

NGB-AVS-SG

SUBJECT: All States (Log Number P01-0075) Army National Guard (ARNG) Safety and Occupational Health Program -- POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

Safety

POLICY AND RESPONSIBILITIES FOR INSPECTION, EVALUATION AND OPERATION OF ARMY NATIONAL GUARD INDOOR FIRING RANGES

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### **Appendices**

Appendix A - Abbreviations

Appendix B - References

Appendix C - Indoor Firing Range Accident Response Plan

Appendix D - Permission and Release of Liability Certificate

### **Addendum**

Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning

#### **1-1. General**

This policy prescribes Army National Guard (ARNG) policy and responsibilities for inspection, evaluation and operation of ARNG indoor firing ranges. It applies to all training, maintenance, and firing activities conducted on indoor firing ranges. This policy supplements AR 385-10, AR 385-63, and AR 385-64.

#### **1-2. Explanation of abbreviations and terms**

Abbreviations used in this publication are listed in Appendix A. Terms that apply specifically to IFRs can be found in paragraph 1-37 of this regulation.

#### **1-3. Policy**

- a. Ammunition shall only be fired in properly classified indoor firing ranges.
- b. Detailed initial and periodic inspections of all indoor firing ranges shall be conducted as prescribed to ensure compliance with current safety and health standards.
- c. ARNG or civilian personnel shall not use any indoor firing range, which has been classified as unsafe.
- d. A DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, shall be posted on the entrance to all ranges classified as unsafe.
- e. Ranges classified as unsafe shall be secured, sufficiently to preclude entry.
- f. New ranges shall be designed using the latest standards provided by NGB-ARI.
- g. The use of indoor firing ranges for purposes other than small arms weapons training and target practice is strictly *prohibited*.

### **Responsibilities**

#### **1-4. Director, Army National Guard (DARNG)**

The Director, Army National Guard establishes policy and provides resources necessary to implement the ARNG Range Safety program per AR 385-63.

#### **1-5. Chief, Aviation and Safety (NGB-AVS)**

The Chief, NGB-AVS, has staff responsibility for supervising the ARNG Range Safety Program and to:

- a. Identify the resources necessary to effect policy and standards throughout the ARNG in accordance with (IAW) AR 385-63.
- b. Coordinate with other HQDA staff agencies and the Adjutants General on matters pertaining to the ARNG Range Safety Program.

#### **1-6. Chief, Safety and Occupational Health Branch (NGB-AVS-S)**

The Chief, NGB-AVS-S shall -

- a. Develop, implement, and manage the ARNG Range Safety Program.
- b. Review the design of all ranges to be constructed or remodeled for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
- c. Determine the classification of indoor firing ranges based upon input from the state safety manager, the ventilation measurements, and the air monitoring results (breathing zone and general area).

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d. Conduct an initial evaluation of new IFRs and reevaluate every two years thereafter. An IFR will be reevaluated if modifications to the range structure or ventilation system are made. *Approval from the State Safety Office and Regional Industrial Hygienist must be obtained before the range is returned to service.*

f. Determine and publish the training requirements for the persons who will conduct range evaluations.

**1-7. Chief, Training Division (NGB-ART)**

The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

**1-8. Chief, Installations Division (NGB-ARI)**

The Chief, NGB-ARI shall -

- a. Provide the design standards for the construction of indoor firing ranges.
- b. Ensure that the designs for new and remodeled indoor firing ranges meet approved standards and are reviewed and approved by the Safety and Occupational Health Branch.

**1-9. The State Adjutant General**

The State Adjutant General shall -

- a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.
- b. Ensure all ranges being used are classified as "safe" or "limited use", those ranges classified as "limited use" under the criteria of this regulation are used on a limited basis, and all ranges classified as "unsafe" under the criteria of this regulation are not used.
- c. Determine and identify funding requirements to ensure development of a comprehensive safety and occupational health program for the users of indoor firing ranges.

**1-10. State Safety Manager**

State Safety Managers shall--

- a. Perform or coordinate performance of all inspections and evaluations of indoor firing ranges.
- b. Determine whether the range is "safe" or "unsafe" based on the physical safety inspection.
- c. Review and approve all indoor firing range SOPs to ensure all requirements are met. An example SOP can be found at Figure 1-3 of this regulation.
- d. Perform design review of IFRs to ensure current safety and occupational health related compliance requirements are met.
- e. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.
- f. Approve the use of the range by non-military organizations.
- g. Maintain copies of all range inspections, ventilation measurements and visitors log.

**1-11. State Occupational Health Nurse**

The Occupational Health Nurse shall -

- a. Schedule medical surveillance examinations for individuals who are or may be exposed to Lead above the action level for more than 30 days per year.
- b. Maintain exposure monitoring (air sampling results) and medical surveillance records for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.
- c. Record the worker's exposure data on DA Form 4700 (Medical Record-Supplemental Medical Data) overprints, IAW TB MED 503 paragraph 3-2 f (1)(a), and DODI 6055.5-M Occupational Health Surveillance Manual.
- d. Institute a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to Lead.

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**1-12. State Environmental Office**

The State Environmental Office shall coordinate disposal of all hazardous waste generated from range operation, cleaning, and maintenance.

**1-13. Facility Commanders**

Commanders of facilities with indoor firing ranges shall maintain and be familiar with AR 385-63, and the provisions of this regulation, to ensure that- -

- a. A Safety and Occupational Health Compliance Program is developed as specified in this regulation.
- b. Indoor firing ranges are secured when not in use.
- c. A custodian is appointed for all indoor firing ranges under his/her area of command.
- d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures IAW paragraph 1-14 of this regulation.
- e. All non-military organizations using indoor firing ranges under their area of command have signed a contract/agreement delineating the conditions of range use and liability. The contract/agreement should also include provisions for hazardous waste disposal expenses.
- f. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.
- g. All required signs are posted IAW Section 1-22 of this regulation.
- h. All individuals using indoor firing ranges under the facility commander's area of command have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and that these individuals have signed an agreement to follow the rules stated therein. See paragraph 1-29 for record maintenance requirements.
- i. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 1-37 of this regulation (if applicable).
- j. Range custodians have documentation to show that they have been educated about the health effects of exposure to Lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement IAW this standard.
- k. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.
- l. All range safety officers and maintenance personnel have a copy of this regulation, AR 385-63, and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.
- m. The range ventilation system is checked every 480 hours of operation IAW paragraph 1-27 of this regulation.
- n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Figure 1-1).
- o. Exposure records shall be maintained IAW paragraph 1-34 when personnel are exposed to airborne Lead concentrations in excess of 0.03 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ).
- p. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the State Environmental Office.
- q. The use of M16 rifles using 5.56 mm ammunition in the indoor firing range is *prohibited*, except on ranges where the bullet trap is rated for 5.56 mm ammunition. Otherwise, the M16 shall be used with .22 caliber adapter and ammunition.
- r. The ventilation system is in operation at all times during firing or cleaning.

**1-14. Range Custodians**

Custodians shall- -

- a. Ensure that all individuals using the indoor firing range understand the range safety regulations, rules, and SOP.
- b. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in the Addendum. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 1-29 for record maintenance requirements.

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c. Maintain the visitor log IAW the range SOP. As a minimum the log should include the names of the shooters, the amount of time spent in the range by each individual, the date of firing, the type(s) of ammunition fired, and the number of rounds fired. See paragraph 1-29 for record maintenance requirements.

d. Forward a copy of the visitor log to the State Safety and Occupational Health Managers on a quarterly basis

**1-15. Unit Commanders**

Unit Commanders shall- -

a. Enforce all range safety and occupational health procedures.

b. Maintain a record of time spent on the range for all personnel using "**limited use**" firing ranges as recorded by the range custodian.

c. Provide the State Occupational Health Nurse with a list of personnel firing in ranges classified as "**limited use**" ranges for more than the prescribed times listed in Figure 1-1. See paragraph 1-29 for record maintenance requirements.

d. Designate range safety officers in writing.

e. Provide the State Occupational Health Nurse with a list of range safety officers and custodians.

f. Ensure all range safety officers and range custodians are enrolled in the Medical Surveillance and Respiratory Protection Programs, as required.

**1-16. Procedures, classification and use**

Indoor firing ranges have been built in armories for many years. Each range design reflects the current emphasis and technology on protecting the health and safety of the shooter. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose users to hazardous conditions.

**1-17. Classification of ranges**

Based on inspection data collected on the range inspection checklist (Figure 1-2), ranges shall be classified as "**safe**", "**limited use**" or "**unsafe**". **Safe** ranges permit authorized firing for military and civilian use. **Limited use** ranges permit use only under controlled conditions based on the personnel exposure limits for intermittent Lead exposure. (Figure 1-1). **Unsafe** ranges are not authorized for use under any conditions.

a. **Building envelope.** (Design standards may be found in DG 415-1, Appendix A or CEHND 1110-1-18).

**(1) Safe ranges.**

(a) Each firing lane is at least 4 feet wide.

(b) Pipes, conduits, lights, lighting fixtures and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets.

(c) Baffles do not disrupt the uniform airflow in the range.

(d) In older ranges, sidewall windows in front of the firing line have been removed and the openings sealed flush to the wall with materials compatible with the adjacent walls. New ranges are not built with windows in front of the firing line.

**(2) Unsafe ranges.**

(a) All firing lanes are less than 4 feet wide. If any one firing lane is less than 4 feet wide, that lane shall not be used for firing.

(b) Pipes, conduits or walls are not sealed to prevent migration of Lead dust to other areas of the range. (See the Addendum for wipe sample procedures used to determine if Lead dust is leaking from the range).

(c) There are open floor drains in the range.

(d) Carpet is located in any part of the range. (Contact the State Environmental Offices for hazardous waste disposal procedures.)

(e) Doors or windows located downrange of the firing line.

(f) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Figure 1-2 of this document.

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**b. Ventilation**

**(1) Safe ranges.**

- (a) The range has an operational mechanical ventilation system.
- (b) The average airflow at the firing line in each firing lane is at least 50 feet per minute (fpm).
- (c) Air is exhausted at or behind the bullet trap.
- (d) Supplied air is introduced into the range behind the shooters.
- (e) The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system.
- (f) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.
- (g) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 1-26 of this regulation.
- (h) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -.05 inches of water gauge (wg) but does not exceed -.20 wg.
- (i) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See the Addendum, for troubleshooting guidance)
- (j) In passive make-up air systems, the supply air louvers and exhaust fan shall be electrically interlocked.
- (k) In systems with active make-up air, the supply and exhaust fans shall be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.
- (l) Range air temperature should be between 65 degrees and 80 degrees Fahrenheit.

**(2) Unsafe ranges.**

- (a) The airflow at the firing line on any lane is less than 50 fpm at any level and air sampling results suggest possible overexposure as determined by a competent person.
- (b) The range has no mechanical ventilation.
- (c) The ventilation system is constructed in a manner that allows exhaust air to enter into other parts of the building or another building air supply system.
- (d) The make-up air exceeds the exhaust, which forms a positive air pressure in the range in relation to adjoining areas.
- (e) Air is exhausted anywhere other than at the bullet trap.
- (f) Make-up air is supplied only from adjacent areas of the building with no provision for inclusion of outside air.
- (g) The static pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is measured less than -.05 wg or in excess of -.2 wg.
- (h) The range is under positive pressure.
- (i) The supply and exhaust air systems are not electrically interlocked.

**c. Range lighting.**

**(1) Safe ranges.**

- (a) Lighting is uniform, non-glaring and does not cause shadows.
- (b) Illumination is at least 100 foot candles on the targets and 30 foot-candles in all other areas.
- (c) All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range.
- (d) Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line.
- (e) Emergency lights are provided behind the firing line and are in working condition.
- (f) Exit lights are provided as required.
- (g) Lighting of at least 30-foot candles is provided behind the bullet trap for maintenance.

**(2) Unsafe ranges.**

- (a) Illumination is below 100 foot-candles on targets or 30 foot-candles in other areas.
- (b) Portions of the lighting fixtures are not protected by baffles.
- (c) Electrical hazard exists in the range.

**d. Bullet traps.**

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**(1) Safe ranges.**

- (a) A bullet trap is permanently installed in the range.
- (b) Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, DG 415-1 App. A, and this regulation.
- (c) The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, for thickness requirements for the bullet trap.
- (d) All plate/sand trap type bullet traps shall be designed to prevent ricochets by directing the projectiles in the same direction they are traveling.
- (e) Sandpits in plate/sand trap type backstops shall extend to a point directly below the leading edge of the sloped plate.
- (f) Forward edges in a escalator or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets.

**(2) Unsafe ranges.**

- (a) Steel bullet traps are bowed, punctured or severely pitted.
- (b) Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth.
- (c) Any type of portable bullet stop is used.
- (d) Forward edges in a escalator or venetian blind type bullet trap are maintained in less than a knife edge condition

**e. Targets and target carriers.**

**(1) Safe ranges.**

- (a) A target retrieval system is operable in all lanes and is constructed in such a manner as to minimize flat surfaces exposed to the firing line. (Firing lanes without a target retrieval system shall not be used).
- (b) Only paper targets are used.

**(2) Unsafe ranges.** Target retrieval system is inoperable or not installed in the entire range, or target retrieval system exposes flat surfaces to the firing line.

**f. Lead levels.**

**(1) Safe ranges.**

- (a) For personnel exposed less than 30 days per year, Lead levels do not exceed  $0.05 \text{ mg/m}^3$ .
- (b) For personnel exposed more than 30 days per year and for all non-Department of Defense (DoD) personnel, Lead levels do not exceed  $0.03 \text{ mg/m}^3$ .
- (c) For personnel under the age of 18, see Figure 1-1.

**(2) Limited use ranges.**

(a) For personnel exposed less than 30 days per year, Lead levels exceed  $0.05 \text{ mg/m}^3$  but do not exceed  $0.4 \text{ mg/m}^3$  in any breathing zone or general area sample. Personnel exposures shall be controlled by limiting the shooters to the times described in Figure 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, Lead levels exceed  $0.03 \text{ mg/m}^3$  but do not exceed  $0.4 \text{ mg/m}^3$  in any breathing zone or general area sample.

**(3) Unsafe ranges.**

Lead levels in air sample results exceed  $0.4 \text{ mg/m}^3$  in any breathing zone or general area sample.

**1-18. Range use**

- a. Indoor firing ranges shall not be used for any purpose other than firing. (I.e., they shall not be used for classrooms, exercise rooms, storage, etc.).
- b. Ranges classified as unsafe may be used for other purposes only after proper decontamination IAW the guidance provided in the Addendum, Guidelines and Procedures for IFR Rehabilitation, Conversion, and Cleaning.
- c. The ventilation system is in operation at all times during firing or cleaning.
- d. Equipment or furniture shall not be stored or maintained in the range, plenum area or behind the bullet trap. (For removal of equipment or furniture, use cleaning instructions provided in the Addendum).
- e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

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**1-19. Prohibitions**

- a. Personnel shall *not* be permitted in the plenum area during firing even if designed for observation.
- b. Plenum area and area behind the bullet trap shall *not* be used for storage of any equipment.
- c. An area directly in front of the plenum wall shall be kept clear at all times to preclude obstruction of airflow.
- d. Variable speed fans are *not* permitted.
- e. Dry sweeping of indoors firing ranges is *prohibited*. Brooms shall not be stored in the range.
- f. Walking downrange is *prohibited* for individuals other than maintenance and inspection personnel.
- g. Pellets, BBs, magnum and armor piercing rounds are *prohibited* in all indoor firing ranges.
- h. To prevent contamination with Lead dust, clothing or equipment that is not required for firing shall *not* be permitted into the range.
- i. Storage of ammunition and explosives in indoor firing ranges is *prohibited*, except in approved and licensed facilities.
- j. There are no open floor drains in the range.
- k. Carpet will not be located in any part of the range (Contact the State Environmental Office for hazardous waste disposal procedures).

**1-20. Personal protective equipment**

- a. **Eye protection.** All personnel in an indoor firing range during firing shall wear eye protection that meets the requirements of ANSI Z87.1-1999, Practice for Occupational and Educational Eye and Face Protection.
- b. **Hearing protection.** All personnel in an indoor firing range during firing shall wear Army approved hearing protection listed in DA Pam 40-501. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers.
- c. **Respiratory protection.** For respiratory protection requirements during indoor firing range conversion cleanup operations, see the Addendum.

**1-21. Posting warning signs**

- a. The following signs shall be posted in or in the vicinity of indoor firing ranges IAW AR 385-63:
  - (1) Eating, Drinking and Smoking are *prohibited*
  - (2) Dry Sweeping is *prohibited*
  - (3) Wash Hands and Face Immediately Following Firing
  - (4) Only the Following Ammunition is *authorized* for use on this Range: \_\_\_\_\_
  - (5) Hearing Protection *shall be* properly worn during firing
  - (6) Proper Safety Glasses/Goggles *shall be* worn during firing
  - (7) Furniture or storage of other items of equipment is *not* permitted in the range
- b. The following signs shall be posted on the entrance door to the range:
  - (1) Noise Hazardous Area
  - (2) Danger Lead Hazard Area
  - (3) Pregnant women are *not* permitted in this area.
- c. An illuminated warning sign, which is interlocked with the range ventilation switch, shall be located outside of the firing range to alert individuals that the range is in use.
- d. Each firing lane shall be numbered at the firing line and at the bullet trap visible to all shooters. This is to ensure shooters use the correct target.
- e. A warning sign *shall be* posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation.

**Note:** All signs shall meet the requirements of DA Pam 385-64.

**1-22. Range Standing Operating Procedures.**

- a. Each indoor firing range shall have a written SOP, which is approved by the State Safety and Occupational Health Office, see figure 1-3.
- b. Range SOPs shall include, as a minimum, the following:



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(1) The requirement for establishment and maintenance of a log of visitors for the indoor firing range. The log shall include the following information for all visitors:

- (a) Name and age of shooter.
- (b) Organizations (if civilian, include address and phone number).
- (c) Sign-in and sign-out times and date.
- (d) Type of ammunition used and number of rounds fired.

(2) The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

(3) Work practices including permissible and banned practices as specified by this regulation.

(4) Instructive guidance for all range procedures.

(5) Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

(6) Authorized ammunition for the range.

(7) The requirement for posting of signs IAW section 1-21 of this regulation.

(8) Cleaning and maintenance requirements.

(9) Personal protective equipment requirements for maintenance, firing and cleaning.

c. Refer to TG 206 for more general guidance on SOPs.

**1-23. Inspection requirements.**

The first part of each inspection shall be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, a competent person shall complete the ventilation survey and air sampling requirements.

**1-24. Initial inspections**

a. An initial inspection of all new and renovated indoor firing ranges shall be completed before the facility is accepted. The inspection report shall be kept on file with the State Safety and Occupational Health Office. The checklist in Figure 1-2 shall be used for this purpose. See paragraph 1-29 for record maintenance requirements.

b. Findings on the initial firing range inspection, ventilation measurements, and air sampling results shall determine the range classification.

**1-25. Annual inspections**

a. A safety inspection of each active range shall be made annually to ensure safety standards, procedures and records are maintained in the operation of the range. These inspections shall be completed by State Safety personnel IAW AR 385-10. The checklist in Figure 1-2 shall be used for this purpose.

b. In accordance with AR 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection.

c. Verify that ventilation measurements have been recorded ever 480 hours of operation.

d. Ensure that air sampling has been conducted after changes or additions have been made to the range.

**1-26. Ventilation requirements**

a. Procedures for evaluating supply and exhaust ventilation systems, firing line velocities and static pressure readings are identified in the Addendum.

b. If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system shall have a high efficiency particulate air (HEPA) filter with reliable back-up filter. In addition, controls to monitor the concentration of Lead and Carbon Monoxide in the return air *shall be* installed and programmed to bypass the recirculation system automatically if the filter system fails. This system shall be operating and maintained IAW 29 CFR 1910.1025(e)(4)(ii).

**1-27. Air sampling requirements**

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a. Initial air sampling to determine airborne Lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use. If initial determination reveals employee exposure to be at or above .003 ug/m<sup>3</sup>, sampling shall be repeated IAW 29 CFR 1910.1025(d)(6)(ii).

b. Air sampling shall be accomplished for each type of ammunition to be used in the range. (For air sampling procedures, see the Addendum).

c. After the initial air sampling, air sampling is required only if changes or additions have been made to the range, there are changes in ammunition or weapons used in the range, or if changes have occurred in ventilation measurements. Once changes occur, air sampling shall be completed every two-years and prior to range use.

d. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne Lead concentrations. A competent person as designated by a Regional Industrial Hygienist may conduct the air sampling.

e. The State Occupational Health Nurse shall maintain copies of all air sampling results when required as part of personnel exposure records. See paragraph 1-11 for specific requirements.

**1-28. Inspection reports**

A completed inspection report shall be provided to the state Adjutant General for information or action as appropriate. An information copy shall also be provided to the Commander of the facility and to the state safety manager. A complete inspection report shall consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 1-24 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to assure required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

**1-29. Record maintenance**

a. All exposure monitoring and medical surveillance records shall be maintained for 40 years or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C.

b. The State Safety Manager shall maintain a record of all inspections for each indoor firing range in the state. All inspections after the initial one shall be used as follow-up checks against previous inspection reports. This is to ensure that required corrective actions have been accomplished and that there have been no structural changes to the building, environmental conditions or safe operating procedures. These records shall be checked during program evaluations and industrial hygiene surveys.

**1-30. Control of potential Lead intoxication**

Occupational Safety and Health Administration (OSHA) Lead standard

a. The requirements of the OSHA Lead standard (29 CFR 1910.1025) shall be followed. The requirements include development of a written compliance program for the protection of workers from Lead exposures (29 CFR 1910.1025(e)(3)). The program shall include at a minimum the following:

- (1) A description of each operation where Lead is emitted;
- (2) Methods used to achieve compliance;
- (3) Methods used to meet the permissible exposure level;
- (4) Air monitoring data, which documents the source of air emissions;
- (5) A detailed schedule for implementation of the program;
- (6) Work practices including PPE (Personal Protective Clothing and Equipment), housekeeping, hygiene facilities and practices;
- (7) Administrative control schedule;
- (8) Personnel enrollment in medical surveillance;
- (9) Other relevant information.

b. Refer to TG 206 for specific guidance on developing the compliance program.

**1-31. Alternative ammunition**

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a. Reduced-Lead and Lead-free ammunition (non-Lead containing bullets) has become commercially available. These alternatives to conventional ammunition should be considered for training use if command policy allows.

b. Lead-free ammunition is being developed which shall have the same ballistic properties as the Lead counterparts. The potential exists for some Lead containing ammunition to be completely replaced by Lead-free ammunition for training and operational uses.

c. Until Lead-free ammunition is available, Lead exposure can be significantly reduced by the use of jacketed rounds. Most bullet traps are rated for the use of jacketed ammunition, but this should be verified with the bullet trap manufacturer.

**1-32. Maintenance requirements**

a. The following are minimum maintenance requirements, which shall be performed every three months by the range custodian or by a person designated by the facility commander:

(1) Inspect the ventilation system fan for condition of belts to ensure that the belts are not torn or frayed and that they are not slipping.

(2) Evaluate static pressure and compare to the baseline static pressure reading. Any changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure they are opening fully.

(4) Lubricate the bullet trap (if applicable).

(5) Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.

b. See the Addendum for a complete list of maintenance requirements for the bullet trap.

**1-33. Housekeeping**

a. The ventilation system shall be in operation during all cleanup operations.

b. An approved National Institute for Occupational Safety and Health (NIOSH) respirator (P-100) for Lead exposure *shall be* used during cleanup operations.

c. During range cleaning operations, workers shall wear coveralls or similar full-body clothing, gloves, hat and change of shoes or disposable booties, face shields and goggles, or other equipment to protect the workers skin and eyes.

d. Blowing, shaking or any other means, which disperses Lead into the air, *shall not* be used to remove Lead dust accumulated on worker's clothing or equipment. A designated area shall be used for changing clothes to prohibit the spread of contamination. Workers shall shower and change clothes before release from work.

e. Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

f. The range shall be cleaned at the end of each firing day with a HEPA vacuum or wet mop method.

g. When performing the cleaning, clean the floor and all horizontal surfaces fifteen feet in front of and behind the firing line, or when there is a visible accumulation of lead dust.

h. Wash water contaminated with Lead can be collected and allowed to slowly evaporate leaving Lead deposits/sludge that may be collected in plastic containers, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums *shall be* properly labeled to identify contents. Disposal of containerized waste *shall be* coordinated IAW state hazardous waste program requirements.

i. The State Environmental Office shall coordinate removal and disposal of all containerized hazardous waste derived from routine use, cleaning, and maintenance of IFRs. Contact your State Environmental Office for proper disposal instructions when bullet trap catch trays are  $\frac{3}{4}$  full. Spent cartridge cases shall be collected and processed in accordance with local ammunition inventory and accountability procedures, AR 710-2, and DA PAM 710-2-1.

j. Prior to converting an indoor firing range to other uses, the entire range area shall be properly decontaminated of any Lead residue. For cleaning and decontamination instructions, see the Addendum.

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**1-34. Maximum exposure hours**

Personnel exposure limits for intermittent atmospheric Lead contamination has been developed by the U.S. Army Medical Command (MEDCOM) in the form of a table of Lead exposure limits (Figure 1-1). This table was developed to control intermittent Lead exposure and to establish maximum allowable hours of exposure based on the airborne Lead concentration and the number of days firing per year. Intermittent exposures to Lead in indoor firing ranges shall be controlled according to the criteria provided in the table of Lead exposure limits as an interim control measure only. Maximum effort *shall be* made to introduce permanent control measures to reduce the airborne Lead levels to 0.03 mg/m<sup>3</sup> or less. Exposure records shall be maintained by the commander of the facility on all personnel who use the firing range when the airborne Lead levels exceed 0.03 mg/m<sup>3</sup>. These records shall contain the airborne Lead concentrations and the amount of time spent on the range for each individual. Other potential Lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in establishing maximum allowable exposure time.

**1-35. Extent of use**

- a. The extent of use for any indoor firing range *shall be* based on permissible exposure of all using personnel to concentrations of airborne Lead dust.
- b. Under no circumstances shall pregnant women be permitted in an indoor firing range, IAW 29 CFR 1910.1025, Appendix C, Section II (5).
- c. Personnel under 17 years of age are *prohibited* from entering any range area with a Lead concentration greater than 0.100 mg/m<sup>3</sup>. For ranges with Lead concentrations less than 0.100 mg/m<sup>3</sup>, follow the guidelines in Figure 1-1.
- d. Use of the indoor firing range by non-military organizations shall be approved and documented in writing by the State Safety Manager.

**1-36. Medical surveillance**

- a. Personnel who are or may be exposed to Lead above the action level (0.03 mg/m<sup>3</sup>) for more than 30 days per year shall be enrolled in the Medical Surveillance Program.
- b. Medical surveillance is not required for intermittent users of indoor firing ranges if the maximum allowable exposure hours shown in Figure 1-1 is not exceeded.

**1-37. Terms**

- a. **Backsplatter**-This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet composition, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backspatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.
- b. **Competent person**-An individual who has been specifically trained to identify safety and occupational health hazards associated with Lead dust and indoor firing ranges. The individual is aware of current regulations governing indoor firing ranges and of ventilation principles and terminology, air sampling media and collection requirements and can interpret air sample results. He can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He can correctly use diagnostic ventilation evaluation equipment and interpret results. He has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.
- c. **Plenum**-This term refers to a chamber used to build static pressure before the air enters the firing range. Air is introduced into the plenum from the side, top, or back and is forced through a perforated wall (called the plenum wall) behind the firing line.
- d. **Smoke Testing**-To conduct a smoke test, a smoke candle is ignited behind the firing line. The smoke is used to check the airflow at and in front of the firing line. There should be laminar flow down the range to the bullet trap and no turbulence at the firing line. It is also important to ensure the smoke does not circle back behind the firing line.

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FIGURE 1-1

<b>FIGURE 1-1 Breathing Zone Exposure Limits for Intermittent Atmospheric Lead Exposures</b>			
<b>Concentrations (In mg/m<sup>3</sup>)</b>	<b>Maximum Hours of Allowable Exposure Per Day For:</b>		
	<b>A.  GUARDSMEN exposed less than 30 days per year</b>	<b>B.  GUARDSMEN on marksmanship teams or GUARDSMEN exposed more than 30 days per year and ALL NON-MILITARY PERSONNEL</b>	<b>C.  Range Users under 17 Years of Age*</b>
0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	<b>LIMITED USE RANGES</b>	<b>LIMITED USE RANGES</b>	<b>LIMITED USE RANGES</b>
0.050 - 0.059	6	4	2
0.060 - 0.079	5	3	1
0.080 - 0.099	4	2.25	1
0.100 - 0.149	2.5	1.5	0
0.150 - 0.199	2	1	0
0.200 - 0.299	1.25	0.75	0
0.300 - 0.399	1	0.5	0
0.400 - 0.499	0.75	0.5	0
0.500 - 0.749	0.5	0.25	0
0.750 - 0.999	0.25	0.25	0
1.000 or above	0	0	0
<ul style="list-style-type: none"> <li>• <u>These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.</u></li> <li>• Adherence to these guidelines shall prevent overexposure to Lead in indoor firing ranges.</li> </ul>			

\* Recommend that an Occupational Health Physician make the determination on length of firing time for individuals 17 years of age and younger.

FIGURE 1-2

INDOOR FIRING RANGE INSPECTION CHECKLIST

See paragraphs 1-23 through 1-25 of this regulation for inspection requirements. For the range to be considered safe each of the following statements shall be true and air-sampling results shall be below the standard for Lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulations.

Location of the Range \_\_\_\_\_ Date \_\_\_\_\_

Range Custodian \_\_\_\_\_ Telephone \_\_\_\_\_

**Part 1, Physical Safety Inspection**

**A. Building Envelope**

- \_\_\_\_\_ 1. Each firing lane is at least 4 feet wide. [1-17a(1)(a)]
- \_\_\_\_\_ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [1-17a(1)(b)]
- \_\_\_\_\_ 3. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [1-17a(1)(d)]
- \_\_\_\_\_ 4. There are no open floor drains in the range. [1-17a(2)(c)]
- \_\_\_\_\_ 5. There is no carpet, drapes or other fiber-like material in the range. [1-17a(2)(d)]
- \_\_\_\_\_ 6. Pipes, conduits and walls are sealed to prevent leakage of Lead dust from the range into other areas. [1-17a(2)(b)]
- \_\_\_\_\_ 7. The interior surfaces or the range floor, walls, and ceiling have no protruding edges or devices. [DG 415-1, App.A, 3-1d]
- \_\_\_\_\_ 8. The roof provides ballistic security. [DG 415-1, App. A, 3-1e(1)]
- \_\_\_\_\_ 9. The walls provide ballistic security. (DG 415-1, App. A, 3-1f(1))
- \_\_\_\_\_ 10. Interior mortar joints are flush with the interior surface. (DG 415-1, App. A, 3-1f(2))
- \_\_\_\_\_ 11. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, App. A, 3-1f(4))
- \_\_\_\_\_ 12. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, App. A, 3-1h)

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**B. Range Lighting**

- \_\_\_\_\_ 1. Lighting is uniform, non-glaring and does not cause shadows. [1-17c(1)(a)]
- \_\_\_\_\_ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [1-17c(1)(b)]
- \_\_\_\_\_ 3. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [1-17c(1)(c)]
- \_\_\_\_\_ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [1-17c(1)(d)]
- \_\_\_\_\_ 5. Emergency lights are provided behind the firing line and are in working condition. [1-17c(1)(e)]
- \_\_\_\_\_ 6. Exit lights are provided and working as required. [1-17c(1)(f)]
- \_\_\_\_\_ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [1-17c(1)(g)]
- \_\_\_\_\_ 8. No known electrical hazards exist in the range. [1-17c(2)(c)]

**C. Bullet traps**

- \_\_\_\_\_ 1. A bullet trap is permanently installed in the range. [1-17d(1)(a)]
- \_\_\_\_\_ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-ARI, the Addendum, and this regulation. [1-17d(1)(b)]
- \_\_\_\_\_ 3. The thickness of inclined plate/sand trap type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [1-17d(1)(c)]
- \_\_\_\_\_ 4. All plate/sand trap type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [1-17d(1)(d)]
- \_\_\_\_\_ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [1-17d(1)(e)]
- \_\_\_\_\_ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [1-17d(1)(f)]
- \_\_\_\_\_ 7. Steel bullet traps are not bowed, punctured or severely pitted. [1-17d(2)(a)]
- \_\_\_\_\_ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [1-17d(2)(b)]

**D. Targets and target carriers**

- \_\_\_\_\_ 1. A target retrieval system is operable in all lanes. [1-17e(1)(a)]  
(Any one firing lane without a retrieval system shall not be used for firing)
- \_\_\_\_\_ 2. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [1-17e(1)(a)]
- \_\_\_\_\_ 3. Only paper targets are used in the range. [1-17e(1)(b)]

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**E. Range use**

- \_\_\_\_\_ 1. The range is not used for any purpose other than firing. [1-18a]
- \_\_\_\_\_ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [1-17d]
- \_\_\_\_\_ 3. No additional clothing or equipment is brought into the range. [1-19h]
- \_\_\_\_\_ 4. Personnel are *not* permitted in the plenum area during firing even if designed for observation. [1-19a]
- \_\_\_\_\_ 5. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) [1-19f]
- \_\_\_\_\_ 6. All areas directly in front of the plenum walls are kept clear at all times. [1-19c]
- \_\_\_\_\_ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [1-19g]
- \_\_\_\_\_ 8. The ventilation system is in operation at all times during firing or cleaning. [1-18c]
- \_\_\_\_\_ 9. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. [DG 415-1, App. A, 4-5]

**F. Range maintenance**

- \_\_\_\_\_ 1. Dry sweeping does not occur in the range. [1-19e]
- \_\_\_\_\_ 2. No brooms are located in the range. [1-19e]
- \_\_\_\_\_ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-13c]

**G. Personnel protective equipment**

- \_\_\_\_\_ 1. All personnel in the range during firing wear ANSI approved eye protection. [1-20a]
- \_\_\_\_\_ 2. All personnel in the range during firing wear ANSI approved hearing protection. [1-20b]

**H. Posting of signs**

- \_\_\_\_\_ 1. The following signs are posted in or in the vicinity of the range: [1-21a]
  - \_\_\_\_\_ a. Eating, Drinking and Smoking are *Prohibited*
  - \_\_\_\_\_ b. Dry Sweeping is *Prohibited*
  - \_\_\_\_\_ c. Wash Hands and Face Immediately Following Firing
  - \_\_\_\_\_ d. The Following Ammunition is authorized for use on this Range: \_\_\_\_\_
  - \_\_\_\_\_ e. Hearing Protection *shall be* Properly worn during firing
  - \_\_\_\_\_ f. Proper Safety Glasses/Goggles *shall be* worn during firing
  - \_\_\_\_\_ g. No Furniture or Storage of Items Permitted in the Range
- \_\_\_\_\_ 2. The following signs are posted on the entrance door to the range: [1-21b]
  - \_\_\_\_\_ a. Noise Hazardous Area
  - \_\_\_\_\_ b. Danger Lead Hazard Area
  - \_\_\_\_\_ c. Pregnant women are *not* permitted in this Area
- \_\_\_\_\_ 3. An illuminated warning sign, which is interlocked with the range ventilation switch, is located outside of the firing range to alert individuals that the range is in use. [1-21c]



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\_\_\_\_\_ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all shooters.  
[1-21c]

\_\_\_\_\_ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. [1-21e]

**I. Range SOP**

\_\_\_\_\_ 1. The indoor firing range has a written SOP, which is approved by the State Safety and Occupational Health Office. [1-10e]

\_\_\_\_\_ 2. The range SOP includes as a minimum the following: [1-22b]

\_\_\_\_\_ a. The requirement for establishment and maintenance of a log of visitors for the indoor firing range.

\_\_\_\_\_ b. The requirement for and contents of a mandatory safety briefing for all individuals prior to entering the range to be given by a designated competent range safety officer.

\_\_\_\_\_ c. Work practices including required, recommended, permissible and banned practices as specified by this regulation.

\_\_\_\_\_ d. Instructive guidance for all range procedures.

\_\_\_\_\_ e. Personnel responsibilities for performing the procedures, for supervising them, and reviewing and updating the SOP.

\_\_\_\_\_ f. Authorized ammunition for the range.

\_\_\_\_\_ g. The requirement for posting of signs IAW section 1-21 of this regulation.

\_\_\_\_\_ h. Cleaning and maintenance requirements.

\_\_\_\_\_ i. Personal protective equipment requirements for maintenance, firing and cleaning.

**J. Recordkeeping**

\_\_\_\_\_ 1. A visitors log is maintained which includes the following information for all visitors/shooters:  
[1-14c]

\_\_\_\_\_ a. Name and age of shooter.

\_\_\_\_\_ b. Organization (if civilian, include address and phone number).

\_\_\_\_\_ c. Sign in and sign out times.

\_\_\_\_\_ d. Type of ammunition used and number of rounds fired.

\_\_\_\_\_ 2. Copies of initial and other previous inspections are available. [1-24a]

\_\_\_\_\_ 3. The initial inspection report includes air-sampling data. [1-24b]

\_\_\_\_\_ 4. An OSHA compliance program is in place, which covers the required aspects. [1-30a]

\_\_\_\_\_ 5. All individuals using the indoor firing range have been provided with a copy of the range SOP or been briefed on the requirements of the SOP, and have signed an agreement to follow the rules stated therein. [1-13h]

\_\_\_\_\_ 6. State maintenance officers/custodians have documentation to show that they have been educated to the health effects from exposure to Lead dust. [29 CFR 1910.1200 and 29 CFR 1910.1025]

\_\_\_\_\_ 7. Range safety officer(s) is/are designated. [1-13c]

**K. New and Renovated Ranges**

\_\_\_\_\_ 1. No doors are installed in the plenum wall.

\_\_\_\_\_ 2. Plenum area is at least 4 feet deep.

\_\_\_\_\_ 3. An access door is installed behind the bullet trap.

\_\_\_\_\_ 4. Only escalator or rubber bullet traps are installed.

## INDOOR FIRING RANGE INSPECTION CHECKLIST

### Part 2, Ventilation Inspection

#### A. Existing Ranges

- \_\_\_\_\_ 1. The range has an operational mechanical ventilation system. [1-17b(1)(a)]
- \_\_\_\_\_ 2. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [1-17b(1)(b)]
- \_\_\_\_\_ 3. 100% of air is exhausted at or behind the bullet trap. [1-17b(1)(c)]
- \_\_\_\_\_ 4. Make-up air is introduced into the range behind the shooters. [1-17b(1)(d)]
- \_\_\_\_\_ 5. Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm. [1-17b(1)(e)]
- \_\_\_\_\_ 6. Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm. [1-17b(1)(f)]
- \_\_\_\_\_ 7. The ventilation system is so constructed that air exhausted from the indoor firing range does not enter into another part of the building or any other air supply system. [1-17b(1)(g)]
- \_\_\_\_\_ 8. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [1-17b(1)(h)]
- \_\_\_\_\_ 9. If air is recirculated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(ii)]
- \_\_\_\_\_ 10. If air is recirculated in the range, controls to monitor the concentration of Lead and Carbon Monoxide levels are installed and programmed to bypass the recirculation system automatically if the filter system fails. [29 CFR 1910.1025(e)(4)(ii)]
- \_\_\_\_\_ 11. The fan(s) in the ventilation system is a single speed fan only. [DG 415-1, App. A, 3-2a]
- \_\_\_\_\_ 12. A smoke test of the range shows laminar air flow and no turbulence in the range. (See the Addendum for troubleshooting guidance) [1-18b(1)(k)]
- \_\_\_\_\_ 13. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [1-17b(1)(l)]
- \_\_\_\_\_ 14. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [1-17b(1)(m)]
- \_\_\_\_\_ 15. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [1-17b(1)(n)]

#### B. New and Renovated Ranges

- \_\_\_\_\_ 1. A manometer is installed leading into the exhaust fan, which is capable of measuring at least 20 inches of static pressure.
- \_\_\_\_\_ 2. Supply and exhaust fans are electrically interlocked with the downrange lighting.
- \_\_\_\_\_ 3. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.
- \_\_\_\_\_ 4. Passive supply systems have opposing blade louvers.
- \_\_\_\_\_ 5. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

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### INDOOR FIRING RANGE INSPECTION CHECKLIST

#### Part 3, Air Sampling

1. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: \_\_\_\_\_
2. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: \_\_\_\_\_
3. Air sampling has been scheduled for: \_\_\_\_\_

Print and sign: \_\_\_\_\_

Position: \_\_\_\_\_ Date: \_\_\_\_\_

4. Air sampling was completed on: \_\_\_\_\_ for the following types of ammunition:  
\_\_\_\_\_.
5. Air sample results do not exceed: \_\_\_\_\_ mg/m<sup>3</sup> (results are attached)
6. For military personnel exposed less than 30 days per year, this range is classified as: \_\_\_\_\_  
(SAFE, LIMITED USE, UNSAFE)
7. For military personnel exposed more than 30 days per year and for all non-DoD personnel, this range is classified as: \_\_\_\_\_ (SAFE, LIMITED USE, UNSAFE)

Print and sign: \_\_\_\_\_

Position: \_\_\_\_\_ Date: \_\_\_\_\_

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**FIGURE 1-3**  
**EXAMPLE OF INDOOR FIRING RANGE SOP**  
**STATE OF \_\_\_\_\_, DEPARTMENT OF MILITARY AFFAIRS**  
**XXXX SOUTH MAIN STREET**  
**SOMEWHERE, \_\_\_\_\_ XXXXX-XXXXX**  
**\_\_\_\_\_ ARMORY INDOOR FIRING RANGE**  
**\_\_\_\_\_ STANDING OPERATING PROCEDURE (SOP)**

**1. References:**

- a. AR 385-10
- b. AR 385-63
- c. NGR 385-10
- d. NG PAM 385-XX
- e. 29 CFR 1910.1025
- f. 29 CFR 1920.1200
- g. 29 CFR 1926
- h. 29 CFR 1960
- i. USACHPPM, TG 141

**2. Purpose.** The \_\_\_\_\_ Armory indoor firing range SOP is published to establish procedures to minimize the exposure of Lead (Pb) to personnel and provide uniform safe range operations and maintenance procedures. The provisions set forth herein shall govern all actions and personnel associated with range operations.

**3. Review and Update.** This SOP should be reviewed yearly by the Commander of the facility and the State Safety and Occupational Health Office. A cover sheet, which documents the signature and dates of personnel involved with the review of the SOP, should be attached.

**4. General.**

- a. Each Officer or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations shall maintain a current copy, and be familiar with the provisions of this SOP, and NGR 385-10.
- b. These directive and military regulations are applicable to all active duty military, military technicians, federal and state civilian employees and civilian personnel, to include local or state police authorities.

**5. Range Control.**

a. The \_\_\_\_\_ Armory Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO to the position of Range Control Officer (RCO).

b. The RCO is responsible to perform the following:

- (1) Enforce the facility range safety program and SOP.
- (2) Notify Armory personnel of times when the range shall be in use.
- (3) Coordinate and schedule all activity on the firing range.
- (4) Ensure that the range is secured when not in use.
- (5) Ensure that nothing is stored at the range.

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(6) Investigate and report all accidents and incidents involving weapons and ammunition in accordance with NGR 385-10.

(7) Determine which weapons and ammunition are authorized for the range. This should be coordinated through the Safe Safety and Occupational Health Office and in accordance with manufacturers' specifications.

(8) Ensure that all OIC/NCIOCs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(9) Prepare a range OIC/NCIOC briefing packet for all using units. The packet should contain, as a minimum; a copy of this SOP, emergency telephone numbers of local rescue authorities, and a current copy of the Accident Prevention Plan (**Appendix C** of this SOP).

(10) Ensure that mandatory signs listed in NGR 385-10, paragraph 1-21 are posted as required.

**6. Range OIC/NCIOC.** The Commander or supervisor of all using units or groups shall designate an OIC/NCIOC in the grade of E-6 or above to be the responsible for the safe conduct of firing and proper use of the facilities. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties. The duties of the range OIC/NCIOC shall include but are not limited to the following:

a. Prior to firing.

(1) Receive a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative. If the condition of the range is acceptable, assume control and request clearance from the RCO to fire.

(2) Ensure the overall safe conduct of training and the proper use of the facility.

(3) Ensure that all participants are familiar with the verbal commands, hand signals, range procedures and safety requirements.

(4) Be present when the range is in use and determine when it is safe to fire.

(5) Be knowledgeable of the weapons to be used and ensure that only authorized weapons and ammunition are used. Ensure that the proper operators' manuals are available for each individual using the range.

(6) Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

(7) Ensure that at least three individuals are present on the range when the range is in use.

(8) Ensure that all personnel wear the proper hearing and eye protection as required.

(9) Ensure that all individuals using the range have signed-in on the roster maintained by the facility Commander.

(10) Ensure that the range has a working telephone, or that other means of emergency communication is available.

(11) Ensure that appropriate emergency medical personnel have been notified that the range is in use, and that the projected hours of operation are from \_\_\_\_\_ to \_\_\_\_\_ hours.

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**b. During Firing.**

- (1) Ensure that personnel do not leave the firing line without the permission of the OIC/NCOIC.
- (2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the OIC/NCOIC to do so.
- (3) When not in use, revolvers shall have cylinders open and automatic weapons shall have magazines removed and the slide/receiver locked to the rear. Rifles shall also have the magazine removed, if applicable, bolts and/or slides open or locked to the rear when not in use. Weapons shall be carried to and from the firing line in the configuration described above, with the muzzle pointed downrange.
- (4) Ensure that weapons malfunctions/jams are cleared only at the direction of the OIC/NCOIC in accordance with the procedures established in the operators' manual for the weapon.
- (5) Ensure that weapons are cleared and checked during temporary suspension of firing.
- (6) Ensure that firing is stopped promptly when an unsafe act is observed or reported.
- (7) Do not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.
- (8) Limit firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contact the State Safety Manager to determine if the range has time limitations placed upon it.

**c. After Firing.**

- (1) Ensure that all weapons are cleared prior to being removed from the firing line.
- (2) Ensure that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.
- (3) Ensure that all bullet casings are removed from in front of and behind the firing line and that the range is restored to a serviceable condition. **Dry sweeping of the range is prohibited.**
- (4) Conduct a final inspection of the range. Secure the range, and turn the keys and shooters log into the RCO or his/her designated representative.

**7. Range Control Officer Qualifications.** His or her commander may appoint any individual in the rank of E-6 and above to the Rang Control Officer. Appointment orders for all RCOs shall be maintained on-file at the facility. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties. Law enforcement and civilians requesting appointment to perform RCO duties, shall show evidence that they have completed an Army and/or National Rifle Association approved firearms instructor's course or equivalent prior to appointment.

**8. Range Restrictions.**

- a. The \_\_\_\_\_ Armory is restricted to firing the following ammunition based upon manufacturer specifications:

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**EXAMPLE**

- (1) .22 caliber including the M-16 with adapter
- (2) .38 caliber
- (3) .45 caliber
- (4) 9 mm pistols

**Note:** No other weapons can be fired without the approval of the State Safety Manager.

- b. Pellets, BBs, magnum and armor piercing rounds are prohibited.
- c. Dry sweeping of the range is prohibited.
- d. Trick shooting including, quick draw and hip shooting is prohibited.
- e. Storage of any item in the range is prohibited.
- f. Smoking and consumption of food or beverages is prohibited.
- g. Proper hearing and eye protection shall be worn during firing.
- h. Civic groups with individuals under 18 years of age are required to have written permission from the ARNG State Safety Manager prior to firing.
- i. Personnel shall not be allowed in the observation/plenum area during firing.

**9. Mandatory Signs.** As a minimum the following signs shall be posted on the door/entrance to the range or inside as appropriate:

a. Inside the Range.

- (1) Eating, drinking and/or smoking are prohibited.
- (2) Dry sweeping is prohibited.
- (3) Wash hands and face immediately after firing.
- (4) Hearing protection shall be worn during firing.
- (5) Safety glasses/goggles shall be worn during firing.
- (6) Storage of furniture and other items is prohibited.
- (7) The following ammunition is authorized for this range: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

b. On the Door to the Range.

- (1) Noise Hazardous Area.

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(2) Danger Lead Hazard Area.

(3) Pregnant women are not permitted in this area.

**10. Authorized Use of the Range.** Utilization of the \_\_\_\_\_ Armory range is authorized for organizations of the \_\_\_\_\_ Army National Guard conducting unit training and for the marksmanship team conducting competition or in preparation for competition. Non-Military personnel are subject to the same requirements and regulations as National Guard personnel and shall be in strict compliance with this SOP, Army Regulations, ARNG regulations and applicable subject letters and directives from the Adjutant General, State of \_\_\_\_\_.

**11. Release of Liability.**

a. The military Range Control Officer shall obtain a signed Release of Liability (**Appendix D** of this SOP) form from each civilian user of the range. Signed agreements shall be kept on file with the Commander of the facility.

b. Organizations with members who are minors shall obtain Permission and Release of Liability (**Appendix D** of this SOP) form signed by a parent or guardian. **The ARNG State Safety Manager shall be notified prior to minors firing on ARNG ranges.**

**12. Denial of Range Access.** The Commander of the facility may withdraw range privileges from any person or organization that willfully disobeys rules and regulations pertaining to range operations. In addition, range privileges may be denied to an individual whose knowledge of the principles of marksmanship is deficient to the degree of posing a safety hazard.

FOR THE COMMANDER:

John Doe  
CPT, IN, \_\_\_\_ ARNG  
OIC/Armory Commander



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**APPENDIX A  
ABBREVIATIONS**

**ANSI**

American National Standards Institute

**AR**

Army Regulation

**ARNG**

Army National Guard

**CFM**

Cubic feet per minute

**CFR**

Code of Federal Regulations

**CNGB**

Chief, National Guard Bureau

**DA**

Department of the Army

**FPM**

Feet Per Minute

**HEPA**

High Efficiency Particulate Air

**IAW**

In Accordance With

**IFR**

Indoor Firing Range

**mg/m<sup>3</sup>**

Milligrams per cubic meter

**NIOSH**

National Institute for Occupational Safety and Health

**NGB**

National Guard Bureau

**OSHA**

Occupational Safety and Health Administration

**SOP**

Standing Operating Procedure

**SP**

Static pressure

**USACHPPM**

U.S. Army Center for Health Promotion and Preventive Medicine

**wg**

Inches of water gauge

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**APPENDIX B  
REFERENCES**

**ACGIH 22nd Ed, Industrial Ventilation**

A Manual of Recommended Practice

**Army Regulation (AR) 11-34**

The Army Respiratory Protection Program

**AR 40-5**

Preventive Medicine

**AR 350-41**

Army Forces Training

**AR 385-63**

Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat

**AR 385-64**

U.S. Army Explosives Safety Program

**Army National Guard (ARNG) Design Guide (DG) 415-1**

Design Guide for Armories

**American National Standards Institute (ANSI) Z87.1-1999**

Practice for Occupational and Educational Eye and Face Protection

**CEHND 1110-1-18**

USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

**Department of the Army Pamphlet (DA PAM) 385-64**

U.S. Army Explosives Safety Program

**DA PAM 40-501**

Hearing Conservation

**DA PAM 710-2-1**

Using Unit Supply System (Manual Procedures)

**Department of Defense Instruction (DODI) 6055.1**

Department of Defense Occupational Safety and Health (OSH) Program

**DHEW NIOSH 76-130**

Lead Exposure and Design Considerations for Indoor Firing Ranges

**FM 25-7**

Training Ranges

**National Guard Regulation (NGR) 385-10**

Army National Guard Safety and Occupational Health Program

**NGR 415-5**

Military Construction Army National Guard (MCARNG) Project Development

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**APPENDIX B (Continued)**

**GR 420-10**

Operations/Maintenance and Minor Construction, Army National Guard

**Technical Bulletin Medical (TB MED) 502**

Occupational and Environmental Health, Respiratory Protection Program

**TB MED 506**

Occupational and Environmental Health, Occupational Vision

**TG 206**

USACHPPM Technical Guide for Indoor Firing Ranges

**Title 29, Code of Federal Regulations (CFR) Revision, Part 1910**

Occupational Safety and health Standards

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**APPENDIX C  
INDOOR FIRING RANGE ACCIDENT RESPONSE PLAN**

1. If a mishap or injury occurs at any time during the conduct of range operations, the following procedures shall be followed:

a. The OIC/NCOIC or person in charge of the range shall order a cease-fire immediately. **All weapons shall be cleared and muzzles pointed downrange.**

b. Render first aid to the injured as appropriate.

c. The OIC/NCOIC or person in charge of the range shall direct an individual to telephone and/or radio for medical assistance. **The primary telephone to be used in case of an emergency is located \_\_\_\_\_.** The emergency numbers are \_\_\_\_\_.

d. A person shall be stationed at the main entrance of the range to provide direction to emergency medical personnel.

e. After all injured personnel have been removed or attended to:

(1) The OIC/NCOIC shall notify the RCO of the mishap.

(2) The RCO shall in-turn notify the office of the Adjutant General at DSN \_\_\_\_\_, or the duty officer, and the State Safety and Occupational Health Office at DSN \_\_\_\_\_.

f. The RCO, with the assistance of the State Safety Manager, shall investigate the mishap and file a DA Form 285 "Accident Investigation" as appropriate.

2. All injuries or mishaps shall be reported to the RCO as soon as possible. The OIC/NCOIC shall be responsible to obtain witness statements and assist in making reports as may be required.

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APPENDIX D  
PERMISSION AND RELEASE OF LIABILITY CERTIFICATE

\_\_\_\_ ARNG  
Somewhere, USA  
Date: \_\_\_\_\_

BE IT KNOWN TO ALL: WHEREBY I, \_\_\_\_\_;  
Have been granted permission to use firearms on the indoor firing range located at the \_\_\_\_\_ Army National Guard Armory; and whereas I am doing so entirely upon my own initiative, risk, and responsibility; now therefore, in consideration of the permission extended to me by the United States Government and/or State of \_\_\_\_\_ through their officers and agents do hereby for myself, heirs, executors and administrators, remiss, release and forever discharge the Government of the United States and the State of \_\_\_\_\_, the \_\_\_\_\_ Army National Guard, their officers, agents, employees expressly including the Adjutant General of the State of \_\_\_\_\_, acting officially or otherwise, from any and all claims, demands, action, or causes of action on account of my death, or account of injury to me or my property which may occur from any cause during the period of the above granted permission. I further acknowledge and certify by my signature below that I have read and understand the applicable range facility standing operating procedure (SOP) and shall comply with it and all applicable safety regulations.

Signature: \_\_\_\_\_

Witness to Signature: \_\_\_\_\_

---

In case of emergency, please contact:

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Telephone Number \_\_\_\_\_

---

TO BE SIGNED BY THE PARENT OR GUARDIAN OF INDIVIDUALS UNDER 18 YEARS OF AGE. NO MINOR SHALL BE ALLOWED TO UTILIZE AN ARNG FIRING RANGE WITHOUT PARENT OR GUARDIAN SIGNATURE.

I, said parent, and/or legal guardian of the above-named minor, hereby give my consent to said minor executing this release, and do hereby also release and agree to save harmless the parties above-named as to said minor and as to myself as an individual, and for our heirs, executors, administrators and assigns.

Signature of Parent or Guardian: \_\_\_\_\_

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**ADDENDUM**

**GUIDELINES FOR IFR REHABILITATION, CONVERSION, AND CLEANING**

**CONTENTS (Listed by paragraph number)**

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Appendix I - Glossary	

**Purpose**

1. This addendum establishes policy and procedures for rehabilitation, conversion, and cleaning of ARNG indoor firing ranges.

**2. References**

Related publications are listed below.

- a. DODI 6055.1 (Department of Defense Instruction, Occupational Safety and Health (OSH) Program).
- b. AR 11-34 (The Army Respiratory Protection Program).
- c. AR 40-5 (Preventive Medicine).
- d. NGR 385-15 Policy, Responsibilities, and Procedures for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges).
- e. 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards
- f. OSHA Technical Manual, Edition VII.
- g. DHEW NIOSH 76-130 (Lead Exposure and Design Considerations for Indoor Firing Ranges).

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#### 3. Explanation of Abbreviations and Terms

Abbreviations and special terms used in this publication are listed in the glossary.

#### 4. Policy and Procedures

Conversion of Ranges. Indoor firing ranges can be safely rehabilitated or converted for other uses, such as a storage area, kitchen, or office space, provided the following –

a. Previously active ranges must be thoroughly decontaminated and cleaned to acceptable levels.  
b. The level of cleanliness is to be determined by sampling. The Occupational Safety and Health Administration's (OSHA) Technical Manual, 5<sup>th</sup> Edition, provides guidance on the methods and techniques needed to collect wipe samples (Appendix A).

(1) Wipe samples must be collected and analyzed prior to and after cleaning.

(2) Post-cleaning surface wipe sample results must be less than or equal to 200 micrograms per square feet (ug/sq ft). The sampling strategy, which is the amount and location of wipe samples to be collected, is provided in Appendix B. Methods for interpreting the sample results are contained in Appendix C and D.

c. Equipment/items previously stored in the range must be decontaminated and cleaned to acceptable levels.

(1) Samples must be collected from equipment/items stored in the range. Sample selection is critical, because the number of items stored and length of storage differs from range to range. The amount and location of the samples, should be representative of the areas where lead dust is most likely to accumulate. The more samples collected, the better the statistical comparison of the results.

(2) Samples must be collected from the smooth surfaces of the equipment/items, in so much as possible. Results of samples collected from a rough surface will be inaccurate due to the minimal surface contact of the media. Further, the likelihood of tearing the media filter is greater on rough surfaces.

(3) Samples should also be collected on items stored the longest period of time, and which have not been disturbed. Items stored closest to the bullet trap and firing line are likely to have higher concentrations of lead dust. Methods for interpreting the sample results are contained in Appendix C and D.

#### 5. Goal

To ensure every indoor firing range is free of lead dust, and to reduce the number of unsafe ARNG indoor firing ranges.

#### 6. Background

The Environmental Protection Agency (EPA) identifies lead as a highly toxic metal. Elemental lead is indestructible, and common in the environment. Lead can enter the body by inhalation (breathing) or ingestion (eating). In addition, lead is a cumulative poison. It accumulates in the blood, bones, and organs, including the kidneys, brain and liver. Effects include nervous and reproductive system disorders, delays in neurological and physical development, cognitive and behavioral changes, and hypertension. Symptoms include loss of appetite, difficulty sleeping, irritability, fatigue, headache, and inability to concentrate. It can stay in the bones for decades. Worker awareness and training are important to ensure that employees can recognize the symptoms of exposure and get prompt medical attention.

#### 7. Wipe Sample Media

a. OSHA Technical Manual provides the necessary guidance on the technique needed to collect wipe samples (Appendix A). Only distilled or deionized water will be used to saturate dry sample media. At least one field blank filter must be submitted with each sample sheet. The field blank must be from the same lot, and labeled as a blank on the sample sheet. Appendix E identifies how and where to obtain sample media. Use the following guidance for determining media acceptability.

(1) Acceptable Media consists of –

(a) Ghost Wipes™ (**PREFERRED METHOD**)- Pre moistened

(b) Thirty-seven (37) millimeters (mm) mixed cellulose ester (MCE) filters, with or without the cassettes.

(c) Eleven (11) centimeter (cm) diameter Whatman™ #40 paper.

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(2) Unacceptable Media consists of but is not limited to—

- (a) Cotton balls
- (b) Baby wipes or wet wipes

b. Documentation of Sample Collection. A Surface Wipe Sample Sheet must be completed and submitted with samples to your supporting laboratory. A copy of this form is located in Appendix G. Refer to Appendix A on how to collect wipe samples.

**8. Wipe Sampling Protocol**  
See Appendix A.

**9. Ranges Cleaning Instructions**

a. Written procedures, such as a scope of work, or Standing Operating Procedure (SOP) that complies with all federal, state and local regulations must be established prior to decontamination operations. The range ventilation system will be in operation during range cleaning to ensure that a negative pressure environment is maintained. In the absence of mechanical ventilation system, all doors and windows will be sealed to eliminate fugitive emissions. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup followed by wet wiping of the range. The HEPA vacuum is designed to collect loose surface lead dust particles.

b. Any general purpose cleaning solution can be used. However, Spic and Span™ has been found to be an effective cleaning solution by other Army organizations. Mix new solutions of cleaning solution frequently. Wet wiping will require dual containers of water; one container for wetting the applicator (mops, rags, sponge, etc.) and the other container for rinsing the applicator after the dust has been wiped from the surfaces. When placed in containers, wastewater should be left to evaporate.

c. PROPERLY DISPOSE OF ALL HAZARDOUS WASTE. DO NOT PLACE LEAD CONTAMINATED WASTE INTO THE SEWER SYSTEM OR ONTO THE GROUND.

d. Mop-heads, sponges and rags will be discarded as hazardous waste following cleanup.

e. Wet cleaning by a high-pressure system is prohibited, as this method may embed the lead into the substratum and generate large quantities of unwanted hazardous waste.

f. Dry sweeping is not permitted.

g. All surface areas of the range must be cleaned. Do not remove the coating on smooth painted surfaces that are properly sealed.

h. Wood floors should receive a coat of deck enamel or urethane; concrete floors should be sealed with deck enamel and linoleum or tile floors should be waxed.

i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. After removing the sand, if applicable, and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plate(s) should be cleaned. Next, clean the ceiling, lights, baffles, retrieval system, heating system(s), and ventilation duct(s). Acoustical material should be vacuumed and removed rather than painted over.

j. A Toxic Characteristic Leaching Procedures (TCLP) test for lead only may need to be performed on the acoustical material. A TCLP test will determine if the material is classified as "hazardous" and can be disposed of in a sanitary landfill. Contact your State Environmental Office for assistance before arranging for this laboratory testing. The floor should be the last surface cleaned, starting at the bullet trap and ending behind the firing line.

k. After wet wiping all surfaces, permit the area to dry. Vacuum all surface areas until no dust or residue can be seen using the HEPA.

l. A thorough visual inspection to detect dust should be made following cleanup and prior to collecting post surface wipe samples.

m. As a variety of conditions exist in ranges, unique situation may arise and specific written guidance from your Regional Industrial Hygiene Office may be required.

**10. Cleaning Stored Contaminated Equipment**

a. Equipment contaminated (sample result is higher than 200 micrograms/sq ft) with lead dust must be decontaminated before it is removed from the range.



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b. Equipment located near the bullet trap and firing line should be cleaned first and then removed. The cleaning method depends on the size of the equipment and the material it is comprised of, i.e. metal, wood, concrete, porous, non-porous, smooth or rough finish etc. However, either HEPA vacuum or the wet wipe method will be used. Refer to paragraph 9 for additional guidance.

c. Every attempt should be made to clean and reclaim items since disposing of equipment, as hazardous waste is costly and wasteful. Only as a last resort will the item be discarded as hazardous waste. Porous items, such as office partitions and carpet that were present during firing should be considered grossly contaminated and be discarded unless analysis proves otherwise. Consult your State Environmental Office for the proper hazardous waste disposal methods.

**11. Contaminated Sand and Lead Waste**

Consult your State Environmental Office for specific disposal guidance to ensure compliance with local laws and regulations.

**12. Medical Surveillance**

a. A pre-placement medical examination is required for all individuals involved with range cleanup operations. Consult 29 CFR 1910.1025 for additional information on medical surveillance requirements.

A medical examination must include—

- (1) A detailed work and medical history
- (2) A thorough physical examination
- (3) A respirator use evaluation
- (4) A blood pressure measurement
- (5) Blood sample analysis to include:
  - (a) A baseline blood lead level
  - (b) A complete blood count (CBC)
  - (c) Blood urea nitrogen (BUN)
- (6) Serum creatinine
- (7) Zinc protoporphyrin
- (8) A routine urine analysis
- (9) Recordkeeping

b. Air Monitoring. Worker breathing zone (BZ) air samples must be collected to ensure personnel are not overexposed to airborne lead during the cleanup phase. Representative air samples will be collected on all personnel involved in the cleanup operation. These exposure levels will be used to evaluate work practices and personal protective equipment. Within five (5) working days after receipt of monitoring results, each employee will be notified in writing of the air sampling results. Contact your Regional Industrial Hygiene Office for additional information pertaining to air sampling.

**13. Worker Education**

OSHA 29 CFR 1910.1025 requires that workers who are potentially exposed to any lead level shall be informed of the content of Appendix A and B of this standard. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritations exists. The training program shall be repeated for personnel currently involved in range cleanup operations, at least annually, this training must be documented on DD Form 1556 or DD Form 1556-1 and filed permanently in the employee's Official Personnel File (OPF) or the soldier's Official Military Personnel File (OMPF). As a minimum, complete blocks 1, 2, 3, 7, 8, 11, 12, 13, 17, 18, 24, 33 and 36 of DD Form 1556. Place the following statement in block 18, "Do not destroy, retain this record for the duration of employment/service plus 30 years." The employer will assure that each employee is informed of the following:

- a. The content of the standard and its appendices.
- b. The specific nature of operations that could result in exposure to lead above the action level.
- c. The purpose, proper selection, fitting, use and limitations of respirators.
- d. The purpose and a description of medical surveillance program.
- e. Eating and drinking are prohibited in lead contaminated areas.
- f. Smoking and smoking materials will not be permitted in contaminated areas.

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- g. Employees must wash their hands and other exposed skin whenever they leave the work area.
- h. The engineering controls and work practices associated with the individual's job assignment.
- i. The contents of any compliance plan in effect.

**14. Personal Protective Equipment**

For housekeeping and rehabilitation the employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the National Institute for Occupational Safety and Health (NIOSH). The employer shall institute a respiratory protection program in accordance with 29 CFR 1910.134. As a minimum, personnel conducting the decontamination of the range will be provided with the following personal protective equipment.

a. Employees engaged in range rehabilitation and/or range conversion, the employer shall provide at no cost to the employee, and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

- (1) Protective coveralls with hood and shoe covers or disposable Tyvek™ full body suit.
- (2) Disposable rubber gloves; and disposable shoe coverlets (If necessary).
- (3) Full-face air purifying respirator with P-100 cartridges.

b. The employer shall provide the clothing required in a clean and dry condition at least daily to employees engaged in the conversion of indoor firing ranges.

c. The employer shall provide for the cleaning, laundering, or disposal of used or contaminated protective clothing and equipment.

d. The employer shall assure that all protective clothing is removed at the completion of a work shift only in areas designated for that purpose (Change Areas or Change Rooms).

e. The employer will ensure that contaminated protective clothing that is to be cleaned, laundered, or disposed of, is placed in a closed container in the change area that seals sufficiently enough to prevent dispersion of lead dust.

f. The employer will further inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

**15. Housekeeping**

This chapter applies to all active indoor ranges classified as "safe" for use. To keep the range operating properly and to keep possible hazards to a minimum, a routine housekeeping/ maintenance program is essential.

a. The employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. To this end the range will be clean at the conclusion of each firing day.

b. The range ventilation system will be in operation during all cleaning operations, to ensure a negative pressure environment is maintained.

c. Ranges will be cleaned by using the wet method or vacuuming. A HEPA (High Efficiency Particulate Air) filtered vacuum system is the preferred method of meeting this requirement. The use of compressed air to clean floors is absolutely prohibited. If the wet method is utilized the floor should be equipped with a floor drain, and collection system. When there is no collection system, the water can be allowed to slowly evaporate leaving lead deposits/sludge. The deposits/sludge can then be collected, placed in metal drums, and stored for future delivery to an authorized hazardous waste disposal site. Drums must be labeled to identify contents, in accordance with the hazardous waste program.

d. A NIOSH approved respirator (P-100) for protection against lead dust, fume, and mist will be worn at all times while cleaning.

e. When cleaning start behind the firing line forward, cleaning the floor and horizontal surfaces.

**16. Maintenance**

The following are the minimum maintenance requirements, which must be performed quarterly by the range custodian, or by a person designated by the facility commander.

a. Inspect the ventilation system fan for condition of belts to ensure that they are not frayed or slipping.

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- b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes will be reported through the safety manager to the Regional Industrial Hygienist.
- c. Inspect Louvers, if applicable, to ensure they are opening fully.
- d. Inspect the bullet trap for pitting or other damage and for sharp edges on venetian blind type bullet traps.
- e. Bullet Trap. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.
- f. The range ventilation system will be operational during all bullet trap cleaning procedures.
- g. All personnel involved in cleaning of the bullet trap will wear a NIOSH approved respirator, and proper personal protective equipment.
- h. All debris from the bullet trap will be collected, package and turned in, in accordance with guidance from the environmental office.

#### **17. Range Rehabilitation.**

This chapter applies to all indoor firing ranges that have been identified as candidates for rehabilitation. This chapter further provides guidance for cleaning and/or sampling that might be required prior to the start of rehabilitation.

- a. The portion(s) of the range to under go rehabilitation must be sampled to determine the level of lead contamination. Wipe samples will be taken per the established sampling protocol. See Appendix A.
- b. All personnel involved in range rehabilitation will wear a NIOSH approved respirator (P-100), and proper personal protective equipment as prescribed in paragraph 14 above.
- c. Prior to start of rehabilitation the environmental office must be notified to determine the disposition of lead containing debris.

#### **18. Conversion of Indoor Ranges**

Prior to the start of decontamination, employers must ensure that all procedures to be used comply with Federal, State, and local regulations. To ensure that all lead contamination is removed the following procedure is established.

- a. All ranges slated for conversion will be inspected and evaluated.
- b. All equipment stored in the range, if applicable, prior to the start of decontamination must be sampled, decontaminated, re-sampled and removed or turned in as lead contaminated material. See paragraph 10 above.
- c. All acoustical tiles and/or sound proofing material (if applicable) must be removed and turned in as lead contaminated material through the environmental office.
- d. The backstop, bullet trap, target retrieval system and firing line stations must be removed and turned in as lead containing material through the environmental office.
- e. Light fixtures and ventilation system grills must be removed and decontaminated.
- f. Ventilation system ducts need to be decontaminated or removed and replaced.
- g. The exhaust fans and/or the complete ventilation air-handling unit (if applicable) must be decontaminated or removed.
- h. Cover all openings of any component previously decontaminated prior to start of interior decontamination of the firing range.

#### **19. Deviation**

Deviations from this guidance will require a written exception to policy from your Regional Industrial Hygiene Office. Questions and/or comments regarding this subject should be directed to your Regional Industrial Hygiene Office or Chief, National Guard Bureau, Attn: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382.

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**APPENDIX A  
GENERAL PROCEDURES FOR COLLECTING WIPE SAMPLES**

A-1 If multiple samples are to be collected at the work site, prepare a rough sketch of the area(s) or room(s), which are to be wipe sampled.

A-2 A new set of clean, impervious gloves should be used for each sample to avoid contamination of the media by previous samples and to prevent contact with the substance.

A-3 (1) If using Ghost Wipes™, tear open the individually sealed package. Remove the moistened wipe. Unfold the wipe.

(2) If using a dry media such as MCE or Whatman™ filter, moisten the filter with distilled or deionized water prior to sampling.

A-4 Place a 10 cm by 10 cm template on the area to be wiped.

A-5 Apply uniform firm pressure while wiping the area inside the template.

A-6 To insure that all portions of the partitioned area are wiped, start at the outside edge and progress toward the center making progress toward the center making concentric squares decreasing in size.

A-7 After collecting a sample, fold the filter or wipe inward and place into a container and number it. Note the number at the sample location on the sketch.

A-8 At least one blank filter treated in the same fashion but without wiping, should be submitted to the laboratory.

**APPENDIX B  
SAMPLING STRATEGY FOR COLLECTION OF WIPE SAMPLES**

B-1 Prior to cleaning the ranges, the three samples must be collected and analyzed for total lead dust on each surface, i.e., floor, ceiling, backstop, and wall to include the plenum wall, if applicable. In addition, a total of 3 samples should be collected from areas which have been least disturbed by airflow. Established walkways should be avoided.

B-2 Samples should be staggered to different areas of the range. A grid system should be utilized. Each range surface areas should be divided evenly into 3 by 3 sections. Samples should not be collected on all one section of a wall or end of the building.

**APPENDIX C  
INTERPRETATION OF SAMPLE RESULTS (PRIOR TO CLEANING)**

C-1 200 micrograms/sq ft or LESS

If all sample results are 200-micrograms/sq ft or less, the range can be converted and/or used for any purpose.

C-2 BETWEEN 201 and 200,000 micrograms/sq ft

Range must be decontaminated. Continued with cleaning instructions listed in paragraph 9 Sample results will be used to establish a baseline.

C-3 Over 200,000 micrograms/sq ft

Your sample media may not be capable of collecting additional lead dust and results that are above 200,000 micrograms/sq ft, and should be considered suspect.

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**APPENDIX C (Continued)**

C-4 High sample results may exist due to personnel walking or moving equipment/vehicles over the range surface causing the lead dust to be "ground" into the substratum. For examples, a maintenance activity may have oversprayed paint or spilled solvents onto the surface Regional Industrial Hygiene Office for specific guidance.

**APPENDIX D**

**INTERPRETATION OF SAMPLE RESULTS (AFTER CLEANING)**

D-1 200 micrograms/sq. ft or less

If all sample results are less than 200 micrograms/sq ft, the range can be converted and/or used for any purpose after a coat of lead-free latex paint is applied.

**APPENDIX E**

**RECOMMENDED SAMPLE MEDIA AND CONTAINERS**

E-1 The following is a list of vendors, which supply the media and containers necessary to collect air and lead surface wipe samples. The information is provided to assist in obtaining the proper media and containers. Alternative vendors are available and may be utilized, if known. Contact your Regional Industrial Hygiene Office for additional assistance or clarification.

E-2 Pre-loaded 3 piece cassette with mixed cellulose ester (MCE) filter and pad, 37 millimeter (mm), pore size 0.8 microns, breathing zone (BZ) and general area (GA) air samples.

<u>Order From</u>	<u>Catalog Number</u>
a. Millipore Corp. Ashdy Road Bedford, MA 01730 617-275-9200 800-225-1380	MAWP-037-A0
b. Gelman Sciences 600 South Wagner Rd Ann Arbor, MI 48106 313-665-0651 800-521-1520	64678 (GN-4)
c. Supelco, Inc. Supelco Park Bellefonte, PA 16823 800-247-6628 800-359-3041	2-3368M

E-3 37 mm MCE Filter with pad, no cassette included, for lead surface wipe samples.

<u>Order From</u>	<u>Catalog Number</u>
a. Supelco Inc. Supelco Park Bellefonte, PA 16823	2-3381IM

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**APPENDIX E (Continued)**

800-247-6628  
800-359-3041

b. Millipore Corp.           AAWP-037-00  
Ashdy Road  
Bedford, MA 01730  
617-275-9200  
800-225-1380

c. SKC, Inc.               225-5  
334 Valley View Rd.  
Eighty Four, PA 15330  
412-941-9701  
800-752-8472

E-4 Number 40 Whatman paper, 11.0 centimeters in diameter, used for surface wipe samples.

<u>Order Form</u>	<u>Catalog Number</u>
-------------------	-----------------------

a. Cole-Parmer	L-06647-13
7425 North Oak Park Ave	
Chicago, IL 60648	
708-647-7600	
800-323-4340	

b. Thomas Scientific	09-845-D
99 High Hill Rd at I-95	
P.O. Box 99	
Swedesboro, NJ 08085-0099	
609-467-2000	
800-524-0027	

c. Fisher Scientific	09-845-D
711 Forbes Avenue	
Pittsburgh, PA 15219	
412-562-8300	

E-5. Glass container (25 milliliter) for collection and shipment of media.

<u>Order From</u>	<u>Catalog Number</u>
-------------------	-----------------------

a. Pierce Chemical Co.	13219 (screw cap)
P.O. Box 117	
Rockford, IL 61105	
815-968-0747	
800-874-3723	

b. Alltech Associates, Inc.	95321 (screw cap)
Applied Science Labs	
2051 Waukegan Rd.	
Deerfield, IL 60015	
312-948-8600	

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#### APPENDIX E (Continued)

800-255-8324

##### E-6. Ghost Wipes™.

Order From              Catalog Number

Environmental Express    SC4200  
490 Wando Park Blvd.  
Mt. Pleasant, SC 29464  
1-800-343-5319

##### E-7. Ghost Wipe™ Containers

Order From              Catalog Number

Environmental Express    SC499  
490 Wando Park Blvd.  
Mt. Pleasant, SC 29464  
1-800-343-5319

E-8. Plastic ziplock bags can be obtained through the Army logistics system. Many sizes are available. Contact your supporting logistics branch for assistance.

E-9. Distilled water can be purchased at larger grocery stores, usually by the gallon, at a cost of approximately \$1.25. Deionized water can be obtained at local and state water labs or a hospital.

#### APPENDIX F

##### EXAMPLES OF COMPUTATION OF LEAD LEVELS FROM WIPE SAMPLE RESULTS

Sample results will be returned in the form of micrograms. The results must be converted to micrograms per square foot. This can be accomplished by following the examples listed below:

$$\frac{75 \text{ ug}}{100 \text{ cm}^2} \quad \frac{929 \text{ cm}^2}{1 \text{ sq ft}}$$

$$\frac{75 \times 929}{100} = \frac{69675}{100} = 696.75 \text{ ug/sq ft}$$

ug – Microgram

Cm2 – Centimeters squared

Sq ft – Square foot

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APPENDIX G  
SURFACE WIPE SAMPLING SHEET

Industrial Hygiene Surface Wipe Sample Sheet			
Return Address		Point of Contact (name & phone #)	
		Samples Collected By	
Sampled Facility	City	State	Location (bldg/area)
Description of Operation		Date Collected	Date Shipped
Analysis Desired			
Sampling Data			
Lab Use Only	Sample #	Results	Remarks
Comments to Lab:			



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APPENDIX H  
AIR SAMPLING SHEET

<b>Industrial Hygiene Air Sample Sheet</b>								
Return Address				Point of Contact (name/phone #)				
				Samples Collected By				
Sampled Facility		City		State		Location (bldg/area)		
Description of Operation		___ Persons Exposed		___ Hrs/Day		Method of Collection		
Analysis Desired								
Sampling Data								
Sample No.								
Pump No.								<b>B</b>
Time On								<b>L</b>
Time Off								<b>A</b>
Total Time (min)								<b>N</b>
Flow Rate (LPM)								<b>K</b>
Volume (liters)								
GA/BZ								
Employee Name/ID								
Laboratory No.								
Calibration Information								
Pump No.	Calibration (LPM)			Rotameter Setting		Date		
	Pre-Use	Post-Use						
Name of Calibrator		Calibration Date		Pump Manufacturer				
Comments to Lab:								

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**APPENDIX I  
ABBREVIATIONS AND TERMS**

**Section I  
Abbreviations**

**ARNG**

Army National Guard

**BUN**

Blood urea nitrogen

**BZ**

Breathing zone

**CBC**

Complete blood count

**CFR**

Code of Federal Regulations

**cm**

Centimeter

**DHEW**

Department of Health, Education and Welfare

**EPA**

Environmental Protection Agency

**GA**

General area

**OMPF**

Official Military Personnel File

**OPF**

Official Personnel File

**OSHA**

Occupational Safety and Health Administration

**TCLP**

Toxic Characteristic Leaching Procedures

**ug/sq ft**

Micrograms per square foot

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## APPENDIX I (Continued)

### Section II

#### Terms

##### ***HEPA***

Refers to high efficiency particulate air filter systems capable of capturing up to 99.97 percent of particles 0.3 microns in size or larger.

##### ***Lead-Contaminated Range***

It is assumed that all indoor ranges, which have been fired in, are lead-contaminated.

##### ***Wipe Sample***

The terms wipe, swipe, or smear samples are use synonymously to describe the techniques utilized for assessing lead surface contamination.