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13. ABSTRACT *(Maximum 200 words)*
THIS DOCUMENT DESCRIBES THE GENERAL RULES OF RMA FOR THE PREVENTION OF ACCIDENTS INVOLVING PERSONNEL, EQUIPMENT, AND PROPERTY. THERE ARE SECTIONS ON THE FOLLOWING:

1. INSPECTIONS
2. SAFETY PROCEDURES
3. PROTECTIVE CLOTHING
4. TRAINING.

14. SUBJECT TERMS
PROTECTION, CLOTHING, INSPECTION

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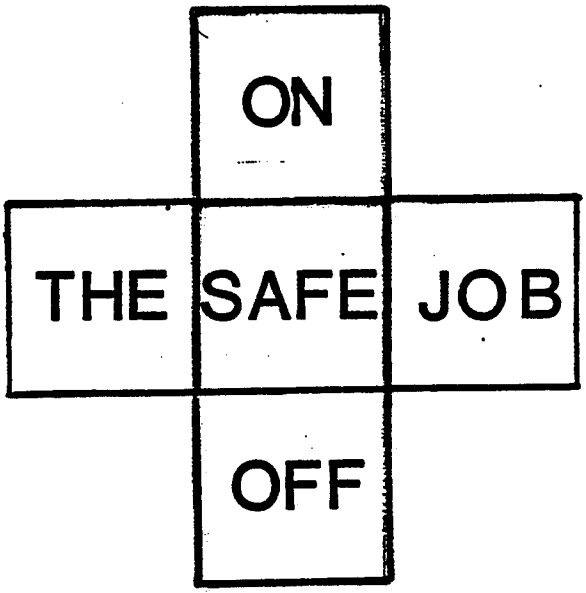

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DA, ROCKY MOUNTAIN ARSENAL

MAY 1983

DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
Commerce City, Colorado 80022

RMA PAMPHLET
No. 385-1

2 May 1983

SAFETY PROGRAM

MASTER ACCIDENT PREVENTION

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

CHAPTER 1

Introduction

1-1. Purpose. This Safety Pamphlet prescribes the general rules of the Rocky Mountain Arsenal for the prevention of accidents involving personnel, equipment, or property, whether they occur on or off the Arsenal. The Pamphlet is intended to augment the 385 series of AR's, DARCOMR's, ARRCOMR's, and the OSHA Standards.

1-2. Scope. The rules and regulations prescribed herein are applicable to all military, civilian, contractor, and other personnel assigned to, stationed at, employed by, or otherwise engaged in activities of RMA.

1-3. Concepts. The contents of this Pamphlet are intended to provide all levels of supervision with additional safety guidance in the planning and execution of their unit's accident prevention effort.

a. The success of a safety program is dependent on the support applied by the supervisor/manager.

b. Supervisors/managers must be held accountable for the personnel and property under their immediate jurisdiction. Management is responsible to keep supervision informed as to proper safe practices and procedures.

c. Good management control and direction are reflected in low accident rates.

d. Management must ensure that proper safe practices and safe physical standards are incorporated in all directives and that these practices are complied with accordingly.

e. Accidents do not just happen--human beings cause them by failure to observe and recognize certain simple fundamentals. Hazardous situations must be discovered and immediately corrected to prevent occurrence of future accidents from these situations.

1-4. Policies.

a. With respect to the mission performance of the Arsenal, the following order of priority is established: Safety, Quality, and Production.

NOTE: All references to "he/him/his" apply to both the masculine and feminine genders unless it specifically states "her".

b. Administrative activities in the area of safety shall be designed, planned, programmed, and executed to accomplish the purpose, scope, and concepts as contained in this Safety Pamphlet.

c. Each individual of this command shall be thoroughly informed of his responsibilities and authority in regard to safety.

1-5. Responsibilities.

a. The Commander is solely responsible for the safety of RMA; and in this capacity, will approve such plans, programs, etc., as required to maintain and control accident prevention.

b. The Safety Manager shall be directly responsible to the Commander for the establishment, continuing interest in, and the success of all phases of the safety program. Top management, as well as the entire Arsenal work force, must realize that the Safety Manager does not stop accidents. He coordinates the accident prevention mission for management and furnishes them information and guidance so that they, being in control of personnel and facilities, can effect appropriate measures to avoid accidents.

c. Each Director and Office Chief shall be responsible to the Commander for the safety of his activity and the application of the designated safety program activities utilized therein. As representatives of top management, they must supply the leadership, direction, and support to the Arsenal's accident prevention efforts. Good safety management is a way of getting things done economically with respect to men, money, and time; and efficiently with respect to planning, performance, and results. Each shall take active, aggressive leadership of his activity and shall comply with all the requirements of applicable safety regulations.

d. Each supervisor/manager shall be responsible for the prevention of injuries to employees under his jurisdiction, and he shall consider safety to be the most important phase of his job.

e. Each employee, as a condition of employment, shall be responsible for the following:

(1) Adhering to all safety instructions.

(2) Wearing protective clothing and equipment as his job dictates.

(3) Using protective devices provided for machinery, equipment, tools, and processes.

(4) Warning his fellow employees upon noticing any unsafe act or practice.

(5) Reporting to his immediate supervisor all personal injuries, as well as any unsafe condition observed.

(6) Accepting the responsibility for his own safety.

(7) Recognizing that the presence of supervisory personnel does not relieve him of his responsibility for observing all precautions applicable to his work.

SAFETY ORGANIZATION FUNCTIONAL CHART

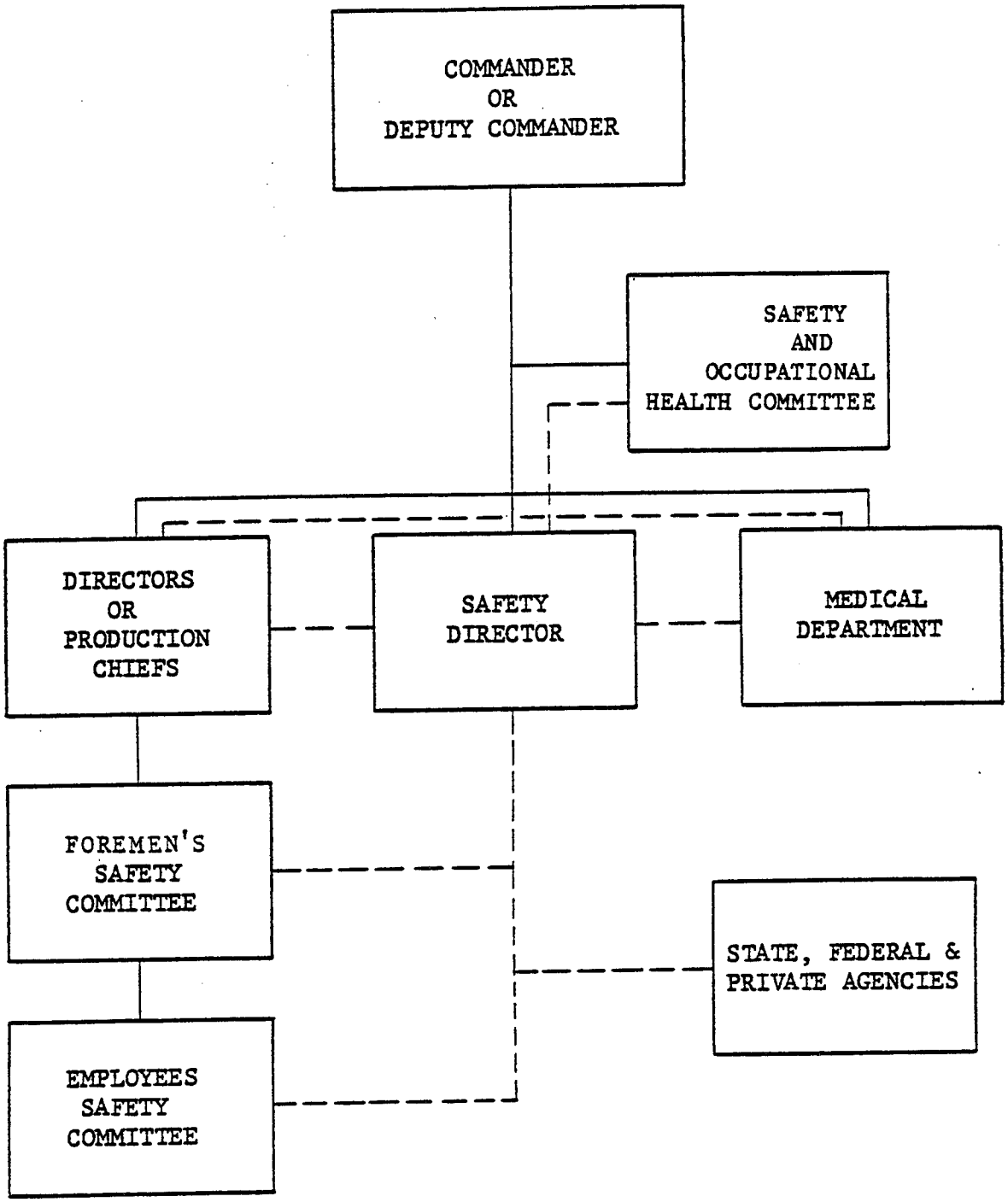


FIGURE 1-1 Safety Organization Functional Chart

CHAPTER 2

Safety Inspections

2-1. General. Safety inspections are the most practical means of determining the work conditions and observing physical hazards and unsafe practices. Inspections assist in determining the protection necessary against hazards before accidents and personal injuries occur. A good inspection program demonstrates to employees management's interest and sincerity in accident prevention. Inspections should not be conducted primarily to find out how many things are wrong, but rather to determine if everything is satisfactory.

2-2. Responsibilities.

a. The Safety Office will perform inspections of all activities in accordance with the following schedule or on a special basis as dictated by the operational element involved:

(1) All operations, storage, construction, and any others which are considered as being extra-hazardous will be inspected or observed a minimum of once daily or more often, if necessary.

(2) All buildings or areas where explosives or other dangerous materials are being assembled for training, testing, or demilitarization will be inspected daily.

(3) Maintenance shops, laboratories, laundry, and operational areas not included in paragraph (2) above will be inspected once each month.

(4) Administrative and similar areas will be inspected annually.

(5) Igloos, magazines, munitions storage areas, and warehouses will be inspected quarterly (if occupied) or annually (if empty).

(6) Standby buildings, leased areas, post housing, Health Clinic and tenant activities will be inspected only on special assignment.

(7) All operational elements will be spot-checked to ensure that the frequency of inspection as indicated in Appendix A of this Chapter is being accomplished.

b. Foremen will conduct a daily inspection of their work areas and operating conditions to ensure that all hazards have been minimized and that safe practices are evident.

2-3. Schedules.

a. Appendix A to this Chapter contains the schedule of basic inspections that are required by regulations.

b. Appendix B to this Chapter contains the schedule of inspections and testing required for pressure vessels.

c. Inspection of portable electric equipment and specific mechanical equipment and devices will be performed in accordance with the schedule shown in Appendix A.

d. Follow-up inspections will be conducted to ensure that all discrepancies noted in the basic inspections have been corrected.

2-4. Requirements and Procedures.

a. The frequency of safety inspections conducted by the Safety Office is based upon the severity of the potential hazards involved. Unsafe conditions or acts observed during these inspections will be reported to the responsible foreman or supervisor for corrections. It is incumbent upon the operating official to effect corrective action immediately.

b. The daily inspections by the foremen should include review of all personal protective equipment, safety devices, machine guards, housekeeping, fire extinguishers, hand tools, and electrical hazards, including grounding of portable power tools. They shall immediately repair, replace, or remove from service any defective or unserviceable equipment found and shall correct any unsafe condition when possible. Unsafe conditions which require the attention of higher level supervisors shall be reported immediately through appropriate channels.

c. Inspection of specialized areas, manual, mechanical, and electrical equipment is discussed in further detail in the respective chapters covering the subject.

2-5. OSHA Requirements. All inspections and/or surveys will be conducted in accordance with established Federal standards. "Standard" refers to a standard that requires condition or the adoption or use of one or more practices, means, methods, operations, or processes reasonably necessary or appropriate to provide safe or healthful employment and places of employment.

2-6. Purpose. The safety and health inspections are designed to eliminate accident causes before they happen and to reduce to a minimum all hazards that cannot be eliminated. A good safety inspection will consist of:

a. Detecting specific unsafe conditions and practices before they occur.

b. Becoming aware of the need for specific safeguards for machines, tools and especially for personnel.

c. Making RMA personnel aware of our safety program.

d. Encouraging all RMA personnel to be conscientiously aware of their part in keeping their work area, tools, machinery and equipment, personal and protective clothing, and work practices in excellent condition.

d. Giving information on the effectiveness of the safety program.

e. Systematic inspection schedules.

f. Effective follow-up procedures.

g. Effective Manager/Supervisor/Foreman input.

APPENDIX A

List of Basic Safety Inspections

Title of Inspection	Required By	Responsible Element	Record Action	Frequency
Single Phase Portable Equipment	Para 6-16, DARCOMR 385-100	Operators, Foremen, BG&U Br	DA 2409, Inspection Record kept	Daily by operator; monthly by Foreman
Testing Equipment Grounds	Para 7-4, DARCOMR 385-100	Electrical Shop, BG&U Br	Record kept in BG&U Br	Initially and periodically
Conductive Floor Test	Para 7-7, DARCOMR 385-100	Electrical Shop, BG&U Br	Permanent record & office copy in Safety	Initially and semi-annually
Testing & Inspection (lightning protection)	Para 8-21a, DARCOM R 385-100	Electrical Shop, BG&U Br	Record kept in BG&U Br	Visually semiannually & annually for electrically and grounding continuity
Cranes	Para 9-5d, DARCOMR 385-100; ANSI B30.11-1973; TB 43-0142; RMAP 385-1	Operators, Foremen, BG&U Br	DA 2409	Daily by operator; frequently by Foreman; periodic by BG&U Br
Hoists	Para 9-6a, DARCOMR 385-100; ANSI B30.16-1973; TB 43-0142; RMAP 385-1	Operators, Foremen, BG&U Br	DA 2409	Daily by operator; frequently by Foreman; monthly by BG&U Br
Chains	Para 9-8b, DARCOMR 385-100; ANSI G61.1-1968; TB 43-0142; RMAP 385-1	Qualified personnel, Operator, Foreman, BG&U Br	DA 2409	Daily by user; monthly by BG&U Br
Wire Rope	Para 9-9b, DARCOMR 385-100; ANSI B30.9-1971; RMAP 385-1	Operator, Foreman, BG&U Br	DA 2409	Daily by user; monthly by BG&U Br

Slings, fiber rope	Para 9-10, 9-11, 9-12, DARCOMR 385-100; ANSI B30. 9-1971; RMAP 385-1	Operator, Foreman, BG&U Br	DA 2409	Daily by user; monthly by BG&U Br
Ladders	Para 9-32, DARCOMR 385-100	Using element	SARRM 94	New ladders inspected upon receipt; every 4 months after by Foreman
Scaffolds	Para 9-34, DARCOMR 385-100; ANSI A12.1	Using element	None	Before each use
Grinding Wheels	Para 9-21a, DARCOMR 385-100	Qualified personnel of using element	None	Inspected upon receipt & before use
Hand Tools	Para 9-16a, DARCOMR 385-100	Qualified personnel of using element	None	Inspected upon receipt & frequently after
Protective Clothing & Equipment	Para 10-6b & 11-5c, DARCOMR 385-100; DARCOMR 385-102; RMAP 385-1	Operator, Foreman, Laundry, Safety, QA	None	Inspected daily by user & Foreman; periodically by Laundry and Safety
Electrical Hazard Equipment & Buildings	Para 6-5 & 16-18d & e, DARCOMR 385-100	Operator, Foreman, Safety	Record kept in BG&U	Initially before use & daily when working in hazardous areas
Personnel & Materials Limits	SOPs; Para 16-1 & 16-9, DARCOMR 385-100	Using element	None	Continuously by Foreman & Safety
Maintenance Equipment in Hazardous Areas	Para 6-5b, 16-9, 16-18a, & 16-18e, DARCOMR 385-100	Operator, Foreman	None	Prior to beginning work
Open/Outdoor Storage Sites	Para 18-14c, DARCOMR 385-100	Operating & Safety personnel	None	Frequently
Transportation of Hazardous Materials	Para 21-7b & 21-3a, DARCOMR 385-100; RMAR 55-2	Transportation Officer, QA, Safety	None	Continuously

Inspection of Cars Before Unloading	Para 21-18a-c, DARCOMR 385-100; RMAR 55-2	Transportation Officer, QA	None	Upon entrance
Inspection of Cars After Unloading	Para 21-19, DARCOMR 385-100; RMAR 55-2	Unloading element	None	After each unloading
Motor Vehicle Shipment Regulations	Para 22-4, DARCOMR 385-100; AR 55-355	Transportation Officer, QA	None	Before loading with dangerous cargo
Inspection of Vehicles	Para 22-6, DARCOMR 385-100	Qualified personnel, operators, Transportation Officer	None	Daily & frequent regular intervals as est. by Trans Ofcr
Materials Handling	Para 24-9, DARCOMR 385-100; TM 743-200; RMAP 385-1	Operator, Foreman, Supply Div	Record filed (checklist)	Daily by operator; frequent intervals as stated by Supply Div
Operational Shields	Para 25-4b, DARCOMR 385-100	Engineering Div/Safety	Report of test sent to USADARCOM Field Safety Activ.	Prior to being placed in operation
Scrap, Metal, Decontamination & Demilitarization of	Para 25-7 & 25-8, DARCOMR 385-100	QA qualified personnel	Certification	Prior to transfer to disposal
Detonation of Explosives	Para 27-17b & 27-18b, DARCOMR 385-100; applicable SOP	Escort & Disposal Det; QA	None	Before & after each detonation
Inspection & Storage of Chemical Munitions	Para 11-2, DARCOMR 385-100	Supply Division	None	Regularly as stated in operating directives
Personal Protective Equipment	Para 11-5c, DARCOMR 385-100; Para 4-1c, DARCOMR 385-102; RMAP 385-1	Using element	None	Prior to & after each use & on a regular basis

Respiratory Protective Devices & Protective Masks	Para 10-9, DARCOMR 385-100; TM 3-552-15; TM 3-4240-202-14; TB MED 223; TB MED 502; RMAP 385-1	User, Foreman, Safety, Laundry, and QA	None	Daily by user; semi-annually by Laundry
Pressure Processes (Unfired Pressure Vessels)	DARCOMR 420-19; Para 4-7b, DARCOMR 385-100; SOPs	Qualified Inspectors	Report filed	Annually by BG&U Br
Compressed Gas Cylinders	Para 13-21a, DARCOMR 385-100; Chapter IV, Para 4-1, AR 700-68	Foreman	Report filed	As required
Welding & Flame Cutting	Para 9-27, DARCOMR 385-100; RMAR 420-3, Annex B	Fire Prevention Div	SARRM 71	As required before operation commences
Air Compressors	DARCOMR 420-19	Using element, BG&U Br	Records kept in BG&U Br	Annually by BG&U Br

CHAPTER 3

Inspection and Testing of Lifting Devices

3-1. Policy. It is the policy of RMA that all lifting devices be inspected, load tested, and certified before placement in service. All lifting devices will be retested and a written record prepared after extensive alteration, repair, or replacement of any load sustaining parts. The test load shall be the same as the test load for new equipment. Scheduled tests and preventive maintenance intervals will be established by the Chief, Buildings, Grounds & Utilities Branch, in coordination with the Chief, Equipment Management Division, and the Safety Manager, based on the type of materials handled, e.g., explosives, corrosive materials, etc.; local conditions; and this Chapter.

3-2. Definitions. For the purpose of this Chapter, the following definitions apply:

a. Lifting Devices. Forklifts, cranes (including vehicular types), derricks, A-frames, hoists, personnel lifts, clings, chains, ropes, cables, hooks, O-rings, pear rings, spreader bars, lifting clamps, etc.

b. Manufacturer's Rated Load. The maximum working load for which a crane or individual hoist or any appurtenance thereto is designed and built by the manufacturer, as shown on the equipment nomenclature plate or operating instructions.

c. Installation's Rated Load. The maximum safe working load established by the Arsenal. This load will not exceed the manufacturer's rated load.

d. Test Load for New Equipment. The test load used by the manufacturer when performing the initial test of new equipment is as indicated below for the following items of equipment:

(1) Mobile Cranes, Crawler Cranes, and Hoists. Percentage of rate load will not be more than 110 for Mobile Cranes and Hoists. Crawler cranes will be load tested at 100 percent of manufacturer's rated load.

(2) Wire Rope, Chains and Jacks. Wire rope and chain type items are to be load tested at 200 percent of manufacturer's rating. Jacks are to be load tested at 100 percent of manufacturer's rated load.

(3) Forklift Trucks. 100 percent of the manufacturer's rated load. The safe working load will not be more than 100 percent of the maximum load sustained during the test.

e. Special Load Test. A load test used at this installation on locally-fabricated equipment or used equipment that no longer can meet the specifications or the manufacturer's or the installation's rated load.

3-3. Responsibilities.

a. The Chief, Buildings, Grounds & Utilities Branch, in coordination with the Safety Manager, will assure that the following are accomplished:

(1) A maintenance and testing program is initiated and conducted for all lifting devices.

(2) Equipment failing to satisfactorily pass appropriate inspections or test is immediately removed from service.

(3) Required load tests are performed prior to return to service after extensive disassembly, repair, or replacement of the load-bearing system.

b. The Chief, Buildings, Grounds & Utilities Branch and the Motor Maintenance Section are responsible for periodic inspections, tests, marking, and maintenance of equipment under their jurisdiction.

c. Area foremen are responsible for frequent inspections of equipment within their areas of responsibility. They are also responsible to ensure that periodic inspections are conducted, as required.

d. Operators are responsible for a daily visual inspection of the equipment they use. This consists of preoperational, operational, and postoperational inspections.

3-4. Procedures.

a. Records. Responsible activity chiefs will initiate and maintain historical records for each item of equipment. Tests will be scheduled on DD 314 (Preventive Maintenance Schedule and Record) or through Automatic Data Processing (ADP). These records will include the following:

(1) Nomenclature.

(2) Identification.

(3) Acceptance certification.

(4) Location.

(5) Record of inspection results.

(6) Record of test results.

(7) Date of maintenance services.

(8) Record of parts replaced.

(9) Any additional pertinent data.

b. Marking. The marking system established for all lifting devices on the Arsenal will be in accordance with the American National Standards. These markings will not be painted over or removed except for maintenance, test, or change of this installation's rated load, at which time the item will be retagged or restenciled.

c. Maintenance. Preventive maintenance will be scheduled and performed in accordance with applicable technical publications.

d. Inspections.

(1) Inspections for lifting devices have been established in accordance with the standards promulgated by TB 43-0142, the American National Standards Institute (ANSI), the Occupational Safety and Health Act (OSHA), and as implemented by this Chapter.

(2) Prior to use and as required thereafter, all new or altered lifting devices shall be inspected to ensure compliance with the above provisions.

(3) Inspection procedures for lifting devices in regular service are divided into two general classifications, based upon the intervals that the inspection must be performed, as follows:

(a) Frequent Inspections. Daily to monthly intervals.

1. The operator shall inspect the equipment daily when it is in use. This inspection will be visual and will begin prior to starting or operating the lifting device, continuing the observation during the operation, and ending after the operation is completed. Any damage or deficiencies noted will be brought to the attention of the foreman, who will examine the equipment to determine if a safety hazard exists.

2. The foreman shall inspect the lifting devices under his jurisdiction at frequent intervals to assure that all hazards have been eliminated or minimized. He shall immediately require a complete, periodic inspection of any lifting device that has been subjected to an overload.

3. Visual inspections should include, but are not limited to, the following items:

a. Control and operating mechanisms for proper adjustment and operation.

b. Lines, tanks, valves, and pumps for leaks.

c. Hooks for cracks and deformations.

d. Rope and chain for kinks, twist, stretch, and broken parts.

e. End fittings for distorted, bent, worn, corroded, cracked, or broken parts.

f. Bolts, rivets, welds for cracks or breaks.

g. Pins, gears, shafts, bearings, etc. for wear.

h. Limit and safety switches or controls for proper operation.

i. Booms, frames, masts, guys, etc., for broken, bent, loose, worn, or distorted parts.

j. Power plant for proper performance.

(b) Periodic Inspection. One to twelve months intervals.

1. This inspection is conducted by an appointed and authorized individual from the Buildings, Grounds, and Utilities Branch and the Motor Maintenance Section and shall conform to the ANSI standards as indicated in the references.

2. This inspection must be thorough and performed at regular intervals based upon the activity, severity of service, and environment. A record must be maintained for each lifting device inspected.

3. Chains, wire ropes, slings, hoists, cranes, and hooks are to be inspected monthly.

4. Forklift trucks, derricks, A-frames, and jacks are to be inspected quarterly.

e. Load Tests.

(1) Load testing of lifting devices has been established in accordance with the standards promulgated by TB 43-0142, ANSI, and OSHA and as implemented by Arsenal precedent.

(2) All new lifting devices shall be load tested prior to initial use, with the following exception: New lifting devices, purchased from a supplier, need not be load tested, provided the equipment is certified by the manufacturer that it has been tested prior to purchase.

(3) Altered or modified lifting devices, equipment that has undergone extensive repair, and lifting devices that have been locally fabricated must be load tested prior to being placed in service. This load test shall be the same as for new equipment.

(4) Although there are no OSHA or ANSI standards that require periodic load testing of lifting devices, load testing at this installation is required on an annual basis due to the hazardous operations involving chemical munitions. However, if load testing is desired on a more frequent interval for any specific item or piece of equipment, the load test must be coordinated with the Safety Manager and the Chief, Buildings, Grounds, and Jtilities Branch. Periodic or special load tests will not exceed 100 percent of the manufacturer's or the installation's rated load, as applicable.

(5) Load tests of cranes and hoists will be made by using weights that are locally fabricated or any other available item of proper weight. Appurtenances, slings, chains, spreader bars, etc., may be load tested concurrently.

(6) Load tests of forklift trucks will be accomplished by utilizing pallet loads of known weight.

3-5. References.

a. TB 43-0142.

b. ANSI Standards.

(1) B30.1, Jacks.

(2) B30.2, Overhead and Gantry Cranes.

(3) B30.5, Crawler, Locomotive, and Truck Cranes.

(4) B30.9, Slings.

(5) B30.10, Hooks.

(6) B30.11, Monorail Systems and Underhung Cranes.

(7) B30.15, Mobile Hydraulic Cranes.

(8) B30.16, Overhead Hoists.

c. OSHA Standards, Subpart N, Sections 1910.176-1910.184.

CHAPTER 4

Inspection and Testing of Single-Phase Portable Electric Equipment

4-1. Policy. It is the policy of RMA that single-phase portable electric hand tools will be identified and inspected before being placed into service. They will be visually inspected and tested for ground fault on a regularly scheduled frequency thereafter. Scheduled test intervals will be established by the Chief, Buildings, Grounds & Utilities Branch, in coordination with the Safety Manager. Written records of the inspection and testing will be maintained.

4-2. Definitions. For the purpose of this Chapter, the following definitions apply:

a. Portable Electric Appliance. An item other than a tool which is readily movable and capable of being detached from its source of electric current by means of a flexible cord and plug.

b. Portable Electric Hand Tool. A tool readily movable, normally hand-held during use, capable of being detached from the source of electric current by means of a flexible cord and plug.

c. Inspection. Refers to a visual inspection of an electrical appliance or tool to determine the condition of the flexible cord and plug and general condition of the noncurrent carrying parts.

d. Test. A test conducted with a testing device to detect if the tool is adequately insulated and grounded.

4-3. Responsibilities.

a. Directors/Office Chiefs will coordinate with the Chief, Buildings, Grounds, & Utilities Branch to assure that periodic inspecting, testing, and maintaining of records is being performed on equipment under their jurisdiction.

b. The Chief, Buildings, Grounds & Utilities Branch will assign an individual from the Tool Crib to conduct inspections and tests of portable electric hand tools under his control.

c. Area Foremen.

(1) Are to ensure that inspections of all portable electric hand tools in their area are conducted as scheduled.

(2) Must immediately remove from service equipment which does not satisfactorily pass the inspection. These items will be delivered to the Buildings, Grounds & Utilities Branch for repair or replacement, as required.

(3) Must assure that all portable hand tools are safe for his employees to use.

d. Operators.

(1) Are responsible for a daily visual inspection of the portable electric hand tools they use.

(2) Must report any safety deficiency or malfunction of the tool to the foreman immediately.

(3) Must never use a portable electric hand tool that is not grounded properly.

4-4. Procedures.

a. Marking.

(1) Every portable electric hand tool will be identified by the manufacturer's nomenclature and serial number, whenever possible.

(2) If a new item does not have a manufacturer's serial number, Supply Division personnel will mark it with a CARM number before it is delivered to the using department.

b. Records. Responsible activity foremen will initiate and maintain historical records for each portable electric hand tool. DA 2409 (Equipment Maintenance Log (Consolidated)) will be used for that purpose. Information necessary to complete the form will include the following:

(1) Section A.

(a) Model number.

(b) Serial number.

(c) Location.

(d) Frequency of inspection.

(e) Nomenclature.

(f) Manufacturer.

(g) Date put into service.

(2) Section B.

(a) The date of each inspection and/or test.

(b) Initials of the person conducting the test.

(c) Result of the inspection or test.

(3) Section C.

(a) The date of any repairs.

(b) Work order number, if required.

(c) Nature of repair.

(4) Section D. This Section will be used to record any modifications made to the equipment.

The records will be maintained by the area foreman and kept in the shop or area of his jurisdiction.

c. Maintenance. Maintenance of portable electric hand tools will be performed only by the Electrical Shop or tool crib personnel.

d. Inspections. Visual inspection of portable electric hand tools will be conducted by the area foreman or his designated representative on a monthly basis. The inspection will determine the safe condition of the flexible electric cord and plug, the connection of the flexible cord at the tool, and the general condition of the tool itself. Any safety deficiency discovered during the inspection must be repaired before a test of the tool can be made.

e. Tests.

(1) Tests of portable electric hand tools will be conducted by electrical or tool crib personnel or his designated representatives on a regular basis to ensure proper grounding. (Frequency of test shall be determined by the degree of service and in sufficient detail to uncover any defects.)

(2) After the tool has satisfactorily passed the visual inspection, it will be tested with a testing device that will indicate that the tool is adequately insulated and grounded.

(3) Any tool that fails to satisfactorily pass the "Ground Fault Test" must immediately be taken out of service, tagged, and sent to Buildings, Grounds & Utilities Tool Crib, Bldg. 543, for repair or replacement, as required.

f. Portable Appliances.

(1) Portable electric appliances (i.e., coffee makers, electric heaters, etc.) must be inspected by the Electrical Shop and tagged by the Fire Prevention Branch before being placed into service.

(2) Privately-owned as well as Government-owned appliances used on the Arsenal must be inspected.

(3) Appliances used in military quarters are exempt from this inspection.

(4) Typewriters, adding machines, calculators, etc., are exempt from this inspection.

(5) Appliances need not be reinspected except if moved to another area or directed by the Safety Office or the Fire Prevention Branch.

4-5. References.

a. DARCOM-R 385-100.

b. TM 38-750.

c. OSHA Standards, Subpart P, 1910.241-1910.243.

CHAPTER 5

Accident Investigation, Reporting, Analysis, and Records

5-1. General. All accidents resulting in injury, property damage, or motor vehicle damage are reportable and timely notification to the Safety Office is essential. A Safety Office representative will investigate these accidents as appropriate for the prevention of similar accidents. All accident reports are to be factual since the usage of a statistical analysis of them is directly dependent upon the quality of the reports. Recordable accident reports are submitted to Headquarters, Department of the Army, for statistical analysis. Accidents resulting in minor injuries or minor damage to property are of interest for prevention purposes at the lower echelon.

5-2. Responsibilities.

a. The Supervisor must:

(1) Report all accidents/injuries within 1 hour by telephone to the Safety Office, Ext. 338 (unless circumstances prevent).

(2) Complete appropriate accident forms in accordance with AR 385-40 and Unit Training Package dated January 1981.

(3) Fill out a DA Form 1051/DD 689 for an injured employee and send it with the employee to the Health Clinic. In an emergency, the form will be completed later and forwarded to the Health Clinic.

(4) Submit property damage, Army motor vehicle accidents, and recordable injuries on DA Form 285 within 5 days to the Safety Office.

(5) Determine if employee's accident is drug/alcohol related and annotate it on the accident form.

b. The Safety Manager will:

(1) Review all accident/injury reports.

(2) Investigate accidents/injuries, when deemed necessary.

(3) Submit recordable DA 285 Forms to higher headquarters in a timely fashion.

(4) File all accident/injury reports.

c. The Employee will:

(1) Comply with all established safety rules and regulations, use personal protective clothing and equipment that is provided for their protection and report any unsafe and unhealthful working conditions.

(2) Participate in the Arsenal's Occupational Safety and Health Program, which is essential in assuring safe, healthful working conditions.

(3) May review copies of the Arsenal's standards, injury and illness statistics, and procedures.

(4) May assist in inspections to assure a thorough safety and health inspection is being accomplished, and may tell inspectors about unsafe or unhealthful working conditions without reprisals.

(5) Will report unsafe or unhealthful working conditions first to their supervisor; if not corrected in a timely fashion, may submit DA Form 4756 to the Safety Office to report such condition.

5-3. Accident Prevention Program.

a. Prevention of accidents must be exercised by all RMA employees, supervisors, foremen, and management at all levels. Excellence or negligent failure on anyone's part in obeying/not obeying safety and health rules and regulations will be considered in the evaluation of the performance or potential of that individual.

b. Central Safety and Occupational Health Council.

(1) This Council will be appointed by the Commander (composed of organizational elements of RMA) and shall meet quarterly or at the call of the Chairman and concern itself with ways and means of improving overall participation in the accident prevention program, evaluate past accident experience, new safety goals, and discuss proposed major policy or program changes.

(2) The Commander shall serve as the Chairman and the Safety Manager shall serve as the Co-Chairman and Recorder. (Formulation of the Council shall be in accordance with DARCOM-R 385-100, AR 385-10, and Executive Order 12196.)

c. Supervisor's/Foreman's Safety Committee.

(1) This Committee will be appointed by the Commander (composed of supervisors/foremen within each primary organizational element) and shall meet on a monthly basis. Election of officers shall be held by this Committee with a Safety representative as an advisor. (Outline for this Committee must be in accordance with DARCOM-R 385-100, AR 385-10, and Executive Order 12196.)

(2) This Committee must concern itself with ways and means of improving personnel participation in the accident prevention program. They shall perform walk-through inspections to insure that any OSHA/DA safety or health deficiencies are identified, reported, and corrected. A follow-up system shall be established to insure that the deficiencies are corrected in a timely manner and do not recur.

(3) Minutes of each meeting must be kept and a copy forwarded (to include inspection report) to the Safety Office for review and record.

5-4. Definitions.

a. An Army accident is an unplanned event or series of events that result in one or more of the following:

(1) Damage to Army property.

(2) Injury to on-duty civilian personnel or Army contractor personnel.

(3) Injury to military personnel on or off duty.

(4) Occupational illness to civilian, military, or Army contractor personnel.

(5) Injury or illness to non-Army personnel or damage to non-Army property as a result of Army operations.

b. Recordable accidents/injuries are as follows, but not all inclusive:

(1) Whenever property damage or loss is $700.00 or over.

(2) Any accident/injury resulting in lost time or restricted work activity.

(3) Fatality of civilian or Army contractor personnel on the job or military personnel on or off the job.

(4) Motor vehicle accidents resulting in a cost of $700.00 or more.

(5) Motor vehicle accidents involving injury regardless of the extent of damage to the vehicle.

c. Nonrecordable accidents are as follows:

(1) Minor injury/illness resulting in first aid.

(2) Motor vehicle accidents/property damage costing less than $700.00.

d. Trend Analysis (monthly and quarterly) is the investigation and evaluation of:

(1) The interrelationship of hazards.

(2) The factors involved in the safety of a product system and its operation.

(3) A means of controlling or eliminating hazards.

(4) The possible damaging effects resulting from lack or loss of control.

(5) Safeguards for preventing injury or damage.

5-5. References. The appropriate procedures and requirements for accident investigation, reporting, analysis, and records are contained in the following references and will be used:

a. AR 385-40, Accident Reporting and Records.

b. DARCOM Suppl 1 to AR 385-40.

c. ARRCOM Suppl 1 to AR 385-40.

d. RMA Suppl 1 to AR 385-40.

e. AR 50-6, Chemical Surety Program.

f. RMA Annex C, Chemical Accident and Incident Control.

g. Unit Training Package (new DA Form 285).

CHAPTER 6

Decontamination, Marking, and Disposal

6-1. Introduction. This Chapter outlines the necessary precautions to be taken with materials which by nature of their use, or intended use, could be contaminated or contain a contamination; and the method for decontamination and marking. Specific application includes, but is not limited to, the following:

a. Removal from a contaminated operating area within the Arsenal for maintenance repair or modification.

b. Removal from a contaminated operating area to any area within the Arsenal for intermediate or long-term storage.

c. Preparation for in-place maintenance repair or modification.

d. Modification or repair by private industry.

e. Preparation for off-Arsenal shipment to other Government installations or agencies.

f. Preparation for sale to private industry as scrap or salvage.

6-2. Definitions. The following definitions apply for the purpose of this Chapter:

a. Contaminant. Any reactive material (i.e., explosives, propellents), radioactive material, acid or corrosive materials, toxic substances, chemical agents/munitions, or harmful by-products. For the remainder of this Chapter, the use of the word "contaminant" shall refer to chemical agent contaminant only. For information regarding contaminants other than toxic chemical agents, the reader is referred to ARRCOMR 385-5.

b. Contaminated. Status of an item which has been in contact with or exposed to a contaminant.

c. Contaminant Area. The area within which the contaminant is contained. It may be limited to the inside of a laboratory hood, single room within a building, an entire building, open terrain or vehicle; and may include drains, sumps, ventilation equipment, etc.

d. Uncontaminated. Status of an item which has never been in contact with nor exposed to a contaminant.

e. Decontamination. The partial or complete removal or neutralization of a contaminant. The words "decontamination" and "decontaminated"

should be used with other words, such as "degree of," "partial," "complete," or "completely" to assure that the person receiving information does not assume complete removal of the contaminant if only partially removed.

f. Degree of Decontamination and Markings.

(1) "X" - A single "X" indicates the level of decontamination is unknown or that an item is contaminated in some manner. "X" items are not acceptable for storage, salvage, repair, modification, sale, or transfer from RMA.

(2) "XXX" - Three "X's" indicate that the item has been surface decontaminated by local procedures, cleaned with steam, water, solvent, or neutralizing solution to remove large accumulations of contaminants, and is considered safe for its intended use only. Such items may be accepted for storage with other items so marked and, under certain conditions, may be transferred to other Government agencies under escort. Items so marked are not acceptable for sale to the public, except to those persons on an approved buyers' list as indicated by the Army. Such items are not considered toxically safe and shall not be exposed to open flame or high temperature, except as authorized by this procedure.

(3) "XXXXX" - Five "X's" indicate that the item is clean, has been inspected and/or tested after decontamination, is entirely safe, and may be released from RMA for general use, or open flame and heat may be applied. Five "X" must be certified by the Commander's designated representative.

(4) "0" - A single "0" (zero) indicates the item, although located in a contaminant area, was never exposed to the contaminant and may be released for general use. Examples: Equipment in motor-equipment rooms; offices isolated from the contaminant within a contaminant area; a building which contains no contaminants and is located within a contaminant area, such as an inert building within a contaminated test or production area.

g. Decontamination Tag, DA Form 3803 (Figure A to this Chapter) will be utilized for markings.

6-3. General Procedures.

a. All component parts, materials, supplies, tooling, furnishings, fixed and unfixed equipment, structures, etc., originating from a location subjected to chemical agents will be treated as contaminated, unless proven otherwise.

b. Items originating from an inert (containing no explosive or chemical agents) building or inert auxiliary facility located within a hazardous operating area may be treated as uncontaminated, provided such items have never been subjected to chemical agents while in use at such locations.

c. Items as listed in a. above, originating from and used only in an inert location within a contaminated building, may be treated as uncontaminated, provided such inert locations are segregated in such a manner as to preclude the entry of contaminants.

d. Contaminated equipment or material will not be disposed of by burying.

e. Contaminated metal scrap will not be sold unless it has been decontaminated to ("XXXXX") and verified by the Quality Assurance Office and the Analytical Systems Branch Laboratory to be free of agent and/or any other hazardous contamination. This shall be accomplished by incineration, chemical neutralization, or other approved methods.

f. Any contaminated equipment which has been removed from an agent operation for use in another Arsenal facility will subsequently have to be decontaminated prior to being offered for sale. The method for certification is described in para e above.

g. All contaminated combustible material will be destroyed by burning.

h. The use of open flame or heat-producing equipment for the maintenance repairs or modification of "XXX" items will require a Hazardous Work Permit (SARRM Form 243)/Hot Work Permit (SARRM Form 71) and the authorization of the Safety Office/Fire Prevention Branch representatives. These representatives will evaluate the hazards involved in such repairs and will/will not concur in the operation stated on the Hazardous/Hot Work Permits.

i. Items may be cleaned to a "XXX" condition by approved methods as outlined in this procedure. To decontaminate any item to a "XXX" condition will require that all exterior surfaces of such item be exposed to the cleaning action of the decontaminant used and that all exterior surfaces are exposed to inspection and/or test(s) to determine if contaminant removal has been completed after cleaning. "XXX" decontamination will not require the item to be disassembled.

j. Small decontaminated items which cannot be conspicuously marked may be sold and transferred off-post without being marked but must be accompanied by a Certificate of Clearance. While stored on post awaiting disposition, such items will be stored in drums or other suitable containers appropriately marked designating the degree of contamination.

k. Scrap items decontaminated to a "XXXXX" condition may be sold in car or truck loads without any markings but require a Certificate of Clearance prepared by the Quality Assurance Office.

l. Contaminated equipment and material will be marked to indicate the hazard present when stored in open areas. Contaminated buildings not in use are to be kept securely locked, except when actual decontamination is in process.

m. All land burial sites and areas known to be contaminated must be conspicuously marked and fenced to preclude accidental entry or exposure of unauthorized personnel. This would include areas where agent material is known to have seeped into the ground because of a leaking container or munition.

n. When work is being performed in a contaminant area or on a contaminated item, the work will be supervised by a trained team leader and person(s) knowledgeable of the item and the contaminant.

6-4. Controls.

a. For the purpose of controlling the internal movement of material that has been subjected to contamination, and to prevent the in-place repair or modifications to facilities or equipment of unknown degree of contamination, the use of tags is mandatory, designating it is contaminated and to the degree of contamination, if known.

b. In order that items within a contaminated operating area may be properly identified prior to repair, modification, storage, transfer to another Government-owned facility, or sale to the public, the following methods will be used:

(1) DA Form 3803 (See Appendix A) - Listed below are conditions where this Tag will be utilized:

(a) Any item, material, or equipment that must be moved from a location or area where it has been subjected to known contamination must be tagged by the supervisor or a designated representative of the location or area before it is removed for delivery to a decontamination area.

(b) Any item, material, or equipment bearing this Tag shall be handled in accordance with the instructions and information indicated on the Tag, and current operating procedures.

(c) When an item has been decontaminated by any of the methods listed in this procedure, the foreman will complete all of the appropriate items on the Tag and attach it to the item. In the event a box, barrel, or container of decontaminated materials is involved, the Tag will be attached to the box, barrel, or container.

(d) Any item leaving a contaminated operating area for transfer to the maintenance or motor pool shop areas for repair or modification will be accepted only when tagged with a properly executed Decontamination Tag signed by the supervisor of the originating or using agency or location.

(e) When it becomes necessary or desirable that repairs or modification work be performed on installed equipment or facilities within a contaminated operating area or building, a Decontamination Tag is required. A Hazardous/Hot Work Permit will be executed as required by each situation.

(f) Any item leaving a contaminated operating area for transfer to the Director, Installation Services for disposition or storage will be accepted only when tagged with a properly executed Decontamination Tag signed by the supervisor of the originating or using unit or location, verified by the Quality Assurance Office and certified by the Safety Office.

(g) When any item bearing a Decontamination Tag is returned to service, the Tag shall be removed.

(2) Markings.

(a) Markings are mandatory on all decontaminated items leaving a contaminated operating area when such items are destined for storage, sale, or transfer from RMA. Markings are not required on decontaminated items leaving a contaminated area when such items are destined for in-house maintenance repairs or modifications but shall have a Decontamination Tag.

(b) Items shall be marked with yellow "X's" or "O" as appropriate for the degree of contamination.

(c) When any item bearing markings is returned to service, all markings shall be removed or obliterated.

(3) Certification of Decontamination.

(a) Certification of Decontamination statements are mandatory on property documents being utilized to turn decontamination material over to Defense Property Disposal.

(b) Quality Assurance personnel, after witnessing, examining, and/or testing decontaminated items, will affix and/or sign the following Certification of Decontamination statement on the turn-in document: "The items listed herein have been inspected by me or under my supervision and have been found to be free of any toxic or explosive contamination."

(d) Quality Assurance personnel, after witnessing, examining, and/or testing decontaminated items, will initiate a DF (DA 2496) with the signed statement cited in (b) above and forward two copies to the Transportation Officer at the time of shipment.

6-5. Means and Methods of Decontamination.

a. Controlled Heat.

(1) When it is desirable to subject materials or equipment to heat, the decontamination will be performed in accordance with an approved procedure, relating to the item, to assure that it is maintained at an adequate temperature.

(2) In all incineration operations, personnel shall be shielded from exposure.

(3) Temperature is important in the decontamination of chemical agents, and the degree of heat will be recorded at regular intervals to ensure completeness of decontamination.

(4) In instances where metal items are proposed to be sold as scrap metal, they must be heated in the incinerator to a temperature above the decomposition temperature and held at this temperature to ensure complete removal of agent.

b. Neutralizing, Cleaning, and Flushing Solution.

(1) Chemical agents may be neutralized by reactions with chemicals used for decontamination. A list of the chemicals used as decontaminants may be found in TM 3-220, CBR Decontamination. Neutralization of the agent is effective only when the decontaminant is allowed direct contact with the agent for a sufficient time.

(2) The liquid or solid waste material resulting from decontamination operations must not be disposed of except as indicated in an approved SOP. Care will be taken to ensure that none of this material is discharged into drainage ditches or the sanitary sewer system. Unless otherwise directed, decontaminated liquid waste will be processed through the spray dryer. (Consultation with EPA may be required.)

(3) Solvents may be used to decontaminate certain items (glassware); however, as a general rule, they only aid in removing the agents but do not neutralize them.

(4) Flushing a contaminated surface with water usually transfers the contamination to another location. Liquid used for flushing would require appropriate disposal action as indicated in paragraph (2) above.

6-6. Responsibilities.

a. Director of Installation Services.

(1) Will ensure that all known disposal sites of ammunition, explosives, or chemical agent munitions are properly fenced and/or posted to preclude entry of unauthorized personnel. All such sites will remain posted and fenced until they are cleared completely of any contamination.

(2) Will ensure that all contaminated areas, facilities, or equipment not presently being utilized by, or assigned to other directorates, are conspicuously posted with appropriate danger warning signs and, if necessary, restricted from entry by fencing. This includes underground piping.

(3) Will maintain a plan layout drawing which reflects the location of each site indicated in the foregoing paragraphs.

(4) Will establish appropriate records which reflect the appropriate date of contamination, type and quantity of items or contaminated material, and insofar as practicable, the extent of contamination.

(5) Will initiate and have coordinated with interested staff offices a safety submission for the disposal of any contaminated facility or land. The submission is to include the essential information as stated in ARRCOMR 385-5 and this Safety Pamphlet.

(6) Will ensure that Buildings, Grounds & Utilities personnel are aware of the restrictions on handling contaminated material and are thoroughly acquainted with the hazards involved and the operational procedures for entering contaminated buildings or areas.

(7) Will ensure that proper procedures are prepared to control the handling, transfer, and repair of contaminated equipment and material within, or from, all facilities presently assigned to his Directorate.

(8) Will ensure that previously contaminated equipment or material is not permitted to be processed as scrap or Government excess without being decontaminated to a "XXXXX" condition.

b. Director of Installation Services and Director of Technical Operations.

(1) Will determine what items and equipment in an operating building have/have not been exposed to contamination.

(2) Will ensure that all equipment or material removed from the Toxic Storage Area is identified and handled in accordance with this Chapter. This does not include bulk agent or munitions being delivered for demilitarization operations.

c. Director of Technical Operations will initiate immediate action to have all scrap metal generated marked in accordance with this Chapter prior to transfer to Defense Property Disposal.

d. Chief, Quality Assurance Office.

(1) Will inspect and/or test all contaminated or suspect equipment/material prior to removal from an operational facility.

(2) Will verify that items are properly decontaminated, marked, tagged, and certified prior to removal from the facility.

(3) Will require notification when instruments, tools, equipment, etc. decontamination is to be performed, to determine the need for witnessing the procedure.

(4) Will review/approve the decontamination procedures used for all equipment, facilities, and materials being decontaminated.

(5) Will notify operations personnel of material failing decontamination tests or lacking proper verification records.

e. Safety Manager.

(1) Will monitor the activities as outlined in this Chapter and assure that safety policies are fully implemented in the decontamination and disposal of equipment and materials from hazardous operations.

(2) Will review/approve the decontamination procedures used for all equipment, facilities, and material being released for repair and/or for disposal by public sale or donation.

6-7. References.

a. DARCOM-R 385-100.

b. ARRCOM-R 385-5.

c. TM 3-220.

FIGURE A

DECONTAMINATION TAG
For use of this form, see AR 746-1; the proponent agency is DARCOM.

Serial No. _____
Replaces Tag Serial No. _____

INSTL/ACTV _____

THIS TAG IS VOID IF ALTERED, MODIFIED IN ANY WAY, STUB REMOVED, OR ATTACHMENT SEAL IS BROKEN. For information, changes or replacements call INSTALLATION/ACTIVITY SAFETY OFFICE.

REMOVE TAG BEFORE USING ITEM. FILL OUT STUB.

DEGREE OF DECONTAMINATION
Letter(s) not crossed out are the degree. **X X X X O**

See back of tag for general definitions, instructions and restrictions.

Description of Item

Item used for	Contaminant
Serial, model or USP No.	Item tagged at bldg/area

Reason for decontamination
☐ Repair in place ☐ Transfer to _____ for _____
☐ Other (explain)

Date decon. _____ Additional info:

Decontamination procedure used:
☐ Hot water ☐ Flame Temp ____ ☐ SOP No _____
☐ Steam ☐ Decon oven Hours ____ ☐ Other (explain)
☐ Solvent - Type _____

Specific instructions

Signatures
1. Decontaminated by _____ Date _____
Supervisor
2. Inspected by _____ Date _____
Safety Office Representative

INSTL/ACTV _____ Serial No. _____

Complete this stub when tag removed and send stub to Installation/Activity Safety Office. Keep tag for your records.

Tag removed by _____ Date _____
(Name of person removing tag)

Reason: ☐ Item being used ☐ Tag replaced by tag No. _____

☐ Other (explain)

DA FORM 1 OCT 77 3803 EDITION OF 1 OCT 71 IS OBSOLETE.

CHAPTER 7

Protective Clothing and Equipment

7-1. General.

a. The most effective way to control a hazard is to eliminate or isolate the hazard during the design process. In many instances, hazards or hazardous conditions cannot be eliminated or controlled at the source; consequently, persons who must work in that environment will be provided with personal protective clothing that will protect the person from head to toe as needed. Continuous action will be taken by all supervisors to provide personnel working in hazardous areas with reasonable protection from injury. All protective clothing, equipment, or devices used must meet or surpass minimum standards prescribed in current directives. Definitions of personal protective clothing and equipment levels of protection can be found at the end of this chapter.

b. In areas where personnel are required to wear special clothing and must change from street clothing, a designated location for changing clothes with provisions for washing and showering will be established. Suitable lockers for storing clothing will also be provided.

7-2. Standards. The types of protective clothing and equipment listed in the appropriate regulations governing the handling of hazardous materials may be used by personnel of the Arsenal. All new, nonstandard, or modified chemical personal protective clothing and equipment shall be approved by the Director, DARCOM Field Safety Activity, ATTN: DRXOS-C, prior to using the items.

7-3. Responsibilities.

a. Safety Manager will:

(1) Assist operating officials in determining areas that are hazardous and need protective clothing and/or equipment.

(2) Establish standards for protective clothing and equipment and ensure that these standards are met before any protective clothing and equipment is purchased or procured.

(3) Assure that an analysis is conducted by the supervisor of every hazardous operation and that SOP's reflect the result of the analysis, to include requirements for the use of protective clothing and equipment.

(4) Periodically survey operations for compliance with SOPs for serviceability of protective clothing and equipment.

b. Director of Health Services will:

(1) Assist the Safety Manager in determining the protective clothing and equipment needs for environmental health hazards as prescribed by DARCOM and other safety regulations.

(2) Assist and advise the Safety Manager and all operating officials in establishing standards for protective clothing and equipment.

c. Chief, Supply Division will:

(1) Coordinate with element heads and assure that all requests for protective clothing and equipment, except prescription safety glasses, are adequately reviewed and promptly processed.

(2) Coordinate with element heads and assure that adequate stocks of protective clothing and equipment are available at the Laundry and their serviceability conforms to existing standards.

(3) Submit to the Safety Manager for review and approval all initial requests for new types of protective clothing and equipment not contained in DOD or GSA supply lists.

d. Chief, Plant Operations will:

(1) Assure that items of used protective clothing and/or equipment turned in for reissue are inspected for serviceability, cleaned, and disinfected as necessary, using standards stated in DA supply bulletins, technical manuals, manufacturers' instructions, or Arsenal guidelines.

(2) Conduct inspections/tests of protective clothing and equipment as indicated herein to ensure that items are serviceable.

(3) Establish a recall system for protective masks to ensure that they are returned to the Laundry semiannually for technical inspection and annually for mask exchange. (Other PC&E recall will be determined as required.)

e. Chief, Quality Assurance will:

(1) Perform independent check of maintenance procedures for processing protective clothing and equipment in the Laundry.

(2) Check protective clothing and equipment in areas where QA personnel are assigned, to assure there is no contamination present before it is returned to the Laundry.

(3) Maintain current list of serviceable M9 gas mask canisters and M13A2 filters for the M17/17A1 gas masks and furnish the Chief, Plant Operations and the Chief, Supply Division with copies of current serviceable list so that only serviceable canisters and filters will be available for issue and use.

f. Directors/Office Chiefs will:

(1) Assure that the proper type of protective clothing and equipment is specified for the hazards peculiar to each operation and that sufficient quantities of equipment and clothing are available to handle emergencies that could arise.

(2) Assure that the protective clothing and equipment in their control is properly stored in a central location, adequately protected, ready for immediate use, kept in a serviceable condition at all times, and properly used by the workmen.

(4) Process purchase requests for personal safety clothing and equipment, except prescription ground safety eyewear, through the Safety Manager to the Chief, Supply Division.

g. Supervisors will:

(1) Assure that employees wear the protective clothing and equipment as prescribed for their jobs in SOP's, JHA's, or Work Permits. The protective clothing and equipment designated for a specific job classification or task are minimum requirements only. When emergencies arise requiring temporary performance of extra-hazardous tasks by an employee, supervisors will be responsible for assuring that the employee is equipped with additional protective clothing to meet the hazards of the situation.

(2) Study the occupational hazards within working areas, review protective clothing and equipment specifications for positions under their organization, and coordinate proposed changes with the Safety Manager.

(3) Inform the Safety Manager in advance of contemplated projects requiring safety equipment, to enable a study and review of requirements.

(4) Instruct each individual in the proper care and use of protective clothing and equipment.

(5) Prevent use of unapproved items of protective clothing and equipment.

(6) Require all individuals visiting hazardous areas to have the prescribed protective clothing and equipment.

h. All personnel will:

(1) Be familiar with the protective clothing and equipment pertinent to his job.

(2) Assure that his personal protective clothing and equipment is kept in serviceable condition at all times and report any faulty protective equipment immediately to his supervisor.

7-4. Protective Equipment. Protective equipment consists of various items of clothing, equipment, and protective masks that protect personnel from the hazards of toxicological agents and industrial hazards.

a. Impermeable Protective Clothing.

(1) Description. Impermeable protective clothing is made of cotton cloth coated on both sides with butyl rubber. The material does not allow the passage of air through its fabric and consequently provides adequate protection against chemical agents handled on the Arsenal. Liquid agent will begin to penetrate the butyl rubber if allowed to remain on the material for only a few minutes, so it is imperative that decontamination of liquid splashes be accomplished as soon as possible. Chemical decontaminants do not decontaminate absorbed agent (only non-absorbed agent on the surface). Once an agent has been absorbed into butyl (or any other similar material), the only method of decontamination is with 10% sodium carbonate or sodium hydroxide solution, flushed with water. The protective clothing is placed in a sealed plastic bag for 4 hours at a temperature of about 70°F. The atmosphere inside the plastic bag will be tested for contamination using bubblers. If agent is detected by test, the clothing will be disposed of by incineration. Whenever protective clothing is destroyed by incineration, the Contaminated Tag indicating the clothing's number will be forwarded to the Laundry to enable processing a change to the accountability record.

(2) Marking and Records. The Laundry will mark each controlled item of personal protective clothing with an identifying number. A computerized record-keeping system will be maintained at the Laundry through the use of the protective clothing transaction daily report form and will reflect the nomenclature: date of initial receipt; date inspected; date of issue; Arsenal element to whom issue was made; date of return to Laundry for laundering, maintenance, and testing; and date of certification as to serviceability after reprocessing. Using elements will deliver controlled items to the Laundry for salvaging whenever they appear to be

unserviceable or of questionable repair to the user at the work site. Controlled items will be inventoried each month by the using element and a record sent to the Laundry for verification.

(3) Issue. Each item of personal protective clothing, either on initial receipt or after reprocessing at the Laundry, will be tagged to indicate it is ready for issue. The items will be issued to one central location for storage and issue only as needed. Buildings, Grounds & Utilities Branch and Quality Assurance will not maintain a supply of personal protective clothing for their personnel who are required to support demilitarization or other agent activities. Their personnel will process through the change procedures pertaining to each activity and will be expected to comply with all provisions of this Pamphlet and applicable SOP's. Emergency stocks of personal protective clothing maintained by activities such as the Environmental Division, monitoring teams, and Fire Prevention Branch will be stored in a suitable location and protected from heat, dust, etc.

(4) Inspecting and Testing. The impermeable butyl rubber protective clothing, including gloves and boots, worn when Levels A and B protection are required, will be returned to the Laundry in accordance with the SOP of the operating element. Clothing must be decontaminated before it is sent to the Laundry for cleaning. Any clothing that indicates a positive test will not be returned to the Laundry. Special decontamination or disposal procedures will be followed for those items. If no physical contact with agents or contaminated equipment results while wearing the suit, e.g., first-entry monitoring, it needs only to be aerated at the work site before reuse. In the event items of impermeable protective clothing are not required for use in an operational area, they will be returned quarterly to the Laundry for inspection and testing.

b. Permeable Protective Clothing.

(1) Impregnated Underclothing. Personnel who are required to work in operations involving Mustard will wear additional protective clothing. Workers who must wear Level A or B protection are required to also wear impregnated chemical protective shirt and trouser liners, gloves, and socks under the rubber clothing. One of the substances contained in the impregnite acts as a decontaminate to any Mustard vapors that may become trapped under the rubber clothing, thus preventing serious exposure to the wearer.

(2) Leather gloves are not utilized in any operation where the wearer is required to touch equipment that may have been exposed to Mustard-contaminated equipment.

c. Protective Masks.

(1) Issue of Masks. The protective mask will be issued on a one-to-one basis to personnel whose work requires protection from chemical agent vapors. The M9 mask normally will be issued to operating personnel who must have Level A or B TAP clothing issued to them for work assignments involving the handling of chemical agents in storage, demilitarization, testing, etc. All Arsenal personnel who work in or visit these areas and whose duties do not require actual contact with agents will be issued the M17 series mask.

(2) Marking of Masks. Each mask is to be marked with a serial number directly on the facepiece. The mask carrier for permanently assigned masks will be kept on file by by the Laundry.

(3) Inspection and Testing.

(a) Masks are returned semiannually for technical inspections established by the recall system. The exchange of masks for technical inspections does not alter the current procedures for changing canisters and filters as outlined in DARCOM Reg. 385-31 and 385-102.

(b) The M17/M9 masks will have their filter elements/canisters changed annually or sooner if exposed to agent or if breathing is difficult.

(c) Masks must be returned annually to be inspected, tested on the M14 and the M4A1 testing machines, cleaned, and disinfected. When they are serviceable, they will be marked and prepared for reissuance.

(d) Masks assigned to an activity that are used regularly are normally returned to the Laundry after each use. These masks will be inspected, tested on the M14 and M4A1 testing machines, cleaned, and disinfected each time they are returned. The canisters and filters will be removed and/or replaced, as required.

(4) Facepiece Fit Tests and Procedures. Everyone who is issued a mask shall receive fitting instructions, including demonstrations and practice in how the protective mask should be worn, how to adjust it, and how to determine if it fits properly. Each SOP involving the handling of chemical agents will contain a section, General Safety Requirements, with specific instructions for employee leak check of the protective mask as well as individual care and use. Protective M9 or M17 series masks are not to be worn when conditions prevent a good face seal. Examples of such conditions are a growth of beard, sideburns, temple pieces on glasses etc. The absence of one or both dentures can also seriously affect the fit of a facepiece. To assure proper protection, the facepiece fit shall be checked by the wearer each time he puts on the mask; and he shall inspect it after each use.

(5) Commercial Masks and Canisters. All canister-type commercial masks for acids, dusts, paint sprays, and toxic vapors will be governed by TB MED 223. Any variations to these standards for a type of canister not listed must be cleared through the Safety Manager and the Health Clinic.

(6) Masks for Visitors. All visitors to the agent demilitarization areas and Toxic Storage Area must have in their possession a protective mask that has been fitted and tested by the Laundry or Safety Manager's Office. It is the responsibility of Arsenal personnel escorting visitors to ensure that the visitor is properly equipped to enter these areas. The escort personnel will be responsible for obtaining the masks and returning them to the Laundry/Safety Office upon completion of the visit. The Laundry/Safety Office will issue protective masks to off-post personnel for the duration of their visit to toxic areas. Arsenal personnel visiting the toxic areas will acquire protective masks through regular issue from the Laundry. Visitors to the Health Clinic, Building 1710, need not have protective masks.

d. Protective Footwear.

(1) Boots. Boots used in toxic chemical operations shall be butyl rubber containing no reclaim, other synthetic polymer, or natural rubber.

(2) Orthopedic Safety Footwear. Orthopedic safety footwear would be justified for the employee furnishing a prescription from his personal doctor (who specializes in foot disorders) and concurred in by the Director of Health Services and the Safety Manager's Office that special safety shoes are needed. A DA Form 2765 along with prescription and concurrences must be submitted to Chief, Equipment Management Branch, for procurement. (See Command Policy Letter, 17 Feb 83.)

e. Eye Protection.

(1) Acquisition. Eye protection devices will be approved, purchased, and issued as outlined in RMA 40-8.

(2) Visitors. Visitors to eye hazardous areas will be provided with suitable eye protection by the area supervisor. Areas will be designated by posting a sign, "NOTICE -- EYE PROTECTION REQUIRED IN THIS AREA."

(3) Lens Inserts for Protective Masks. Personnel whose visual acuity, as determined by the Health Clinic, is such that they could not perform their duties safely without corrective lens will be provided with protective mask lens inserts.

(4) Contact Lenses. Wearing of contact lenses inside a respirator is not allowed in contaminated atmospheres. A contaminated atmosphere is considered as an atmosphere having chemical agent vapors, corrosive chemicals, or small particles. Workers have suffered permanently impaired eyesight as a result of harmful substances getting between contact lenses and the eyes.

7-5. Accountability. The accountability procedures for items of protective clothing and equipment, except safety shoes and prescription ground eyewear, are established in AR 735-35.

a. Safety shoes will be issued to military personnel and civilian employees as personal property. Shoes being replaced should be turned in before new shoes are issued. The exception to this rule is on initial issue of safety shoes.

(1) Military personnel: Records are maintained by the Headquarters Detachment Supply Sergeant.

(2) Civilian employees: A hand receipt file is maintained in the Equipment Management Division.

b. Prescription ground safety eyewear will be issued to military personnel or civilian employees as personal property in accordance with the procedures outlined in RMA 40-5. Appropriate records will be maintained in the health record for military personnel and the permanent medical files of civilian employees. Prescription ground safety glasses may be retained by the user upon termination of employment.

c. Lens inserts for protective masks will be removed from the mask prior to turn-in and replaced in newly-issued masks.

d. Winter Coats. The accountability and turn-in procedures for winter coats or jackets provided for cold weather protection of personnel will be the same as that prescribed in paragraph 7-5a.

7-6. Authority for Purchase and Issue.

a. Title 5, USC, Section 7903, provides that appropriations are available for purchasing and maintenance of special clothing and equipment for the protection of personnel in the performance of their assigned tasks.

b. Title 5, USC, Section 7902, authorizes and directs the development of organized safety promotion and measures deemed proper for the prevention of injuries.

c. AR 385-32 provides the criteria for approving the purchase and issue of protective clothing and equipment without cost to military personnel and civilian employees.

7-7. References.

a. AR 40-5.

b. AR 385-10.

c. AR 385-32.

d. DARCOM Reg. 385-11.

e. DARCOM Reg. 385-31.

f. DARCOM Suppl 1 to AR 385-10.

g. RMA Reg. 710-2.

h. Command Policy - Protective Footwear, 17 February 1983.

CHAPTER 8

Hazardous Work Permit

8-1. Policy. It is the policy at RMA that a Hazardous Work Permit will be prepared for all hazardous work or tasks that involve hazardous material unless they are otherwise covered by a SOP or JSA (Prior to performing maintenance, repair or construction operations). The Hazardous Work Permit does not supersede or overlap the requirements of a Hot Work Permit (SARRM 71, Figure A-1) issued by the Fire Prevention Branch.

8-2. Definitions. For the purpose of this Chapter, the following definitions apply:

a. Hazardous Areas. An area where the activity consists of work with chemical agents, chemical munitions, explosives, missile fuel, and industrial radiation, as well as exposure to abnormal heat stress and high noise levels. Other unusual or hazardous operations include excavations, work in close proximity to high voltage electrical lines, and high work.

b. Hazardous Work Permit. A locally devised form SARRM Form (SF-243) 243, Figure A-2, which, when properly executed, will provide the following:

(1) Authorization for performing work.

(2) Scope of work to be performed.

(3) Safety precautions to be observed during the life of the work permit.

(4) Personal protective clothing as prescribed for level of work.

(5) Temporary safeguards for the safety of personnel and property.

(6) Special instructions, equipment, or tests necessary to assure safe performance of the job.

c. Maintenance. Work that may be required routinely or on special occasions to permit activities to continue or resume normal operations with as little delay as possible. Such work may include repairs or modifications to operating equipment or test facilities, repairs to chemical agent or explosive storage facilities, removal of contaminated lines or pumps, emergency work on or near energized circuits, etc.

8-3. Procedures.

a. A supervisor representing the requesting activity will furnish to the servicing activity a properly executed SF-243 in triplicate, defining

the nature of work to be accomplished. The specific hazards that may be involved and the protective clothing and equipment required will be specified. The necessary control measures to ensure the safest possible performance will also be included in the permit.

b. The servicing activity (organization to perform the work) upon receipt of the SF-243 will review the work involved and clarify to the workmen the proper safeguards and controls. The supervisor of the servicing activity, or the craft support workmen (if shift work is involved) will sign the work permit, indicating that he understands and accepts the task to be performed.

c. The servicing activity will then obtain the concurrence of the Safety Office representative prior to starting the work. In the event the safety representative is not available (such as may occur during a shift operation), the SF-243 will be reviewed by the senior representative present at the requesting activity. The work may commence after the requesting activity and servicing activity indicate agreement by their signatures on the work permit.

d. The signatures of the activities listed on the work permit constitute authorization to perform the work.

e. After the work permit is properly completed, one copy will be posted at the work site until completion of the work, at which time it may be destroyed; one copy will be forwarded to the requesting activity; and one copy will be furnished to the Safety Office.

f. The work permit will continue in force until completion of the task, except when modification or curtailment of the job occurs. If the job is modified or if it is temporarily stopped, the interested individuals of each activity must review the work permit prior to resumption of the work.

8-4. Responsibilities.

a. Requesting Activity will:

(1) Submit a properly initiated work permit to the servicing activity for all jobs of a hazardous nature as outlined within this Chapter.

(2) Prohibit the start of operations until the work permit is properly executed.

(3) Prepare the facility for work and close and tag pertinent valves and/or switches to isolate the facility.

NOTE: Activity, as used in this Chapter, means RMA Organizational Element.

(4) Remove all hazardous materials from the work site where possible, when this will not introduce secondary hazards.

(5) Decontaminate the work site, if necessary; and indicate level of protective clothing required to perform the task.

(6) Decontaminate or cause to be decontaminated all items of equipment, tools, and/or material removed from contaminated areas.

(7) Prohibit the removal of any safeguards or lockouts until the work is completed.

b. Servicing Activity:

(1) The servicing activity is responsible for compliance with the safety aspects and control measures indicated in the work permit, as well as all other safety rules and regulations that may apply to the particular operation.

(2) Whenever possible, the supervisor of each craft or activity involved in performing the requested services will visit the work site to review and approve the work method, equipment, and safety measures to perform the task. In the event servicing activity supervisor is not available (shift work), the individual(s) to perform the work will sign the work permit.

(3) Will assure that all personnel scheduled to work with chemical agents, explosives, or in high work, dirty work, or excessive noise areas, have the necessary medical clearance.

(4) Will initiate necessary action for the preparation of SOP's or JSA's for all repetitive tasks, i.e., removal of co-taminated lines or replacing moyno pumps.

(5) Will assure that all personnel of their organizations are provided with the safety equipment necessary for entrance to specific work areas, i.e., eye protection, mask and mask inserts, hard hats, etc.

c. Safety Manager or his Safety Representative:

(1) Will review work permits for adequacy.

(2) Sign the work permit to indicate that the safeguards and protection applied is commensurate with the job to be accomplished.

(3) May perform spot, on-site inspection of the work location on an audit basis while the work is in progress and after completion of the work.

(4) Will determine the requirement for use of a SOP or JSA for the work.

(5) Will provide necessary guidance in the preparation of standard operating procedures.

HAZARDOUS WORK PERMIT INSTRUCTIONS

REQUESTING ACTIVITY

1. Name of your activity and date, e.g., Industrial Division, Supply Division, etc., and signature of official requesting the work.

2. Date and time the work will commence.

3. Location where work is to be performed, e.g., Building 536, near the reactor, southeast of Building 1501.

4. Nature of work, explain what is to be done, i.e., remove reactor nozzles, dig trench to remove sewer line, etc.

5. Special instructions should include details relative to extent of contamination or decontamination, suggested methods of operations, and explanations of the hazards involved.

6. Show special preparation measures taken, i.e., valves and switches to be closed or blocked, shoring of excavations, or other preparation taken prior to starting work.

7. List and/or explain the personal protective clothing and equipment needed to assure the worker will be adequately protected.

SERVICING ACTIVITY

1. Name of your activity, date, and signature of supervisor or support workman, if shift work is involved.

2. Show the number and title of the appropriate SOP or JSA to be followed in the performance of the job.

3. Give the names of the supervisors and workers who will perform the job.

4. List the special equipment required to complete the job, e.g., scaffolding, mobile crane, ramset, etc.

5. List the temporary safeguards necessary to isolate or guard against injury to workers, i.e., lockouts, barricades, shoring, close valves, etc.

6. Special tests include tests to determine explosive or oxygen-deficient atmosphere, surface contamination, etc.

SAFETY OFFICE

1. If you concur, date and sign the form.

2. If you do not conur, list additional controls or regulatory requirements applicable to the job, as well as the technical safety aspects, safeguards, and safe practices that may not already be included.

Figure A-1

ROCKY MOUNTAIN ARSENAL - HOT WORK PERMIT

This Hot Work Permit is good for one work day or until _____

Date & Time Issued: _____

Location: _____ Date & Time Closed: _____

Permission is hereby granted to _____
(Name of Person doing Work)

to: Check only if answer is "Yes")
- O Use (Oxy-acetylene) (Arc) welding and/or cutting equipment to _____
- O Use Roofing Tar Pot
- O Use torch to free frozen or stuck line or valve
- O Burn off weeds for fire break, etc.
- O Other: _____

Safety Instructions:
- O Must have fire extinguisher near by
- O Must have (Fire Guard)(Fire Apparatus) stand-by
- O Other: _____

Foreman/Welder Receiving Permit: _____

Fire Inspector Issuing Permit: _____

Foreman/Welder Completing Job: _____

Fire Inspector Closing Permit: _____

SARRM FORM 71 (REV 1) (4 Feb 76) replaces SARRM FORM 71 (1 Oct 75) which is obsolete.

HAZARDOUS WORK PERMIT

(Figure A-2)

REQUESTING ACTIVITY DATE SIGNATURE

DATE & TIME WORK TO BEGIN

LOCATION OF WORK

NATURE OF WORK

SPECIAL INSTRUCTIONS

SPECIAL PREPARATIONS

PERSONAL PROTECTION REQUIRED

SERVICING ACTIVITY DATE SIGNATURE

SOP OR JHA NO. & TITLE

NAME OF SUPERVISOR WORKERS

SPECIAL EQUIPMENT REQUIRED

SAFEGUARDS

SPECIAL REQUIREMENTS OR TEST

SAFETY OFFICE REPRESENTATIVE DATE SIGNATURE

2 ICURRENCE/COMMENTS

CHAPTER 9

Job Safety Analysis

9-1. Purpose. The useful purposes of a Job Safety Analysis (JSA) include the following:

a. Studying existing physical hazards that may have been overlooked in the layout of operations and in the design of machinery, equipment, and processes.

b. Identifying positions or actions that are hazardous and develop solutions that will eliminate or give adequate controls.

c. Determining the qualifications required for the safe performance of a job, such as physical fitness, motor skills, special abilities, etc.

d. Determining equipment and tools needed for safety.

e. Establishing standards for safety, including instruction and training of the employee.

9-2. Definitions. As used in this Chapter, the following definitions apply:

a. JSA. A procedure that identifies the potential hazards or accidents associated with each step of a job. It develops solutions that will either eliminate or guard against such hazards.

j. Job. Certain tasks, by their nature, will be too complex for the application of the JSA. Others will be too simple. A job appropriate for analysis is a sequence of separate steps of activities combined to accomplish a specific work operation or goal. For example, the following types of jobs would be suitable for analysis:

(1) Drilling, draining, and decontaminating of shells.

(2) Unloading, sorting, and palletizing metal drums from railroad boxcars.

(3) Cutting and machining metal for fabrication of munition sections.

(4) Removing, repairing, and mounting tires.

9-3. Responsibilities.

a. The Safety Manager is responsible for the JSA program and will provide assistance relative to determining applicable and

nonapplicable jobs, maintenance of a master file of all submitted analyses, and inspection services to assure compliance with requirements. The Safety Manager is also responsible for:

(1) Reviewing job procedures in order to eliminate hazards that could cause accidents.

(2) Executing a follow-up analysis where a change in procedures or elimination of hazards exist.

(3) Assisting in training employees, as needed.

b. Directors, Office Chiefs will be responsible for establishment and effective use of the JSA program within their element in the interest of improving the Arsenal's overall accident prevention effort.

c. The first-echelon supervisor is usually responsible for preparation of the JSA, since he exercises immediate control over the performance of the job. He may select a worker whom he feels is fully experienced, capable, and cooperative and have him record each step in the breakdown. Regardless of the method used in the preparation, care must be taken to see that the steps are neither too general nor too limited or the identification of hazards and accident potential will not be meaningful. The first-echelon supervisor will also be responsible for the effective use of the JSA in employee training, for obtaining guidance in their preparation, if necessary, and for assuring the review and submission requirements are met.

d. Employees are required to read and understand the JSA applicable to their assigned job and perform their work in accordance with the JSA.

9-4. Preparation.

a. Job descriptions, technical descriptions, and SOP's, when available, are the primary requisites to be used in the development of a JSA. From this information, key steps are listed for any given operation and from accident report data addition key steps are added to the list. The next step is to identify potential health and injury hazards by studying:

(1) The tools and equipment used.

(2) The necessary movements of the employee.

(3) The work flow pattern.

(4) Other conditions or actions that may have a bearing on the job performance.

b. The supervisor making the JSA should also solicit information from the employee(s) who actually perform the task being analyzed and from safety personnel or others who can contribute specific information on the operation.

c. Supervisors will, with the help of the Safety Office, conduct a JSA for those jobs defined in para 9-2 above. The analysis will be made for the most hazardous operation first, then expanded, as practical, to cover all operations.

d. SARRM Form 1003 (Figure A to this Chapter) will be utilized in outlining the key job steps, hazards and preventive measures.

Figure A

WORKSHEET FOR JOB HAZARD ANALYSIS	OPERATION	MACHINE	DATE

DIVISION	BRANCH	LIGHTING	HOUSEKEEPING
CLOTHING	EXPOSURES HEAT COLD	AGENTS	FUMES
MISTS	GASES	DUST	OTHER (Explain)

DESCRIPTION OF PROCEDURE

KEY JOB STEPS	HAZARDS INVOLVED	PREVENTIVE MEASURES

KEY JOB STEPS	HAZARDS INVOLVED	PREVENTIVE MEASURES
SUPERVISOR (Signature)	REVIEWED (Signature)	SAFETY REPRESENTATIVE (Signature)

CHAPTER 10

Standing Operation Procedures

10-1. Introduction. This chapter prescribes policy, responsibility, and procedures for the preparation and review of SOP's. It applies to operations involving chemical agents, explosives, industrial radiation or other specialized operations, and the attendant activities such as receipt, storage and issue, care and preservation, maintenance, renovation, demilitarization, disposal, surveillance, laboratory analysis, etc. All SOP's of an industrial and technical nature as defined by DARCOM-R 385-100 will be accomplished in accordance with the below-listed instructions, and as outlined in Appendixes A through E of this chapter.

10-2. Policy.

a. Prior to starting any operations involving chemical agents, explosives, industrial radiation, and/or other hazardous materials, a SOP will be developed and approved by the Deputy Commander. The SOP will include, as a minimum, such items as safety and surety requirements, fire protection needs, personnel and explosive limits, a sequence of operations outline, approved tools and equipment, a list of personal protective clothing and equipment, a description of the characteristics of the hazardous material and applicable controls, and instructions for the clearance of the work area in case of an emergency.

b. Operations which are similar can be covered by one SOP. An example of such an operation is the movement of ton containers containing different agents. The SOP's must be reviewed to determine any potential hazards and to incorporate any necessary protective equipment. The new operation must be reviewed by the Safety Manager.

c. The Deputy Commander may authorize a one-time operation to be conducted without a SOP after coordination with the Safety Manager and other staff elements that might be involved. They may also give oral authorization for a modification of a SOP during a plant start-up after coordination with the Safety Manager. This authorization does not constitute a waiver or authority to deviate from existing directives from higher headquarters or accepted safe practices.

10-3. Responsibilities.

a. The Commander is responsible for safety, operational, and technical control of all RMA operations. He has delegated authority for approving SOP's to the Deputy Commander.

b. Directors/Office Chiefs will assure the preparation, evaluation, and maintenance of SOP's for any of their operations. Normally, the SOP will be initiated by the office having primary responsibility for actions involved.

c. Staff Officers responsible for the review of SOP's prepared by their respective organizations will ensure that all grammatical errors and misspelled words have been corrected prior to staffing the SOP.

d. The concurring officers will review, comment, or concur on the proposed SOP's. (To include QA and Surety Officer, where appropriate.)

e. The Safety Manager will be the last office to review, comment, or concur on the SOP prior to forwarding it to the Deputy Commander.

f. All SOP's for demilitarization and any other operations generating a potentially hazardous waste will be reviewed and concurred in by the RMA Environmental Coordinator/Officer.

10-4. Procedures.

a. SOP's will be reviewed as required and approved by the Deputy Commander. SOP's will be prepared sufficiently in advance of the start of an operation to permit submission, review, approval, and distribution as prescribed by this chapter.

b. SOP's will contain step-by-step instructions to enable the operator to perform the work required. However, procedural steps need not be listed, if such procedures are contained in a DA publication or in a detailed check list. References should be made to the pertinent DA publication and section prescribing the procedures for the specific operation. The publication or that portion referenced must be available at the site of the operation. When publication referenced must be available at the site of the operation. When publication coverage is considered too general to assure positive safety and technical adequacy, necessary procedures, along with other appropriate technical instructions, will be included in the SOP. SOP's normally shall not contain classified information.

c. Special engineering tests or pilot operations usually generate considerable on-the-spot minor operational changes to the initial SOP. These changes will be processed as indicated in paragraph 10-2c.

10-5. Format.

a. The format for SOP's is shown in Appendixes A through E. Each SOP will consist of the following, which are applicable to the operation:

(1) Cover Sheet. (See Appendix A)

(2) Index of Operations. (See Appendix B)

(3) Operations Format. (See Appendix C)

(4) Preparation of Line Layouts. (Appendix D)

(5) Preparation of Supervisor's Statement and Operators' Statements. (See Appendix E)

b. Figures F-1 through F-4 are examples included in a Laboratory SOP.

10-6. Changes and Revisions.

a. A change will be made as the operation dictates and will consist of a page-for-page substitution with a new cover sheet reflecting the signatures of the concurring officers and approval of Command. All changed portions of the text or contents will be indicated by vertical lines in the left margin.

b. A revision should be made when one-third or more of the SOP requires a change or has been changed, or when review of the SOP or the operation indicates a revision is necessary.

c. Changes and revisions will be submitted for review and approval in the same manner as the basic SOP, except changes resulting from incorporation of the following:

(1) Comments from operational and safety reviews, as may result from a safety or surety inspection.

(2) Pen and ink changes to a posted SOP made by Division Chiefs, when the nature of such changes are purely operational and do not affect other staff elements. Such changes will be initialed and dated by the person making the change. The Safety Office will be notified by telephone whenever these changes occur in order that the record copy on file in the office is similarly changed.

(3) A referenced publication change (e.g., technical manual, supply bulletin, or other DA publication), provided no other sections of the procedure are affected.

d. Changes as cited in c(1), (2), and (3) above will be included in the next revision of the SOP.

e. When time does not permit preparation of a SOP change as required by a. above, a DF (staffed and approved in the same manner as the SOP) may be used to effect the change. All changes by DF action must be processed in accordance with a. above within five work days, unless the operations have been completed within this time period.

10-7. Forwarding Instructions.

a. Three signed copies of each SOP, change, or revision will be furnished to the Safety Office, the office of record for SOP's. The Safety Office will make distribution to off-post elements as required.

b. The originating office of SOP's will assure that the approved draft of the SOP is prepared in final form and reproduced in adequate copies and that on-post organizations are furnished copies according to their requirements and needs.

10-8. References.

a. DARCOM Reg 385-100, Safety Manual, 17 Aug 81.

b. DARCOM Reg 385-31, Safety Regulation for Chemical Agents H, HD, and HT, April 79.

c. DARCOM Reg 385-102, Safety Regulation for Chemical Agents GB and VX, 1 Jun 82.

d. DARCOM Reg 385-1, Preparation for Standing Operating Procedures, 22 Feb 82.

APPENDIX A

INSTRUCTIONS FOR PREPARATION OF THE SOP COVER SHEET

1. The cover sheet will be completed as illustrated in Figure F1, pg. 10-19 and 10-19-1. Information applicable to each numbered line not listed below is considered self-explanatory.

a. Line 1 - Installation: ROCKY MOUNTAIN ARSENAL
Standing Operating Procedure for:

b. Line 2 - Indicate complete nomenclature of item if listed in supply manual; otherwise, a brief descriptive sentence to include the hazard classification and fire symbol (if applicable) required for the item to be processed.

c. Line 3 - Operation: Indicate the type of activity, e.g., renovation, detoxification, demilitarization, or inspection as applicable.

d. Line 4 - Arsenal Organizational Symbol: Insert the Arsenal symbol, followed by the office symbol of the originator.

e. Line 5 - SOP Number and Date: Insert the Arsenal symbol, office symbol, and basic number for the SOP, e.g., SARRM-F-E-1, SARRM-F-E-2, etc., and date of the basic SOP.

f. Line 5a - Revision Number and Date: Enter the appropriate revision number when a complete revision of the SOP is made, e.g., Revision 1, Revision 2, and date of the revision.

g. Line 5b - Change Number and Date: Insert the change number and date of the change. Each time a change is made to a portion of the SOP, a new cover sheet will be completed, reflecting the new change.

h. Line 6 - Authority: Indicate the appropriate technical reference, modification work order, operation procedure, etc., from which the SOP was developed.

i. Lines 7, 8, and 9 - Show typed name and signature, along with title.

j. Line 10 - Concurrences: Indicate the three headings: OFFICE, SIGNATURE, and TITLE.

k. Line 11 - Approval: Deputy Commander's Office Symbol, Signature, and Titel.

l. Line 12 - Quarterly Review

m. Line 13 - Semiannual Review:

n. Line 14 - Biennial Review:

2. Paragraphs l, m, and n will be completed by originator of SOP, C, Mgt Spt Ofc and the Safety Manager respectively at time of review.

APPENDIX B

INSTRUCTIONS FOR PREPARATION OF INDEX OF OPERATIONS

The index of operations will be completed as illustrated in Figure B-1.

a. Column 1 - Indicate the operation number.

b. Column 2 - Identify the building or site where the operation is being conducted. Identifying numbers will coincide with site plan drawings submitted.

c. Column 3 - Insert a description of the operations, e.g., unpack, disassembly, etc.

d. Column 4 - Page number.

e. Remarks - Insert a brief description of the work to be performed. List waivers, exemptions, or approved deviations which apply to this operation. Insert the reason for a change or revision. If a SOP supersedes a SOP of another number, an explanatory statement and notice of supersession should be made. List references used to prepare SOP.

SOP NO: _____ DATE: _____

REV NO: _____ DATE: _____

CHANGE NO: _____ DATE: _____

INDEX OF OPERATIONS

Operation No.	Location	Operation	Page No.

Remarks:

Operation consists of . . .

Figure B-1

APPENDIX C

INSTRUCTIONS FOR PREPARATION OF OPERATIONS FORMAT

The illustration of operations format, Figure C-1, is not intended to cover all situations; and the reflected information does not necessarily have complete or accurate steps. The illustration has been provided solely for the purpose of adding clarification to the written instructions below, applicable to Lines A through L on the Figure C-1.

a. Line A - Standing Operating Procedure For: Indicate the operation and nomenclature of the item being worked, e.g., Assembly of M34 Clusters for Engineering Tests and Training.

b. Line C - Location: Show building, room, or cubicle number.

c. Line G - Operation: Indicate the title of the operation, e.g., paint bomblet bodies.

d. Line H - Limiting Factors: Indicate the number of units or pounds that have been determined safe for efficient operation.

e. Line I - Personnel Limits.

(1) Operator: An operator is defined as any individual (worker, leader, supervisor, or inspector) who performs work in the operation on a continuing or intermittent basis.

(2) Transient: A transient is an individual (supervisor, safety inspector, or visitor) who does not touch the item or participate in the operation. He may only witness or survey the proceedings.

f. Line J - Step No.: Description of operation and specific instructions.

(1) The procedural details of work to be performed will be listed under "Description" of operation in a numbered and logical sequence. Description must be sufficient to allow the operator to accomplish the task in a safe and technically correct manner.

(2) Procedural steps need not be listed in detail if they are contained in a DA publication in sufficient detail to assure safety of the operation. Reference will be made to the publication and exact section which describes the work to be performed, and this section of the publication must be available at the job site for ready reference and use by the operator.

(3) "Specific Instructions" are intended to furnish further information that applies to the specific step of the operation and which has not been included in the actual description of physical work performed. Items to be listed here include quality characteristics, specific safety equipment or clothing required, safety precautions to be taken, and technical instructions pertaining to task accomplishment. Instructions will be identified to indicate the step and type of instruction: Safety (S), Operational (O), and Quality Characteristics (Q). Specific instructions will be located opposite the step in the operation description to which they are applicable and must not be placed opposite steps to which they do not apply (refer to Figure C-1).

g. Line K - Special Requirements: This space will include instructions which apply to one operation only and which normally do not apply to any other operation or to one particular step of an operation. Instructions may concern safety, technical aspects of the operation, or equipment inspection requirements. Items covered under Item J of the SOP need not be duplicated under Item K. Surveillance and/or inspection requirements may be listed under Special Requirements for each operation or included as a separate operational page covering the surveillance quality audit inspection.

h. Line L - Equipment, Tools, Gages, and Supplies: List the equipment, tools, gages, and supplies that are necessary for the work of the operation, i.e., specific hand tools, specific safety equipment or any other specific items that are necessary. It is important that the term "approved type" is not used, e.g., "approved type safety shoes". Specific nomenclature will be used in all cases, e.g., "conductive safety shoes".

A. STANDING OPERATING PROCEDURE FOR: Laundry

B. OPERATION NO: 9

C. LOCATION: Bldg. 314

D. SOP NO: TOI-O-L-2 DATE: 29 May 82

E. REV. NO: _____ DATE: _____

F. CHANGE NO: _____ DATE: _____

G. OPERATION: Testing of boots.

H. LIMITING FACTORS: Boots will have been washed per SOP NO. TOI-O-L-2-4. This operation can only be used if it is in compliance with para. 2, page S5-1.

I. PERSONNEL LIMITS: ____ OPERATORS: 2 TRANSIENTS: 6

J.

Step No.	Description	Specific Instructions (Safety-S, Quality Characteristics-Q, Operator(s)-O)
		NOTE Testing of boots shall be performed prior to reissue, after washing.
1.	Visually inspect boots for cracks, holes, tears, or the presence of foreign matter residue.	1. (Q) Boots with cracks, holes, or tears will be rejected and disposed of per SOP NO. TOI-O-L-1-3. (O) Boots with foreign matter residue will be set aside for removal of the matter and relaundered prior to reinspection.
2.	Fill a 30 gal. can with water.	
3.	Block the opening with a clamp.	3. (O) Special clamp provided with an air line.
4.	Inflate boot to 5.0 psi.	
5.	Submerge boot in water for 10 seconds. Check for air bubbles.	
6.	Boots that leak will be rejected.	6. (Q) Rejected boots will be disposed of per SOP NO. TOI-O-L-1-3.

Figure C-1

SOP NO: TOI-O-L-2
REV. NO: _____

DATE: 29 May 82
DATE: _____

OPERATION NO: 9

7. Remove clamp and place acceptable boot on air drying rack.

8. The mate to the rejected boot will be paired with a new mate and renumbered with a new serial number. The old serial number will be deleted from the protective clothing recall system, and the serial number of the newly created pair will be entered into the system per SOP NO. TOI-O-L-2-12.

K. SPECIAL REQUIREMENTS: None

L. EQUIPMENT, TOOLS, GAGES, AND SUPPLIES:

30 gal. can
Boot testing clamp, with airline and pressure gage
Drying rack

APPENDIX D

INSTRUCTIONS FOR PREPARATION OF LINE LAYOUTS

A clear, legible line layout may be required for some operations, and they are to be forwarded with the SOP that is submitted for review. The following instructions apply: (Figures D-1 and D-2)

a. Line layouts will be prepared in the format shown in Figure D-1. A layout should show the structural material of the building, fire protection, location of dividing walls, operational shields, and permanently installed equipment. Operational shields must be detailed to show the type of material used, height, and thickness. Permanently installed equipment must be listed whether or not it is used on the specific operation. Each bay or room must be identified by a numeral or letter. A directional symbol must be used to indicate true north. The building number and the applicable SOP number must also be shown.

b. The operational sequence must be depicted by the use of standardized symbols as illustrated in Figure D-2. The location of pallets, tables, equipment, etc., must be shown where they will be used. A legend must be used to briefly explain the operations, inspections, and location of tables, equipment, etc., as well as flow of material.

SPRINKLER SYSTEM IN ALL BAYS
MECHANICAL VENTILATION IN BAYS B & E
HOOD & DELUGE SYSTEM IN BAY H
EXTERIOR WALLS - 8" CONCRETE BLOCKS
WITH STEEL FRAME WINDOWS & CONCRETE FLOORS
ROOF - ASPHALT AND GRAVEL
BARRICADES - WALLS 1' REINFORCED CONCRETE

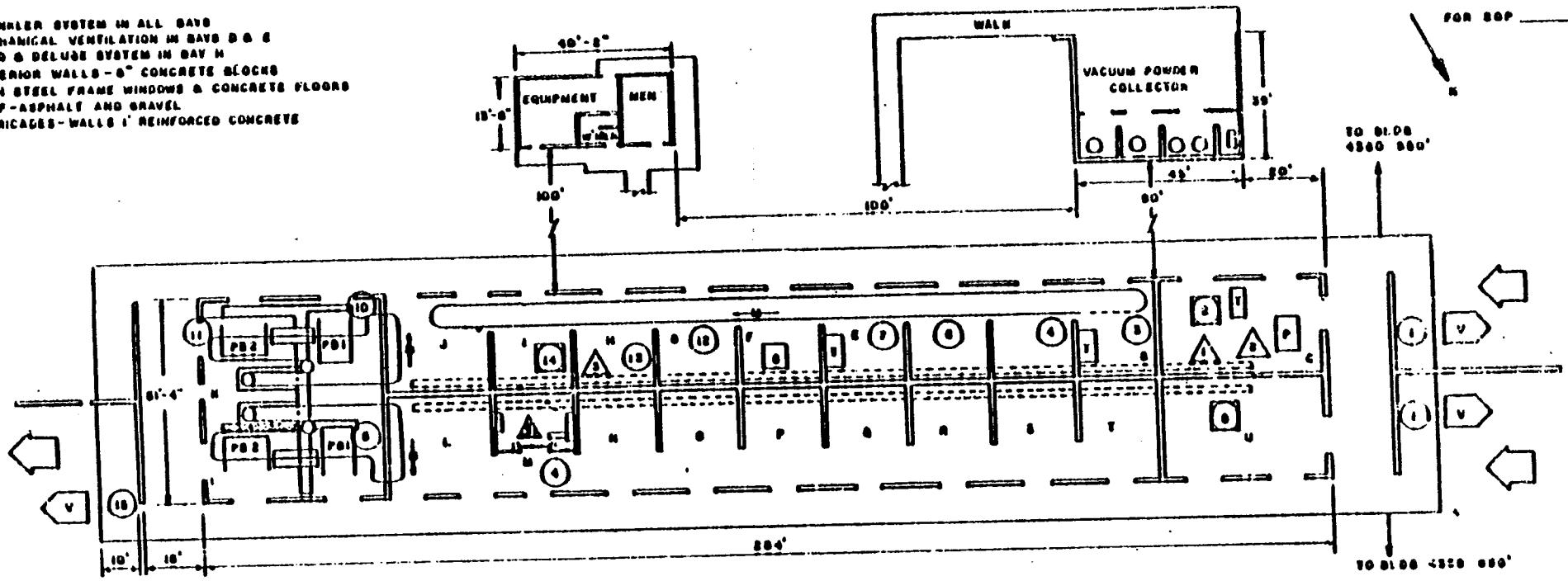


Figure D-1

LEGEND

(1) RECEIVE FROM STORAGE	(6) PAINT & STENCIL PROJECTILE	[9] INSPECTION & REPAIR OF BOXES	(13) PLACE ROUNDS IN CONTAINER & TAPE
[2] UNPACK & INSPECT	[8] RECEIVE & INSP NEW FUZES	(10) PAINT & STENCIL BOXES	[14] INSPECT & REPACK
(3) DEFUZE & PLUG	(7) REFUZE PROJECTILES	(11) PAINT & STENCIL FIBER CONTS.	(15) OUTBOUND
(4) CLEAN PROJECTILES	[5] QA INSPECTION OF CART. CASES & PROJECTILES	[12] CHAMBER GAGE CART. CASES	⚠1 APE 1270
			⚠2 APE 1221
			⚠3 APE 1209

2 May 1983

2 May 1983

STANDARDIZED SYMBOLS

STORAGE

OPERATION

INSPECTION - VERIFICATION OR ACCEPTANCE

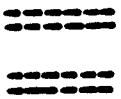
INSPECTION-OPERATION - IN PROCESS

PRODUCTION EQUIPMENT

TABLES, DOLLIES,
WORK BENCHES, TRUCKS, ETC.
PALLETS

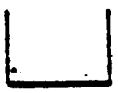
VAN

MONORAIL



POWER CONVEYOR

ROLLER CONVEYOR



PAINT BOOTH

OPERATIONAL SHIELD

Figure D-2

APPENDIX E

INSTRUCTIONS FOR PREPARATION OF SUPERVISOR'S AND OPERATOR'S STATEMENTS

Each operator and supervisor/foreman shall sign these statements. (See Figures E-1 and E-2.) The signature shall indicate that they have:

a. Received adequate training to perform the operations.

b. Been afforded the opportunity to ask questions and clarify any uncertain or unclear instructions.

c. Reviewed and understand the applicable sections of the SOP.

SUPERVISOR'S STATEMENT

SOP NO: ____ REV. NO: ____ CHANGE NO: ____ DATE: _____

OPERATION NO: ____

I have personally reviewed each of the operational steps of this SOP and have no question in my mind that the operation can be performed safely and efficiently. I have trained my operators in the details of their part of the operation and instructed them to follow the SOP without deviation.

SUPERVISOR/FOREMAN	DATE	BADGE NO
_____	_____	_____

Figure E-1

OPERATOR'S STATEMENT

SOP NO: ____ REV. NO: ____ CHANGE NO: ____ DATE: _____

OPERATION NO: ____

I have read, or have had read to me, and understand the general and specific safety requirements necessary to accomplish my operation. I have been thoroughly trained in, and am familiar with, my part of the operation. I agree to abide by these instructions throughout my assignment.

NAME	DATE	BADGE NO

Figure E-2

1. ROCKY MOUNTAIN ARSENAL
STANDING OPERATING PROCEDURE FOR:

2. ITEM: _____

_____

_____

_____

_____

_____

_____

_____

3.a. OPERATION: _____

b. ESTIMATED DAILY PRODUCTION RATE: _____

4. ARSENAL ORGANIZATIONAL SYMBOL: _____

5. SOP NO.: _____ DATE: _____

a. REV NO.: _____ DATE: _____

b. CHANGE NO.: _____ DATE: _____

6. AUTHORITY: _____ DATE: _____

_____

7. PREPARED BY: _____ TITLE: _____

TELEPHONE: _____

8. REVIEWED BY: _____ TITLE: _____

REVIEWED BY: _____ TITLE: _____

9. SUBMITTED BY: _____ TITLE: _____

10. CONCURRENCES:

OFFICE	SIGNATURE	TITLE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	Environmental Coordina
_____	_____	Surety Officer
SMCRM-SF	_____	Safety Manager

FIGURE F-1
SOP COVER SHEET

11. APPROVAL:

_____	_____	_____
_____	_____	_____
_____	_____	_____

12. QUARTERLY REVIEW:

_____	_____	_____
_____	_____	_____
_____	_____	_____

13. SEMIANNUAL REVIEW:

_____	_____	_____
_____	_____	_____
_____	_____	_____

14. BIENNIAL REVIEW:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

FIGURE F-1 (CONTINUED)

E X A M P L E

SOP NO: SARRM-TOE-21
REV NO: NA
CHANGE NO: NA

DATE: 1 December 1982
DATE: NA
DATE: NA

INDEX FOR CHEMICAL
DETOXIFICATION IN BUILDING 313

1. PURPOSE: The purpose of this SOP is to provide a procedure for detoxification of chemical agents GB, H and HD in building 313.

2. SCOPE: This SOP applies to all personnel assigned to work in building 313.

3. RESPONSIBILITIES: Personnel assigned to work in building 313 are responsible for the safety and surety of the building and its contents. Each person is responsible for reading "Contingency Procedures for Laboratory Personnel in Building 313 & 1611" dated 14 August 1979; SARRM-TOE-28 "Lab Operations and Storage in Building 313" dated 20 July 1980; and "Hazard Supplements for GB, H and CG".

Figure F-2

BLANK

SOP NO: SARRM-TOE-21 DATE: 1 December 1982
REV NO: NA DATE: NA
CHANGE NO: NA DATE: NA

4. LOCATION: Only room 114 of building 313 will be used for detoxification of neat agent or agent solutions above the concentrations or amounts listed in paragraph 11. The hoods which can be used are "C", "D", or hoods approved by Chief, Air Monitoring Section.

5. MONITORING: Monitoring will be conducted as specified in SOP No. SARRM-TOE-28, "Lab Operations and Storage in Building 313" dated 20 July 1980, Revision No. 1, 15 October 1980.

6. NOTIFICATION: The following will be notified NLT 24 hours before operations are to begin: Chief, Fire Prevention Branch; Chief, Analytical Systems Branch; Chief, Security Office; Safety Manager; Surety Officer; Director, Health Services and disinterested third party.

7. SURETY: All receipt, transfer, detoxification and distribution of agent(s) must be recorded in the Toxic Agent Record Book and must have issue/turn-in DA Form 3161 completed. Both items must include verifying signatures of at least the following: custodian or alternate, user and witness (disinterested third party). The "two man rule" or "buddy system" applies to all agent operations.

8. HOODS:

8.1. All hoods used for detoxification will have been flow verified by USAEHA or Industrial Hygiene within the last six months. Flow shall be 150± 30 lfpm at working height with mechanical stops installed at the 150 limit. (See para 14.1.)

8.2. Charcoal filters will have been checked by Quality Assurance with Freon within the last three months.

8.3. Audible alarms and lights will be checked before each detoxification day begins.

9. DETOXIFICATION: Detoxification of agents in building 313 is limited to a maximum of 50 grams of agent (or agent solution above the concentrations or amounts listed in paragraph 11) per hood at one time, not to exceed 1,000 grams total per day. (See para 14.2.)

10. PROTECTIVE CLOTHING: Only approved protective masks, aprons, gloves and boots included in the laundry recall program will be used during operations.

11. DILUTE SOLUTIONS. Dilute solutions are those solutions which present significantly reduced hazards. These solutions are defined as follows:

a. GB - 20 mg maximum total quantity per container with 2 mg/ml maximum concentration.

SOP NO: SARRM-TOE-21
REV NO: NA
CHANGE NO: NA

DATE: 1 December 1982
DATE: NA
DATE: NA

b. H or HD - 100 mg maximum total quantity per container with 10 mg/ml maximum concentration. (See para 14.3.)

12. GB:

12.1. LEVEL OF PROTECTIVE CLOTHING: The person doing the detoxification and his buddy will wear mask, apron, and gloves while the detoxification is in process.

12.2. SOLUTIONS FOR DETOXIFICATION: Aqueous sodium hydroxide (NLT 10%) or other solutions listed in paragraph 14.4.

12.3. METHOD FOR DETOXIFICATION:

12.3.1. To a container (adequate for three gallons of hot caustic liquid) add a minimum of one gallon of 10% NaOH.

12.3.2. Place this container in hood.

12.3.3. To this container add approximately 10 mls of GB agent or agent solution and stir for two minutes with stirring rod.

12.3.4. Repeat step 12.3.3. until a maximum of 50g of GB or GB solution has been added per container.

12.3.5. All waste materials are immersed in the resultant solution which is left in the hood for not more than 24 hours to insure complete detoxification.

12.4. WASTE:

12.4.1. All liquid waste will be tested for pH 10 or greater; additional caustic will be added as necessary until the solution has a pH 10 or greater. All waste will be placed in containers for incineration in accordance with 'SOPs for Chemical Agent Identification Sets (CAIS)" SOP No. SARRM-T-ID-104-1, Suppl 1, dated 25 October 1980.

12.4.2. Gloves, aprons, etc., will be processed in accordance with SOP No. TOI-0-L-2, "Plant Operations Branch - Laundry, Operation #4" dated 29 May 1981, Change 1, dated 20 July 1982.

13. H or HD:

13.1. LEVEL OF PROTECTIVE CLOTHING: The person doing the detoxification and his buddy will wear mask, apron and gloves while the detoxification is in process.

SOP NO: SARRM-TOE-21
REV NO: NA
CHANGE NO: NA

DATE: 1 December 1982
DATE: NA
DATE: NA

13.2. SOLUTIONS FOR DETOXIFICATION: Commercial liquid bleach (tested for at least 5% of sodium hypochlorite or less than one year old) or other solutions as listed in paragraph 14.5.

13.3. METHOD FOR DETOXIFICATION:

13.3.1. To a container (adequate for three gallons of hot corrosive liquid) add a minimum of one gallon of liquid bleach.

13.3.2. Place this container in hood.

13.3.3. To this add approximately 2 mls of H or HD agent or agent solution and stir for three minutes with stirring rod.

13.3.4. Repeat step 13.3.3. until a maximum of 10g of H or HD, or H or HD solution, has been added per container.

13.3.5. All waste materials are immersed in the resultant solution which is left in the hood for not less than 24 hours to insure complete detoxification.

13.4. WASTE:

13.4.1. Waste from the detoxification process will be placed in containers for incineration in accordance with SOPs for Chemical Agent Identification Sets (CAIS) "SOP No. SARRM-T-ID-78-106-4, dated 15 April 1981.

13.4.2. Gloves, aprons, etc., will be processed in accordance with SOP No. TOI-0-L-2, "Plant Operations Branch - Laundry, Operation #4" dated 29 May 1981, Change 1, dated 20 July 1982.

14. REFERENCES:

14.1. DARCOM-R 385-31, dated 19 March 1982, paragraph 8-2(b)1 and DARCOM-R 385-102, dated 6 May 1982, paragraph 8-2(b)1.

14.2. DARCOM-R 385-31, dated 19 March 1982, paragraph 8-7(b) and DARCOM-R 385-102, dated 6 May 1982, paragraph 8-7(b).

14.3. DARCOM-R 385-31, dated 10 March 1982, paragraph 1-3(g) and DARCOM-R 385-102, dated 6 May 1982, paragraph 1-3(g).

14.4. DARCOM-R 385-102, dated 6 May 1982, paragraph 5-1(d).

14.5. DARCOM-R 385-31, dated 19 March 1982, paragraph 5-1(d).

SOP NO: SARRM-TOE-21
REV NO: NA
CHANGE NO: NA

DATE: 1 December 1982
DATE: NA
DATE: NA

ANNEX A

SAFETY

1. Each operator will use care in handling strong bases to keep these chemicals off skin and clothing. NaOH is a strong skin and eye irritant in solid form and can cause severe tissue damage. When diluted with water it acts less quickly on the skin, but will still cause damage and/or strong irritation to the eyes.

3. All detoxification will be done inside of hood "C" or "D" in room 114 of building 313 or other hoods as designated by Chief, Air Monitoring Section.

4. All alarms and safety showers must be working and checked prior to each operation.

5. All applicable medical and surety requirements must be met by personnel working in building 313.

6. All personnel in building 313 must be notified prior to detoxification operations.

7. An observer must be present in the hallway of building 313 (by the entrance door of room 114) during the detoxification. This observer may (but need not) be the disinterested third party.

SUPERVISOR'S STATEMENT

SOP NO: ____ REV. NO: ____ CHANGE NO: ____ DATE: _____

OPERATION NO: ____

I have personally reviewed each of the operational steps of this SOP and have no question in my mind that the operation can be performed safely and efficiently. I have trained my operators in the details of their part of the operation and instructed them to follow the SOP without deviation.

SUPERVISOR/FOREMAN	DATE	BADGE NO
_____	_____	_____

Figure F-3

OPERATOR'S STATEMENT

SOP NO: ____ REV. NO: ____ CHANGE NO: ____ DATE: _____

OPERATION NO: ____

I have read or have had read to me and understand the general and specific safety requirements necessary to accomplish my operation. I have been thoroughly trained in, and am familiar with my part of the operation. I agree to abide by these instructions throughout my assignment.

NAME	DATE	BADGE NO

Figure F-4

CHAPTER 11

Safety Engineering

11-1. Objectives. The objective of safety engineering is to apply scientific and engineering principles for the timely identification of hazards and initiating actions necessary to eliminate or control those hazards to ensure maximum safety consistent with mission requirements. Procedures and methods of safety engineering are used to specify, predict, and evaluate the level of safety in Arsenal activities and to ensure that retrofit actions to improve safety are minimized through the timely inclusion of safety factors. Historic safety data generated by earlier, similar programs is to be consistent and used wherever appropriate. Safety considerations must be included with procurement actions for new equipment and machines.

11-2. Policy. It shall be the policy at RMA to conduct preoperational surveys of all new operating lines and those inactive lines which are being renovated for demilitarization operations. The Safety Office will review all line layouts and construction or modification drawings. All new equipment, machines, and supplies shall meet applicable OSHA Standards and will be certified by the Safety Office.

11-3. Responsibilities.

a. The Chief, Contracting Division shall be responsible for purchasing only safety or medically-approved items of personal protective equipment. In case of "or equal" or substitute items submitted by the vendor, they should not be accepted until specifically approved by the original approving organization.

b. The Safety Manager shall be responsible for the following:

(1) Reviewing new operating lines or renovated old lines with the Chief, Facilities Engineering Division. The emphasis should be on "before the fact" engineering to isolate and correct potential hazards.

(2) Reviewing all drawings and plans for building construction or modification and layout of operating facilities.

(3) Reviewing all contracts that involve contractor personnel in potentially contaminated areas. The review of these contracts is to ascertain inclusion of items such as medical examinations, safety and medical orientation, use of personal protective equipment, and that contracted personnel report to work clean-shaven.

(4) Specifying, approving, and certifying all personal protective equipment in conjunction with the Director of Medical Activities.

(5) Certifying new equipment and machines as follows:

(a) During initial procurement planning phases at RMA and development of parameter criteria to be provided to the vendor, Safety Personnel must assure the adequacy of all plans from a safety viewpoint.

(b) The final safety certification will be accomplished by the Safety Manager or his representative after the equipment has been received and has achieved its operational function.

(c) The Facilities Engineer will submit engineering drawings and construction plans to the Safety Office for final safety review, coordination, and signature of the Safety Manager or his representative.

11-4. Site Plans and Safety Submissions.

a. Each Organizational Element Head will ensure:

(1) That constructions plans for final safety review and approval are submitted through channels and approved prior to contractual obligation for construction or initiation of Army construction. Final safety review submission will be made as promptly as possible.

(2) That all applicable safety information, required by AR 385-60 and DARCOM-R 385-100, is incorporated into or furnished as a part of the final safety review submission.

(3) That Engineering drawings are available and that construction plans are prepared for final safety review, and coordinate and obtain the signature of the Safety Manager or his representative on drawings.

b. The Safety Manager will:

(1) Review all projects, plans and work orders to identify those which have potential occupational and health hazards and will coordinate with the Director, Health Clinic.

(2) Review safety site plans and construction plans for final safety approval prior to submission thru ARRCOM Safety Office to DARCOM Field Safety Activity.

11-5. Hazard Analysis.

a. A hazard analysis will be developed for all projects being submitted in accordance with DARCOM-R 385-3.

b. Hazard analysis will emphasize the quantitative assessment of process/production conditions in engineering terms and the establishment

CHAPTER 12

Safety Training

12-1. General. Safety training shall be incorporated in all parts of the training programs for hazardous and nonhazardous operations at RMA. Supervisors are expected to continue the training of employees by follow-up instruction, enforcement of regulations, and adhering to procedures. The Safety Office will strive to improve the quality of safety training through the implementation and direction of formal and on-the-job programs, and to provide guidance for training programs that may affect the overall safety of the Arsenal. Training will be provided for top management as well as supervisors and employees, to emphasize the safe responsibilities of all levels of Arsenal employees.

12-2. Responsibilities.

a. The Safety Manager will:

(1) Provide accident prevention material for civilian and military safety training.

(2) Give new employee orientation to all new employees and specify the Arsenal's Safety Program; also give orientation to contractor/visitors as well.

(3) Coordinate with the RMA training officers for civilian and military personnel to assure adequate accident prevention training is given to all personnel. The Safety Office will monitor the selection of supervisors to assure that the training indicated in paragraph 12-3a(3) has been accomplished.

(4) Assure that safety staff members are trained in accordance with OSHA Standards and CPR's, CP12, and the locally prepared training plan for safety personnel.

(5) Continually review and evaluate the overall training program as it may affect the Arsenal Safety Program on the Arsenal.

(6) Make periodic spot checks of the training being accomplished.

(7) Keep a central file of all RMA employees' OSHA, SOP, and any job related safety training.

b. The Arsenal Central Safety Committee and the Safety Office should determine the need for regular and specialized safety training and make recommendations to the Training Officer for the establishment of safety training programs.

c. Training Officers for civilian and military personnel shall assist all operating elements in determining safety training needs and for establishing and coordinating courses to meet those needs.

d. Civilian Personnel Office shall orient each new employee, addressing their rights, privileges and responsibilities as a Civil Service employee.

e. Directors/Office Chiefs shall ensure that each newly hired or transferred employee is given an orientation pertaining to the safety rules and regulations of his assigned work area before the employee is permitted to work on his own.

f. Medical Personnel. The Physician in charge of the medical facility, or his designated representative, will review and approve the content of first-aid and CPR training and approve personnel to conduct the training. He is also responsible for conducting the Agent Orientation Briefings as outlined in Appendix A to this chapter.

g. Supervisors are the keystone to any training program. They are the individuals who participate in most aspects of employee training. The supervisor is responsible for developing employee competence to carry out the mission of the organization and to see that each employee receives the necessary instruction and training required to perform his job in the safest possible manner.

h. Employees, as a condition of employment, shall follow all instructions and use the personal protective equipment and protective devices provided for machinery, equipment, tools, and processes. Each employee should develop intelligent and safe working habits by following safe practice rules and regulations, in order to protect himself and fellow workers from injury and to prevent damage to material, equipment, and facilities. Each employee should contribute any suggestions which may assist in the effort to prevent accidents and, in general, take an active part in the Arsenal Safety Program.

12-3. Training Guidance.

a. General.

(1) A formal training program is required to assure that each employee can perform his assigned job both proficiently and safely.

(2) An effective training program for new employees consists of orientation, instruction, and testing.

(3) Employees selected to be first-line supervisors will be given supervisory development training prior to being placed on the job. Training must include:

(a) Role of the Supervisor.

(b) Job instruction training.

(c) Safety responsibilities.

b. Orientation.

(1) The first orientation will be presented by the Civilian Personnel Office and covers the basic aspects of the Arsenal, such as traffic regulations, decals, identification badges, etc.

(2) The second orientation will be presented by the organization line supervisor and covers such items as hours of work, lunch room location, the employee's part in the organization, and basic rules and regulations relating to the line or area.

(3) The third orientation is shared by the Safety Office, Health Services, and Fire Prevention.

(a) The Safety Office will cover safety requirements on protective clothing and equipment, buddy system, accident prevention, etc.

(b) Health Services will cover agents and life saving measures, etc.

(c) The Fire Prevention Branch will cover fire safety.

c. Instruction. Two phases of instruction are deemed necessary for most employees; especially, those to be assigned in agent areas.

(1) Whenever possible, the first phase of instruction is classroom training. A qualified instructor will be utilized in the presentation of this phase, with the important consideration being the integration of safety training with job training. The toxic agents orientation briefing will be conducted for new employees in this phase of instruction.

(2) After completion of the classroom training and a demonstration of the employee's understanding of the operation, the second phase is to be undertaken. This phase of training will expose the new employee to the operation in which he will be involved, and may be accomplished by

the supervisor on the job, by special instructors, or by other qualified persons. The employee shall be thoroughly instructed in the efficient, safe method of performing his assigned work before being permitted to work "on his own." The personal benefits to the employee by conformity with these rules should be explained. The instructor should include an outline of the necessary steps in the performance of the job; a listing of the essential techniques for the efficient performance of each step; a listing of the hazards present in each step; and definite, positive instructions regarding each hazard, which will enable the employee to avoid accidents or injury.

d. Testing.

(1) A determination must be made of the standards of proficiency to be attained by the new employee.

(2) The new employee must demonstrate his knowledge of the operation before he is permitted to perform his new duties. Any area in which the employee demonstrates misunderstanding should be resolved.

(3) An audit should be performed at varying intervals after the new employee's initial training to determine that the standards required for the job are maintained.

e. Training for Hazardous Operations.

(1) All employees who work with hazardous explosives or chemical agents should receive a minimum of eight hours of job induction training and the training recorded on SF 7B, Employee Record. SOP's or JSA's should be utilized in this training. Before the employee is permitted to work with hazardous materials such as a bomblet, he should perform the job on an inert or mock-up item, if available. It is essential that the new employee demonstrates his ability to do the job and completely understands the hazards connected to it before he is permitted to perform duties involving hazardous materials.

(2) New employees working in areas where H, GB, and CG are involved need a minimum of an additional eight hours of special training which will cover the special cautions needed in these areas. A refresher course will be given to employees working in these areas at least every six months.

(3) Agent Orientation Training. In addition to the normal training requirements, personnel routinely working with or near agents, and other personnel in the Chemical Personnel Reliability Program, should receive a quarterly agent orientation. The purpose of this orientation is to reacquaint personnel in the signs and symptoms of agent poisoning, physiological effects, self and first-aid, personal protection, and the purpose of CHE and EEG testing.

(4) As a means of improving the procedure for recording of personnel attendance, it has been determined to utilize SARRM Form 1031, Appendix B of this chapter. This form will be handed out to each individual at the time the briefing is presented. He will print his name and organization, complete the date of briefing, and personally sign the certificate of attendance. The forms will be collected by the Safety representative attending the briefing, and the Safety Office will ensure that they are distributed to each applicable organization. Entry on the 7B Form will fulfill compliance with the safety and surety regulations; and at the same time, indicate to the responsible operating official that his personnel are receiving the prescribed training.

f. National Safety Council Defensive Driving Course. The DDC is aimed at preventing traffic accidents. It offers every licensed driver a standardized method of improving his driving ability by learning about proven, professional driving techniques. All Arsenal personnel who drive government vehicles are required to attend. Eventually, the Course will be extended to include all civilian and military personnel who drive. Military dependents may also attend.

g. Motor Vehicle Training. Remedial training will be given to each driver who has been in an accident or who needs the training as evidenced by improper vehicle operations. The Safety Office will coordinate this training with interested organizations. Training will be in compliance with the Motor Vehicle Safety section of this Pamphlet (Chapter 13).

h. Materials Handling Equipment. This training should be based on the guidelines of DARCOMR 385-100 and TM 21-305. An actual performance check, as well as a written test based on standards of proficiency should be utilized to determine the employee's capabilities before he is permitted to perform his assigned operation.

i. Engineer Equipment. The course of instructions for operators of engineer equipment is contained in TM 21-300. Performance testing based on established standards is critical in this training program.

j. Weapons Training for Guard Personnel. This training program should be based on guidelines in FM 23-35. Refresher training should be given yearly. Riot training should be included in this program.

k. First-aid and Cardiopulmonary Resuscitation (CPR). This training program can be based on Red Cross, Civil Defense Medical Self-Help, r courses established by Arsenal medical personnel. The requirements of paragraph 1-19, DARCOMR 385-100, should be complied with. Refresher courses should be established on a three-year basis, except for those persons indicated in Appendix A, who require refresher training every six months.

l. Protective Mask. Training in this area will be based on DARCOMR 385-102 and DARCOMR 385-31 and the technical manual prescribed for the applicable model of the protective mask. Safety Office or Laundry personnel will train and test personnel in proper donning and fitting of the mask and in its use and care when it is initially issued. The mask-testing procedures contained in DARCOMR 385-31 and 385-102 will be followed. Refresher courses (instructions) will be repeated annually.

m. Chemical Accident and Incident Control.

(1) Annex C to RMA Disaster Control Plan. A general orientation on this Annex and the SOP's of each Directorate/Office Chief will be conducted initially and subsequently refreshed on a quarterly basis.

(2) Chemical Accident/Incident Training Exercises. Appendix VIII of Annex C to RMA Disaster Control Plan provides guidelines for the quarterly training exercise.

n. Off-the-Job Training. Although no specific guidelines are published in this area, avoiding off-the-job accidents is fully as important to the employee, his family, and to the demilitarization of chemical agents, as is being a safe worker on the Arsenal. Periodically, employees will be furnished with pamphlets, booklets, cards, etc., devoted to such topics as pedestrian safety, safe driving, fire prevention, home safety, recreational safety, and first-aid. Employees should be encouraged to take this material home for use by the entire family.

1. Supervisors

Course/Subject	Reference	Remarks
Supervisory Development Training	RMA Training Prospectus	For newly appointed supervisors at time of appointment or soon thereafter. (In-office training)
Ofc of Personnel Mgt Development Training	CPR & FPM 335 & 410	Within six months after appointment for new supervisors. Other supervisors as needed.
DARCOM FSA Chemical Agent/Munitions Safety Industrial Hygiene Aspects of the OSHA	CFR 1960-54 thru CFR 1960-59 Executive Order 12196 Sec 19 RMA Pam 385-1	Supervisors, employees, Safety and Health Specialists, as needed
Supervisors Safety Training	RMA Pam 385-1 CFR 1960-54 thru CFR 1960-59	To be presented to supervisory personnel annually.
Safety Training for Top Management	RMA Pam 385-1 CFR 1960-54 thru CFR 1960-59	As arranged.
Foreman Safety Training	DARCOMR 385-100	To meet monthly. Safety representatives to attend as advisors.

2. Employees

Motor Vehicle Operator Training	AR 600-55 TB 600-1	For all personnel prior to operating Government motor vehicles. Renewed at three-year periods.
Remedial Driver Training	AR 190-5 RMA Pam 385-1 Command Policy Ltr	As deemed necessary by the Safety Office, for all persons involved in motor vehicle accidents.
National Safety Council Defensive Driving Course (DDC-1)	Command Policy Ltr RMA Pam 385-1	Every three years, for all persons who drive government vehicles, before new license or renewal of license. To be renewed one month before the anniversary date of AMV renewal. All (POV) as

Material Handling Equipment Operator (MHE)	TM 743-200 TM 21-305	For all personnel prior to operating MHE.
Engineer Heavy Equipment Operator	TM 21-300 TM-305	For all personnel prior to operating engineer equipment.
Shelter Management/ Radiological Monitoring	App IV to Annex G, RMA Emergency Plan	All Shelter Managers, others as needed.
First-Aid Training Cardiopulmonary Resuscitation (CPR)	DARCOMR 385-100 TM 5-682	Electricians, maintenance men, guards, firemen, safety office personnel. Other RMA personnel as available. Refresher course required every six months for electricians.
Toxic Agents Orientation	DARCOMR 385-102 AR 50-6	Required quarterly for personnel working with or in close proximity to chemical agents.
Chemical Accident/ Incident Control Plan	AR 50-21 RMA DCP, Annex C	RMA Plan to be tested quarterly.
Firefighting Training	AR 420-90	Continuous for personnel assigned to Fire Prevention Branch.
Installation Fire Marshal, Auxiliary Firefighters	AR 420-90	Each area required to have a Fire Marshal. Auxillary firefighters as deemed necessary by Fire Prevention Branch.
On-the-Job Training	DARCOMR 385-100 DARCOMR 385-102	For all new employees in all areas
Employee Safety Meetings	DARCOMR 385-100 CFR 1960	A minimum of 30 minutes a month for hazardous operations; 10 minutes a month for administrative personnel. Minutes of the meetings are to be forwarded to the Safety Office within five workdays.
Protective Mask Training	DARCOMR 385-102 DARCOMR 385-31	Annually for everyone issued a mask.

DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, COLORADO 80022

AGENT ORIENTATION BRIEFING

Agent orientation sessions are part of our training program to insure that each employee in the Suitability/Reliability Program and workers in chemical agent areas in particular has a sufficient knowledge of the characteristics and hazards of the chemical agents handled at the Arsenal. Each employee is informed of the preventive and protective measures to reduce the likelihood of exposures to an absolute minimum. Workers are also informed of the requirements and the need for protective clothing and equipment and are trained in procedures for the safe use of this equipment. The necessity for training in and a complete understanding of the established standing operating procedures is also explained. The orientation includes the subject matter indicated below.

1. Medical

   a. Description of Agents

      (1) Physiological Effects

      (2) Signs and Symptoms

   b. Life-Saving Measures

      (1) Self-Aid and First-Aid

      (2) Artificial Respiration

      (3) Administration of Atropine

      (4) Agent First-Aid Kit

      (5) Prompt Evacuation

   c. Medical Surveillance Program

      (1) Annual Physical Examination

      (2) Purpose of ChE Baseline

      (3) Other Medical Screening Tests

      (4) Emergency Medical Identification Card

2. Safety

   a. Personal Protection

      (1) Protective Mask

      (2) Protective Clothing

DEPARTMENT OF THE ARMY
ROCKY MOUNTAIN ARSENAL
COMMERCE CITY, CO80022

TYPE OF TRAINING: _____ SUBJECT: _____

INSTRUCTOR: _____ ORGANIZATION: _____

DATE: _____ TIME: _____ PLACE: _____

TOTAL HOURS OF TRAINING _____

PERSONNEL ATTENDING

NAME (PRINT)	ORGANIZATION

CHAPTER 13

Motor Vehicle Safety

13-1. General. The Arsenal safety program includes traffic accident prevention. This program is designed to combat accident deaths, injuries, and damages which result from faulty operation of motor vehicles, inadequate inspection, maintenance deficiencies, physical hazards, lack of traffic control devices, or traffic violations. The Motor Vehicle Safety Program shall be administered by the Safety Office in coordination with Arsenal supervisors whose functions are pertinent to traffic activities and whose cooperation is essential to its success. The Program applies to all military and civilian personnel on the Arsenal and shall especially cover the field of education, engineering, and enforcement. The skills, training, and qualifications of other personnel shall be used whenever available in the administration of the Program.

13-2. Responsibilities.

a. The Safety Manager shall:

(1) Participate in investigations, determine cause(s), and recommend corrective action(s) in motor vehicle accidents.

(2) Analyze and record each motor vehicle accident and forward quarterly reports to management.

(3) Review DA 285 to ensure completeness of action. The Safety Office will forward the report to higher headquarters after completing the Safety staff portion.

(4) Schedule and/or conduct special training courses as deemed necessary as a result of an analysis of the Arsenal vehicle accident experience.

b. The Headquarters Detachment Commander will assure that all military personnel are counseled on the importance of driving defensively at all times before granting pass or leave or departing on TDY or PCS. Noncommissioned officers should conduct this counseling.

c. The Transportation Officer will test Arsenal drivers' abilities to operate vehicles and issue government driving permits to those who pass the test.

13-3. Education.

a. The driver is the critical factor in the safe operation of motor vehicles. The best designed and best constructed vehicles maintained

by the best mechanics cannot compensate for bad driving. Supervisors selecting candidates for driver training, testing, and licensing must exercise good judgment in determining abilities and attitudes of those selected.

b. The requirements of AR 600-55 shall apply for selection, testing, and licensing of motor vehicle drivers. Drivers will be licensed only after successfully completing the National Safety Council Defensive Driving Course, a written test and demonstrating proficiency in the type of vehicle to be licensed for. Every person operating a vehicle controlled by the Arsenal, including MHE and engineer equipment, must have in his possession a valid permit, SF 46.

c. Motorcycle operators and passengers (as defined by the State of Colorado motor vehicle regulations) will wear securely fastened helmets and face shields or goggles when operating such vehicles on RMA.

d. Safety Meetings. One month of each year shall be designated as "Safe Driving Month." This topic will be emphasized by all supervisors at safety meetings. Appropriate material will be provided by the Safety Office.

e. Off-the-Job Safety. A program to encourage the prevention of motor vehicle accidents to employees and their families will be carried on through the use of a separate "off-the-job" safety program. The Safety Office will provide literature, pamphlets, and booklets devoted to safe driving and pedestrian safety.

13-4. Safe Drivers' Training Program.

a. Drivers who have been involved in AMV violations or an accident will be given specific training in the particular driver action which caused or contributed to the violations or accident. Drivers selected for this training will attend or be subject to having their government license suspended or revoked.

b. The Safety Office will arrange for regularly scheduled driver improvement courses directed toward defensive driving, with primary emphasis on using the National Safety Council Defensive Driving Course.

c. Remedial training will be given to each driver who has been in an AMV accident or who needs the training, as evidenced by improper vehicle operation procedure. The Safety Office will coordinate this training with interested organizations.

13-5. Enforcement.

a. The provisions of RMA 190-4 provide a set of traffic rules and regulations. Traffic rules and regulations are prepared and published to become a part of the orientation and indoctrination of all new employees. Accident

trends involving violations disclosed through accident reports will be highlighted and disseminated to personnel by supervisors at the regular safety meetings.

b. Traffic Control. Security police personnel are used in apprehending violators of traffic rules and regulations. Individuals who are in violation of these rules and regulations must appear before the Federal Magistrate for Colorado. Traffic points are assessed against both the individual's Arsenal driving privilege and his Colorado or state of residency privileges.

c. Investigating and Reporting Accidents. Every motor vehicle, MHE, or engineer equipment accident will be investigated by the supervisor of the activity responsible for use of the vehicle and the Safety Manager, when necessary. Every motor vehicle accident will be reported on a SF 91 by the operator at the scene of the accident. DA 285, Accident Report, will be prepared in accordance with Regulations.

13-6. All AMV and POV operators must be knowledgeable of the governing rules and regulations of the RMA roadways.

13-7. References.

a. DARCOM-R 385-100.

b. AR 385-55.

c. TM 21-300.

d. TM 21-305.

e. RMA 190-4.

f. Colorado Driving Handbook.

g. National Safety Council Defensive Driving Course.

h. Command Policy Letter - Army Motor Vehicle Operations.

i. Command Policy Letter - Operator's Maintenance.

CHAPTER 14

Housekeeping

14-1. Policy. It is the policy of RMA that a high standard of housekeeping be maintained in all buildings and areas at all times. Housekeeping standards will be included in SOP's and JSA's to ensure more efficient operations.

14-2. Responsibilities.

a. Directors and staff officers will:

(1) Include a program of good housekeeping practices in the SOP's and JSA's for operations under their control.

(2) Make available to all assigned personnel the equipment and material required to maintain a high standard of housekeeping.

(3) Ensure that all assigned personnel receive adequate instructions and appropriate encouragement regarding the proper ways of maintaining a high standard of housekeeping.

(4) Instruct supervisors to continually check the facilities and operations under their control and to correct promptly any deficiency in standards of housekeeping.

(5) Ensure that surveys and inspections of their facilities and operations are conducted and that necessary corrections or improvements of housekeeping practices are made in a timely manner.

(6) Ensure the prompt correction of any deficiencies in housekeeping standards that are reported by the Safety Manager; the Chief, Fire Prevention Branch; or the Director of Health Services.

b. Safety Manager will include reports of housekeeping standards in surveys and inspections of all areas and report deficiencies noted.

c. Director of Health Services (or his designated representative) will:

(1) Conduct, at least annually, health inspections in areas that presently house personnel to ensure the maintenance of sanitary conditions. These inspections are part of the continuing effort to combat creations of situations which are detrimental to health and will be reported to the Safety Office.

(2) Coordinate inspections or surveys conducted by the US Army Environmental Hygiene Agency, or its Regional Division, that are OSHA related.

d. The Chief, Fire Prevention Branch will conduct surveys and inspections and report housekeeping discrepancies that are fire hazards to each appropriate RMA element and notify the Safety Office.

14-3. Procedures.

a. General.

(1) Fire prevention housekeeping standards are prescribed in RMA 420-2. Guidance for establishing and maintaining high standards of housekeeping in hazardous operations is contained in DARCOM 385-100 and CFR 1910.

(2) Trash containers will be emptied on a daily basis.

(3) Working areas, including floors, aisles, stairways, and passageways, will be kept clean, orderly, dry, and free from obstructions and protrusions.

(4) All work surfaces will be kept clean and orderly at all times.

(5) Restrooms, washrooms, and locker rooms will be maintained in a high state of order and cleanliness.

(6) Lunchrooms and canteen areas will be kept exceptionally clean and free of waste material.

(7) Refrigerators for food will be kept clean. A continued effort will be exercised to dispose of unwanted food.

(8) Microwave ovens will be cleaned after each day's use. All care must be exercised to eliminate any possible fire hazard.

b. Shops, Plants, and Storage Buildings.

(1) Pans and/or other collection devices will be used to prevent splashing of oil, grease, and similar material on floors and around machinery.

(2) Accidental spills will be cleaned up promptly. Decontamination, when required, will be performed immediately.

(3) Tools and equipment will be kept clean, orderly, and in designated locations.

CHAPTER 15

Range Safety

15-1. General. The ranges at RMA may be used for training, sighting-in, demolition, or recreational purposes. Units, activities, or separate groups may use the ranges, providing that arrangements are made five days in advance and approval obtained before using the range. Safety will be given primary emphasis at all times that the ranges are in use, and their use will be limited as follows:

a. Pistol Range. Firing is limited to the use of hand-held semi-automatic pistols, revolvers, and riot-type shotguns. Use of other shotguns, rifles, machine guns, or magnum ammunition is strictly prohibited.

b. Rifle Range. Firing is limited to shoulder fire arms (small). Use of automatic fire weapons or weapons firing multiple projectiles is prohibited.

c. Demolition Range. The type and quantity of material detonated on the Demolition Range is determined by the Escort and Disposal Detachment at RMA.

15-2. General Responsibilities.

a. Range Officer. The Range Officer or his designated representative has the following responsiblities:

(1) Coordinating and scheduling the use of the range.

(2) Providing supervision and enforcement of range safety regulations.

(3) Arranging for the maintenance, modification, and installation of ranges in accordance with the procedures prescribed in AR 385-63 and with the policies of the Commander.

(4) Providing notification of intended range usage as required in paragraphs 15-4 through 15-6.

(5) Assuring that the General Range Safety Requirements in paragraph 15-3 are met.

(6) Assuring that appropriate SOP's and range procedures are available at the range and are followed.

(7) Ensure that no weapon is loaded until the firer reaches the firing line and that the weapon will be loaded only upon his command.

(8) The Range Officer will wear a red helmet liner.

b. Range Safety Officer. The Range Safety Officer is a direct representative of the Officer-in-Charge (OIC) of firing. He will not be assigned other duties while acting in this capacity. He is responsible to the OIC for assuring the adequacy of safety when firing is being conducted. He shall also assure that the Federal Aviation Administration (FAA) is properly notified, if required.

c. Using Activity. The group using the range has the following responsibilities:

(1) Requesting the range five working days in advance when applicable.

(2) Conducting firing in a safe and orderly manner.

(3) Policing of the range when finished.

(4) Providing safety officers to assist the range officer.

15-3. General Range Safety Requirements.

a. An up-to-date copy of range procedures for each range must be furnished to the Safety Office and be made available along with this document at the range during use.

b. All ranges must be opened and closed by notifying the Security Desk (Ext. 369/372 or by radio, call sign NET).

c. While the range is in use, the capability of making radio or telephone contact with the Security Desk must be maintained.

d. Alcoholic drinks or intoxicated persons will not be allowed on the ranges. Caution will be exercised when using certain drugs or medications that may temporarily impair sight or reflexes.

e. Treat every weapon with the respect due a loaded weapon.

f. Always carry the weapon so that you can control the direction of the muzzle, even if you stumble.

g. Keep the safety on until you are ready to fire.

h. Roads leading into range areas or impact areas must be adequately marked to indicate approach to a range. When the range is in use, a range flag must be flown to give warning to approaching personnel.

i. If there is an emergency such as an accident or an unsafe condition, anyone who sees it, whether he be range personnel, firers, or spectators, immediately commands "Cease Fire" in a loud, clear voice. The same person then commands "Make the line safe." Regardless of who gives the command, all firers must cease firing immediately. Even though he may be ready to get a shot off, each firer must immediately remove his finger from the trigger and trigger guard and then clear and ground his weapon.

j. Wildlife will not be fired upon.

k. Use of standard targets is mandatory. Bottles, cans, or any other nonstandard targets will not be used.

l. Use of the firing ranges for recreational purposes is strictly at your own risk.

m. Firing will cease and demolition will not be initiated when low-flying aircraft approach the range.

n. When firing is in progress, an ambulance or other litter-carrying vehicle must be readily available.

15-4. Pistol Range.

a. Responsibilities. The Chief, Security Office, is the responsible individual for the Pistol Range. He, or his designated representative, will be the Range Officer. Agencies other than Security must notify the Chief, Security Office, five days prior to any intended use of the Range.

b. Procedures. Detailed range procedures for the use of the Pistol Range will be provided by the Range Officer at the Range when in use and to the Range Safety Officer.

15-5. Rifle Range.

a. Responsibilities. The designated Rifle Range Officer shall be the responsible individual for the Rifle Range. Agencies intending to use the Range shall notify the Range Officer five days prior to use.

b. Procedures. Detailed range procedures for the use of the Rifle Range will be provided by the Range Officer at the Range when in use and to the Range Safety Officer. Appendix A to this chapter shows the limits of the controlled firing area of the RMA Rifle Range.

15-6. Demolition Range.

a. Responsibilities. The Demolition Range is the responsibility of the OIC, Escort and Disposal Detachment, RMA. The Range is not available for use by other activities without prior consent.

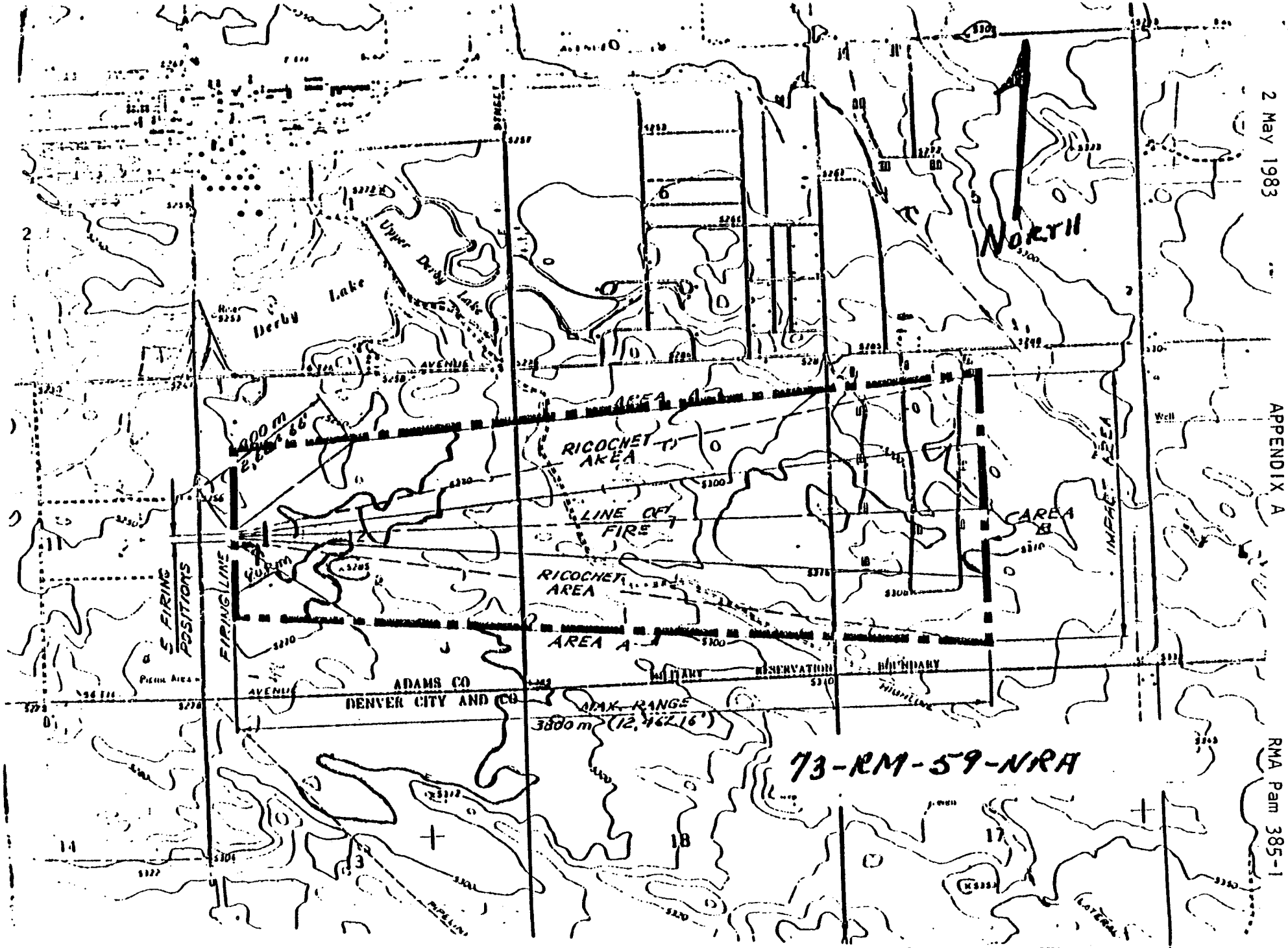
b. Procedures. Range procedures for the use of the Demolition Range are contained in Annex F (Disposal Operations) to Escort and Disposal Detachment SOP, an up-to-date copy of which must be kept on file in the Safety Office. Additional procedures are found in the technical manuals and SOP's available to the Escort and Disposal Detachment.

15-7. Maintenance/Modification. Requirements for maintenance, modifications and installation to ranges will be identified on DA Form 4283 (Work Request) and submitted to the Facilities Engineer.

15-8. References.

a. AR 385-63, Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat, 22 Feb 78.

b. DARCOMR 385-100. Safety Manual, 17 Aug 81


North
Upper Derby Lake
Derby Lake
AVENUE
AREA A
RICOCHET AREA
LINE OF FIRE
AREA B
IMPACT AREA
RICOCHET AREA
AREA A
FIRING LINE
FIRING POSITIONS
ADAMS CO
DENVER CITY AND CO
MILITARY RESERVATION BOUNDARY
MAX. RANGE
3800 m (12,467.16')
73-RM-59-NRA
PIPELINE

CHAPTER 16

Off-the-Job Safety

16-1. Policy. It is the policy of RMA to actively pursue methods of preventing off-the-job accidents and injuries to employees. Emphasis will be placed on safe driving, home safety, vacation safety, winter hazards, and other off-the-job exposures. This emphasis will be accomplished by the utilization of education materials, instructions, training, and other devices to secure the interest and participation of all personnel, maintain their interest, and create a favorable attitude toward safety everywhere, all the time.

16-2. Objectives. The objectives of the off-the-job safety promotion are as follows:

a. Improve individual attitude through prevention of off-the-job accidents.

b. Reduction of absenteeism by preventing off-the-job accidents which result in injury to the individual or members of his family.

c. Improve efficiency by the reduction of injuries in off-the-job accidents.

16-3. Responsibilities.

a. The Safety Manager shall monitor the off-the-job safety program. At designated intervals, safety pamphlets, booklets, etc., will be distributed by the Safety Office to each individual to read. They should be encouraged to take these publications home with them for the benefit of other members of their immediate family.

b. Supervisors should make a continuous effort to inform workers in their area of the hazards present in and around the home, on the highways, and the seasonal hazards, such as sports, winter driving, vacation driving, driver fatigue, water safety, etc. and encourage them to apply all of their safety training and knowledge in their personal activities after working hours.

16-4. Off-the-Job Accident Reporting.

a. Off-the-job accident statistics are maintained to aid in evaluating off-the-job accident causes. They serve to identify high-accident activities and provide information needed to control those causes which contribute most to these accidents. Prompt reporting of off-the-job

disabling injuries is necessary for the statistics to be valuable. Supervisors will report off-the-job disabling injuries to the Safety Office as soon as they are apprised of the injury and at no time later than close of work on the same day. Injuries that occur during a long weekend holiday are to be reported to the Safety Office on the first work day following the long holiday.

b. An off-the-job disabling injury is one in which the individual is injured in an accident and is unable to work one or more days following the accident.

CHAPTER 17

Contracts Involving Work in Hazardous Areas

17-1. Purpose. The purpose of this Chapter is to establish RMA policies and responsibilities regarding the execution and administration of contracts that require contractor personnel to work in agent-handling or similar hazardous areas.

17-2. Scope. This Chapter applies to all Arsenal elements concerned with developing contract requirements, awarding and/or administering of hazardous contracts involving prime contracts (subcontracts as applicable) requiring installing/checking equipment or providing a service inside a chemical-restricted area.

17-3. General. The RMA Safety Office is assigned the mission function to review all solicitations and awards where contractor personnel are required to enter agent-handling or other hazardous areas that involve materials injurious to health. The purpose of this review is to set forth safe methods, practices, and standards for all work in a hazardous rea to ensure the safeguarding of personnel and prevention of damage to overnment equipment. (Normally the contract will require the contractor to provide and maintain his own personal protective equipment.)

17-4. Responsibilities.

(1) Will be responsible to review all solicitations and awards that involve a prospective contractor who is to install/check out equipment or provide a service that will require contractor representatives to work inside an agent-handling or other hazardous area.

(2) Will provide the specific safety standards' clause applicable to these contracts.

(3) Will provide contractor personnel with the necessary training in use of protective clothing and equipment required for the area where work is to be performed, the hazards involved, and specific safety conditions peculiar to the contract.

b. Director of Health Services will provide the necessary medical requirements that contractor and subcontractor representatives must fulfill prior to their working in hazardous areas and/or with toxic substances.

c. Director of Installation Services

(1) Will notify the Safety Office of upcoming preaward conferences for contracts involving hazardous items and/or operations as well as

on-post assistance by general industry contractors (services, construction, etc.).

(2) Will identify contracts which demand inclusion of safety requirements.

(3) Will coordinate with the Safety Office to assure effective application of safety standards and conditions peculiar to these contracts.

(4) Will include proper structuring and coverage of safety standards to assure that the contractor, in compliance with the terms of the contract, accomplishes the following:

(a) Performs a service or installs/checks equipment to prevent serious accidents.

(b) Provides protection to Government property loaned by the Arsenal.

(c) Notifies prime contractors involved in agent-handling areas that proposed subcontractors are to be cleared with the Contracting Office to assure the same standards of safety are applicable. (A statement to this effect must also be included in the contract specification.)

(5) Will provide information to the Director of Health Services for identifying personnel as contractor or subcontractor. Information should include a definite period of time to determine their eligibility for medical services, as concerns initial screening for clearance or denial for cause or for emergency medical treatment.

d. Directors/Staff Officers. Will instruct their project engineers/officers who are responsible for preparation to the technical specifications relative to these contracts and coordinate with the Safety Office to assure that the safety clause is tailored to the hazardous aspects of the contract. The contractural document should include a course of action to be followed in case of incidents involving contractor personnel, i.e., definitive care by Arsenal medical personnel, Government, and/or private medical care. The latter is necessary because many contractors are either self-insured or carry an obligation of medical coverage for all their activities. Coordination with the Director of Health Services is required for all such contracts.

17-5. Procedures.

a. The technical review of these contracts may originate with a document submitted by the Contracting Division to the Safety Office or by the project officer/engineer from the Directorate/Staff Office responsible for the item or service to be procured. In the event contractor personnel are required to perform in areas mentioned in

paragraph 17-3, then a safety clause will be prepared. The clause will be tailored specifically to the hazardous aspects of the equipment or service to be provided under the contract.

b. Contracts that involve work in hazardous areas shall include the requirements of the Occupational Safety and Health Act, pertinent RMA safety and security regulations, and other safety clauses as required by Defense Acquisition Regulation (DAR).

c. Each invitation for bid (IFB), request for proposal (RFP), request for quotation (RFQ), specific instructions, or other document soliciting bids or proposals that involve work in agent-handling areas will identify unusual hazards connnected with them and will provide adequate information concerning the recommended safety precautions.

d. The IFB, RFP, RFQ, or other document soliciting bids that involve work in agent-handling areas will incorporate a safety clause setting forth the specific safety standards applicable thereto which are recommended to the contractor in the fulfillment of his responsibilities. The safety clause will also include specific medical requirements that are to be fulfilled by contractor personnel prior to their gaining entrance to contaminated areas that require Level A protection.

e. Contractor personnel for all on-post work contracts will be required to undergo a briefing by the Arsenal Safety Office, to include the wearing of protective items of equipment and of the specific hazards involved in agent-handling areas. Applicable regulations for the reporting of work injuries will be included in this briefing and indoctrination session. This instruction requirement cannot be waived and must be accomplished under the direction of the Safety Office.

f. When the contractor is authorized permission under the provisions of a contract to use Government facilities and equipment, he shall be required to comply with the Arsenal safety regulations and SOP's as applicable. (Normally the contract will require the contractor to provide and abide by his own safety regulations and SOP's that have been coordinated with necessary RMA elements.)

g. When contractor personnel are required to work in hazardous areas on weekends or times of reduced chemical bubbler monitoring, the Chief, Environmental Division, will be notified in sufficient time to allow sampling for background and for increasing the bubbler frequency commensurate with standard work area monitoring procedures. Responsibility for notification of this Division will rest with the organization which has cognizance of the area wherein the contractor is to work.

CHAPTER 18

LABORATORY SAFETY

18-1. Minimum Requirements for Operation.

a. The entrances to all laboratory rooms in which chemical agent is present shall be posted with appropriate warning signs, noting the presence and type of toxic agent and any special requirements for entry. Signs will be changed, removed, or updated as is necessary to reflect current requirements when agent is no longer present.

b. Only the personnel necessary to the operation will be permitted in the laboratory room, but at least two persons will be present when work involves lethal or incapacitating chemical agents and/or other significant hazards.

c. An SOP will be provided for all operations. It will be kept current, include emergency procedures, and maintained for ready reference in each work area where the SOP will be used. A pre-operational survey is required for all chemical surety material SOPs.

d. Laboratory personnel will have medical clearance, be in the PRPC and be trained prior to being assigned to work with agents. Training will also include proper use of protective clothing/equipment, decontamination procedures, emergency procedures, first-aid and self-aid procedures, and cardiopulmonary resuscitation (CPR).

e. Appropriate clothing and equipment must be furnished and worn. Approved safety eyewear will be worn at all times in operating chemical laboratories in accordance with this regulation.

f. Operations will be performed in appropriate facilities, such as ventilation hoods, glove boxes, etc.

g. The storage or consumption of food or beverages, storage or application of cosmetics, smoking or storage of smoking materials, tobacco products or other products for chewing; or the chewing of such products in all laboratory areas, is prohibited. Laboratory beakers or similar containers will not be used to prepare or consume food or beverages. Items for human consumption will never be stored in refrigerators containing chemicals, potentially hazardous items, or other items of unknown nature. Notices will be attached to refrigerators indicating "STORAGE OF EDIBLE FOOD AND DRINK PROHIBITED" or "STORAGE OF CHEMICALS ONLY."

h. If a first-line supervisor encounters a safety problem that he feels is beyond his competence, he will discontinue the operation and request assistance. The operation will not be resumed until the problem is resolved.

i. Containment of agent liquid and vapors is required at all times within a laboratory. When agent must be removed from the containment provided by laboratory engineering controls, the following restrictions apply:

(1) For quantities of one milliliter or less of neat agent, one of the following is required:

(a) A double containment system.

(b) A single containment system with a protective mask worn (for agents GB and VX only).

(2) For quantities in excess of one milliliter of neat agent, a double containment system is required.

j. A single containment system must totally contain agent liquid and vapor. Examples include glass bottle sealed with gaskets or parafilm tape, syringes with needle caps, septum bottles, sealed ampoules and capped liquid impingers (bubblers).

k. A double containment system must provide total primary containment as above and, in the event of leakage or breakage of the primary containment, must totally contain agent liquid and substantially contain agent vapors. Examples of secondary containment include, but are not limited to, metal cans with friction fit lids containing absorbent material and sealed syringe carriers.

l. Unattended overnight storage of agents in ventilation hoods requires double containment of agent.

m. Operations involving more than one agent will not be performed concurrently in the same room unless agents are separated by engineering controls (i.e., separate ventilation hoods, or unless specifically approved by the Safety Manager). Provisions must be made for detection of each agent to levels required.

n. Bubbler analysis (GB or VX only) may be conducted outside a ventilation hood provided the samples were taken from an area where significant contamination is not expected. Samples taken from areas with actual or expected positive contamination will be analyzed in a hood or glovebox.

18-2. Ventilation.

a. Laboratories will be equipped with either laboratory type ventilation hoods or glove boxes to provide the engineering controls necessary to

contain agent during operations. Ventilation systems will be designed so that air flow is away from the operator toward the source of agent. Pressure within the laboratory will be maintained below that of surrounding areas and entry corridor.

b. Effluent air from laboratory hood systems must not contain concentrations of agent in amounts that would produce harmful effects in human beings, considering appropriate dilution factors from the discharge location to the location of personnel access. If the quantity of agent being used, or the type of operation is such that this amount may be discharged into the atmosphere, then the discharge of the ventilation system must be equipped with chemical type filters or other air treatment systems to reduce the agent in the effluent to the above level. A record will be maintained noting filter replacement dates for each air filtering system.

c. Laboratory ventilation systems must be adequate to maintain a comfortable temperature level. They must have sufficient capacities to properly condition make-up air required for exhaust systems, with intakes (normally in the form of hoods) at points where contaminants are generated. Exhaust systems for toxic chemicals must conform with guidelines established by the US Army Environmental Hygiene Agency and the following standards:

(1) Laboratory hood criteria.

(a) Provide uniform exhaust-air distribution in hood. (Adjustable baffles and slots are acceptable, but are subject to tampering.) Ventilation exhaust will not be recirculated or used as make-up air for areas occupied by unprotected personnel. The design exhaust volume should be 180 cfm/sq ft of hood face opening to provide excess initial capacity.

(b) Locate hood away from heavy traffic aisles, doorways, and supply grilles.

(c) Use agent and corrosion-resistant materials suitable for expected use.

(d) Locate exhaust blower-motor assembly outside buildings.

(e) Avoid sharp corners at jambs and sill. Flanges and rounded hood inlets are desirable.

(f) Bypass openings in hood are desirable to avoid excessive indraft under partially closed sash and to simplify laboratory airflow balance.

(g) Provide tempered make-up air to laboratory; make-up air volume should be selected for slight indraft of air from corridor or adjacent rooms.

(h) Laboratory hoods in which agent operations are conducted will provide an average face velocity of 150 +/- 30 linear feet per minute through the working opening. A traverse of one measurement per square foot (approximately) should be used to compute the average velocity. No reading should be less than 90 linear fpm or greater than 210 linear fpm. (See DARCOM-R 385-102, Chapter 8, for more details.)

(i) Existing hood ventilation systems will be equipped with automatic audible and visual alarm device which will give a warning should the ventilation system fail because of power failure or mechanical malfunction, or if the average face velocity falls below minimum requirements. Visible alarms will be located so that they can be readily seen by personnel while working at the ventilation hoods.

(j) Hoods used for chemical agent storage will have individual alarm installations which are independent of ventilation system alarms. The visual alarms should be visible from outside the room containing the hood.

(k) Mechanical stops must be installed on each hood if the air flow requirements can't be met with the hood door at full open level. These mechanical stops are to prevent tampering with by the operator. The Operator should adjust lab hood door to the stop.

(l) Doors of hoods containing agent will be closed when unattended; however, closing the door on a standard lab hood (without by-pass) will create a pressure situation where the hood exhaust motor will/may be overloaded and will/may "burn up".

(m) Laboratory room air circulating fans will be turned off when hoods are used to avoid turbulent flow of air in the hood.

(n) Windows and doors will be kept closed, to minimize cross drafts and pressure changes.

(o) At anytime the minimum flow is not obtained, the Facilities Engineering Division will be contacted to make necessary adjustments. Before repair work begins, the laboratory supervisor will discontinue work in the hood(s) and all chemical agent and hazardous material will be removed to proper storage. Maintenance personnel will ensure this has been accomplished and will affix the necessary warning signs to the hoods and on doors of the room prior to starting repair work. Upon completion of repairs, maintenance personnel will remove the warning signs and notify laboratory personnel. This procedure is necessary to ensure that hoods are not utilized while maintenance work is performed.

(p) An approved SARRM 243, Hazardous Work Permit, is required for maintenance and repairs on all chemical agent hoods.

(q) Daily checks of hood flow must be made by the operators before operations begin to certify that the airflow face velocity meets regulatory guidelines. Each laboratory room will have a device that can measure approximate hood face velocity, such as a hanging vane velometer.

(r) All chemical agent hoods will be inspected semi-annually and an airflow test (face velocity) conducted. An inspection report will be attached to the hood by the inspector to certify inspection. All other hoods will be inspected annually and an airflow test (face velocity) conducted. An alternate choice would be to keep and properly maintain a log of all lab hoods, giving the same information and kept accessible (on file).

1 No work will be performed in hoods without current certification.

2 Only work indicated by the use of a form for Toxic Chemical Work will be permitted in the hood.

3 Any time that an operator or supervisor is in doubt that the hood airflow meets the requirement, he must cease operations in the hood and call the RMA Safety Office for reinspection. (The Safety Office will in turn notify the Industrial Hygienist.)

(s) No agent or agent contaminated equipment should be allowed within 20 centimeters of the face of the hood. This zone should be designated by paint or tape. No chemical or scientific equipment should be used within 20 centimeters of the face of the hood, if possible.

(2) Glove box criteria.

(a) For gloveboxes involved in toxic agent operations, the effluent filter should be activated charcoal or other system which will remove toxic agents from effluent air. Gloveboxes must be located in a hood or vented to a hood to remove possibly contaminated air from the operating area.

(b) Arm-length rubber gloves should be sealed to glove port rings. Glovebox gloves contaminated with liquid agent will be replaced immediately.

(c) Pressure within gloveboxes will be a minimum of 1/4 inch of water gauge below that of surrounding areas.

(d) Make-up air should be allowed into the glovebox to prevent stagnation and build-up of agent concentrations. The make-up air sources will be protected by filters, back-flow dampers or other means.

(e) Other openings into a glovebox (such as during glove replacement) must maintain an inward flow of at least 150 lfpm if agent is contained in the glovebox.

(f) If a glovebox has large or permanent open areas, it will be treated as a laboratory hood.

(g) Specific applications not covered by the criteria above should be referred through channels to the Safety Manager.

18-3. Monitoring.

a. A detection capability for G, V, and H agents with a sensitivity equal to or better than the M8 alarm or blue band tube must be maintained within the laboratory or readily available outside. A detection capability for other chemical agents with a sensitivity equal to or better than the M256 kit must be maintained within the laboratory or readily available outside.

b. First entry monitoring for G and V agents.

(1) For the following conditions, first entry monitoring will be conducted with a M256 kit or enzyme ticket while wearing a protective mask and gloves. A protective mask will continue to be worn in the room until ventilation is restored.

(a) During loss of ventilation in a hood with single or double contained agent, not exceeding 24 hours.

(b) Following loss of ventilation (less than 24 hours) if ventilation has not been restored for at least 30 minutes.

(2) For the following conditions, entry in level E with visual observation for tampering, leakage, or ventilation failure is acceptable.

(a) Normal entry with no apparent problems.

(b) Following restoration of ventilation (for at least 30 minutes) in a hood containing only double contained agent provided the ventilation loss did not exceed 24 hours.

(3) For the following conditions, first entry monitoring, protective clothing, and decontamination will be in accordance with DARCOMR 385-102. Unmasked personnel may not reenter until airborne contamination is verified to be below the TWA. Requirements can be obtained from the Safety Manager.

(a) Agent spill outside of containment.

(b) Major agent spill within hood.

(c) Ventilation failure of hood with contained or uncontained agent.

c. First entry monitoring for chemical surety materials (except G, V, and H agents).

(1) For loss of ventilation in a hood with single or double contained chemical surety material, or chemical surety material contained in compressed gas cylinders, first entry monitoring will be conducted with a M8 alarm or M256 kit while wearing a protective mask. A protective mask will continue to be worn in the room until monitoring results are negative.

(2) For normal entry of ventilated storage with no apparent problems, entry in Level E with visual observation for tampering, leakage, or ventilation failure is acceptable.

(3) The following conditions require special first entry monitoring, protective clothing and decontamination. Unmasked personnel may not reenter until airborne contamination is verified to be below TWA. Requirements can be obtained from the Safety Manager.

(a) Agent spill or leak outside of containment.

(b) Major agent spill or leak within hood.

(c) Ventilation failure of hood with uncontained agent.

d. Prior to removal from engineering controls, agent containers (single and double) will be sampled for gross surface contamination with M8 paper or have thorough external decontamination immediately prior to removal.

18-4. Definitions.

a. Laboratory - A location or facility where engineering controls include a glove box or laboratory type ventilation hood and the quantities of chemical agents used at one time is small, normally not exceeding one liter. Laboratory operations may include Research and Development (R&D) production/acceptance testing, sample analysis and evaluation, limited detoxification, animal testing, or other small scale agent operations.

b. IDLH - Immediately Dangerous to Life or Health.

c. Non-related Personnel - All personnel except those who are specifically involved with chemical agent operations and who are medically monitored, trained (first aid, use of detectors, etc.) and fitted with a protective mask.

d. Field Operations - Operations conducted outside of a man-made enclosure or structure, including movement of munitions.

e. Dilute Solutions - Those solutions presenting significantly reduced hazards.

f. Enclosed Area - Any operating building, shed, magazine, railroad car, truck, or trailer that sufficiently restricts natural ventilation to allow possible accumulation of agent vapors.

18-5. Laboratory Checklist. A daily checklist should be used at the beginning of each day's operation to assure presence or function of first-aid supplies, decontamination materials, ventilation systems, warning signs/labels, SOP's, uncluttered work area, protective clothing, etc. Suggested Laboratory Checklist is attached as Figure 18-1.

18-6. References.

a. DARCOMR 385-102.

b. DARCOMR 385-100.

c. DARCOMR 385-31.

Figure A-1

LABORATORY INSPECTION CHECKLIST

(Reference: DARCOMR 385-102, Chapter 8)

1. Are SOP's available and current?
2. What types of operations do you do?
3. How many and what types of agents are used in the laboratory?
4. Storage of agents (neat and dilute)?
5. Is 1st entry monitoring conducted?
6. Periodic/continuous bubbler monitoring (RTM)?
7. Bubble at beginning of new operations?
8. Use of M18 (or M256) kits - demonstrate?
9. Hood flow and alarms checked? Procedures for checking alarms.
10. Presence of air flow measurer (velometer) for hood?
11. Hood Filters - how is time logged? When do you know to change out filters? How are hood filters monitored?
12. How can you tell if hoods have been down during the night prior to 1st entry?
13. Emergency generator?
14. How is glassware decontaminated?
15. Where does liquid decon go?
16. How is contaminated waste handled?
17. How is contaminated waste tested and disposed of?
18. Check PC&E supplies (level A's and level B's). Tested? Laundered?
19. Are masks, goggles, face shields, etc. readily available?
20. What type of gloves are worn when working under the hood?
21. Are gloves reused? How are they disposed of?
22. First Aid Kit - atropine lot #'s; expiration date; 3 per person; bleach solution good; instructions.
23. Is there evidence of eating, gum chewing, or smoking in the laboratory?
24. Housekeeping.
25. Operator checklist.

CHAPTER 19

Handling and Storage of Compressed Gas Cylinders

19-1. Policy. It is the policy of RMA that the prescribed safety procedures of this Chapter be adhered to in the storage and handling of compressed gas cylinders. Personnel who handle these cylinders must be cognizant of the characteristics and physical dangers that are associated with compressed gases and of the color coding of cylinders.

19-2. Responsibility. Supervisors will ensure that all personnel who are assigned to store and handle compressed gas cylinders receive adequate instructions and that the safety rules are complied with as set forth by this document.

19-3. Color code for pipelines and compressed gas cylinders. Piping and compressed gas cylinders will be painted as prescribed by MIL-STD-101. Where the standard does not offer sufficient flexibility, request for exception to the standard will be submitted to the Safety Manager for processing.

19-4. Color Coding.

a. Personnel who handle compressed gas cylinders must be familiar with the color coding of cylinders as shown in Military Standard 101B.

b. Color coding is provided as a hazard warning and should not be used by itself to identify the contents of a cylinder. The use of color code MIL-STD 101B will promote greater safety and will lessen the chances of error, confusion, or inaction in times of emergency by providing a uniform color code to quickly warn personnel of outstanding hazards inherent in the materials involved.

c. Warning Colors. The following colors are assigned for use as both primary and secondary warnings:

(1) Yellow -- flammable materials. All materials known ordinarily as flammables or combustibles.

(2) Brown -- toxic and poisonous materials. All materials extremely hazardous to life or health under conditions as toxic or poisons.

(3) Blue -- anesthetics and harmful materials. All materials productive of anesthetic vapors and liquid chemicals and compounds hazardous to life and property but not normally productive of dangerous quantities of fumes or vapors.

(4) Green -- oxidizing materials. All materials which readily furnish Oxygen for combustion and fire producers which react explosively or with the evolution of heat in contact with many other materials.

(5) Gray -- physically dangerous materials. All materials, not dangerous in themselves, which are asphyxiating in confined areas or which are generally handled in a dangerous physical state of pressure or temperature.

(6) Red -- fire protection materials. All materials provided in piping system or in compressed gas cylinders exclusively for use in fire protection.

d. Colors Having no Significant Meaning. Black, white, orange, and buff -- these colors are without significant meaning and for general use.

19-5. Handling Compressed Gas Cylinders. Personnel who handle or use compressed gases or gas cylinders should be trained to recognize the dangers that are associated with the items and the safety practices in the handling of cylinders to avoid damage to the cylinders. Some general rules on handling are as follows:

a. All cylinders shall be adequately secured against accidental tripping, dropping, or falling.

b. Containers of compressed gases shall be handled carefully to avoid striking them against any solid object -- common wire rope slings are not to be used in handling cylinders.

c. Cylinders will never be lifted by grasping the valve or valve protection cap.

d. Cylinders will never be utilized as rollers or supports.

e. Cylinders shall not be dropped or otherwise roughly handled.

f. Prior to installing a regulator, it is good practice to open the cylinder valve one-fourth turn and close immediately to remove any dust or debris that would enter the regulator. Always point the valve opening away from the body and not toward anyone else.

g. Cylinder valves should be opened slowly to prevent a sudden discharge of gas.

h. During use, all cylinder valves except acetylene will be opened fully and then closed one-half turn. Acetylene cylinder valves shall never be opened more than one and one-half turns.

i. Gas shall not be transferred from one cylinder to another.

j. Compressed gas will not be used to dust off clothing or other objects -- serious injury may result.

k. Compressed gases from cylinders must never be used without reducing the pressure through a regulator that was designated for that purpose.

19-6. Storage of Compressed Gas Cylinders. It is important that safety precautions are exercised in the storage of compressed gases. The following requirements must be implemented when storing compressed gas cylinders:

a. All cylinders shall be stored in an upright position, except Anhydrous Ammonia cylinders should be stored on their sides in a cool place.

b. Cylinders containing the same gas shall be stored in a segregated group. Empty cylinders shall be stored in the same manner.

c. Cylinders should be stored in definitely assigned places away from elevators, stairs, exits, walkways, driveways, etc.

d. Filled and empty cylinders shall be stored with valves closed and caps in place, hand tight.

e. Filled and empty cylinders should be stored separately. When "filled" cylinders and "empty" cylinders must be stored in the same location, the cylinders shall be grouped according to the gases they contain and segregated.

f. Empty cylinders shall be marked with a tag stating "EMPTY."

g. Cylinders shall be stored in well-ventilated locations.

h. Cylinders shall be protected from extremes of temperature ($125^{o}F$), physical damage, and electric current.

i. Defective or leaking containers shall be removed immediately from the storage area or area of use.

j. Compressed gas cylinders shall not be stored within 40 feet of flammable or combustible materials or by a fire resistive partition.

k. Storage of compressed gas cylinders inside a building, except those in actual use or attached ready for use, shall be kept at an absolute minimum. However, it shall never exceed a total of 10 cylinders.

l. Storage of compressed gas cylinders by Supply Division may exceed 10 cylinders when they are stored in special buildings, rooms, or compartments designated for that purpose. They must be adequately ventilated, have no open flame, and the area must be properly posted.

m. Smoking shall be prohibited within 50 feet of compressed gas cylinder storage and "No Smoking" signs conspicuously posted.

19-7. Gases Considered Nontoxic and Nonflammable. The following gases enter into this category: Air, Compressed; Argon; Carbon Dioxide; Chloro/Fluorohydrocarbons; Helium; Nitrogen; Oxygen; and Sulphur-Hexafluoride. Refer to paragraph 19-3 for specific hazards associated with these gases.

19-8. Hazardous Toxic Gases. The following gases comprise this category: Ammonia, Chlorine, Chlorine Trifluoride, Carbon Monoxide, Ethylene Oxide, Methyl Bromide, Methyl Chloride, and Sulfur Dioxide.

19-9. Hazardous Flammable Gases. The following gases enter into this category: Acetylene, Ammonia, Butane, Carbon Monoxide, Chlorine Trifluoride, Propane, Ethylene Oxide, Hydrogen, Mapp Gas, and Methyl Chloride.

19-10. Compressed Gas Cylinders, Safety Procedures (Not All Inclusive).

a. Cylinders with valves must always be stored with the valve protector cap securely in place. Except for acetylene, cylinders without provisions for a valve protector cap shall be stored horizontally unless they are crated or palletized and strapped securely.

b. The use of a cylinder for gas other than what it last contained is prohibited.

c. Protective masks and antidotes for compressed gases of surety agents, such as AC (hydrogen cyanide), CK (cyanogen chloride), and CG (phosgene) will be provided for emergencies. Precautions for each gas will be posted.

d. Reduction valves, gauges, and other fittings used for oxygen will not be used on other cylinders. Reduction valves, gauges, and other fittings used for other gases will not be used for oxygen. Likewise, the use of fittings to interchange the use of different gas cylinders is not permitted.

e. Personnel using cylinders of acid gases shall be informed of the inherent dangers in the event of accidental rupture and shall be provided with an approved acid gas mask. Masks will be stored in a readily accessible location outside each room where acid gas cylinders are contained. The masks should be stored in clearly marked compartments

built for that purpose so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired. Masks should not be stored in such places as lockers or tool boxes. Masks shall be inspected for serviceability, cleaning, and disinfecting after each use and at least semi-annually. Records of inspection dates and findings shall be maintained for each mask.

19-11. Definitions. For the purpose of this Chapter, the following definitions apply:

a. Compressed Gas Cylinder. A compressed gas cylinder is any tube, bottle, or other type of pressure cylinder larger than three inches in diameter by six inches in length, which contains a pressure that exceeds 104 pounds per square inch at 130°F or any flammable liquid material having a vapor pressure exceeding 40 pounds per square inch absolute at 100°F. (One-ton type bulk containers are included -- all ammunition is excluded.)

b. Characteristics of Gases. In handling and using cylinders, personnel should have knowledge of some of the characteristics of the particular gas involved:

(1) Acetylene (DoT red flammable gas tag). Acetylene is highly flammable; and when mixed with water, is highly explosive. The cylinders should be stored in an upright position. Owing to its explosiveness, sparks and flame must be kept away from the cylinders.

(2) Air, Compressed (DoT green gas tag). Compressed air is generally inert; however, it does contain about 20 percent Oxygen and should be handled with due respect for its ability to support and intensify combustion.

(3) Ammonia (DoT green gas tag). Ammonia in light concentrations is extremely irritating to the eyes, skin, and mucous membranes. In heavier concentrations, it can be fatal. It is explosive in mixtures of 16 to 24 percent by volume in air. Liquid Ammonia is extremely dangerous; it will freeze and cause caustic burns on contact.

(4) Argon (DoT green gas tag). Argon is nonflammable and nontoxic and will not support combustion. High concentrations ... a confined area may displace air and cause suffocation.

(5) Helium (DoT green gas tag). Helium is much lighter than air, is nonflammable, and does not support combustion. High concentrations in a confined area may displace air and cause suffocation.

(6) Hydrogen (DoT red flammable gas tag). Hydrogen is highly combustible and must be kept at a safe distance from sparks and flame. When mixed with air or oxygen, it becomes highly explosive. It is nontoxic and dissipates rapidly in air.

(7) Liquified Petroleum Gases (LPG) (DoT red flammable gas tag). LPG such as Butane and Propane are flammable and must not be stored with Oxygen cylinders or flammable substances. The gases are relatively non-toxic but may act as an anesthetic. They are heavier than air.

(8) Nitrogen (DoT green gas tag). Nitrogen has approximately the same density as air, is nonflammable, and does not support combustion. Nitrogen is divided into two subclasses: "oil-free" and "oil-tolerant." The former indicates that the compressor used in manufacture was lubricated with water or liquid gas to prevent possible contamination with oil. Oil-tolerant Nitrogen must not be used in conjunction with Oxygen. High concentrations of Nitrogen in a confined area can displace air and cause suffocation.

(9) Oxygen (DoT green gas tag). Oxygen is nonflammable but supports combusion intensely. It must not be stored or used near flammable materials or gases. Oil or grease must never be allowed to come into contact with Oxygen cylinders.

19-12. References.

a. AR 700-68.

b. DARCOMR 385-100.

c. MIL-STD-101B.

d. OSHA Standards, Vol. 39.

CHAPTER 20

RESPIRATORY PROTECTION

20-1. General. Respiratory protective devices, except military respirators, used within RMA must carry National Institute for Occupational Safety and Health (NIOSH) or the Mine Safety and Health Administration (MSHA) approval. Approved respirators are listed in TB Med 502, Section III. Military protective masks are not authorized for use in industrial-type operations. Supervisors of employees requiring these respirators will submit requests through the Safety Office, RMA, to the Chief, Plant Operations Branch, Protective Clothing and Equipment Recall Coordinator. Request will contain the following information:

a. Name of immediate supervisor, building number, and telephone extension.

b. Type of respirator approved by the Industrial Hygienist, FAMC.

c. Type of hazard against which protection is required (e.g., solvents, chemical vapors, dust, etc.).

20-2. Care and Use.

a. Supervisors and employees will make daily inspections of respirators before use, particularly of functional parts, such as exhalation valves and filter elements, to ensure cleanliness and serviceability. All defective components will be replaced before the respirator is used.

b. All respirators will be kept clean to minimize skin irritation, dermatitis, and to prolong the life of the item. Manufacturer's recommendations will be followed for cleaning and maintenance, but if there are none given, the following procedures will be used:

(1) After each day's use:

(a) Remove filter.

(b) Wash facepieces with soap and water.

(c) Rinse facepieces with water and dry at room temperature before replacing components of air purifier units.

(d) Place unit in plastic bag or other closed container for storage.

(2) Oil, grease, solvents, and other harmful materials will be removed as soon as they collect on the mask surface.

c. Each worker will be taught the working principles of the device, the necessity of its fitting properly to prevent leakage around the face-piece, when and how to replace the purifying elements, and how to sterilize the device when that is his responsibility. Personnel will be supervised continually to ensure compliance.

d. Each employee will use his own respirator. Before storage or issuing to other operators, respirators will be cleaned thoroughly by scrubbing with a strong soap solution, rinsed with water, and sponged with disinfectant recommended by the manufacturer or with 50 percent ethyl or isopropyl alcohol, or as recommended by the Health Clinic.

e. Respirator will be stored in a protective container in a clean, dry area.

20-3. Chemical agent operations.

a. In activities where respiratory protection is required, there will be an established program for its selection, use, and maintenance.

b. The program will include the following essential elements:

(1) Selection. The device which will give the best protection and which can be worn with the greatest degree of comfort under conditions of employment will be selected using the following standards:

(a) In an atmosphere which is oxygen deficient (less than 16 percent oxygen) or in which the toxic agent vapor concentration exceeds 0.2 mg/m^3 (GB or VX), approved self-contained breathing apparatus (SCBA) or air-supplied respirators will be used.

(b) Canister for filter-element-type masks can be used where oxygen deficiency is not a factor and the vapor concentration does not exceed 0.2 mg/m^3 (GB or VX).

(c) Military protective masks are designed and issued for protection against field concentration of chemical, biological, and radiological warfare agents and should not be used in industrial applications.

(2). Wearer Instructions. The wearer will be properly fitted and trained in the use and care of the device and the means by which it gives protection.

20-4. Maintenance. The Laundry will issue and maintain respiratory protective equipment in accordance with the current supply and maintenance guidance for the equipment. It will ensure that an adequate stock of approved serviceable respiratory protective equipment is always available.

a. Canister and filter element replacement will be in accordance with the requirements of the latest technical manuals and supply bulletins for the individual M9 and M17 protective masks. The M9 and M17 protective masks will afford adequate protection against the inhalation of vapors and aerosols provided the following precautions are observed:

(1) The concentration and exposure time is not exceeded.

(2) The canisters of filter elements are properly installed.

(3) The facepiece is properly fitted to the wearer.

(4) Mechanical damage to mask, canister, and filter elements is prevented.

b. In addition to the replacement requirements for canisters or filter elements given in the appropriate TM, the following replacement requirements will also apply:

(1) Whenever the mask becomes contaminated with liquid agent.

(2) When the mask has been worn in an accidental spill situation and exposed to agent vapor.

(3) Under other conditions of accidental exposure to a high concentration of agent vapor.

(4) The protective masks will be stored so they will be kept in carrier and hung by the shoulder strap or carrier.

20-5. Individual care and use of protective masks.

a. Initial fit. When a protective mask is issued or the filter element or canister is changed, it will be inspected for serviceability, fitted to the person, and tested for leakage. This inspection shall be performed by designated personnel at the mask control and issue point.

b. Employee leak checks. Personnel employed in operations where the mask is required for protection will check for fit and leakage, whenever the mask is donned, as follows:

(1) With the left hand, pull open the carrier flap, and with the right hand, reach into the carrier, grasp the front portion of the facepiece in the area of the voicemitter-outlet valve assembly, and withdraw the mask from the carrier.

(2) Grasp the left side of the facepiece with the left hand and the right side of the facepiece with the right hand. Slip the thumbs under the head harness straps. Separate the hands to open the facepiece.

(3) Seat the chin in the chin pocket. Then slip the head-harness straps over the head to pull the mask up onto the face. (Do not slip the head-harness straps over the head and then pull the mask down over the face).

(4) Make sure that the head-harness straps lie flat against the head. Pull adjustment tabs equally to ensure snug fit is obtained. Initial fit and adjustment will be performed per para a above.

(5) Place the palm of one hand over the openings in the bottom of the outlet valve cover. Expel the air that has been held in the lungs, forcing exhaled air to escape around the facepiece and thus clearing the mask of contaminated air.

(6) Press the palms of the hands over the canister inlet (M9) or the inlet valve caps (M17). Inhale lightly and hold the breath for approximately 10 seconds to determine whether an airtight seal of the mask against the face has been obtained as indicated by collapse of the facepiece.

c. Each individual is responsible for the condition of his own mask. Under the supervision of trained and qualified personnel he will see that the mask fits. All personnel engaged in toxic operations must report to work with clean-shaven faces to ensure proper fit of protective mask to face. He will also make a minute visual inspection as explained in the appropriate TM for the mask. Defects will be reported immediately by the individual to his supervisor.

d. Masks will be inspected semi-annually by the RMA Protective Clothing and Recall Coordinator.

20-6. Industrial operations.

a. The Industrial Hygienist, FAMC, will evaluate industrial respiratory hazards, the types of respirators required, and will evaluate those respirators already in use to determine their adequacy.

b. The Protective Clothing and Recall Coordinator or his designee, Plant Operations Branch, will provide instructions and training on mask fitting and maintenance requirements for users.

c. Respirator cleaning and disinfecting will be the responsibility of the user. Supervisors will ensure cleaning materials are procured, stocked, and made available to employees and also will make sure employees are given cleaning instructions.

d. Semi-annual maintenance will be performed by the Plant Operations Branch. This maintenance will include replacement of worn or deteriorated parts. Routine day-by-day inspections will be conducted by the user.

e. Respirators for emergency use, such as the self-contained breathing apparatus, will be thoroughly inspected by the Safety Office and Plant Operations Branch at least once a month and by the user after each use. Any other special type respirators (excluding emergency ones) must be maintained, cleaned and inspected per instructions by the Chief, Plant Operations Branch, to be coordinated with the Safety Office and Health Clinic.

f. When masks are used daily, inspection and cleaning shall be performed weekly to insure serviceability. Supervisory personnel must check to assure that cleaning and inspection of masks are being performed by employees.

g. The RMA Health Clinic will determine physical capability of each individual assigned to RMA who is required to use respiratory protection in accordance with TB MED 502.

20-7. References.

a. AR 50-6.

b. AR 385-32.

c. AR 385-102.

d. DARCOM-R 385-100.

e. RMA SOP 385-1.

f. TB MED 502.

CHAPTER 21

Safety Color Codes

21-1. General. The purpose of color coding is to supplement the proper guarding or elimination of hazardous conditions by the use of standard colors which will aid in the recognition of specific hazards by process of association. The marking of a physical hazard by a standard warning should never be accepted as a substitute for the complete elimination of the hazard whenever this is possible. It should be noted that color coding is intended to identify the hazard, not the material.

21-2. References. Utilization of the appropriate safety color codes is mandatory. The following standards are to be used at RMA:

a. AR 385-30, for colors to be used in industrial operations.

b. Military Standard 101B, for color coding pipelines and compressed gas cylinders.

c. Military Standard 709, for the color code system used to identify ammunition.

d. ANSI Standard Z53.1-1979, Safety Color Code for Marking Phisical Hazards.

e. OSHA Standards, Federal Register, Vol. 39, No. 125, paragraph 1910.144, Safety Color Code for Marking Physical Hazards.

f. RMA Chemical Hazard/Fire Explosive Symbols (Fig. A-1).

EXPLOSIVE FIRE HAZARD SYMBOLS

	INDICATES	HAZARD
	DIV 1, CLASS 1.1. INCLUDES AMMUNITION AND EXPLOSIVES	MASS DETONATING WITH POSSIBLE PRIMARY AND SECONDARY FRAGMENTS. FIREFIGHTING FORCES SHALL KEEP 1,000 FT AWAY WHEN FIRE INVOLVES LESS THAN 50,000 POUNDS OF EXPLOSIVES UNTIL CLEARANCE IS GRANTED TO ENTER THE AREA. WHEN QUESTION OF SAFETY IS IN DOUBT, NO EFFORT WILL BE MADE TO EXTINGUISH THE FIRE.
	DIV 2, CLASS 1.2. INCLUDES AMMUNITION AND EXPLOSIVES.	EXPLOSIVES WITH FRAGMENT HAZARD. NO ATTEMPT TO FIGHT FIRES INVOLVING SYMBOLS 1 AND 2 EXCEPT FOR MANUAL ACTIVATION OF INSTALLED FIRE EXTINGUISHING EQUIPMENT.
	DIV 3, CLASS 1.3. INCLUDES EXPLOSIVES WHICH BURN VIGOROUSLY	MASS FIRE WITH INTENSE RADIANT HEAT. EXTREME CAUTION SHOULD BE TAKEN BY FIRE FIGHTING ORGANIZATION. UNLESS FIRE IS MINOR, CONFINE OPERATIONS TO PREVENT SPREAD OF FIRE TO OTHER BUILDINGS.
	DIV 4, CLASS 1.4. INCLUDES AMMUNITION AND EXPLOSIVES SUCH AS OILS, PAINT, GASOLINE, COMPRESS GASES, AND METALLIC POWDERS WHEN PACKED IN CLOSED SHIPPING CONTAINERS.	MODERATE FIRE. PRESENTS A FIRE HAZARD WITH NO BLAST HAZARD AND VIRTUALLY NO FRAGMENTATION OR TOXIC HAZARD BEYOND THE FIRE HAZARD CLEARANCE ORDINARILY SPECIFIED FOR HIGH-RISK MATERIALS.
	APPLY NO WATER.	A DANGEROUS REACTION WILL OCCUR IF WATER IS USED IN ATTEMPT TO EXTINGUISH FIRE.

PREPARED BY: ROCKY MOUNTAIN ARSENAL
SAFETY OFFICE (SARRM-SF) MAY 1981

CHEMICAL HAZARD SYMBOLS

	INDICATES	HAZARDS
	GROUP A G TYPE NERVE AGENT WEAR PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT	HIGHLY TOXIC LETHAL AGENT CAUSING INCAPACITATION OR DEATH
	GROUP A VX NERVE AGENT WEAR PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT	HIGHLY TOXIC LETHAL AGENT CAUSING INCAPACITATION OR DEATH
	GROUP B BZ INCAPACITATING AGENT WEAR PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT	PROVIDES PHYSICOLOGICAL OR MENTAL EFFECTS (MENTAL ABERRATION)
	GROUP A H TYPE MUSTARD AGENT IF DETECTED, PERFORM WORK IN ONLY FULL PROTECTIVE CLOTHING AND EQUIPMENT	CAUSES REDDENING AND INFLAMMATION OF EYES, NOSE AND THROAT BURNING. MAY BLISTER SKIN OR MUCOUS MEMBRANE
	GROUP A LEWISITE WEAR PERSONAL PROTECTIVE CLOTHING AND EQUIPMENT	MAY BE ABSORBED THRU THE RESPIRATORY TRACT, SKIN OR EYES
	FULL PROTECTIVE CLOTHING M9 SERIES PROTECTIVE GAS MASK OR SELF CONTAINED BREATHING APPARATUS, IMPERMEABLE SUIT, HOOD, BOOTS, UNDERGARMENTS, COVERALLS, GLOVES AND PROTECTIVE FOOTWEAR.	INDICATES HIGHLY TOXIC CHEMICAL AGENTS WHICH MAY CAUSE DEATH OR SERIOUS INJURY TO BODY FUNCTIONS
	FULL PROTECTIVE CLOTHING M8 SERIES PROTECTIVE GAS MASK OR BREATHING APPARATUS, COVERALLS AND PROTECTIVE GLOVES	INDICATES HARASSING AGENTS (RIOT CONTROL AGENTS AND SMOKES)
	FULL PROTECTIVE CLOTHING M9 SERIES PROTECTIVE GAS MASK OR SELF CONTAINED BREATHING APPARATUS, FLAME RESISTANCE COVERALLS AND FLAME RESISTANCE GLOVES.	INDICATES THE PRESENCE OF WHITE PHOSPHORUS AND OTHER SPONTANEOUSLY COMBUSTIBLE MATERIAL
	WEAR BREATHING APPARATUS PROTECTIVE MASK PREVENTS INHALATION OF SMOKE FROM INCENDIARY MIXTURES.	INDICATES THE PRESENCE OF INCENDIARY AND READILY FLAMMABLE CHEMICAL AGENTS WHICH PRESENT AN INTENSE RADIANT HEAT HAZARD

Fig. A-1

CHAPTER 22

Industrial Hygiene Program

22-1. Policy.

a. An Industrial Hygiene Program has been established and shall be maintained at Rocky Mountain Arsenal.

b. The Industrial Hygiene Program is designed to provide management with necessary information to maintain a good working environment for all RMA employees.

22-2. Objectives.

a. To recognize, evaluate, and control the environmental factors in the workplace, which may adversely affect the employee's health and well-being.

b. To maintain close liaison with the assigned Industrial Hygiene Technician/Industrial Hygienist and the Safety Office in all matters regarding health and industrial hygiene problems that may arise.

22-3. Responsibilities.

a. The Safety Manager shall be responsible for administration of the Industrial Hygiene Program at RMA, in conjunction with the Deputy for Preventive Medicine, FAMC.

b. The Director Health Services will:

(1) Provide the services of a qualified Industrial Hygiene Technician/Hygienist to assist the Safety Manager in his duties.

(2) Administer the RMA Health Program.

(3) Record radiation exposure, determined from film badge dosage reports, on permanent record monthly.

(4) Supply technical advice concerning all medical aspects of dermatitis and other industrial health problems.

(5) Provide a qualified member for the Radiation Control Committee.

c. The Industrial Hygienist/Industrial Hygiene Technician will:

(1) Report to the Safety Office all matters concerning safety and health at RMA.

(2) Conduct all industrial hygiene surveys, inspections, samplings, in any area where he deems a health and industrial hygiene problem might exist.

(3) Assure that all areas are checked periodically for excessive concentrations of toxic fumes, dust, and other contaminants, and recommend corrective action.

(4) Survey ventilation systems and make necessary recommendations to correct deficiencies.

(5) Other functions outlined in Commander's Policy Letter, SARRM-CO, 4 November 1982, Subject: Industrial Hygiene Support.

d. The Director, Installation Services will route plans for future buildings or equipment modification of existing facilities through the Director, Health Services to the Industrial Hygienist/Technician for review from an industrial hygiene or environmental health standpoint.

e. The Chief, Facilities Engineering Division will:

(1) Assure that positive engineering efforts are initiated to reduce noise, and any other potential health hazards so determined by authoritative sources.

(2) Design and/or re-design machines, tooling, ventilation and equipment to meet required industrial hygiene standards.

f. All Organizational Element Heads will:

(1) Ensure employees are aware of and follow all rules and regulations in their respective areas of responsibility that pertain to industrial hygiene practices.

(2) Ensure their employees are provided with the necessary occupational safety and health training, to include specialized job safety and health training appropriate to the work they perform as specified by OSHA.

(3) Inspect their individual areas for excessive noise or any health hazards and submit a request through the Safety Office to the Industrial Hygiene Technician/Hygienist to conduct an appropriate survey.

22-4. References.

a. DARCOM Reg. 385-100.

b. Executive Order 12196.

c. 29 CFR 1960.

d. 29 CFR 1910.

e. AR 40-5.

f. DOD Insturction 6055.3.

g. Commander's Policy Letter, 4 Nov 82.

h. RMA Reg. 40-3.

CHAPTER 23

Radiation Safety

23-1. Purpose. The primary goal of a Radiation Protection Program is to maintain radiation exposure to personnel and the environment at a level that is as low as is reasonably achievable.

23-2. Applicability. This applies to all RMA and tenant activities who use radiation producing devices except for personnel exposed to ionizing radiation while being examined or treated for medical or dental purposes.

23-3. Objectives.

a. To prescribe minimum standards and procedures necessary to carry out the Radiation Protection Program.

b. To have control over personnel, radiation sources, and areas; and to keep internal and external exposures to radiation as low as possible.

c. To comply with pertinent regulations and directives of the Nuclear Regulatory Commission (NRC) and Department of the Army (DA); the provisions of Title 10, Code of Federal Regulations (CFR); and the provisions of the Byproduct Material License issued to Rocky Mountain Arsenal.

d. To assure that adequate and approved shielding, signs and warning devices are provided when any radiation sources are installed, and to inspect this equipment periodically.

e. To provide proper training for all employees operating any equipment with an ionizing radiation source.

f. To obtain appropriate licenses for ionizing radiation sources.

23-4. Policies.

a. A qualified individual will be designated as the RMA Radiological Protection Officer and will be responsible for the overall Radiation Safety Program.

b. A qualified individual will be designated as the Alternate Radiological Protection Officer (ARPO) and when the RPO is absent, will assume all radiation safety duties.

c. An Ionizing Radiation Control Committee will be appointed to advise in the supervision and control of radioactive activities. A member of the Safety Office as well as a member of Health Services will be members of this committee.

d. A written Radiation Protection Program that adequately covers any ionizing radiation activity at RMA must be maintained and kept up-to-date.

e. The RPO will conduct necessary inspections of all ionizing radiation equipment, and take necessary action to correct any deficiencies noted while making a radiation survey.

f. Reports will be submitted on any radiation accidents/incidents in accordance with AR 385-40.

23-5. Policy for Control of Radiation Sources.

a. Procurement.

(1) The Ionizing Radiation Control Committee approves the quantities and types of radiation sources which may be used at RMA. A request for authority to use a new radiation source must be sent by the user through the Director/Office Chief and RPO to the Ionizing Radiation Control Committe for approval.

b. Inventory.

(1) A physical inventory of all radioactive material will be conducted quarterly, and a record of these inventories will be maintained by the user. Any discrepancies noted during an inventory will be reported immediately to the RPO.

(2) A complete physical inventory of all radioactive materials covered by the NRC licenses will be made at least once every six months by the RPO in accordance with AR 700-52.

c. Disposal of Unwanted Radioactive Material.

(1) The manufacturer will accept for disposal the EC detectors sold to RMA. These detectors are sealed sources.

(2) All other radioactive items will be disposed of in accordance with instructions from Higher Headquarters.

23-6. Responsibilities.

a. The Commander will:

(1) Establish a formal radiation safety program in accordance with Federal and Army regulations.

(2) Obtain required licenses, authorizations, or permits before purchase, receipt, use, transfer, or disposal of radioactive materials.

(3) Designate in writing an RPO, and ARPO, and an Ionizing Radiation Control Committee.

(4) Enforce steps prescribed by the NRC and DA for the safe use, control, and disposal of radioactive materials, and report and correct safety defects and noncompliances.

b. The Ionizing Radiation Control Committee will:

(1) Establish the rules and procedures for procurement, storage, and safe use of radiation sources.

(2) Review SOP's and applications for licenses and authorizations.

(3) Study reports of incidents and adverse findings.

(4) Make recommendations for improvements.

c. The Radiation Protection Officer will:

(1) Implement the Radiation Protection Program.

(2) Provide guidance on creating working conditions and operating procedures that comply with applicable regulations and directives.

(3) Train personnel in safe working practices, emergency procedures, harmful effects of radiation exposures, plus topics required by 10 CFR, parts 19, 20, and 21, and 29 CFR 1910.

(4) Evaluate and document hazards related to operations involving storage, use, transportation, disposal, or loss of control of radioactive material to ensure adequate control and safeguards are used.

(5) Maintain an inventory of radioactive materials and ionizing radiation producing devices.

(6) Ensure that NRC Form 3, radiation warning signs, and other notices that are required are posted at work areas.

(7) Inspect radiation equipment and initiate action to correct deficiencies.

(8) Ensure that film badges are issued, and film badge reports of all employees who work in the radiation areas are monitored on a monthly basis.

(9) Formulate necessary plans and directives required for a well-balanced program.

(10) Monitor installation of new or modified radiation equipment

d. The Directors/Office Chiefs will assure that all requests for purchase of radiation sources will be sent to the Contracting Division through the RPO to the Ionizing Radiation Control Committee for approval.

23-7. Personnel Exposure.

a. Types of Hazards.

(1) Internal - Protection consists of excluding the probability of getting radioactive material inside the body.

(2) External - Protection consists of controlling time, distance, and shielding.

b. Allowable exposure rates (external radiation only).

(1) Exposures incurred during examination or treatment for medical or dental purposes are not to be included in the considerations that follow.

(2) Accumulated dose to whole body, head, trunk, active blood-forming organs, gonads, or lens of the eye will not exceed:

(a) 1.25 Rem per calendar quarter.

(b) Total lifetime, 5(N-18) Rem, where N = present age in years.

(3) Members of the general public personnel not exposed and persons less than 18 years of age will not be exposed to more than:

(a) 125 millirem (.125 Rem) in any calendar quarter.

(b) One-half Rem (.500 Rem) in any calendar year.

(4) Pregnant women will not be exposed to ionizing radiation for other than medical reasons.

23-8. Personnel Dosimetry.

a. The Army film badge packed in 5B11-206 will be the only device used to officially determine personnel exposure. Film badges will be worn by each individual who is likely to be exposed to radiation or radioactive materials. This requirement applies to visitors as well as installation or activity personnel.

b. Pocket dosimeters may be used to supplement the film badge dosimeter.

(1) Such devices are useful when worn in areas in which an individual is likely to receive 5 or more millirem in one hour.

(2) In areas where the exposure rate is likely to be 100 millirem (.100 Rem) or more in one hour, personnel must wear self-reading pocket dosimeters in addition to the film badge.

c. Personnel who may receive an accumulated dose equivalent in excess of 5 percent of the applicable quarterly radiation exposure standard will wear a personnel monitoring device.

23-9. Survey Instruments.

a. Ionization chambers measure the ionization in a small volume of air. If the ionization chamber is exposed to a beam of radiation, a current will flow in the circuit because the electrons that are knocked out of the air atoms by the radiation will be attracted by the positive electrode. The ionization chamber measures ionization directly and is energy independent.

b. Geiger-Mueller counters are capable of detecting low levels of radiation. It is an ionization chamber, but has a special gas and a greater voltage supplied between its electrodes.

23-10. Definitions.

a. Ionizing - Producing ion pairs in matter; descriptive of the action of higher-energy forms of radiation, as opposed to microwave radiation, which is nonionizing.

b. Radiation - Electromagnetic or particulate emanation capable of producing tissue damage by the process of ionization or excitation, directly or indirectly, during its passage through the body.

c. Examples of Ionizing Radiation include alpha and beta particulates, neutrons, gamma rays and X-rays.

d. Source of Ionizing Radiation include the sun, naturally occurring radioactive materials, radiographic and fluoroscopic equipment, R-F generators, certain klystons/magnatrons, and products containing radioactive material such as electron tubes, instrument dials, calibration sources, static electricity detectors.

e. Sealed Source - A source in which the radioactive material is contained in a manner intended to prevent leakage.

f. Curie - A unit of activity defined as the quantity of any radioactive nuclide in which the number of disintegrations per second is 3.7×10^{10}.

g. Roentgen - The unit used to measure exposure where $1R = 2.58 \times 10^{-4}$ coulombs.

h. Rem - Roentgen equivalent man-one rem is the quantity of ionizing radiation of any type which when absorbed by man produces a physiological effect equivalent to that produced by the absorption of 1R of X-ray of gamma radiation.

i. Rad - A unit used to designate the amount of radiation absorbed per unit mass or irradiated material. (The Rem is a dose unit of biological effect whereas the Rad is a unit of absorbed energy dose and the roentgen is one of exposure.)

j. Health Physics - The science concerned with recognition, evaluation and control of health hazards from ionizing radiation.

k. Personnel Monitoring Equipment - Devices designed to be worn or carried by an individual for the purpose of measuring the external dose of ionizing radiation to which he was exposed. A film badge is one type of personnel monitoring equipment.

l. Radiation Protection Officer - A person who, by reason of training or experience, is responsible for the safe use of all sources of ionizing radiation within an activity for which he is so designated on official orders.

m. Nonionizing Radiation - Electromagnetic radiation without sufficient energy to cause ionization.

n. Electromagnetic Radiation, in its simplest form, consists of vibrating electric waves moving through space accompanied by a vibrating magnetic field exhibiting the characteristics of wave motion. It is described by the relationship of its wavelength and frequency to the speed of light.

$$C = f\lambda$$

f is frequency (vibrations per sec)
λ is wavelength (cm)
C is the speed of light (3×10^3 cm/sec)

Electromagnetic radiation includes:

Ultraviolet light
Visible light
Infrared light
Broadcast beams
Power transmissions

The whole range of electromagnetic radiation may be classified according to the biological effects produced upon exposure.

Ultraviolet, visible and infrared radiations are significant to the eye and skin.

Radio, microwave and ultrasound affect the skin and underlying tissue.

A very important difference between the regions of the electromagnetic spectrum is the depth of penetration. The longer the wavelength, the lower the frequency, the deeper the penetration.

The organ most susceptible to damage from a laser is the eye. Ultraviolet radiation can cause sunburn. Eye inflammation, termed keratitis, is small lesions on the cornea. Visible light is transmitted to the back of the eye onto the retina. Here, focused light burns the retina resulting in blind spots. Excessive exposure of the eye to infrared radiation may cause cataracogensis (heat cataract).

23-11. References.

a. AR 40-14.

b. AR 40-46.

c. AR 385-11.

d. AR 385-40 and DARCOM Suppl to 385-40

e. AR 700-64

f. DARCOM-R 385-25.

g. DARCOM-R 385-100.

h. TB Med 270.

i. TB Med 279.

j. TM 3-261.

k. Title 10, CFR 19, 20, and 21.

l. Title 49, CFR 171.

m. MIL STD 129.

CHAPTER 24

Safety Awards Program

24-1. General. This program is established for the purpose of maintaining the interest of all employees in the RMA Safety Program and recognizing an outstanding individual or organizational element for safety performance by giving the individual or organization element an award.

24-2. Responsibilities.

a. DARCOM Safety Awards. RMA is eligible for the following DARCOM Safety Awards:

(1) DARCOM Award of Honor for Safety.

(2) DARCOM Award of Merit for Safety.

(3) DARCOM Commendation for Safety.

b. RMA will be evaluated for awards based on the following criteria as outlined in DARCOM Suppl 1 to AR 385-10, Appendix F:

(1) Statistical evaluation.

(2) Safety standards.

(3) Special Emphasis Areas.

(4) Other Safety Program elements.

c. RMA Safety Awards.

(1) The Safety Manager will:

(a) Maintain a comprehensive record of accident statistics for each activity of the Arsenal, in order to administer the Safety Awards Program.

(b) Submit favorably considered recommendations for awards to the Arsenal Commander and make necessary arrangements for a suitable ceremony for presentation of the approved awards.

(2) Supervisors will:

(a) Maintain adequate records of accident prevention and safety achievement to assure qualified individuals and activities are considered for a Safety Award.

(b) Submit nominations for awards for individuals and/or activities based on qualifying performance not later than 20 July of each year.

24-3. Safety Leader Award.

a. A Quarterly Safety Leader Award will be given to a safety-minded employee who has shown his initiative in safety and has been selected by his supervisor as the Safety Leader for the quarter.

b. Employee will be selected using the following criteria:

(1) Job performance.

(2) Personal accident experience.

(3) Leader in area/activity Safety Program.

(4) Valid suggestions on reducing hazards or eliminating hazards.

(5) Motor vehicle accident experience.

CHAPTER 25

Office Safety

25-1. General. Office safety is very important to the overall successful operations of the Arsenal. While office work is not commonly classified as hazardous, there are many occasions when accidents occur due to the carelessness of those who work in these areas. Unless you are aware of what things could be hazardous, follow office safety rules and regulations, give rise to eliminating any unsafe acts and unsafe conditions, the office can be a hazardous place to work.

25-2. Items Associated with Office Accidents.

a. Desks and file cabinets must be kept away from exits and walkways. Drawers should not be left open.

b. Weight in file cabinets should be distributed appropriately.

c. Only one file drawer should be opened at a time.

d. All work places and stairways are to be well lighted.

e. Any office furniture that is faulty must be repaired or removed.

f. Aisles and floors must be in good condition and no unnecessary items left in these areas. Keep small objects picked up.

g. Electrical cords, phone cords/outlets should be protected by some means.

h. Polished floors should be "slip resistant".

i. Torn carpeting should be replaced, as it is needed. If it has curled edges, they should be fastened down.

j. All electric fans must be protected with guards and careful consideration should be given as to the placement of fans.

k. Electrical office machines and appliances, that have metal parts exposed, should be grounded.

l. Light fixtures or parts should be correctly hung.

m. Office accidents are reportable, the same as other type accidents.

25-3. Housekeeping Practices.

a. Supervisors will instruct new employees of:

(1) General housekeeping practices.

(2) Safe lifting procedures.

(3) Accidents that result from office houseplay, i.e., throwing paper clips, shooting rubber bands, etc.

(4) Storing and using cleaning fluids in the office.

(5) Correct use of approved ladders for high-reaching items.

b. Supervisors will periodically instruct all office personnel in maintaining a safe and accident-free office, as needed.

25-4. References.

a. AR 385-10.

b. AR 385-40.

c. DARCOM-R 385-100.

The proponent agency of this publication is Safety Office, Rocky Mountain Arsenal. Users are invited to send comments to the Chief, Safety Office.

SARRM-SF

FOR THE COMMANDER:

GREGORY L. GOEHRING
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CHAPTER 26

Nonionizing Radiation Program
Microwave Oven Protection

26-1. Purpose. To establish policy and assign responsibilities for the control of the potential hazards from food service devices using microwave energy at Rocky Mountain Arsenal.

26-2. Scope. This applies to all RMA and tenant activities who use microwave ovens.

26-3. Policy.

a. The operation and use of microwave ovens involves risk of accidental exposure to potentially hazardous radiation. The hazards involved are due to the leakage of microwave energy and are usually confined to the area surrounding the oven door. This program is established to insure that all microwave ovens are operated IAW AR 40-583 and TB Med 523.

b. Even low leakage from microwave ovens in good operating condition has been documented as hazardous to individuals wearing cardiac pacemakers because the radiation may disrupt the normal rhythm of the pacemaker. Individuals using pacemakers are cautioned not to enter areas where microwave ovens are in use.

26-4. Responsibilities.

a. The Commander will:

(1) Implement this program, inform supervisors of its existence, and ensure training of individuals for its operation.

(2) Control movement and positioning of microwave ovens.

b. The Radiation Protection Officer will:

(1) Maintain an inventory of all microwave ovens located at RMA and tenant activities. A copy of this inventory shall be available for microwave oven surveys and microwave oven program management surveys.

(2) Insure that all microwave ovens meet the radiation leakage standards of para 11 (b) of AR 40-583.

(3) Insure proper use of microwave ovens by all personnel.

(4) Coordinate with Fitzsimons Army Medical Center (FAMC) Preventive Medicine Service (PVNTMED) personnel to perform comprehensive oven surveys to insure that all ovens are surveyed IAW para 6(a)(1)(a) and (b), TB Med 523.

(5) Insure that all microwave ovens are positioned IAW the physical location requirements of para 6(a)(3)(e), TB Med 523.

(6) Insure that maintenance and repairs are performed by representatives of the manufacturers or other individuals qualified and perform maintenance and repairs IAW para 11 (c), AR 40-583.

(7) Insure that disposal of microwave ovens to the public will be IAW para 11 (e), AR 40-583.

(8) Insure that each microwave oven has posted to it the name and telephone number of the person to notify of any malfunction of a microwave oven.

(9) Report improper use of the microwave ovens to the Commander.

(10) Insure that at least one individual from each area having a microwave oven is designated to perform periodic visual surveys IAW para 6(a)(1)(a), TB Med 523. These persons must be properly instructed by qualified personnel.

c. FAMC Preventive Medicine Service (PVNTMED) will:

(1) Conduct comprehensive surveys of all microwave ovens at RMA at least semiannually, and at other times at the request of the RPO. Comprehensive surveys will be conducted IAW para 6(a)(1) and (2), TB Med 523.

(2) Be a qualified survey person IAW para 11 (d), AR 40-583.

(3) Furnish the Safety Office at RMA with copies of the comprehensive surveys.

d. Individuals designated to conduct visual surveys will:

(1) Conduct visual surveys as often as possible, but at least once a week.

(2) Attend the visual survey training sessions.

(3) Report improper oven use, deficiencies, or malfunctions to the person who is posted on the microwave oven and to the RMA Safety Office.

e. Individual users will:

(1) Conduct a daily visual inspection of each oven to insure that ovens are clean and clean oven, is necessary.

(2) Use oven properly IAW posted signs and instructions.

(3) Report malfunctions to the person whose name is posted on the microwave and to the RMA Safety Office.

26-5. References.

a. AR 40-583.

b. TB Med 523.

c. AR 385-40.

CHAPTER 27

EXPLOSIVE SAFETY

This section outlines safety requirements for certain explosives operations and is supplementary to other pertinent regulations.

27-1 General Requirements: (Destruction of explosive material). Explosives and ammunition which are dangerously deteriorated or cannot be definitely identified shall be destroyed by an approved method. Burying explosives or ammunitions or dumping them into waste places, pits, wells, is prohibited except as may be authorized in DARCOM-R 385-100. Destruction shall not be undertaken without prior approval of the Commander, US Army Materiel Development and Readiness Command, ATTN: DRCSF, unless the RMA Commander decides that immediate destruction of deteriorated explosives or ammunition is necessary for the protection of life or property.

27-2 Personnel and Materials Limits:

a. The cardinal principle to be observed in any location or operation involving explosives, ammunition, severe fire hazards or toxic materials is to limit the exposure of a minimum number of personnel, for a minimum time, to a minimum amount of the hazardous material consistent with safe and efficient operations. All operations shall be scrutinized to devise methods for reducing the number of people exposed, the time of exposure, or the quantity of material subject to a single incident.

b. All buildings, cubicles, cells, rooms and service magazines containing hazardous materials shall have posted in a conspicuous place a placard stating the maximum number of workers and transients permitted in the room at any one time. In addition, other placards shall be posted to set forth important local regulations as needed.

27-3 Fencing Restricted Areas: Fencing should not be placed closer to explosives operating buildings than intraline distance. (This distance) is the minimum distance permitted between any two buildings within one operating line, also used for separating certain specific areas, buildings and locations even though actual line operations are not involved.)

27-4 Boundary of Arsenal: The boundary of the Arsenal shall be fenced and posted as required by DARCOM-R 190-3.

27-5 Parking of Privately Owned Automobiles:

a. Parking of privately owned automobiles on the Arsenal shall be controlled to minimize fire and explosion hazards and prevent congestion in event of emergency. Automobiles shall be parked in designated areas only.

b. Parking areas for privately owned vehicles will be separated from potential explosion sites by unbarricaded intraline distance only if they serve the workers assigned to a particular area. Privately owned vehicles parked in administrative areas will be a minimum of public traffic route distance (this distance is the minimum permitted between a public traffic route that is opened to the public for thoroughfare), from the nearest potential explosion source.

26-6 Housekeeping in Hazardous Areas:

a. Structures containing explosives shall be kept clean and orderly.

b. In explosives areas, waste materials such as oily rags, combustible and explosive scrap, and paper shall be kept separate from each other. Such waste should be placed in approved, individually marked containers, preferably located outside the buildings. Combustible or explosive scrap shall not be left in unoccupied buildings.

c. Leakage from ammunition shall be removed by use of approved solvents such as acetone. Unpacked ammunition, loose explosives, those not in process, and combustible materials shall not be permitted to accumulate and must be placed in designated receptacles or in designated storage space.

d. Explosives, explosives dusts and other hazardous materials shall not be allowed to accumulate on structural members, radiators, heating coils, steam, gas, air water supply pipes or electrical fixtures.

e. A regular program of cleaning shall be carried on as frequently as local conditions require for maintaining safe conditions. General cleaning should not be conducted while hazardous operations are being performed. Explosives and ammunition should be removed from the building prior to general cleaning operations, when practicable.

27-7 Safety Hand Tools: Safety hand tools that are constructed of wood (or other nonsparking or spark resistant materials such as bronze, lead, beryllium alloys), under normal conditions of use, will not produce sparks. Properly maintained, nonferrous hand tools shall be used for work in locations which contain exposed explosives or hazardous concentrations of flammable dusts, gases or vapors. Hand tools or other implements used in the vicinity of hazardous materials must be handled carefully and kept clean. All tools should be checked out before beginning work and checked in at its completion.

27-8 Procedure in Event of Electrical Storms:

a. Whenever an electrical storm approaches the Arsenal, personnel shall be evacuated from locations at which there is a hazard from explosives which could be initiated by lighting. Such locations include:

(1) Facilities without approved lighting protection systems, should they contain explosives or explosive-loaded ammunition, and locations

within "intraline distance" of such facilities. (However, explosives should not be stored in a building which has no lightening protection).

(2) Buildings containing explosives dusts or vapors, whether or not equipped with approved lightening protection systems and locations within intraline distance of such buildings.

(3) When personnel are to be evacuated from explosives operations, the operation should be shut down (in an orderly manner), with the windows and doors closed, and electric switches thrown to the off position.

(4) Personnel in direct charge of railroad trains and motor trucks containing explosives should, when possible, move the equipment to locations of comparative safety before retiring to designated bombproof or change houses. When such shelters are not available, personnel shall be withdrawn to places at inhabited building distances from the hazardous locations. (This distance is the minimum permissible distance between an occupied building (humans) and an ammunition or explosives locations).

27-9 Prohibited Articles in Hazardous Areas: Personnel shall not be permitted to carry matches, cigarette lighters or other flame-producing devices into hazardous materials restricted areas. In addition, personal articles of metal, such as keys, knives and coins shall be prohibited in such areas when they increase the existing hazard.

27-10 Photographing Hazardous Areas: Magnesium flashlights, photoflash bulbs, or electronic flash attachments shall not be used in photographing locations where exposed explosives, explosive dusts, flammable gases or vapors are present. After all explosive or highly flammable materials have been removed and equipment prepared, as for major repairs, such photographic aids may be used.

27-11 Standing Operating Procedures: Prior to starting any operation involving ammunition explosives, or other hazardous operations, adequate Standing Operating Procedures (SOP) shall be developed concurred in by Quality Assurance, RMA Environmental, Medical and Safety (to include other concerned elements), and then approved by the Deputy Commander, Commanding Officer of the Arsenal, or by a qualified member of his staff who has been delegated the responsibility for review of and authority for approval of SOP's.

27-12 Any hazardous operations to be performed that do not have a SOP will not be performed until a Hazardous Work Permit (See Chapter 8) has been initiated and signed by the Safety Manager or his/her representative. In the event the Safety Manager or his/her representative is not available (such as may occur during a shift operation), the permit will be reviewed by the Senior Representative present as the requesting activity, initialed, concurred in and copy forwarded to the Safety Manager within 24 hours.

27-13 References:

a. DARCOM-R 385-100

b. DARCOM-R 385-102

c. 29 CFR 1910

CHAPTER 28

CHEMICAL AGENT SAFETY

1. Purpose - The primary goal of this Chapter is to establish policies, describe responsibilities, and set forth guidance for actions to be taken to minimize the harmful effects of a chemical accident or incident.

2. Applicability - This Chapter applies to all organizational elements of Rocky Mountain Arsenal and all tenant activities.

3. Definitions

a. Access - Access means close physical proximity to a chemical agent, container, or munition under any circumstances that could provide an opportunity to require, release, tamper with, damage, or come in direct contact with the chemical agent.

b. Augmentation Force (AF) - Additional military personnel (or units) other than those assigned to a specific security or reserve force, trained and capable of augmenting the security and response forces as required.

c. Backup Alert Force (BAF) - A security response force composed of a minimum of three trained personnel equipped with the necessary transportation and communication equipment to reinforce the security alert team (SAT) in the event of alarms, emergencies, and irregularities.

d. Chemical Accident (CA) - Any situation involving an unintentional or uncontrolled release of chemical agent which results in:

(1) Exposure of personnel to a chemical agent that results in a fatality, a lost work day case (away from work), or physiological symptoms requiring more than standard first-aid procedures.

(2) Chemical agent hazard off post.

(3) Property damage of $10,000 or more.

(4) Chemical agent presence in the atmosphere that exceeds the maximum allowable agent concentrations -- time-weighted levels over an eight-hour work day for exposure of unprotected personnel in surrounding areas to which nonrelated personnel have access.

(5) A production interruption that will exceed or has exceeded 24 hours, unless voluntarily halted pending the outcome of an investigation.

(6) Significantly degraded operational capability.

(7) Probable high interest by the public or news media.

e. Chemical Accident and Incident Response and Assistance (CAIRA) - Those actions taken to save life, preserve health and safety, secure chemical surety material, protect property and provide for the controlled release of information in the event of a chemical accident or incident.

f. Chemical Accident and Incident Control Officer (CAICO) - An individual designated by the commander having CAIRA responsibility, who controls all emergency teams and supervises operations at the immediate accident or indicent site until arrival of the on-scene commander (OSC).

g. Chemical Agent - A chemical substance which is intended for use in military operations to kill, seriously injure, or incapacitate man through its chemical properties. Riot control agents, chemical herbicides, and smoke and flame materials are excluded.

h. Chemical Incident (CI) - Any situation involving chemical surety material which results in:

(1) Exposure of personnel to a chemical agent that results in a lost work day case, restricted work activity, light duty, or physiological symptoms requiring standard first-aid treatment.

(2) Unintentional release of a chemical agent which is not defined as a chemical occurrence, minor leak, or an accident.

(3) Property damage of at least $100 that is not reported as an accident.

(4) Loss (other than caused by acceptable laboratory processes), attempted theft or diversion of chemical surety material, actual or attempted penetration of a chemical-limited area, or attempted damage to a storage facility.

i. Chemical Limited Area - A chemical-restricted area bounded by a single fence or barrier; a designated area surrounding one or more chemical-exclusion areas which are enclosed by a barrier to ensure that only authorized personnel are permitted entry into the area.

j. Chemical Occurrence - An unintentional release of chemical agent which results in:

(1) Symptomatic exposure of operating personnel without the need for medical treatment.

(2) Agent presence, below the maximum allowable concentration -- time-weighted levels over an eight-hour work day for unprotected personnel, in the atmosphere in surrounding areas to which nonrelated personnel have access.

(3) An event on contractor premises which would be classed as a chemical accident or incident had it occurred on an AMC installation.

(4) An event that reasonably may be expected to be of command interest or may provide lessons learned for other AMC organizations.

(5) Liquid spill outside of engineering controls or presence in the atmosphere above the allowable time-weighted averages in an operating area where unprotected personnel are present.

k. Chemical Surety - Those controls, procedures, and actions which contribute to the safety, security, and reliability of chemical agents and their associated weapon systems throughout their life cycle without degrading operational performance.

l. First-Aid - Any one-time treatment and any follow-up visit for the second purpose of observation of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care. Such one-time treatment and follow-up visit is considered first-aid, even though provided by a physician or registered medical professional personnel.

m. Minor Leak - An unintentional release of chemical agent which results in:

(1) Exposure of operating personnel without the need for medical treatment.

(2) Property damage of less than $700.

(3) Agent presence below the maximum allowable concentration-time levels for unprotected personnel, in the atmosphere in surrounding areas to which nonrelated personnel have access.

(4) From leaks in ammunition items, normally discovered during surveillance or maintenance operations, which are reported in accordance with SB 742-1 (Ammunition Surveillance Procedures).

n. On-Scene Commander (OSC) - A general officer designated by the responsible major Army command who is normally dispatched to the scene of a chemical accident and assumes responsibility for all operations at the accident scene.

4. Responsibilities

a. RMA Commander/Deputy Commander will:

(1) Immediately notify the Commander/Deputy Commander at AMCCOM and HQ AMC when a chemical accident occurs on post. The Army Area Commander (AAC) will be notified only when a Chemical Accident/Chemical Incident

occurs off post. During those initial notification calls, if the local situation dictates, the reporting installation will request On-Scene Commander's (OSC) support.

(2) Control emergency operations to ensure all necessary safety, security, rescue, and control actions are taken within available resources.

(3) Act for the CG, USAAMC, in the event on-post hazards extend off post until the responsibility is assumed by an OSC.

(4) Request assistance from higher headquarters, appropriate Area Commander and other off-post sources when, in his/her judgment, the seriousness of the local situation indicates a need for such assistance.

(5) Approve all reports to higher headquarters and approve public affairs information prior to release to the general public.

(6) Authorize liaison with respresentative of the civilian community for the purpose of informing or coordinating plans and agreements relating to chemical accidents or incidents.

(7) Furnish appropriate information and notification of next-of-kin of positively identified casualities.

(8) Designate the Rocky Mountain Arsenal CAICO, the Assistant CAICO, the ECC, and Alternate ECC staff members.

b. Chemical Surety Officer (CSO) Will:

(1) Provide primary staff supervision of the Arsenal CAIRA Program.

(2) Review this Plan, Annex C (Chemical Accident and Incident Control) of RMA's Disaster Control Plan, and supporting SOP's to ensure compliance with surety requirements.

(3) Assure that CAIRA procedures are incorporated into chemical surety material movement plans prepared by the Arsenal.

(4) Perform the Commander's function as required by this Plan and by Annex C of RMA's Disaster Control Plan in the absence of the Commander/ Deputy Commander, unless specifically directed otherwise by the Acting Commander.

(5) Monitor the staffing and training of Arsenal CAIRA emergency response teams and the ECC.

(6) Ensure that the Annex C Plan is tested at least once a quarter in coordination with the chief exercise controller.

c. Alternate CSO Will - Assume the duties of the CSO in his absence.

d. Chief, Exercise Controller Will:

(1) Organize, train, and maintain a CAIRA evaluation team with sufficient resources to properly test and evaluate the implementation of the Annex C Plan.

(2) Develop and conduct, as a minimum, quarterly test exercises of the Annex C Plan in coordination with the CSO; maintain records of test scenarios and evaluations.

(3) Provide the CSO with a written evaluation of each exercise.

e. Director of Emergency Control Center (ECC) Will:

(1) Direct the operation of the ECC.

(2) Deploy ground forces which are under direct ECC control.

(3) Coordinate with Arsenal staff elements for support or backup teams and equipment.

(4) Keep the Commander appraised of the general situation.

(5) Develop data on casualties, downwind hazard, and CAI resolution for reports to higher headquarters.

(6) Recommend actions requiring the Commander's decision.

f. The Chemical Accident/Incident Control Officer (CAICO) Will:

(1) Coordinate with directors/office chiefs to assure that emergency teams are trained to implement the plans pertaining to CAIRA. These teams will include personnel qualified to provide protection, decontamination, medical, and security services.

(2) Determine whether or not the procedures of Annex C pertaining to CAIRA are to be implemented.

(3) Activate a Command Post (CP) near the scene of the accident/incident and determine which teams are required to contend with the particular situation.

(4) Determine the level of protection required for initial entry (reconnaissance) teams. Also, may modify existing levels of protective clothing to meet emergency requirements.

(5) Advise the Commander of the situation at the scene.

(6) Advise and provide operational support to the on-scene commander, if one arrives at the Installation.

(7) Ensure that the area of the incident/accident is rendered safe for unprotected personnel and, when required, execute a certificate of

decontamination.

(8) Direct the response teams in controlling chemicals spilled to include the containment and clean up of the area's equipment and the personnel involved.

g. The Assistant CAICO Will:

(1) Upon direction of the CAICO, or his designated representative, proceed to the CA/CI site.

(2) Upon arrival, assume control of all actions at the CA/CI site and provide status reports of actions to the CP. Ensure accomplishment of all tasks directed by the CAICO or his designated representative.

(3) The senior fire official present at the CA/CI site will assume the duties of the Assistant CAICO in the event that person is disabled or unavailable.

h. The Director of Technical Operations Will:

(1) Implement and control emergency actions associated with an accidental release in areas assigned to the Plant Operations Branch. Notify the Fire Prevention Division of any emergency situation which cannot be resolved using assigned resources. Immediately notify the Commander, CAICO, Safety Office, and Chemical Surety Officer of any CA/CI resolved within the Directorate.

(2) Have available the necessary emergency decontamination equipment.

(3) Assure that the Clothing Treatment Plant is properly staffed during an emergency situation in order to provide additional personnel protective equipment as needed.

i. The Director of Installation Services Will:

(1) Obtain and place in storage the necessary emergency equipment for decontamination.

(2) Staff the warehouse (Building 618) whenever an emergency situation is declared to provide additional supplies and equipment as needed.

(3) Advise the Transportation Officer to be prepared to furnish, upon notification, transportation required for emergency work, including evacuation of personnel and equipment.

(4) Dispatch the engineer equipment team and equipment to the Command Post when requested by the CAICO.

(5) Notify tenants, contractors, and lessees of the potential hazard of the CA/CI. When instructed by the ECC, notify all to evacuate.

(6) Anticipate impairment of any utility service caused by the CA/CI and eliminate the hazards of broken or ruptured electrical, gas, and steam lines in the immediate vicinity of the disaster scene.

j. The Chief, Fire Prevention Branch, Will:

(1) Establish, train, and equip firefighting/rescue, ambulance/EMT Assistant Chief teams in the techniques of handling toxic munitions, fires, and toxic casualities.

(2) Immediately proceed to the vicinity of the CA/CI and establish a CP. Determine whether or not the procedures of Annex C pertaining to CAIRA are to be implemented. Take action as outlined in Appendix 1, Part I of Annex C.

(3) Assumes CAICO duties of the CAICO is incapacitated or until relieved by the CAICO.

(4) Combat any fire and determine when operations personnel can be allowed to enter into any areas or facilities. The level of protection required at the sence of the fire will be determined by the senior Fire Prevention official in charge of fighting the fire and will be approved by the CAICO.

(5) Rescue or direct the rescue of injured or entrapped personnel.

(6) Administer emergency first-aid as required.

(7) Arrange for outside back-up auxiliary firefighting agencies and/or "Flight for Life" patient evacuation as needed.

(8) Furnish water to remote storage areas as required to support decontamination activities.

(9) Provide training for local fire agencies, upon request, in special firefighting procedures applicable to situations involving toxic chemical agents.

k. The Safety Manager Will:

(1) During duty hours, notify the Army Operations Center (OC); Chief, AMCCOM (Rock Island, IL) Safety Office; and HQ AMC (Washington) Safety Office upon the discovery of an accident/incident as described in para 5-7 of AR 50-6 and Appendix VI of Annex C on approval of the Commander of the ECC.

(2) Submit accident/incident reports as prescribed in para 5-7, AR 50-6, and Appendix VI of Annex C on approval of the Commander of the ECC.

(3) Ensure that emergency actions (SOP's) conform with safety standards and regulations.

l. The Chief, Security Office, Will:

(1) Upon direction by the Fire Prevention Division or the CAICO, activate the red phone system and use CA/CI emergency or test exercise messages in accordance with communications procedures outlined in Appendix II of Annex C.

(2) Establish traffic control points (TCP's) to control access to the CA/CI area, and assign a guard to control access and maintain an Entry/Exit Roster at the Hot Line.

(3) Assemble the reserve force at the Fire Station for further deployment.

(4) Assist in notifying personnel on Post to evacuate to a safe area when so directed by the ECC. Inform evacuees of the route to the evacuation area and provide traffic control as required.

(5) Send a representative to the CP to direct employment of security forces.

(6) Corrdinate and direct all security force actions to capture dissident elements or prevent them from obtaining chemical surety material.

(7) Close outside gates to traffic and permit entry and exit only in compliance with instructions issued by the ECC or Commander.

(8) Monitor the "Charlie" net for information on the hazard area to prevent accidental exposure of security forces.

(9) Ensure that security forces are issued clear, understandable orders as to the degree of force to be used.

(10) Investigate possible thefts/seizures of chemical surety material in accordance with the procedures in Appendix 1, Part II of Annex C.

(11) Have investigative personnel preserve evidence in its original container and location, as far as practical, and maintain an accurate record of the continuity of handling of all material which must be removed due to public health and safety considerations.

(12) Protect an accident/incident scene from all disturbances until necessary investigations are completed.

(13) Coordinate with CID, MI, FBI, and local civilian law enforcement agencies as required.

m. The Director of Health Services Will:

(1) Advise the CAICO in all matters related to the care, treatment, and evacuation of casualties.

(2) Coordinate with local medical officials and provide training of medical personnel as needed.

(3) Coordinate with Fitzsimons Army Medical Center (FAMC) for additional medical support and request the same when required. Evacuate casualties to FAMC as necessary.

(4) Submit medical reports as described in Appendix VI of Annex C.

(5) Assist the Commander/Deputy Commander in notification of next-of-kin os positively identified casualties.

n. The Director of USACC-RMA Will:

(1) When directed by the ECC or Commander, implement "MINIMIZE" procedures.

(2) Inform the necessary civilian agencies of the "Authentication Code Word" per Appendix IV of Annex C.

o. The OIC, Technical Escort and Disposal Detachment, Will:

(1) For on-post emergencies, proceed immediately with the Technical Escort Team to the CP of the CA/CI and function in accordance with instructions of the CAICO or Fire Chief.

(2) In off-post situations, proceed directly to the scene and function in accordance with regulations of Technical Escort Unit, Aberdeen Proving Ground, Maryland.

p. The Staff Duty Officer Will:

(1) Report to Building 111 and activate the ECC or assist in ECC operation if already activated.

(2) Maintain as accurate as possible a chronology of events for use in the preparation of follow-up reports, OSC briefing, etc.

q. The General Attorney Will - Investigate and process claims arising from a CA/CI in accordance with established claim directives.

r. The Public Affairs Officer Will:

(1) In accordance with para 5-8 of AR 50-6, issue appropriate news releases upon approval of the Commander.

(2) Coordinate with local and State agencies as directed by the Commander.

(3) Maintain injury and casualty data for the ECC.

(4) Furnish appropriate information and notification of next-of-kin of positively identified casualties.

(5) Protect exposed classified material from news media as required by AR 360-5.

(6) Request helicopter support from Buckley ANG, when directed.

5. References:

a. AR 50-6.

b. Disaster Control Plan, Annex C.

CHAPTER 29

Procedures for the Preparation of Hazard Abatement Plan

29-1. General.

a. Safety inspections will be done to determine the unhealthy conditions, unsafe practices, and physical hazards that exist in the work place, after which corrected measures will be adopted to eliminate these hazards before they cause any personal injuries and/or property damage. A Union representative will be invited on all scheduled command inspections, however, if no representative is present, the inspection will take place as scheduled. For on-the-spot safety inspections, the Union will not be notified. All inspections must be documented and kept on file in the Safety Office.

b. Discrepancies and recommendations identified by the inspections, with a suspense date for corrected actions taken or to be taken, will be forwarded by DF through the Director or Office Chief to the responsible element. Abatements of unsafe or unhealthy conditions will be accomplished in the area by the supervisor in charge, in the shortest possible time. Verification of corrective action(s) will be done on follow-up inspections.

29-2. Procedure.

a. All hazards will be analyzed. DA Form 2457-R (OSH Abatement Plan) or a formal variance will be completed for all hazards recorded on DA Form 4754 which entail a Risk Assessment of III B (see page 29-3) or higher that are not correctable within 30 days from date of discovery.

b. Each hazard will be assigned a Risk Assessment Code (RAC). The method of determination of RAC is explained in para c and d.

c. Hazards can also be assessed on the basis of cost correction, future intended use of the facility and availability of desirable alternative method of control.

d. A decision to eliminate the hazards will be based upon their RAC. In other words, the hazards will be eliminated on a worst first basis if the resources permit and the variance is not appropriate. All the deficiencies having identical characters will be grouped together into a single abatement plan and this plan will be kept current by adding new plans into it. The completed projects will be placed in a "Completed Projects Section" of abatement plan. A DA Form 2457-R must be prepared for all deficiencies which have correction time of more than 30 days. All violations that cannot be corrected immediately will be entered on DA Form 4754 as deferred deficiencies and will remain on this form until resources for correction become available.

e. Spot-checking and sampling will be performed by Safety personnel to ensure that interim control measurements are being implemented.

f. Copies of the abatement plans will be placed at each activity or each unit, in a conspicuous place such as the personnel bulletin boards.

g. Violations that are caused by another Army Command, DoD or outside agency on this installation will be brought to the attention of the responsible personnel for action. These deficiencies will be entered onto DA Form 4754, but no abatement plan will be prepared for them.

h. MACOM and HQ, DA will review periodically the abatement plans for RMA to ensure adequate resource allocation.

i. All abatement plans will be reviewed and signed off on by the Comptroller, Facilities Engineer, and Safety Director prior to submission to higher headquarters.

DETERMINATION OF RISK ASSESSMENT CODE

ACCIDENT PROBABILITY		A	B	C	D
HAZARD SEVERITY	I	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	5

HAZARD SEVERITY

I. Death or permanent total disability.

II. Permanent partial disability or temporary total disability in excess of three(3) months.

III. Lost workday accident/compensible injury/illness.

IV. First Aid or minor supportive medical treatment or simple violation of standard.

ACCIDENT PROBABILITY

A-Likely to occur immediately.

B-Probably will occur in time.

C-Possible to occur in time.

D-Unlikely to occur.

RISK ASSESSMENT CODES

1-Critical

2-Serious

3-Moderate

4-Minor

5-Negligible