) Hearing protection (when operating or working near labeled noise hazard equipment).

J-2. WAREHOUSING OPERATIONS. Same requirements as paragraph 1.

J-3. HEAVY EQUIPMENT AND FORKLIFT OPERATIONS.

a. Mandatory PPE.

(1) Safety shoes.

(2) Hard hats.

(3) Safety glasses.

b. Conditionally Mandatory PPE. Hearing protection when operating labeled, noise hazard equipment.

J-4. HAND-HELD/STATIONARY POWER TOOLS.

a. Mandatory PPE.

(1) Safety shoes.

(2) Safety glasses/shield.

b. Conditionally Mandatory PPE.

(1) Hard hats (in designated areas or in proximity of overhead operations).

(2) Hearing protection (when operating labeled, noise hazard equipment).

J-5. SOLVENT CLEANING/PAINTING (SPRAY AND BRUSH) OPERATIONS.

a. Respirator (when spraying/brushing solvent base paints in unventilated shops as recommended by MEDDAC Preventive Medicine).

b. Hearing protection (in designated noise hazard areas).

c. Hard hats (in designated hard hat areas or when working in proximity of overhead operations).

d. Face shield (when there is potential for splashing or spraying).

e. Gloves, solvent resistant (when handling liquids).

J-6. GRINDING OPERATIONS.

a. Mandatory PPE. Safety glasses or face shields with safety goggles/glasses.

b. Conditionally Mandatory PPE. Hearing protection (in designated noise hazard areas and when working with equipment labeled "noise hazard").

J-7. BATTERY (ACID) CHARGING/HANDLING OPERATIONS. Mandatory PPE.

a. Face shield with chemical goggles.

b. Apron, rubber.

c. Gloves, rubber.

d. Rubber safety shoes or rubber overshoes over safety shoes.

J-8. WELDING, BRAZING, AND GAS CUTTING OPERATIONS. Mandatory PPE.

a. Apron, leather.

b. Leggings, leather.

c. Sleeves, leather.

d. Gloves, leather.

- e. Goggles/helmet, welders impact resistant with shaded lens.
- f. Safety shoes.
- g. Respirator with fume filter.

J-9. NONLEAKING HAZARDOUS MATERIAL AND WASTE OPERATIONS.

a. Mandatory PPE.

- (1) Gloves, leather (chemical resistant if containers are in poor condition).
- (2) Safety shoes.
- (3) Coveralls.

b. Conditionally Mandatory PPE.

- (1) Goggles/face shield when handling corrosives.
- (2) Hard hat (in designated hard hat areas or when working in proximity of overhead operations).
- (3) Hearing protection (when working in proximity of equipment labeled "noise hazard").

J-10. DESIGNATED CONFINED SPACE OPERATIONS.

a. Mandatory PPE.

- (1) Safety harness and lifeline.
- (2) Hard hat.

b. Conditionally Mandatory PPE.

- (1) Respiratory protection (determined by RACH Preventive Medicine).
- (2) Eye protection (in dust, mist, and vapor-contaminated atmospheres).
- (3) Hearing protection.
- (4) Gloves.
- (5) Body protection.

J-11. ASBESTOS HANDLING/REMOVAL OPERATIONS. Check with MEDDAC Preventive Medicine and DPW for mandatory EPA certified training requirements.

J-12. HAZARDOUS MATERIAL SPILL RESPONSE/CONTAINMENT/CLEANUP OPERATIONS.

a. Mandatory PPE (known exposure level). Level B consists of SCBA with full-face mask, chemical resistant outerwear, gloves, foot cover, and gloves.

b. Mandatory PPE (unknown exposure level). Level A consists of SCBA and fully encapsulating chemical resistant suit.

NOTE: Only personnel that are designated, as a spill team member will participate in the operation. They must have received mandatory OSHA certified training and be certified.

J-14. MEAT CUTTING OPERATIONS.

- a. Eye/face protection when operating machinery.
- b. Gloves or knife protection bandage.
- c. Shoes and rubber overshoes.
- d. Cold climate clothing.
- e. Apron.
- f. Hearing protection.

J-15. GENERAL GROUND/LAWN MAINTENANCE WORKERS.

- a. Hearing protection.
- b. Foot protection.
- c. Hand protection.
- d. Head protection.
- e. Long pants.
- f. Eye protection.
- g. Reflective Vest when working near traffic or roadways.

J-16. VEHICLE MAINTENANCE WORKERS.

- a. Safety shoes.
- b. Gloves, as needed.
- c. Coveralls.
- d. Hearing protection.

J-17. OTHER SHOP MEMBERS.

- a. Ear protection.
- b. Eye protection.
- c. Face protection.

APPENDIX K

WATER SURVIVAL TRAINING

K-1. PURPOSE. To prepare soldiers for water hazards they may encounter throughout their training and combat, water survival training has been developed. This appendix is divided into two sections, Drown proofing and Water Survival Techniques.

K-2. TRAINING.

a. Panic in water is the primary cause of drowning. Water survival training provides soldiers with the confidence and skills necessary to survive in the water. The following priority or order of training is recommended:

(1) Drown proof training conditions individuals to avoid panic and to survive in the water. Both swimmers and nonswimmers can learn the techniques. The process is approximately 10 percent physical and 90 percent mental.

(2) Expedient floatation devices.

(3) Water survival techniques.

b. This instruction is for all soldiers regardless of unit, mission, or MOS.

c. Use an indoor or outdoor pool. Provide an instructional area for initial orientation and instruction.

K-3. EQUIPMENT. Equipment requirements include swimming apparel, water safety equipment, and instructional equipment. In some cases, Battle Dress Uniforms (BDUs) are required.

SECTION I

K-4. DROWN PROOFING-AN INTRODUCTION. Drown proofing is a method of water survival based on simple skills and attitudes. Conservation of energy and relaxation until help arrives or until the soldier can work his or her way to safety are the primary objectives. Fear, panic, and exhaustion are avoided by training the soldier to relax and float just under the surface of the water, instead of wasting energy in keeping part of the body afloat above the surface. Normally, the body is kept at rest just under the water with momentary surfacing of the head for air. If forward movement is desired, it takes place just under the water and is slow and deliberate.

K-5. ABILITY TO SURVIVE IN WATER.

a. Panic. Panic in the water may occur from falling into deep water unexpectedly. Panic most likely will occur when under fire while in the water being dragged underwater

by weight of a pack or heavy load, grasped by a nonswimmer and dragged underwater, or taking water into the throat or nose that results in coughing and choking.

(1) Choking. When practicing air exchanges, some soldiers may experience choking. To avoid this, ensure that the teeth are together and the lips are closed while the mouth is underwater. Remember to exhale through the nose by blowing out.

(2) Coughing. If a soldier chokes, he/she must cough to clear the airway. Place the face down into the water and cough downward. Once the throat is clear, continue the air exchange.

b. Muscle Cramps. A cramp itself is not serious, but when it occurs in water, the soldier may panic. A cramp in the calf of the leg can be overcome by raising the toes, forcing the heel downward, and holding the foot down until the cramp stops.

c. Skills. The two basic skills in drown proofing for swimmers and nonswimmers are air exchange and the travel stroke. Two additional skills are the hanging float and the vertical float.

d. Air Exchange. Air exchange is the most important part of drown proofing. It enables the soldier to resupply his/her lungs with air. About 70 percent of the air is exhaled under the surface of the water through the nose as the soldier raises his/her head out of the water. When the head clears the surface, the other 30 percent of air is exhaled. Once all the air has been exhaled, open the mouth wide and fill the lungs with air. Most soldiers will float with their lungs full of air and will sink when their lungs empty of air. Most people drown after a prolonged time in the water because they try to support their head out of the water by using their arms and legs. This movement of the arms and legs will eventually exhaust the individual, and he/she will drown. The air in the lungs provides buoyancy. Store the air in the lungs not in the mouth.

e. Travel Stroke. The travel stroke is designed for people who cannot float. The five steps in the travel stroke are described below. Remember that each step is completed in sequence without pause between steps. To start the travel stroke, the soldier must be in the rest position: face down in the water, arms along the side of the body, feet together, lying horizontal in the water.

(1) Step one-prepare to breathe. Move the hands up along the sides of the body and across in front of the forehead, palms down. At the same time, spread the legs scissor-fashion in preparation for a kick.

(2) Step two-kick and exhale. Kick the feet together while exhaling through the nose and rotate the head slowly out of the water.

(3) Step three-stroke and inhale. Execute a heart shaped stroke, bringing the hands back in front of the chest. At the same time, inhale through the mouth, rotate the head back in the water slowly and spread the legs for another kick.

(4) Step four-kick and level. Extend the hands out in front of the body and, at the same time, kick the feet together.

(5) Step five-stroke and glide. Pull the hands to the side and propel the body in a glide through the water. During the glide, the body is at rest. Stay in this position until the feet drop under the body, or until another breath of air is required, then repeat the process.

f. Hanging Float. Natural floaters use the hanging float to survive in water. The hanging float has four steps. The start position is the rest position, which is hanging face down in the water. The air exchange is the same as used in the travel stroke.

(1) Step one-prepare to breathe. Move the hands up along the legs and across in front of the forehead. At the same time, spread the legs for a kick.

(2) Step two-kick and exhale. Kick the feet together while exhaling through the nose, and rotate the head out of the water.

(3) Step three-stroke and exhale. Stroke the hands from in front of the face out to the side and inhale at the same time.

(4) Step four-second stroke. Having inhaled a breath of air, rotate the face down into the water and stroke by dropping the arms down in front of the body and clapping the hands. Then relax and remain hanging until another breath of air is needed.

g. Vertical Float. The final technique is the vertical float. The rest position for the vertical float is a relaxed vertical position in the water, head and eyes to the front. There are four steps to the vertical float.

(1) Step one-prepare to breathe. Move the hands along the sides of the body to armpit height and extend the arms straight out to the side. At the same time, spread the legs for a kick.

(2) Step two-kick and exhale. Kick the legs together and, at the same time, exhale through the nose.

(3) Step three-stroke and inhale. Stroke the hands down to the sides of the body while inhaling through the mouth.

(4) Step four-second stroke. Bring the hands up in front of the chest, palms down, and then push down, extending the arms out far enough to stop the downward movement of the body. Then relax, return the hands to the sides, and remain in the rest position until there is need for another breath of air.

h. Preparation for Implementing Training. To conduct drown proof training,

consider the following:

- (1) Drown proofing should be performance-oriented and include a proficiency test.
- (2) Provide a swimming area. An Olympic-size pool (25 by 50 meters) is ideal. Divide the swimming area into three sections.
- (3) Provide necessary safety, pool, and uniform items for soldiers. Morale Support Services should furnish the pool equipment.
- (4) Ensure sufficient qualified instructors are available. Instructors should be strong swimmers who have mastered the water survival techniques.
- (5) Provide remedial instruction for soldiers who fail to qualify or did not receive initial instruction.
- (6) Close coordination between the unit and Morale Support Services personnel is necessary to comply with local regulations regarding equipment (fatigues/weapons) to be used in the pool.

i. Methods of Entry into Water. Following orientation, the first thing to be taught in the pool is proper entry into the water. There are two methods of entry into the pool: a sitting and a standing method.

(1) Sitting. Soldiers sit on the edge of the swimming area and scoop water over their bodies to become accustomed to the water temperature. On the command PREPARE TO ENTER WATER, grasp the gutter edge with both hands on one side of the body next to the leg. On the command ENTER WATER, rotate and lower the body into the pool, feet first, so the front of the body faces the wall of the pool (maintain a grip on the pool edge). Raise the feet against the pool wall at approximately 45 degrees with feet shoulder-width apart, keeping the arms straight and on top of the water.

(2) Standing. Later in training, soldiers stand on the deck at the edge of the pool facing the water. On the command PREPARE TO ENTER WATER, the arms are raised straight above the head, and feet are together. On the command ENTER WATER, a feet-first jump into the water is executed, with the body in a vertical position. The soldier then comes to the surface and performs the assigned task.

j. Pool Organization. Establish three stations at the pool. Divide soldiers divided according to swimming and floating ability and instruct accordingly at these three stations. The stations are as follows:

- (1) Station 1, in the deep end of the pool, for swimmers who are also floaters.
- (2) Station 2, in the center section of the pool, for swimmers who are nonfloaters or weak swimmers.

(3) Station 3, in the shallow end of the pool, for nonswimmers. (At the beginning, the nonswimmers are asked to raise their hand. Move these soldiers to station 3, which establishes this station.)

k. Float and Swim Tests. Retain soldiers who can swim at the deep end of the pool. Test these soldiers to measure their ability for purposes of assignment to stations.

(1) Float Test. While in the water, tell soldiers to face the edge of the pool, grasp the gutter edge, and brace their toes against the pool wall. Each soldier, on the instructor's command, is to inhale (fill the lungs), put his/her face in the water and have just the fingertips on the gutter edge to provide balance. The soldier then slowly releases the edge, one hand at a time, thus ending in a dead float. If the soldier sinks, test him/her again. If he/she sinks again, send him/her to station 2. (This action of separating nonfloaters activates station 2.)

(2) Swim Test. Immediately following the float test, tell each soldier to let go of the pool edge, move out in the clear (not beyond the reach of a safety pole), and swim a few strokes so that the assistant instructor can judge his/her swimming ability. Send those soldiers who show they cannot swim to station 3; send weak swimmers and strong swimmers who cannot float to station 2; and retain swimmers who pass the float and swim tests at station 1.

(3) Dry-Land Drill. Dry-land drill is a method of teaching the sequence of steps contained in the air exchange, travel stroke, hanging float, and vertical float. The instructor demonstrates and then leads the group through the sequence; first by the numbers several times, and then at normal speed (for drown proofing, normal speed is slow). Once the soldier learns air exchange, it then becomes part of the travel stroke, hanging float, and vertical float, and the soldier can practice as part of these skills. An example of using dry-land drill in teaching the air exchange follows:

(a) Air exchange. Start position. Feet spread laterally, trunk at right angle to the floor, hands on knees, neck relaxed with head down.

(b) Speed of action. Slow.

(c) Movement. A three-count action.

(1) ONE. EXHALE. Soldier begins blowing air through his/her nose with the mouth shut while raising his/her head out of the water. Time the blowout so that the soldier exhales approximately 70 percent of the air by the time he/she raises his/her head out of the water, then the soldier should exhale the remaining 30 percent in order to blow any remaining water out of his/her nose.

(2) TWO. INHALE. Soldier opens his/hers mouth wide and inhales deeply, then closes his/her mouth, and hold his/her breath.

(3) THREE. REST. Soldier slowly lower his/her head until it is completely down and relaxed, and continues to hold his/her breath. NOTE: If you are not going to repeat the drill, give the command RELAX, and have soldiers assume the erect position. To repeat the drill, command ONE-EXHALE, thus starting the sequence again.

(d) Use of air exchange. Air exchange is used in the travel stroke, hanging float, and vertical float. Do not count the three air-exchange steps separately but integrated them into various steps of the travel stroke and the two floats. Each stroke starts and ends at a rest position. Remember, rest between strokes.

(e) Training at Stations.

STATION 1. Practice the travel stroke, hanging float, or vertical float by the numbers during the dry-land drill until there is no confusion of the sequence. Then, put four to six soldiers in the water at one time to practice. On command, soldiers jump in feet first with arms overhead. They surface and execute the specified skill across the pool, then exit the water. As soon as the first group of soldiers is halfway across, put the next group in the water. Give each soldier two opportunities to practice the designated skill across the pool; return to dry-land drill to correct errors and practice; then return to the pool for more practice across the pool. As proficiency increases, you can eliminate the dry-land drill. When the three skills are learned, conduct stay afloat practice by having all soldiers enter the water and slowly execute the travel stroke, hanging float, and vertical float in any proportion and in any sequence selected by the soldiers. Do not allow soldiers to rest by holding to the pool edge, nor should they attempt to rest by treading water, as such action is tiring. Treading water is not permitted in the 30-minute test; so do not permit it during practice. Encourage soldiers to use one or both floats most of the time and to use the travel stroke to avoid boredom. Do not force soldiers to stay in the water, and carefully supervise and monitor this practice in order to avoid accidents; however, encourage and motivate soldiers to remain in the water for the allotted time. During combat, soldiers may retain an item of equipment during unexpected entry into the water. You can secure a line to any item of equipment and form a loop at the other end of the line for placement about the neck. The item then trails just below the individual during the travel stroke. Use rifles with slings, or ropes to serve as slings, to practice the 75-meter travel-stroke test at station 1.

STATION 2. Use the same general procedure as described in practice of skills at station 1. During practice in the water, change the procedure to place two to three soldiers in the water at one time, and have soldiers attempt to travel stroke across the pool. Maintain a dry-land practice group throughout the period. When it is a soldier's turn to enter the water, he/she leaves the group, travel strokes across the pool, walks around the deck to the dry-land drill group, and rejoins that practice until his/her turn comes again to practice in the water. This rotation continues until other action is directed. The station primary instructor controls the rotation and starts soldiers from one side of the pool. Station an assistant instructor on the opposite side of the pool on

the platform and have the third assistant instructor instruct the dry-land drill.

STATION 3. Progressively introduce soldiers at station 3 to the water to overcome fear. The following progression and techniques are used initially at station 3:
ORIENTATION: WE WILL DIVIDE INTO GROUPS OF 8 TO 10 SOLDIERS WITH ONE ASSISTANT INSTRUCTOR IN CHARGE OF EACH GROUP. AFTER DIVIDING INTO GROUPS, WE WILL PERFORM SEVERAL DRILLS THAT ARE INTENDED TO ACCUSTOM YOU TO PUTTING YOUR FACE UNDER WATER AND TO TEACH YOU BASIC TECHNIQUES. Each assistant instructor leads his/her group into shallow water (teach sitting method of pool entry) and has the soldiers form a circle around him/her. At this time, the assistant instructor begins instructing his/her group.

(f) Instruction and practice exercise. Each group instructor explains how to hold the breath, to include reasons, and how to place the face under water (not the ears) with eyes closed: LEAN FORWARD, PLACE YOUR HANDS ON YOUR KNEES, BEND FORWARD AT THE WAIST, AND PLACE HEAD INTO THE WATER UP TO YOUR EARS. After several trials, repeat, but this time have the soldiers open their eyes after placing their faces in the water. Repeat several times. Finally, have the soldiers' place their faces into the water until their ears are underwater, with eyes open, and practice several times. The soldier then exits the water for air-exchange instruction and dry-land drill.

NOTE: In holding the breath, the soldier closes his/her mouth without tightness and refrains from breathing in through his/her nose. Holding her/her breath establishes a counter pressure inside his/her head; the air thus retained forms a block to water entering the nose.

(g) Air exchange for nonswimmers. Following instruction and dry-land drill in air exchange, soldiers enter the pool and demonstrate the air exchange drill. Soldiers then place their hands on their knees and slowly lower their heads into the water. Each soldier raises his/her head when he/she needs a breath of air, exchanges the air, and again puts his/her head under. Help soldiers who show nervousness and when all soldiers are confident and have learned air exchange, move instruction to the next phase.

(h) Glide. This training is to provide nonswimmers with the feel of moving through shallow (4 to 5 foot deep) water with their feet off the bottom of the pool. The soldier pushes off with his/her feet, from the side of the pool, with face down and arms extended to the front, ride the glide out with head underwater, and then stands up. He/she regains a standing position by sweeping the hands forcefully to the rear and, at the same time, bending at the waist, bringing his/her legs under his/her body. Each soldier within the group glides in turn individually while the group observes and the instructor critiques.

(i) Scissors kick. Teach all nonswimmers to kick properly. Identify and instruct soldiers who have not learned proper kicking in this skill. Instruct soldiers to hold on to

the gutter edge of the pool with the body face down and extend their body out in the water. In this extended position, lower one leg in the water 18 to 24 inches with knee straight. From this position, kick the lower leg upward and bring alongside the top leg. (Assistant instructors should assist soldiers who initially cannot hold the body horizontal by holding their body up at the hip area.)

(j) Travel stroke. Learning air exchange, the glide, and proper kicking leads to practice in putting all of these skills together in order to do the travel stroke. Dry-land drill should come before practice in the water. Following water practice, it is necessary to return to dry-land drill. In fact, alternate periods of dry-land drill and water practice causes the fastest learning. However, the proportion of water practice time should be greater than that of dry-land drill.

(k) Qualification testing. Some soldiers are tested in the next-to-last period and the remainder during the last period. Soldiers at station 1 may qualify as--

1 Drown proof advance. To qualify in this category, soldiers must--

(aa) Enter the water in fatigues (no boots) and stay afloat using any combination of the travel stroke, hanging float, or vertical float for a 30-minute period without touching the bottom or sides of the pool.

(ab) Jump into the water from the side of the pool in fatigues and with rifle, and travel stroke 75 yards without touching the bottom or sides of the pool, towing the rifle suspended by the sling.

(ac) Drown proof beginner. Soldiers at station 2, and those at station 3 who progress to this skill level, must enter the water in swim trunks and travel stroke 75 yards without touching the sides or bottom of the pool.

(ad) Unqualified. This category includes those soldiers who fail to qualify.

(l) Administration of tests. Administer performance testing as follows.

1 Soldiers at station 2 can qualify only in their ability to travel stroke. This limitation is due to their inability to float. These soldiers have only one of the three-drown proofing strokes to learn. As a result of passing the 75-meter travel-stroke test, these soldiers are qualified as drown proof beginners.

2 Test soldiers at station 1 on their ability to stay afloat for 30 minutes without touching the sides or bottom of the pool, using any combination of the hanging float, vertical float, or travel stroke, and on their ability to travel stroke 75 meters with rifle, using only the travel stroke. Passing of these two tests results in an advanced drown proof rating.

(m) Safety and Sanitation. Instruction in and around the water with large groups

of soldiers always presents a safety and sanitation problem. Exercise a high degree of discipline and control at all times. Instructors will fully inform soldiers concerning the rules in effect at the pool. Inform soldiers of the safety regulations during initial instruction and remind them of these rules prior to entry into the water during each pool period.

(n) Administration. Scheduling of drown proofing periods of instruction is limited by two factors: pool availability and instructor availability. The number of personnel being will also influence scheduling. In addition, consider the following:

1 Classroom and pool procedure.

(aa) Unit supervision. Unit leaders should accompany their soldiers to all periods of instruction. These leaders will supervise attendance and discipline, and assist instructors with control during the instruction.

(ab) Uniform. Soldiers are to bring to pool periods, a towel, issue PT shorts, athletic supporter/swimsuit, and issue web trousers belt and buckle.

(ac) Valuables. Do **not** bring to the pool.

(ad) Supervision. Instructors assume control of the class, cover safety procedures, and direct soldiers to the proper area for instruction.

2 Awards. The use of an award is recommended as a motivational device. Individuals will make an extra effort for the good of their unit. A company guidon streamer is recommended. Locally produce and award such streamers. Considering the percentage of soldiers who are nonswimmers or very weak swimmers, at the outset of the instruction, and the short duration of the block of instruction, establish a company average qualification (a combination of DPAs and DPBs) totaling 72 percent as the minimum percentage for earning the award. In some military situations where this instruction has been conducted, the company qualification rate has varied from 65 to 95 percent. Conditions, which affect this rate, are the percentage of nonswimmers, the quality of instruction, command emphasis, and company spirit.

(o) Support Requirements. Personnel, facilities, equipment, and training aids required in order to effectively conduct this training are as follows:

1 Instructors. Officers and NCOs who are qualified as instructors and who are strong swimmers. There will be one team chief to organize and supervise the training; instructors for stations 1, 2, and 3.

2 Swimming facilities.

(aa) Indoor pool. Heat the water and air. The pool should be 25 to 50 meters long. If existing pools are not of that size, in all probability you can use them. If there is

a choice, select the larger pool.

(ab) Outdoor pool. It is not recommended that training be held in outdoor facilities other than in the summer, and do not attempt outdoor training other than in established swimming pools. Dressing facilities are required where soldiers can change clothes and take showers. Dressing rooms must accommodate soldiers. Security of personal valuables is not required, instruct soldiers to leave such items in the unit area.

3 Equipment. Equipment is necessary for the pool, classroom, and individual soldiers. Morale Service Support pools have some of the required equipment. Additional pool items must be available, which are not used in the normal swimming program. Some of these items may be present, but normally, the quantity on hand is not adequate for drown proofing instruction.

4 Pool maintenance. Because of the student time in the water, it is advisable to maintain the temperature of the pool at 85 to 90 degrees F. This temperature range shows no increase in the bacteria count.

SECTION II

K-6. EXPEDIENT FLOATATION DEVICES.

a. Use of BDU as Floatation Device. You may use the BDU shirt and trousers to trap air and serve as a means of keeping the soldier afloat.

(1) Battle dress shirt. Soldier is out of water. Button the shirt except for the top button. Then tie each sleeve in a knot. Place the shirt buttons against the chest and button the top button around the neck, tucking the collar under. Grasp the shirt with the hands at each side, lock the elbows, and jump into the water. Do not expect to remain above the surface of the water when jumping. Maintain a grasp on the bottom of the shirt; float back to the surface. Once you have reached the surface, pull the bottom of the shirt across your to seal off escape of the air, lay your head back and float.

(2) Soldier in water. Another method of filling the shirt with air is used, when in the water. Fill the shirt with air by hand scooping the air into the shirt. To use this method, raise the bottom of the shirt straight away from your body about 3 inches under the surface of the water. Use the free hand, in a downward, scooping action into the water, to force air bubbles into the shirt. Once the shirt is again inflated, pull the bottom of the shirt across your thighs to seal off escape of air, and relax.

(3) Battle dress trousers. Soldier is out of water. Tie the trouser legs together in a knot and place the knot over the head with the button fly towards the body. Close the fly; however, if it is open the trouser will still float. As with the shirt, grasp the waistline of the trousers with your hands at each side, lock your elbows, and jump into the water. After floating back to the surface, draw the waistband across your thighs to seal in the air.

(4) Soldier in water. When the soldier is in the water, there are three methods of filling the trousers with air.

(a) The first method is to lay the trousers on the water, open the waistband, hold it beneath the surface, and use the handscoop technique (as used with the shirt) to scoop air into the trousers.

(b) The second method is to hold the waistband open, put the knot over one shoulder and, grasping both sides of the waistband, flip the trousers into the air and back into the water. Then seal the opening against the thighs.

(c) The third method is to hold the waistband beneath the surface, inhale a large breath of air, submerge beneath the trousers, and exhale the air into the trousers. Do this several times and the trousers will be filled with air. Clothes must be wet. Clothes should be wet prior to entering the water. As clothing dries, air will leak out. Splashing water on the clothes periodically is necessary to prevent loss of air.

(5) Inflation of Clothing. For instructional purposes, you can establish a station where soldiers may practice inflation of either the shirt or the trousers, using each method. Conduct this practice by having soldiers place the knotted BDU trousers around their necks. The first soldiers grasp their trousers and jump into the water. When they float to the surface, they seal off the air and float for a short period. Then they receive instructions to inflate the BDUs using the hand scoop method. When they complete the exercise, the soldiers exit the water and stand by. Then, instruct the next group of three to enter the water and to follow the same procedure as the first group. Continue training groups of threes until all soldiers have completed the exercise.

K-7. WATER SURVIVAL TECHNIQUES.

a. General. The objective of water survival techniques is to teach soldiers, when around water, to take immediate action when they enter the water unexpectedly; proper removal of equipment and clothing; the utilization of clothing as expedient-floatation devices; and a review of artificial respiration.

b. Unexpected Entry into Water. There are many occasions during combat operations when the soldier may enter deep water unexpectedly. This dangerous situation may result from falling from a boat or the boat capsizing; stepping into water over one's head during a stream-fording operation of a beach landing; falling from a bridge or log crossing; and many other ways. To counter the tendency to panic and sink, train soldiers to take the following actions:

(1) Remain calm and composed. Hold your breath, remain composed, open your eyes, conserve strength, assess the situation, and immediately begin to get out of equipment. Panic and improper breathing techniques are dominant causes of drowning. The individual must overcome the natural tendency to panic when entering

the water with equipment. A composed soldier should have complete control of his/her faculties. His/her breathing should be done by taking a "bite" of air and developing a rhythm, thus breathing through the mouth and exhaling through the nose. Soldiers learn this technique during drown proof training. Ensure soldiers are aware that there are generally two types of panic. In the first type, the individual loses control, struggles, gasps, expends energy, and finally drowns. In the second type, the individual simply gives up and drowns without even shouting for help.

(2) Removal of equipment. For safety, wear the uniform properly when operating near water. Brief soldiers on how to wear clothing when operating in swamps or near any body of water. The accepted procedure is as follows:

(a) Trousers unbloused. Bloused trousers tend to fill with air and create difficulty for the swimmer in water movement, as the air caught in the trouser legs tends to keep the soldier's legs too high in the water.

(b) Field jacket and/or BDU shirt (buttoned up) outside of trousers. These two articles of clothing are worn in this manner in order that they may catch and hold air. This trapped air will make floating much easier and help keep the soldier above the surface. A floatation demonstration will illustrate the air-catching ability of the clothing. The demonstration utilizes clothing and equipment, but no weapon.

(c) Harness worn loosely. For safety, the harness is unbuckled at the waist. It is extremely difficult to remove a buckled harness in water. Thus, the soldier wears the harness loosely, in the event he/she should unexpectedly encounter a water hazard. In addition to his/her general clothing, BDUs, boots, and socks, the soldier would normally be wearing the standard Army harness and ammunition pouches and first aid pouch attached. The wearing of the field pack would normally add unwanted weight. Actually, the field pack may tend to be an asset to the swimmer since its added floatation can help keep him above the surface. The wearing of a helmet would make it necessary to unbuckle the chinstrap while in and around water in order to quickly dispose of it should there be unexpected entry into the water. To restate, rig the equipment as follows:

- 1 Harness and chinstrap open.
 - 2 Top shirt button buttoned and shirt outside the trousers.
 - 3 Trousers unbloused.
 - 4 Weapon slung over the shoulder or held at high port when entering the water.
- d. Establish stations so that soldiers can practice removal of their equipment.

Station 1 At this station, rig the soldier's equipment for river crossing; that is, with harness open, top shirt button buttoned, shirt on the outside of trousers, trousers unbloused, and rifle attached to the harness and over his/her

shoulder. Attach the weapon to the harness by looping the harness strap of the ammunition pouch around the sling of the weapon and fastening the strap to the metal ring at the shoulder junction of the harness. The soldier enters the water backward, surfaces, composes himself, submerges, removes his/her harness, and swims to the nearest edge. For the purpose of recovering the harness and weapon, attach a line with a snap link at the end to the harness have the next soldier in line hold it. After the soldier in the water has removed his/her harness, the soldier holding the line pulls in the equipment.

Station 2 At this station, the soldier enters the water blindfolded off a high board. This gives him/her a surprise falling effect, such as he/she would have at night falling off a riverbank, out of a boat, or in similar situations of sudden and unexpected entry into water. At this station, there are two assistant instructors: one on the ground helping the soldier up the ladder and then rating him/her in the water, and one on the stationary end of the diving board to guide the blindfolded soldier out along the board until he/she steps off. The instructor on the ground issues the mask or blindfold and emphasizes to each soldier before he goes up the ladder the importance of keeping his/her weapon at port arms and well away from his/her body when making the jump. This reduces the possibility of the force of the water pushing the weapon into the soldier's face. The soldier must surface, compose himself/herself, remove the blindfold, and swim to edge of the pool. He/she must control his/her breathing under this type of surprise condition. Although clothing need not be a hindrance to remaining afloat or moving by use of the travel stroke, remove heavy clothing. Removal of excess clothing can, best, be accomplished by holding your breath, submerging, and removing the unwanted item(s). Remove heavy footgear. The proper method of removal is to assume the hanging float, untie and loosen the shoelaces or other fasteners, and remove the footgear. During the removal process, the soldier may need to come up for air several times.

K-8. FACTORS AFFECTING ABILITY IN THE WATER. The ability of a good swimmer to swim or travel stroke, a specific distance, depends upon a number of factors. Bad weather, rough water, and strong currents all reduce the ability of a good swimmer. Consider these factors during the conduct of operations involving bodies of water.

SUGGESTED IMPROVEMENTS. The proponent of this regulation is the Installation Branch Safety Office (IBSO), USAFACFS. Customers may send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) through channels to Commander, USAFACFS, ATTN: IMSW-SIL-SO Fort Sill, OK 73503-5100.

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