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*NATIONAL GUARD REGULATION (AR) 385-15

Safety

POLICY, RESPONSIBILITIES, AND PROCEDURES FOR INSPECTION/EVALUATION AND USE OF ARNG INDOOR FIRING RANGES

Summary. This regulation prescribes policy, responsibilities, and procedures for inspection/evaluation and use of Army National Guard (ARNG) indoor firing ranges.

Applicability. This regulation applies to the ARNG and any individual/organization using ARNG indoor firing ranges.

Impact on Unit Manning System. This regulation does not contain information that affects the Unit Manning System.

Supplementation. Supplementation of this regulation is prohibited without prior approval from CNGB (NGB-AVN-S).

Interim changes. Interim changes to this regulation are not official unless they are authenticated by the Executive, NGB. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Internal control systems. This regulation is not subject to the requirements of AR 11-2. It does not contain internal control provisions.

Suggested improvements. The proponent of this regulation is the National Guard Bureau. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to NGB-AVN-S, Bldg E6810, APG, MD 21010-5420.

Contents (Listed by paragraph number)

*This regulation supersedes NGR 385-15, 3 January 1984.

Chapter 1
General Provisions

1-1. Purpose
This regulation prescribes NGB policy, responsibilities, and procedures for inspection/evaluation and use of ARNG indoor firing ranges.

1-2. References
Required and related publications are listed in appendix A.

1-3. Policy
a. Conduct detailed initial, bi-ennial, and when required, special inspections of all indoor firing ranges as prescribed to ensure compliance with current safety and health standards.
b. Ensure that no ARNG or civilian personnel use ARNG indoor firing ranges that may endanger their safety or health.
c. No unsafe indoor firing ranges will be used by any personnel.
d. The use of indoor firing ranges for purposes other than firing will be prohibited.

Chapter 2
Responsibilities

2-1. Chief, National Guard Bureau (CNGB)
The CNGB is responsible for the overall supervision of the ARNG indoor firing range safety and occupational health program and for coordinating with other HQDA Staff agencies and the State Adjutants General on matters pertaining to the prevention of injury and illnesses attributed to indoor firing ranges. This responsibility is vested in the Director, Army National Guard.

2-2. Chief, Army Aviation Division (NGB-AVN)
NGB-AVN will supervise all matters pertaining to the evaluation and safe use of indoor firing ranges.

2-3. Chief, ARNG Safety Branch (NGB-AVN-S)
NGB-AVN-S will--

a. Recommend and implement an effective safety and occupational health program for use in indoor firing ranges.

b. Identify and justify funding needs and personnel requirements to ensure the safety and health of all personnel using indoor firing ranges.

c. Provide safety and occupational health design review for all new and remodeled ranges.

2-4. Chief, ARNG Organization and Training Branch (NGB-ARO)
NGB-ARO will provide weapon training strategies consistent with AR 350-41 and the Standard and Training Commission.

2-5. Chief, ARNG Installations Division (NGB-ARI)
NGB-ARI will--

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 the approved standards.

2-6. The State Adjutants General
The State Adjutants General will--

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are safe and that unsafe ranges 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.

2-7. Commanders of facilities
Commanders of facilities that include indoor firing ranges will ensure that--

a. Indoor firing ranges are secured when not in use.

b. A custodian is appointed for all indoor firing ranges under his area of command.

c. The custodians of the indoor firing ranges maintain the proper records and follow proper procedures.

d. 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.

e. Standing Operating Procedures (SOP) for each range are established, enforced, and approved by the State Safety and Occupational Health Office.

f. All individuals using indoor firing ranges under their area of command have been given a copy of the rules governing the use of the range and have signed an agreement in substantially the following form:

> *"I acknowledge that I have been given a copy of the rules governing the use of the indoor firing range. I have read the rules and agree to follow them. I understand that my use of the range is conditioned on my strict compliance with the rules. (Signature)"*

2-8. Custodians of indoor firing ranges
Custodians will--

a. Ensure that individuals of an organization using the indoor firing range, understands the range safety regulations, and SOPs; and on limited ranges, records the names of the firers, dates of firing, and amount of time spent in the range by each individual.

b. Ensure that the cleaning procedures prescribed in this regulation are performed. (See app B and C.) Dates, list of personnel and time on the range will be documented.

c. Maintain all user time records that pertain to limited use (for lead) indoor firing ranges for 40 years from the date of use, IAW 29 CFR 1910.1025.

2-9. State Safety and Occupational Health Manager
The State Safety and Occupational Health Manager will--

a. Perform or coordinate all inspections and sampling for indoor firing ranges.

b. Determine the range classification by using the criteria in this regulation.

c. Approve all indoor firing range SOP.

d. Perform design review for safety aspects of all ranges to be constructed or remodeled.

e. Maintain copies of all range inspections.

f. Make recommendations to the Adjutants General regarding the use of unsafe ranges.

2-10. Occupational Health Nurse
The Occupational Health Nurse will perform or schedule medical surveillance examinations for those personnel firing in limited ranges for more than the prescribed times listed in appendix D.

2-11. Unit Commanders
Unit Commanders will--

a. Enforce all range safety procedures.

b. Maintain a record of all personnel using limited firing ranges as to time in/out of range, as outlined in paragraph 2-8a.

c. Provide the Occupational Health Nurse with a list of those personnel firing in limited ranges for more than the prescribed times.

d. Identify and provide the State Safety and Occupational Health Manager with a list of range officers and custodians and ensure that they participate in the Medical Surveillance Program.

Chapter 3
Procedures, Classification, and Use

3-1. General
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 firer. Older ranges may not meet the current standards deemed necessary to protect the safety and health of the firers. Under controlled conditions, many older ranges will not expose firers to hazardous conditions.

3-2. Classification of ranges
Based on inspection data using the initial range inspection checklist (app E) ranges will be classified safe, limited or unsafe.

a. Safe ranges. Permits authorized firing for military and civilian use.

(1) Building envelope.

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

(b) Forward edges in a louvre or venetian blind type bullet stop must maintain a knife edge to prevent ricochets.

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

(d) In older ranges side wall windows in front of the firing line must be removed and the openings closed flush to the walls with materials compatible with the adjacent walls. New ranges will not be built with windows forward of the firing line.

(e) Ranges constructed with wooden floors and/or ceilings will be constructed to prevent bullet penetration through floors or ceilings.

(2) Ventilation (app F).

(a) The average air flow at the firing line will be at least 50 linear feet per minute (fpm).

(b) Air will be exhausted at or behind the bullet stop.

(c) Make up air will be introduced into the range behind the firers. When air is introduced through vents it will not exceed 600 fpm velocity.

(d) The ventilation system will be so constructed that exhaust air can not enter into any air supply system.

(e) The exhaust will exceed the make up air to form a negative air pressure in the range in relation to adjoining areas.

(f) No air will be recirculated in a firing range.

(g) New ranges will be designed using the latest standards provided by NGB-ARI.

(3) Range lighting.

(a) Lighting should be uniform, nonglaring, shadowless illumination at 75 foot candles on targets and 30 foot candles on all other areas.

(b) All lighting must be protected by baffles and placed so that the firer has an unobstructed view down range and the baffles do not disrupt uniform air flow.

(4) Bullet stops.

(a) Bullet stops must be of commercial design and manufacture so as to safely handle cartridges up to .45 ACP or 9mm parabellum (NATO requirement).

(b) Armor and steel plating in a safe range must meet these specifications:

Dimensions of Armor Backstops, Side Plates and Baffles for Protecting Lights, etc.

Inclined Plate and Sand Traps

Caliber (up to)	Thickness of Backstops (minimum)	Thickness of Side Plates (minimum)	Thickness of Light, etc. Baffles**
.22 S/LR	1/4" @ 45 degrees	3/16"*	3/16" @ 30 degrees
.38 wad-cutter only	3/8" @ 45 degrees	1/4"	1/4" @ 30 degrees
.45 including hard ball	1/2" @ 45 degrees	3/8"	3/8" @ 30 degrees
9mm	1/2" @ 45 degrees	3/8"	3/8" @ 30 degrees

*(1/8 inch if firing is limited to .22 S/LR)

** (Using older materials already existing in ranges, new material must be 10 gauge (9/64") hot rolled steel or thicker @ 30 degrees.)

For Escalator/Venetian Blind Bullet Traps
(All models are capable of handling all handguns, to include .22 cal M16 adaptor)

Detroit Armor Model # or Equivalent	Thickness of Backstop (minimum)	Thickness of Ceiling Slope Plate	Thickness of Side Plates	Thickness of Light Baffles
2200-5* (escalator)	5/16" not greater than 40 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel
4000-6 (escalator)	3/8" @ 20 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel
4000-8 (escalator)	1/2" @ 20 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel
2400S (venetian blind)	1/4" not greater than 35 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel

*(Normally used in ranges using handguns only)

(5) Target carriers. Target carriers and holders must be constructed in such a manner as to minimize flat surfaces exposed to the firing line.

(6) Lead and Carbon Monoxide Levels (app G).

(a) Lead levels will not exceed 0.05 milligrams per cubic meter (mg/cu meter) of air.

(b) Carbon monoxide levels will not exceed 35 parts per million (ppm).

b. Limited ranges. Permits only limited use under controlled conditions. The personnel exposure limits for intermittent lead exposure will be used for limited operation of this range (app D). See note at the end of the checklist (app E).

(1) Building envelope. The building must meet the same structural requirements as in safe ranges.

(2) Ventilation (app F).

(a) The range must have air flow from behind the firer toward the bullet trap.

(b) Air from the range can not be allowed to enter adjacent rooms or buildings.

(c) Downrange velocity is 35 feet per minute (fpm) or greater, but less than 50 fpm.

(3) Range lighting.

(a) Targets and personnel in the range must be clearly visible.

(b) Light fixtures must be protected by baffles.

(4) Bullet stops.

(a) Bullet stop plates may be bowed and pitted but must not be punctured.

(b) The leading edge of venetian blind type bullet stop plates is maintained in less than a knife edge condition.

(c) Bullet stop may be of the inclined plate/sand trap design.

(d) The thickness of inclined plate/sand trap type bullet stop must be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range.

(e) All plate/sand trap type bullet stops must be designed to prevent backspatter.

(f) Sand pits in plate/sand trap type backstops must extend to a point directly below the leading edge of the sloped plate.

(5) Target Carrier. Not operable or no target carrier system.

(6) Lead and Carbon monoxide levels (app G).

(a) Ranges with lead levels below .4 mg/cu meter of air and above .05 mg/cu meter of air will be classified as limited use. Personnel exposures will be controlled by limiting the firers to the times described in appendix D.

(b) Ranges must have carbon monoxide levels below 35 ppm.

c. Unsafe ranges. Are not authorized for use under any conditions.

(1) Range building envelopes not meeting the requirements of a safe range will be considered unsafe.

(2) Ventilation (app F).

(a) Ranges with no mechanical ventilation or with the exhaust ventilation located behind the firing line will be considered unsafe.

(b) Ranges are unsafe if air from the ranges enters adjacent rooms or buildings.

(c) Downrange velocity less than 35 fpm will be considered unsafe.

(3) Range lighting. Ranges with lighting levels below 15 foot candles through out the range will be considered unsafe.

(4) Bullet stops. Ranges with bullet stops that are punctured or severely pitted, or have plates welded on that are not flush or any uneven surface are unsafe.

(5) Lead and Carbon Monoxide Levels (app G). Ranges with lead levels above .4 mg/cu meter of air and carbon monoxide levels above 35 ppm are unsafe.

3-3. Range use (personnel)

a. Safe ranges. These ranges permit authorized firing.

b. Limited ranges. These ranges permit only limited use under controlled conditions by individuals who abide by the regulations for that range, using the Personnel Exposure Limits as set forth in appendix D.

c. Unsafe ranges. These ranges are not authorized for use under any conditions.

3-4. Range use (activities)

No indoor firing range will be considered for any additional use other than firing, to include storage. Those ranges considered unsafe may be used for other purposes only after cleaning using the procedures in appendix B and C.

3-5. Personal protective equipment

a. All personnel in an indoor firing range during firing shall wear eye protection that meets ANSI Z87.1 to guard against damage from flying projectiles.

b. All personnel in a firing range will wear approved hearing protection.

c. Respiratory protection.

(1) During clean up procedures where lead levels are less than .5 mg/cu meter of air, an air purifying respirator with HEPA filters must be used.

(2) Cleaning ranges where lead levels exceed .5 mg/cu meter requires the use of an air supplied respirator. These conditions are likely to be encountered during the conversion of ranges with little or no powered ventilation and during the cleaning of sand traps.

(3) Ventilation will be on during clean up of all ranges.

Chapter 4
Inspection Procedures

4-1. Initial inspections

a. An initial inspection of all indoor firing ranges will be done within 1 year of the publication of this regulation using the checklist in appendix E. All new indoor ranges will be inspected within 1 year of the completion of

construction, ideally before acceptance of the facility.

b. Findings from the initial inspection checklist will determine range status according to paragraph 3-2.

4-2. Detailed inspections
A detailed inspection will be accomplished for all ranges not considered safe. This inspection will identify all aspects of the range that must be corrected as well as operational deficiencies. The check list in appendix H will be used for this purpose.

4-3. Bi-ennial inspections
A detailed inspection of every operating range will be made every 2 years to ensure safety standards and procedures are maintained in the operation of the range. These inspections will be done/coordinated by State Safety and Occupational Health personnel. The check list in appendix H will be used for this purpose.

4-4. Special inspections
Special inspections will be made by experienced Safety, Occupational Health Nurses and/or Industrial Hygienists when a range condition has worsened.

4-5. Completed reports
Completed inspection reports will be provided to the state Adjutants General for action or information as appropriate. A copy of the inspection report will also be provided to the range custodian.

4-6. Records
The State Safety and Occupational Health Office will maintain a record of each inspection. Subsequent inspections will be made as a follow-up check against previous inspection reports. This is to ensure required corrective action (s) noted have been accomplished and that there are no adverse changes to the building envelope, environmental conditions, and/or safe operating procedures.

Chapter 5
Control of Potential Lead Intoxication

5-1. OSHA lead standard

a. The OSHA lead standard (29 CFR 1910.1025) must be complied with to include medical surveillance requirements. Intermittent personnel exposures to lead at indoor firing ranges will be controlled according to the criteria provided in the table of lead exposure limits (app D).

b. All ranges will be sampled to determine airborne lead levels, during normal firing operations.

c. All ranges will be resampled bi-annually to ensure that the airborne lead level has not changed.

5-2. Maximum exposure hours
Health Services Command has developed alternative criteria for controlling intermittent lead exposure by establishing maximum allowable exposure hours based on the airborne lead concentration and the number of days firing per year (app D).

5-3. Extent of use

a. The extent of use for any indoor firing range must be based on permissible exposure of all using personnel to concentrations of airborne lead.

b. The table of lead exposure limits (app D) were developed to control intermittent lead exposure and establish maximum allowable hours of exposure based on the airborne lead concentration and the number of days firing per year. Use these criteria as an interim control measure only. Maximum effort must be made to reduce the airborne lead levels to 0.03 mg/cu meters or less.

c. ARNG Industrial Hygiene personnel are responsible for testing of the ranges to determine airborne lead concentrations.

d. Lead exposures of personnel will be determined by using a sampling strategy which employs general-area and breathing zone samples. Appendix G contains guidance for air sampling. Once an airborne lead concentration is determined, the table (app D) is to be used to set maximum allowable hours of exposure for each category of range user. Other potential lead exposure, including off duty firing, may contribute to an individuals overall exposure and should be considered in estab lishing maximum allowable exposure time. The maximum allowable exposure hours should be halved for intermittent range users under 17 years of age.

5-4. Blood testing. Medical surveillance (that is, blood lead testing) is not required for intermittent users if the maximum allowable exposure hours shown in appendix D is not exceeded.

Chapter 6
Repair - Remodel - Rehabilitation

6-1. Funding requests
Military construction funds are not available to support a rehabilitation program bringing all structural features and installed equipment in existing ranges up to current standards. However, according to established NGB policy, requests for funding to upgrade existing ranges may be submitted for consideration on an individual case basis.

6-2. Minor repairs
Procedures outlined in NGR 415-5 or NGR (AR) 420-10 as appropriate, should be followed when it is anticipated that estimated propos al costs would be significantly less than $200,000. The order or priority to rehabilitate/restore existing ranges is to reopen "unsafe" ranges and then to correct deficiencies in "limited" use ranges.

6-3. Cost sharing
Cost sharing regarding authorized scope of work for minor construction projects for rehabilitation/ restoration of indoor ranges will be 75 percent federal/25 percent state.

6-4. Repair requests
In order to successfully compete with all other requirements for the limited amount of construction funding available to the ARNG, any request will have to discuss in-depth the severity of the requirement. Also, provide a clear statement of the impact on training and readiness if the deficiency is not corrected, and set forth what other alternatives have been considered and why they are not feasible. Cost of range equipment not eligible for construction fund support will not be included in the proposal.

APPENDIX A
References

Section I
Required Publications

NGR 385-10
Army National Guard Safety and Occupational Health Program. (Cited in para H-1b.)

TB MED 502
Occupational Safety and Health Respiratory Protection Program. (Cited in paras B-2d, H-3o(1), and C-2c.)

29 CFR 1910
Section 1025 Lead (1910.1025). (Cited in paras 2-9c and 6-1a.)

ANSI Z87.1
Occupational and Educational Eye and Face Protection. (Cited in para 5-1a.)

Section II
Related Publications

A related publication is merely a source of additional information. The user does not have to read it to understand this regulation.

AR 385-30
Safety Color Code Markings and Signs.

AR 350-41
Army Forces Training

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

NGR 415-5
Military Construction Army National Guard (MCARNG) Project Development.

NGR (AR) 420-10
Operations/Maintenance and Minor Construction, Army National Guard

FM 25-7
Training Ranges.

ACGIH 19th Ed
Industrial Ventilation, A Manual for Recommended Practices.

DHEW NIOSH 76-130
Lead Exposure and Design Considerations for Indoor Firing Ranges.

APPENDIX B
CLEAN-UP PROCEDURES - HOUSEKEEPING

B-1. General

a. Care must be taken to minimize lead exposures for personnel using indoor firing ranges. Range custodians must perform regular housekeeping operations to minimize lead exposures. All ranges must be cleaned according to the following procedures.

b. The State Safety and Occupational Health Manager, Occupational Health Nurse, or Environmental Specialist must approve specific range cleaning SOPs.

B-2. Equipment and cleaning methods

a. Wet cleaning will require dual containers of water. One container is for wetting the applicator (mop, rags, sponges. etc.) and the other is for rinsing the applicator after the dust has been wiped from a surface. The rinsing container must be emptied often into a sealable container. Waste water is a hazardous waste and must be appropriately disposed of.

b. Wet cleaning by high pressure water spraying is not authorized.

c. Dry cleaning will be accomplished using specialized HEPA filter equipped vacuum cleaners specifically manufactured for haz ardous waste cleanup. These machines are the same type as used in ARNG maintenance shops for asbestos control.

d. Workers must be protected by proper personal protective equipment while performing the work. TB MED 502 specifies the proper respirator and the procedures required for their use. Pro tective clothing will be removed at the work site and workers will shower and change into clean clothes before departing. Workers will wash their hands thoroughly before eating, drinking, or smoking.

B-3. Preparations

a. The range space will be isolated from the rest of the

building by closing and locking all doors except one which is designated as the workers entrance. That entrance will be kept closed during all clean up operations.

b. The range ventilation system will be operated during clean ing procedures.

c. Dust, fume, and mist respirators approved by NIOSH for lead exposure must be used during cleanup operations.

d. Wet method or vacuum (supplied with HEPA filters), not dry sweeping, must be used during cleanup.

B-4. Procedures

a. After each daily firing session—

(1) The firing line must be damp mopped using the 2 container system, or dry vacuumed with a HEPA vac to remove lead contamina tion.

(2) No protective clothing is required.

b. Monthly. Clean the bullet trap of lead particles and bullets. (Workers must wear proper personal protective equipment.)

c. As required (dependent on the amount of use of the range)—

(1) Clean ceilings by vacuuming or wiping with a damp rag or sponge.

(2) Clean exposed steel beams, bar joists, pipes, etc., by wiping with a damp rag or sponge.

(3) Walls will be cleaned by vacuuming or wiping with a damp rag or sponge.

(4) Floors will be cleaned after all other surfaces have been cleaned. Either wet mopping or vacuuming will be employed to clean floors.

(5) All used rags, sponges etc., must be disposed of as a hazardous waste. This applies any time the indoor range is cleaned.

(6) Workers must wear pro-proper personal protective equipment.

APPENDIX C
CLEAN-UP PROCEDURES - GENERAL

C-1. General

a. Before any room that has been previously used for an indoor firing range can be converted to another functional use, or before any remodeling work can be started in that room, it must be cleaned according to the following proced ures.

b. The State Safety and occupational Health Manager, Occupational Health Nurse, or Environmental Specialist must be contacted before any plans for range conversion.

C-2. Equipment and cleaning methods

a. Wet cleaning will require dual containers of water. One container is for wetting the applicator (mop, rags, sponges, etc.) and the other is for rinsing the applicator after the dust has been wiped from a surface. The rinsing container must be emptied often into a sealable container.

b. Dry cleaning will be accomplished using specialized HEPA filter equipped vacuum cleaners specifically manufactured for hazardous waste cleanup. These machines are the same type as used in ARNG maintenance shops for asbestos control.

c. Workers must be protected while performing the work by wear ing proper personal protective equipment. TB MED 502 specifies the proper respirator and the procedures required for their use. Protective clothing will be removed at the work site and workers will change into clean clothes before departing. Workers will wash their hands and face thoroughly before eating, drinking or smoking.

C-3. Preparations

The range space will be isolated from the rest of the building by

closing, and locking, all doors except one which is designated as the workers entrance, and that entrance will be kept closed during all clean up operations, (Initial Cleanup Only).

C-4. Procedures

a. Operate range exhaust system during all cleaning operations.

b. Remove all combustible materials such as wood, composition board, paper, etc.

c. Thoroughly wet the sand in the bullet trap pit and shovel in to 55 gal drums. Seal these containers and remove from the range. Disposal of hazardous waste will be accomplished according to USPFO procedures.

d. Once the sand has been removed, the steel plate, baffles, side plates, etc., can be taken down. Each piece of steel must be cleaned of dust before removal from the site.

e. Clean ceilings by vacuuming with a HEPA vacuum or wiping with a damp rag or sponge.

f. Clean exposed steel beams, bar joists, pipes, etc., by wiping with a damp rag, sponge or HEPA vacuum.

g.. Walls will be cleaned by vacuuming with a HEPA vacuum or wiping with a damp rag or sponge.

h.. Floors shall be cleaned after all other surfaces have been cleaned. Either wet mopping or vacuuming with a HEPA vacuum will be used to clean floors.

APPENDIX D

TABLE OF LEAD EXPOSURE LIMITS

Personnel Exposure Limits for Intermittent Atmospheric Lead Contamination

Concentrations mg/cu meter	Maximum Hours of Allowable Exposure Per Day Column "A" GUARDSMEN exposed Less than 30 days per year	Column "B" GUARDSMEN on Marksmanship Teams or GUARDSMEN exposed more than 30 days per year ALL CIVILIAN PERSONNEL CIVILIAN Marksman/POLICE etc.
0.000—0.030	8	8 (4)
0.031—0.040	8	6 (3)
0.041—0.050	8	4—1/2 (2)
	LIMITED USE RANGES CATEGORY "A"	LIMITED USE RANGES CATEGORY "B"
0.051—0.060	6	4 (2)
0.061—0.080	5	3 (1)
0.081—0.100	4	2 1/4 (1)
0.101—0.150	2—1/2	1 1/2 (0)
0.151—0.200	2	1 (0)
0.201—0.300	1—1/4	3/4 (0)
0.301—0.400	1	1/2 (0)

Persons under 18 years of age are prohibited from entering any range area with a lead concentration greater than 0.100. To do so may result in permanent debilitating effects.

Persons under 18 years of age can enter range areas only for the time period specified in parenthesis ( ). To exceed the specified time may result in permanent debilitating effects.

Maximum allowable exposure times are for any personnel in the range area regardless of their function (control personnel, coaches, spectators, etc.).

Times in column "A" can only be used by guardsmen who will be involved in any activity (as a guardsmen or in his civilian profession) that exposes him/her to airborne lead contamination less than 30 days per year.

Times in column "B" must be used by guardsmen on marksmanship teams, personnel exposed more than 30 days per year and civilian marksman (clubs, ROTC, competitions, police units etc.). The State Occupational Health Nurse should recomend maximum exposure times for guardsmen whose civilian profession exposes him/her to air—borne lead contamination.

APPENDIX E

INITIAL RANGE INSPECTION CHECKLIST

LOCATION OF RANGE_____ DATE _____

RANGE CUSTODIAN_____ TELEPHONE # _____

RANGE CLASSIFICATION: (circle one)

SAFE

UNSAFE

LIMITED

Inspector's Signature_____

Grade and Duty Station_____

_____

INITIAL RANGE INSPECTION CHECKLIST

E-1. General

This checklist provides a method of evaluating indoor firing ranges to make an initial determination of ranges that can be used for training in the near future with a minimal expenditure of time and money. Ranges that will require a reasonable expenditure of time and funds for upgrading to meet required standards, and ranges that may require extensive construction funding and time to up grade to acceptable standards. Ranges in the last category may be considered for conversion from an indoor range to other uses. This checklist in no way constitutes authority to open closed ranges. It does provide the methodology to rank ranges according to their probability of being returned to an operational status.

	SAFE	LIMITED	UNSAFE
E-2. Initial checklist			
a. The building envelope appears to be structurally suitable. (Ceiling height sufficient. No exposed pipes, beams, etc.) If yes, check **SAFE**. If not, check **UNSAFE**.	____	_____	_____
b. If range has—			
(1) An operational ventilation system designed and installed since 1982, with—			
(a) Make-up air inlets provided behind the firing line.			
(b) Exhaust outlet located behind or above the bullet stop.			
(c) Rated capacity of exhaust fan exceeding rated capacity of supply fan.			
(d) Supply and exhaust fans that are interlocked to prevent operation of one without the other.			
If yes, check **SAFE**.	____	_____	_____
(2) An operational ventilation system designed before 1982 with make-up air provided behind firing line but—			
(a) Exhaust outlet located less than 15 feet from firing line, and/or			
(b) Supply fan not interlocked with exhaust fan.			
Then check **LIMITED**.	____	_____	_____
(3) No operational ventilation system, check **UNSAFE**.	____	_____	_____
(4) If exhaust is ducted to other parts of the building, check **UNSAFE**.	____	_____	_____

IF RANGE IS **SAFE** OR **LIMITED** CONTINUE WITH CHECKLIST.
IF RANGE HAS ONE CATEGORY CHECKED **UNSAFE** IT MUST BE CLOSED UNTIL REPAIR IS MADE.

	SAFE	LIMITED	UNSAFE
c. A bullet stop is permanently installed in the range area. If yes, check **SAFE**. If not, check **UNSAFE**.	____	_____	_____
d. The installed bullet stop is entirely manufactured of steel. If yes, check **SAFE**. If not, check **UNSAFE**. If inclined plate/sand trap type, check **LIMITED**.	____	_____	_____
e. Bullet stop is in good condition, not bowed, pitted or punctured. Good condition check **SAFE**, bowed/pitted check LIMITED, punctured or an uneven surface check **UNSAFE**.	____	_____	_____
f. If range has venetian blind type bullet stop are forward edges of steel plates maintained to a knife edge to prevent ricochets. If yes, check **SAFE**. If not, check **LIMITED**.	____	_____	_____
g. If range has an operational ventilation system IAW item 2a and 2b above, measure the down range air velocity using the procedures in the appendix F titled **VENTILATION MEASUREMENT PROCEDURES**. If the down range air velocity is: *(1)* 50 fpm or greater, check **SAFE**. *(2)* Less than 50 fpm but 35 fpm or greater, check **LIMITED**. *(3)* Less than 35 fpm, check **UNSAFE**.	____	_____	_____
h. Range has a target retrieval system. If yes, check **SAFE**. If no, check **LIMITED**.	____	_____	_____
i. Windows or door openings in front of firing line are locked, barred, and protected. If yes, check **LIMITED**. If no, check **UNSAFE**.	____	_____	_____

When this evaluation is completed the range will be classified according to the lowest single category checked (**SAFE**, **LIMITED** or **UNSAFE**).

NOTE: If three or more limited factors (items d,e,f,h,or i above) are present the range will be classified as **LIMITED**. If one or two limited factors are present the range may be classified as **SAFE** by the State Safety and Occupational Health Manager. Factors that may be considered are bullet stops, target carriers, and only if state law requires them, doors down range. Then they must be baffled and opened only from the inside (no outside door knob or lock) in case of emergency. Ventilation requirements are not negotiable issues and must be followed.

APPENDIX F
Ventilation Measurement Procedures

F-1. General

a. Contaminants produced as products of firing (i.e., lead, carbon monoxide, and aldehydes) must be removed from the range by an adequate range ventilation system. The maximum allowable concentration of lead acceptable for an 8-hour daily exposure (time weighted average) is 0.05 mg/cu meter. A ventilation system designed to provide this protection is sufficient to remove other products of firing.

b. Optimum ventilation systems should include make-up air introduced behind the firing line and exhausted at the target line or bullet trap in such a manner that air turbulence is minimized.

c. Individuals who have been trained in performing ventilation measurements are qualified to perform ventilation surveys of indoor range facilities.

F-2. Ventilation measurement

a. Downrange air velocity can be measured by using a 30 second smoke candle and a stop watch. Ignite the smoke candle behind the firing line. Time the smoke from the moment it crosses the firing line until the smoke reaches the bullet stop. Calculate the air velocity by dividing the range length (distance smoke traveled while timed) by the time (distance in feet/time in minutes = velocity in feet per minute). A minimum of 35 fpm is required, which is equal to 35 cubic feet per minute per square foot of cross sectional area. Durthe smoke evaluation, observe the range for any "dead spots" or turbulent air motion that may increase exposure at or behind the firing line. Air supply entry and exhaust points should be depicted on a diagram of the range. Air flow patterns indicating dead spots and turbulence should also be included on the range diagram.

b. Measuring air velocities at the firing line should be accomplished by using an air velocity meter that has been calibrated to a traceable primary standard. This equipment when operated according to manufacturers instructions should provide a direct velocity reading. Sources for this equipment can be found in TB MED 503.

c. Minimum velocity at the firing line is 50 fpm. When this velocity is provided 100 percent of the air should be exhausted downrange at the bullet trap.

d. Make-up and exhaust air velocities in ducts can be measured using a calibrated air velocity meter. The selection of the measuring point greatly affects the reliability of the results. A point should be selected that is at least 3 duct diameters removed from obstructions which may disrupt the air flow. Representative velocity measurements should be taken at that point. For round ducts 6" and smaller, at least 6 traverse point measurements should be made. For round ducts larger than 6" diameter, at least 18 traverse point measurements should be made. For very large ducts, 20 or more traverse point measurements will increase the precision of the air flow measurements. For square or rectangular ducts, no fewer than 16 measurements should be made in a grid pattern throughout the cross section at the point selected. (To make these measurements, it may be necessary to drill holes in the duct or remove grills from duct openings. Drill holes should be covered with duct tape.) The number of measurements taken should be averaged to determine the average velocity of the system evaluated. The cross sectional area where the velocity measurements were taken should be calculated and expressed in square feet (sq ft). Multiply the air velocity in the duct times

the cross sectional area. [(Velocity in fpm) X (area in sq ft) = (volume of air passing through the duct in cubic feet (cu ft)/ minute)]. The product is the volume of air passing through the duct each minute. This number in cu ft/ min should be close to the specifications of the fan moving the air. Deviations of more than 20 percent may indicate a need for maintenance of the fan or replacement with a fan capable of overcoming the pressure losses of the ventilation system. The exhaust air should exceed the make-up air, to provide a slightly negative pressure in relation to adjacent areas.

e. Make-up supply grills or diffusers should have a maximum velocity of 600 fpm and be sized for uniform distribution.

F-3. Other factors

a. The make-up and exhaust air systems must be interlocked. Variable speed fans should not be used.

b. Recirculation of air is not allowed.

c. State or local environmental regulations may require high efficiency particulate filters in the range exhaust system. The environmental POC for your State can assist in this matter.

APPENDIX G
Air Sampling Procedures

G-1. General

Only properly trained personnel will perform air sampling of indoor firing ranges.

G-2. Sample collection

Collect all lead samples on cellulose ester (CE) filters with a pore size of 0.8 microns 37 mm in diameter, mounted in a three piece cassette with a closed face. A personal air sampling pump with tubing and other accessories is necessary to pull air through the cellulose filters. The sampling rate should be one to four liters per minute (lpm) for an optimum volume of 500 liters, (minimum-200 liters and maximum-1200 liters).

G-3. Where to sample

Sample on the firing line, behind the firing line, and in adjacent areas with emphasis placed on occupied areas (i.e. range offices, supply rooms, kitchens, or hallways). Area samples approximating breathing zone samples should be taken in every firing position and off line. Breathing zone samples should be taken on permanently assigned range personnel. Exposures to other personnel who use the range intermittently may be evaluated using data obtained from the general area samples. At least two air samples for lead will be taken in areas adjacent to the range during each monitoring period. These samples will determine if lead contamination is confined to the range.

G-4. Critical factors

The following factors are critical to proper range evaluation—

a. Sample during periods of maximum use.

b. All firing lanes must be occupied by firers.

c. If firing is over an extended period of time, allow time for possible buildup of airborne concentrations before sampling.

d. Consecutive samples of at least 200 liters should be taken to cover the entire time span.

e. Sample during the use of larger caliber ammunition if ammunition other than .22 rimfire ammunition is authorized.

f. Sample only actual weapons qualification or other routine firing. Do not attempt to simulate unit firing procedures using other personnel.

G-5. Equipment
All pumps must be calibrated immediately before and after use to a method traceable to a primary standard (e.g., bubble burette).

G-6. Sampling results
All sampling data, laboratory results, calibration information, etc., will be entered on AEHA Form 9-R (or a locally produced form that contains the same information). In addition, the location where samples were taken will be indicated on a diagram of the range and kept on file in the State Safety and Occupational Health Office.

APPENDIX H

DETAILED RANGE INSPECTION CHECKLIST

LOCATION OF RANGE_____ DATE_____

RANGE CUSTODIAN_____ TELEPHONE #_____

RANGE CLASSIFICATION: (circle one)

SAFE

UNSAFE

LIMITED WITH THE FOLLOWING RESTRICTIONS:

Inspector's Signature_____

Grade and Duty Station_____

Detailed Range Inspection Checklist

H-1. Environmental and health considerations

	YES	NO	N/A
a. The installed ventilation system has been determined to be acceptable both from a uniformity of flow and volume of flow standpoint. (Flow should be uniform from wall to wall and floor to ceiling.) Volume of flow should be adequate to maintain airborne concentrations of lead and other contaminates within acceptable limits. Determine with an Air Sample Sur-Survey. If ventilation has been determined to be inadequate as discussed above, range is closed or exposure controlled per Table (app D), or other corrective action taken. (Critical – explain what action is being taken to correct the situation.)	___	___	___
b. Personnel assigned or detailed to work in the firing range on a permanent basis (ie., range custodians, operating OIC/NCOIC etc.) are enrolled in a Medical Surveillance Program and in a Hearing Conservation Program, IAW NGR 385-10, chapter 5.	___	___	___
c. All personnel permitted to be in the range during weapons firing are required to wear appropriate hearing protection and eye protection devices. This includes firers, coaches, spectators (where permitted) and assigned/detailed operating personnel.	___	___	___

H-2. Building envelope (structural)

a. Width of firing lanes is adequate to fire rifle and/or pistol. (Non–critical but many present some operational problems particularly when firing in the prone position.)	___	___	___
b. Escalator bullet stop is set at an angle of 40 degrees from the horizontal. (Critical only if it appears that lead particles backsplatter to the firing line.)	___	___	___
c. Forward leading edges in a louvre or venetian blind type of bullet stop are maintained to a knife–edge to prevent ricochets. (Critical where leading edges are blunted and cause ricochets or backsplatter.)	___	___	___
d. Pipes, conduit, lights, lighting fixtures, and other projecting surfaces in front of the firing line are baffled. (Critical to protect items mentioned above and reduce maintenance costs.)	___	___	___

	YES	NO	N/A
e. Side wall windows or doors in front of the firing line are removed or bricked in and their openings closed flush using materials compatible with the adjacent wall, or baffled or otherwise protected. (To prevent stray bullets from leaving the range.)			
f. Single inclined plate bullet stop with sand type trap (plate/sand trap) is set at an angle of 45 degrees (+ or – 5 degrees) from the vertical and inclined forward towards the firing line. (Critical to eliminate backsplatter.)	___	___	___
g. Thickness of steel plate/sand trap type bullet stop is adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range.	___	___	___
	___	___	___

DIMENSIONS OF ARMOR BACKSTOPS, SIDE PLATES AND BAFFLES FOR PROTECTING LIGHTS, ETC.

Inclined Plate and Sand Traps

Caliber (up to)	Thickness of Backstops (minimum)	Thickness of Side Plates (minimum)	Thickness of Light, etc. Baffles**
.22 S/LR	1/4" @ 45 degrees	3/16"*	3/16" @ 30 degrees
.38 wad–cutter only	3/8" @ 45 degrees	1/4"	1/4" @ 30 degrees
.45 including hard ball	1/2" @ 45 degrees	3/8"	3/8" @ 30 degrees
9mm	1/2" @ 45 degrees	3/8"	3/8" @ 30 degrees

*(1/8 inch if firing is limited to .22 S/LR)

** (Using older materials already existing in ranges, new material must be 10 gauge (9/64") hot rolled steel or thicker @ 30 degrees.)

For Escalator/Venetian Blind Bullet Traps

(All models are capable of handling all handguns, to include .22 cal M16 adaptor)

Detroit Armor Model # or Equivalent	Thickness of Backstop (minimum)	Thickness of Ceiling Slope Plate	Thickness of Side Plates	Thickness of Light Baffles
2200-5* (escalator)	5/16" not greater than 40 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel
4000-6 (escalator)	3/8" @ 20 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel
4000-8 (escalator)	1/2" @ 20 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel
2400S (venetian blind)	1/4" not greater than 35 degrees	1/4" hot rolled steel	1/4" hot rolled steel	10 gauge hot rolled steel

*(Normally used in ranges using handguns only)

	YES	NO	N/A
h. Plate/sand trap type bullet stop is properly installed. Joints and edge lines are backed with continuous 1/4" thick steel backing plate 4" in width or wider. If joints in bullet stop plates can be welded and ground flush, a backing plate is not necessary. (Critical if missing and joints and edge lines show signs of bullet damage.)	___	___	___
i. Plate/sand trap type bullet stop is suspended by angle braces faced with wood to prevent ricochet or backsplatter. (Critical only if braces show signs of bullet damage.)	___	___	___
j. Bullet stop sidewalls are of steel or covered with steel plate. (Critical only if there is evidence of plate being punctured by bullets.)	___	___	___
k. Plate/sand trap type sideplates extend vertically downward from the top edge of the bullet stop to the bottom rear edge of the bullet stop (Critical to protect firers, building and adjacent areas from ricochets.)	___	___	___

	YES	NO	N/A
l. In high ceiling buildings where the plate/sand trap type of bullet stop has been installed, the rear wall above the stop is lined with 2" of wood (or 2 sheets of 3/4" plywood over a 1/8" steel plate or equivalent) to prevent shooting through the rear wall.			
m. Pitted steel bullet stop plates showing erosion of 1/4 of the metal thickness are repaired by cutting out the damaged piece and welding in a new piece, flush with the existing plate. (Critical to the extent that this condition may result in ricochet, backsplatter or damage to the building walls.)	___	___	___
n. Welds are ground smooth to prevent backsplatter. (For safety and to prolong life of the weld.)	___	___	___
o.. On a plate/sand trap type of range targets are not suspended in front of plate seals or welds. (Non-critical, except where seam/weld is damaged.) Reposition, and relocate target carrier to correct.	___	___	___
p.. On plate/sand trap type ranges, sandpit should extend toward the firing line at least to a point directly below the leading edge of the sloped plate deflector.	___	___	___
q. Special situation items—			
(1) If range floor is constructed of wood with a room below—			
(a) The floor in front of the firing line for at least 8 feet is covered with steel plate of 3/16" minimum thickness for .22 caliber and 1/4" for .38 and .45 caliber ranges. (Steel plate must be covered with a non-skid composition floor covering such as linoleum.)	___	___	___
(b) Wooden floor at firing line is covered with a non-skid composition floor covering to prevent powder from accumulating in cracks and presenting a fire hazard.	___	___	___
(2) Wooden ceiling—			
(a) Ceiling is protected for 10 feet in front of and 10 feet behind the firing line with 3/16" steel covered with 2" structural grade planking or one sheet of 3/4" plywood for .22 caliber and 1/4" steel plate for .38, .45 caliber and 9mm faced with 2" structural grade planking or two sheets of 3/4" plywood. (Mandatory - where applicable.)	___	___	___
(b) Ceiling baffles are constructed and positioned properly to prevent shooting into the ceiling. (Mandatory where ceiling is of wood construction.)	___	___	___

	YES	NO	N/A
(c) Ceiling baffles are placed so they do not restrict vision or interfere with operation of the target carrier system.	___	___	___
r. Target holders are constructed of round bar metal stock without any flat surface exposed to the firing line. (Exposed flat surfaces can cause ricochet or backsplatter.)	___	___	___
s. Targets are numbered to coincide with numbered firing positions. (Essential to permit firer to fire on proper target.)	___	___	___
H-3. Operational safety			
a. Plate/sand trap type bullet stop has a layer of clean sand used to catch deflected lead 6" to 8" deep running the width of and in front of the stop. (Required to attenuate bullets, prevent ricochet and backsplatter.)	___	___	___
b. Sand is screened regularly to remove lead and reduce the possibility of backsplatter. (Frequency of firing will determine the amount of lead bullet mass buildup and frequency of cleaning required.)	___	___	___
c. Doors opening into the range (from the outside or adjacent rooms) in front of the firing line are removed and their openings closed flush using materials compatible with the adjacent wall. (Mandatory from a life safety standpoint. If State Laws require emergency exit doors they will be locked/secured from the inside and keys will be controlled.)	___	___	___
d. Ventilation system is in operation when range is in use and during cleanup. (Mandatory - no exceptions.)	___	___	___
e. Cleaning of the range is accomplished by vacuuming or wet methods. (Use of a hand broom with or without sweeping compound is prohibited.)	___	___	___
f. All drapery and carpeting has been removed from firing range. (Noise attenuation capability of drapery and carpeting is minimal and will collect lead dust.)	___	___	___
g. Range signs are posted denoting caution in the handling of weapons, ammunition authorized to be fired, and other conditions under which the range may be used to include the following: (Mandatory.)	___	___	___
(1) An easily read "Caution" sign will be prominently posted near the firing line of each indoor range.	___	___	___
(2) Smoking and/or the consumption of food/beverages in the range is prohibited.	___	___	___
(3) All personnel will wash hands thoroughly after leaving the range.	___	___	___

	YES	NO	N/A
(4) The sign will display the following message with wording modified as appropriate for the caliber of ammunition and types of weapons authorized.			
Caution — Use of this range facility is restricted to supervised firing with non—magnum handgun ammunition or .22 rimfire rifle ammunition using soft nosed lead or lead alloy ammunition only.	___	___	___
(5) Personnel authorized to use the range.	___	___	___
(6) Hearing protection must be used by all personnel using or observing firing on this range.	___	___	___
(7) Eye protection must be used by all personnel using this range.	___	___	___
(8) Quick draw type firing and/or hip shooting is prohibited.	___	___	___
h. Large numbers, indicating target position, will be painted on the top of the steel plate bullet stop above the top target position, or painted on wooden boards installed above the top of the bullet stop plate, or painted on front backing material above the targets.	___	___	___
i. Only authorized paper targets are used. (Use of non—standard targets can produce ricochets.)	___	___	___
j. Personnel assigned or detailed to work in the firing range on a permanent basis are enrolled in a Medical Surveillance Program and in a Hearing Conservation Program.	___	___	___
k. Where spectators are authorized, they are physically separated by a railing from the firing line. (Mandatory to preclude any interference with firing controls.)	___	___	___
l. A range SOP containing the above items is established and available.	___	___	___
m. Each individual has signed an agreement to comply with the rules of the range and the agreement is available for review.	___	___	___
n. A person assigned to the Armory is designated as custodian of the range and they—	___	___	___
(1) Will ensure that all personnel assigned or detailed to work in the range are required to wear NIOSH approved respirator (for the removal of lead contamination and fumes) while cleaning, repairing, or reclaiming lead from the bullet trap. (Mandatory — TB Med 502. Table 2, part 1 lists respirators and filters suitable to provide protection against lead exposure.)	___	___	___
(2) Has been properly trained to perform their duties and is fully aware of their responsibilities.	___	___	___

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	YES	NO	N/A
(3) Maintains a log of the number of hours the range is used by date and individual/unit/ organization.	___	___	___
(4) Ensures cleaning of range is accomplished at proper intervals, with proper supervision and use of proper personal protective equipment.	___	___	___

H-4. Remarks

By Order of the Secretary of the Army:

JOHN B. CONAWAY
Lieutenant General, USAF
Chief, National Guard Bureau

Official:

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Colonel, GS
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NGR 385-15
ANGI 91-101

POLICY AND RESPONSIBILITIES FOR INSPECTION/EVALUATION AND USE OF NATIONAL GUARD INDOOR FIRING RANGES

Summary. This regulation prescribes policy and responsibilities for inspection/evaluation and use of Army National Guard (ARNG) and Air National Guard (ANG) indoor firing ranges.

Applicability. This guidance applies to all persons responsible for the operation of ARNG and ANG indoor firing ranges. As no regulation/guidance can foresee all situations that might arise, the following is written in a broad scope and is intended to be interpreted as to the INTENT of the law.

Supplementation. Supplementation of this regulation is prohibited without prior approval from Chief, National Guard Bureau (NGB-AVN-SI).

Impact on Unit Manning System. This regulation does not contain information that affects the Unit Manning System.

Interim changes. Interim changes to this regulation are not official unless the Chief Administrative Services authenticates them. Users will destroy interim changes on their expiration dates unless sooner superseded or rescinded.

Internal control systems. This regulation is not subject to the requirements of AR 11-2. It does not contain internal control provisions.

Suggested improvements. The proponent of this regulation is the National Guard Bureau. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Chief, National Guard Bureau, **Attn:** NGB-AVN-SI, 111 South George Mason Drive, Arlington, VA 22204-1382.

Distribution. A/F

Contents (Listed by paragraph number)

Chapter 1
General Provisions

Section I
Introduction

1-1. Purpose
This regulation prescribes National Guard Bureau (NGB) policy and responsibilities for inspection/evaluation and use of ARNG and ANG indoor firing ranges.

1-2. References

Required Publications

Department of Defense Instruction (DODI) 6055.1
Department of Defense Occupational Safety and Health (OSH) Program

Army Regulation (AR) 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

National Guard Regulation (NGR) 385-10
Army National Guard Safety and Occupational Health Program

NG PAM 385-15/ANGI (Air National Guard Instruction) 91-101
Guidelines for Converting Indoor Firing Ranges to Other uses

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

Technical Bulletin Medical (TB MED) 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

Title 29, Code of Federal Regulations (CFR) Revision, Part 1910.1025
Lead

Department of the Army Pamphlet (DA PAM) 40-501
Hearing Conservation

American National Standards Institute (ANSI) Z87.1-1989
Practice for Occupational and Educational Eye and Face Protection

U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) TG 206
Indoor Firing Ranges

Section II
Related Publications

A related publication is merely a source of additional information. The user does not have to read it to understand this regulation.

HQDA LTR 385-93-2, Valid until AR 385-63/DA PAM 385-63 are published. Inspection and Evaluation of U.S. Army Indoor Firing Ranges

AR 385-63/DA PAM 385-63
Ranges

ACGIH Industrial Ventilation, current edition
A Manual of Recommended Practice

CEHND 1110-1-18
USACE Design Manual for Indoor Firing Range

ANSI Z87.1-1989
Practice for Occupational and Educational Eye and Face Protection

DHEW NIOSH 76-130, December 1975
Lead Exposure and Design Considerations for Indoor Firing Ranges

1-3. Explanation of abbreviations and terms
Abbreviations and special terms used in this publication are listed in the glossary.

1-4. Policy

a. The firing of ammunition indoors will be confined to properly classified indoor firing ranges only.

b. Detailed initial and periodic inspections of all indoor firing ranges will be conducted as prescribed to ensure compliance with current safety and health standards.

c. Any ARNG, ANG or civilian personnel will not use any indoor firing range, which is deemed unsafe.

d. For any range classified as unsafe, a DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, will be posted on the entrance.

e. Any range classified as unsafe will be secured.

f. All new ranges will be designed using the latest standards provided by NGB-ARI.

g. The use of indoor firing ranges for purposes other than firing is prohibited.

Responsibilities

1-5. Chief, National Guard Bureau (CNGB)
The CNGB is responsible for the overall supervision of ARNG and ANG indoor firing range safety and occupational health programs. The CNGB is also responsible for coordinating with other HQDA Staff agencies and the Adjutant General on matters pertaining to the prevention of injury and illnesses attributed to indoor firing ranges. This responsibility is vested in the Directors, Army and Air National Guard.

1-6. Director, Aviation and Safety (NGB-AVN)
The Director, NGB-AVN will supervise all matters pertaining to the evaluation and safe use of indoor firing ranges.

1-7. Director, Safety and Occupational Health Branch (NGB-AVN-S)
The Director, NGB-AVN-S will- -

a. Recommend and implement an effective safety and occupational health program for use in indoor firing ranges.

b. Identify personnel requirements to ensure protection of the safety and health of all personnel using the indoor firing ranges.

c. Provide design review for safety and occupational health aspects of all ranges to be constructed or remodeled. This responsibility is delegated to the Chief, Industrial Hygiene (NGB-AVN-SI).

1-8. Director, Training Division (NGB-ART)
The Chief, NGB-ARO will provide weapons training strategies consistent with AR 350-41 and the Standard and Training Commission.

1-9. Director, Engineering (NGB-ARI)

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 industrial hygiene branch.

1-10. Chief, Industrial Hygiene (NGB-AVN-SI)
The Chief, NGB-AVN-SI and the Regional Industrial Hygienists will- -

a. Make the final decision on indoor firing range classification based upon input from the state safety manager, the ventilation measurements, and the air sample results (breathing zone and general area).

b. Conduct air sampling of indoor firing ranges. 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 must be completed prior to range use.

c. Provide design review for safety and occupational health aspects of all ranges to be constructed or remodeled.

d. Make the determination whether industrial hygienists are competent to conduct indoor firing range evaluations.

1-11. The State Adjutant General
The State Adjutant General will- -

a. Establish, supervise, and direct a safety and occupational health program for users of indoor firing ranges.

b. Ensure all ranges being used are "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.

1-12. State Safety Manager

The State Safety Managers will- -

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 Standard Operating Procedures (SOPs) to ensure all requirements are covered.

d. Perform design review for safety aspects of all ranges to be constructed or remodeled.

e. Maintain copies of all range inspections, ventilation measurements and visitors logs.

f. Make recommendations to the Adjutant General regarding the disposition of "unsafe" and "limited use" ranges.

g. Be advised of the use of the range by non-military organizations.

1-13. Occupational Health Nurse

The Occupational Health Nurse will- -

a. Schedule medical surveillance examinations for individuals who are or may be exposed to lead above the action level for more that 30 days per year.

b. Maintain medical surveillance records for 40 years from the date of use 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).

d. In accordance with paragraph 4-7 of this regulation, records are maintained for personnel using the range when the airborne lead concentration is in excess of 0.03 milligrams per cubic meter (mg/m^3).

1-14. State Environmental Office

The State Environmental Office will coordinate removal and disposal of lead fragments from bullet traps in indoor firing ranges.

1-15. Commanders of Facilities

Commanders of facilities that include indoor firing ranges will maintain and be familiar with AR and DA PAM 385-63 and NGR 385-15, and ensure that--

a. An Occupational Safety and Health Compliance Program is developed as specified in paragraph 4-1 of 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 and the name of the custodian is provided to the state Safety and Occupational Health Office.

d. The custodians of the indoor firing ranges maintain the visitors log and follow procedures in accordance with (IAW) paragraph 1-16 of this regulation.

e. A SOP for each range is established, enforced and approved by the State Safety and Occupational Health Office.

f. All required signs are posted IAW Section 2-6 of this regulation.

g. 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 3-7 for records maintenance requirements.

h. Range custodians are enrolled in respiratory protection and medical surveillance programs as required by paragraph 4-9 of this regulation (if applicable).

i. Range custodians have documentation to show that they have been educated to the health effects from exposure to lead dust IAW 29 CFR 1910.1200 and 29 CFR 1910.1025. This is an annual requirement.

j. No equipment or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.

k. All range safety officers and maintenance personnel have a copy of AR and DA PAM 385-63, NGR 385-15 and the range SOP and are familiar with and in compliance with all indoor firing range policies and procedures.

l. The range ventilation system is checked every three months IAW paragraph 4-3 of this regulation.

m. Personnel do not fire in excess of the allowable exposure time as dictated by air sample results (See Appendix A).

n. Lead fragments are not removed from the bullet trap or surrounding areas except as coordinated through the state Environmental Office.

o. The thickness of inclined plate/sand-trap type bullet trap must be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, USACE Design Manual.

1-16. Range Custodians

Custodians will- -

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 NG PAM 385-15. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures.

c. Maintain the visitor log IAW the range SOP (see paragraph 2-7b(1) of this regulation) which records the names of the firers, amount of time spent in the range by each individual, date of firing, type of ammunition fired, and the number of rounds fired. See paragraph 3-7 for records maintenance requirements.

d. Forward a copy of the visitor log to the State Safety Manager on a quarterly basis.

e. Ensure the ventilation system is in operation at all times during firing or cleaning.

1-17. Unit Commanders

Unit Commanders will- -

a. Enforce all range safety and occupational health procedures.

b. Provide the State Safety Manager with a list of personnel firing in **limited use** ranges for more than the prescribed times listed in Appendix A.

c. Designate range safety officers.

d. Provide the range custodian with a list of range safety officers.

e. Ensure all range safety officers participate in the Medical Surveillance Program through the Occupational Health Nurse as required by paragraph 4-9 of this regulation (If applicable).

Chapter 2
Procedures, Classification and Use

2-1. General

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 firer. Older ranges may not meet the current standards deemed necessary to accomplish this. However, under controlled conditions, many older ranges will not expose firers to hazardous conditions.

2-2. Classification of ranges

Based on inspection data collected on the range inspection checklist (Appendix B), ranges will 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. (Appendix A). **Unsafe** ranges are not authorized for use under any conditions.

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

(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. In older ranges, side wall 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.

(d) For optimum air distribution, there should be a minimum distance of 15 feet from the firing line to the plenum wall.

(2) **Unsafe ranges.**

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

(b) Pipes, conduits or walls are not sealed to prevent leakage of lead dust from the range into other areas. (See NG PAM 385-15 for wipe sample procedures used to determine if lead dust is leaking from the range).

(c) Any doors or windows are located downrange.

(d) Range buildings do not meet the other requirements of safe ranges as prescribed in the checklist in Appendix B of this document.

b. **Ventilation**

(1) **Safe ranges.**

(a) The range has an operational mechanical ventilation system.

(b) The airflow at the firing line in each firing lane is between 50 and 75 feet per minute (fpm) at any level.

(c) Air is exhausted at or behind the bullet trap.

(d) Make-up air is introduced into the range behind the firers.

(e) Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm.

(f) Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm.

(g) The ventilation system is electrically interlocked to all downrange lighting circuits in order to ensure that the ventilation system will operate during all firing exercises or cleanup procedures.

(h) 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.

(i) The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas.

(j) Air is not recirculated in the firing range unless equipped with monitoring equipment as specified in section 3-4 of this regulation.

(k) 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.

(l) A smoke test of the range shows laminar airflow in the range and no turbulence at the firing line. (See NG PAM 385-15 for troubleshooting guidance)

(m) In passive make-up air systems, the supply air louvers and exhaust fan must be electrically interlocked.

(n) In systems with active make-up air, the supply and exhaust fans must be electrically interlocked. The make-up air fan should start after the exhaust fan to ensure the range maintains a negative pressure.

(o) 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.

(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 firer 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) Baffles do not protect any part of the lighting.

(c) Any electrical hazard exists in the range.

d. **Bullet traps.**

(1) **Safe ranges.**

(a) A bullet trap is permanently installed in the range.

(b) Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18 or NGB DG 415-1.

(c) The thickness of inclined plate/sand-trap type bullet trap must be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. See CEHND 1110-1-18, USACE Design Manual for Indoor Firing Range, for thickness requirements for the bullet trap.

(d) All plate/sand trap type bullet traps must be designed to prevent ricochets by directing

the projectiles in the same direction they are traveling.

(e) Sandpits in plate/sand trap type backstops must extend to a point directly below the leading edge of the sloped plate.

(f) Forward edges in a louver 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 louver 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. (Any one firing lane without a retrieval system will not be used for firing)

(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 mg/m^3 of air.

(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 mg/m^3 of air.

(c) For personnel under the age of 18, see appendix A.

(2) **Limited use ranges.**

(a) For personnel exposed less than 30 days per year, lead levels exceed 0.05 mg/m^3 of air but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures will be controlled by limiting the firers to the times described in Appendix A.

(b) For personnel exposed more than 30 days per year and for all non-DoD personnel, lead levels exceed 0.03 mg/m^3 of air but do not exceed 0.4 mg/m^3 in any breathing zone or general area sample. Personnel exposures will be controlled by limiting the firers to the times described in Appendix A.

(3) **Unsafe ranges.**

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

2-3. Range use

a. Active indoor firing ranges will not be used for any purpose other than firing. (i.e., they will not be used for classrooms, exercise rooms, storage, etc.)

b. Ranges classified as unsafe may be used for other purposes only after proper decontamination. (NG PAM 385-15, Guidelines for Converting Indoor Firing Ranges to Other Uses)

c. The ventilation system is in operation at all times during firing or cleaning.

d. Equipment or furniture will not be stored or maintained in the range, plenum area or behind the bullet trap.

e. A hand-held ABC-type is located in a recessed cabinet near the entrance door, inside of the firing range.

2-4. Prohibitions

a. Personnel will **not** be permitted in the plenum area during firing even if designed for observation.

b. Plenum area and area behind the bullet trap will **not** be used for storage of any equipment.

c. All areas directly in front of the plenum wall will be kept clear at all times.

d. Variable speed fans are not permitted.

e. Dry sweeping of indoor firing ranges is prohibited. Brooms will 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, additional clothing or equipment not used during firing will **not** be brought into the range.

i. There are no open floor drains in the range.

j. Carpet will not be located in any part of the range. (Contact the State ARNG Environmental Officer for hazardous waste disposal procedures.)

2-5. Personal protective equipment

a. **Eye protection.** All personnel in an indoor firing range during firing shall wear eye protection that meets ANSI Z87.1 requirements.

b. **Hearing protection.** All personnel in an indoor firing range during firing shall wear hearing protection that is approved IAW ANSI S3.19-1974.

c. **Respiratory protection.** For respiratory protection requirements during indoor firing range conversion cleanup operations, see NG PAM 385-15.

2-6. Posting of signs

a. The following signs will 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 Must be Properly Worn During Firing

(6) Proper Safety Glasses/Goggles Must be Worn During Firing

(7) No Furniture or Storage of Items Permitted in the Range

b. The following signs will be posted on the entrance door to the range:

(1) Noise Hazardous Area

(2) Danger Lead Hazard Area

(3) Pregnant Females are Not Permitted in this Area

c. An illuminated warning sign, which is interlocked with the range ventilation switch, will be located outside of the firing range to alert individuals that the range is in use.

d. Each firing lane will be numbered at the firing line and at the bullet trap visible to all firers. This is to ensure firers use the correct target.

e. A warning sign must be posted outside of the access door to the bullet trap, which warns personnel not to enter.

2-7. Range SOP

a. Each indoor firing range will have a written SOP that is approved by the State Safety Office.

b. Range SOPs will include, as a minimum, the following:

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

(a) Name and age of firer.

(b) Organization (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 range safety officer.

(3) Work practices including required, recommended, 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 2-6 of this regulation.

(8) Cleaning and maintenance requirements. For guidance, see NG PAM 385-15.

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

Chapter 3
Inspection Requirements

3-1. General.

The first part of each inspection will be the physical safety inspection conducted by the State Safety Manager. Once the firing range has passed this portion of the inspection, an industrial hygienist will complete the ventilation survey and air sampling requirements.

3-2. Initial inspections

a. An initial inspection of all new and renovated indoor firing ranges will be completed before the facility is accepted. The inspection report will be kept on file in the State Safety Office. The checklist in Appendix B, Part I will be used for this purpose.

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

3-3. Annual inspections

a. A safety inspection of every operating range will be made every year to ensure safety standards, procedures and records are maintained in the operation of the range. State Safety personnel will complete these inspections. The checklist in Appendix B will be used for this purpose.

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

c. Ventilation measurements will be taken quarterly to ensure no changes have occurred as far

as smoke tests, velocities and static pressure measurements are concerned.

3-4. Ventilation requirements

If air from the indoor firing range exhaust ventilation system is recirculated into the supply system of the range, the system must 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 must be installed and programmed to bypass the recirculation system automatically if the filter system fails. This system must be operating and maintained IAW 29 CFR 1910.1025 (e) (5) (ii).

3-5. Air sampling requirements

a. Air sampling to determine airborne lead dust levels during prescribed firing procedures will be conducted for all indoor firing ranges prior to routine use. The highest caliber weapon approved for use in the range will be fired during air sampling.

b. ARNG Regional Industrial Hygienists are responsible for air sampling of indoor firing ranges to determine airborne lead concentrations.

c. Copies of all air sampling results will be maintained by the Regional Industrial Hygienist.

3-6. Completed inspection reports

A copy of the completed inspection report will be provided to the Commander of the facility and to the state safety manager. If medical surveillance is required, a copy of the report will also be provided to the State Occupational Health Nurse. A complete inspection report will consist of the completed safety inspection checklist, ventilation data, and air sample results (initial inspection and as required by paragraph 3-3 above). Subsequent inspections will 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.

3-7. Records maintenance

a. All medical surveillance records be maintained for 40 years from the date of use or the duration of employment plus 20 years, whichever is longer, as prescribed in 29 CFR 1910.1025, Appendix C, Section I.

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

Chapter 4
Control of potential lead intoxication

4-1. Occupational Safety and Health Administration (OSHA) lead standard

a. The requirements of the OSHA lead standard (29 CFR 1910.1025) will 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)).

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

4-2. Alternative ammunition

a. Reduced-lead and lead-free ammunition (non-lead 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 will 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 must be verified with the bullet trap manufacturer.

4-3. Maintenance requirements

Following are the minimum maintenance requirements, which must be performed every three months by the range custodian or by a person designated by the facility commander IAW 29 CFR 1910.1025(e)(5):

a. 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.

b. Evaluate static pressure and compare to the baseline static pressure reading. Any changes must be reported through the state safety manager to the Regional Industrial Hygienist.

c. Inspect louvers, if applicable, to ensure they are opening fully.

d. Lubricate the bullet trap (if applicable).

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

4-4. Housekeeping
The range will be cleaned at the end of each firing day (See NG PAM 385-15 for details on cleaning).

4-5. 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 (Appendix A). This table was developed to control intermittent lead exposure and to establish 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 will be controlled according to the criteria provided in the table of lead exposure limits as an interim control measure only. Maximum effort must be made to introduce permanent control measures to reduce the airborne lead levels to 0.03 mg/m^3 or less. Exposure records will 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^3 . These records will 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 exposure time.

4-6. Extent of use
a. The extent of use for any indoor firing range must be based on permissible exposure of all using personnel to concentrations of airborne lead dust.

b. Under no circumstances will pregnant females be permitted in an indoor firing range under any conditions, IAW 29 CFR 1910.1025, Appendix C, Section II (5).

c. Personnel under 18 years of age are prohibited from entering any range area with a lead concentration greater than 0.100 mg/m^3. For ranges with lead concentrations less than 0.100 mg/m^3, follow the guidelines in Appendix A.

d. The State Safety Manager must be informed of the use of the indoor firing range by non-military organizations.

4-7. Medical surveillance
a. Personnel who are or may be exposed to lead above the action level (0.03 mg/m^3) for more than 30 days per year must 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 Appendix A are not exceeded.

Glossary

Section I
Abbreviations

ANG
Air National Guard

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^3
milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

OSHA
Occupational Safety and Health Administration

SOP
Standard Operating Procedures

SP
static pressure

USACHPPM
U.S. Army Center for Health Promotion and Preventive Medicine [formerly U.S. Army Environmental Hygiene Agency (USAEHA)]

"wg
inches of water gauge

Section II
Terms

Backsplatter
This refers to the small particles, which break off of a bullet as it impacts the bullet trap. Variables such as the bullet alloy, angle of the bullet trap, and the velocity of the impact dictate the amount and pattern of the backsplatter. A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap, which can be very dangerous.

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.

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.

APPENDIX A

TABLE 1
Breathing Zone Exposure Limits for Intermittent Atmospheric Lead Exposures

Concentrations (in mg/m^3)	Maximum Hours of Allowable Exposure Per Day For: A. GUARDSMEN exposed less than 30 days per year	B. GUARDSMEN on marksmanship teams or GUARDSMEN exposed more than 30 days per year and ALL NON-MILITARY PERSONNEL	C. Range Users under 17 Years of Age*
0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	LIMITED USE RANGES	LIMITED USE RANGES	LIMITED USE RANGES
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

- **These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.**
- **Adherence to these guidelines will prevent overexposure to lead in indoor firing ranges.**

* Recommend that an Occupational Health Physician make a determination of length of firing time for individuals 16 years or younger.

APPENDIX B

RANGE INSPECTION CHECKLIST
See Chapter 3 of this regulation for inspection requirements. For the range to be considered safe, each of the following statements must be true and air-sampling results must be below the standard for lead. The information in parentheses after each statement denotes the location of the requirement in this or other regulation.

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. (Optimum width is 5 feet) [CEHND 1110-1-18, 2-1c(2)]

_____ 2. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that will protect these items and prevent ricochets. [2-2a(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) [2-2a(2)(e)]

_____ 4. There are no open floor drains in the range. [2-4]

_____ 5. There is no carpet, drapes or other fiber-like material in the range. [CEHND 1110-1-18, 3-1d(3)] (Contact the State ARNG Environmental Officer for hazardous waste disposal procedures.)

_____ 6. Pipes, conduits and walls are sealed to prevent leakage of lead dust from the range into other areas. [2-2a(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. [CEHND 1110-1-18, 3-1e]DG 415-1, App. A, 3-1h)

_____ 13. For optimum air distribution, there should be a minimum distance of 15 feet from the firing line to the plenum wall. [NIOSH 76-130, p.13]

B. Range Lighting

_____ 1. Lighting is uniform, non-glaring and does not cause shadows. [2-2c(1)(a)]

_____ 2. Illumination is at least 100 foot candles on the targets and 30 foot candles in all other areas. [2-2c(1)(b)]

_____ 3. All lighting is protected by baffles and placed so that the firer has an unobstructed view down range. [2-2c(1)(c)]

_____ 4. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [CEHND 1110-1-18, 3-4b(2)]

_____ 5. Emergency lights are provided behind the firing line and are in working condition. [CEHND 1110-1-18, 3-4c(a)]

_____ 6. Exit lights are provided and working as required. [CEHND 1110-1-18, 3-4c(c)]

_____ 7. Lighting of at least 30 foot-candles is provided behind the bullet trap for maintenance (if applicable). [2-2c(1)(g)]

_____ 8. No known electrical hazards exist in the range. [2-2c(2)(c)]

C. Bullet traps

_____ 1. A bullet trap is permanently installed in the range. [2-2d(1)(a)]

_____ 2. Bullet traps are of a commercial design, which is in compliance with the requirements of CEHND 1110-1-18, NGB-ARI, NG PAM 385-15, Chapter 4 and this regulation. [2-2d(1)(b)]

_____ 3. The thickness of inclined plate/sand trap type bullet trap must be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [2-2d(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. [2-2d(1)(d)]

_____ 5. Sandpits in plate/sand trap type backstops extend to a point directly below the leading edge of the sloped plate. [2-2d(1)(e)]

_____ 6. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [2-2d(1)(f)]

_____ 7. Steel bullet traps are not bowed, punctured or severely pitted. [2-2d(2)(a)]

_____ 8. Plates in the bullet trap are flush with the other plates. Mold seams are ground smooth. [2-2d(2)(b)]

D. Targets and target carriers

_____ 1. A target retrieval system is operable in all lanes. [2-2e(1)(a)]
(Any one firing lane without a retrieval system will 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. [2-2e(1)(a)]

_____ 3. Only paper targets are used in the range. [2-2e(1)(b)]

E. Range use

_____ 1. The range is not used for any purpose other than firing. [2-3a]

_____ 2. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. [2-3d]

_____ 3. No additional clothing or equipment is brought into the range. [2-4h]

_____ 4. Personnel are not permitted in the plenum area during firing even if designed for observation. [2-4a]

_____ 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) [2-4f]

_____ 6. All areas directly in front of the plenum wall are kept clear at all times. [2-4c]

_____ 7. Pellets, BBs, magnum and armor piercing rounds are not used in the range. [2-4g]

_____ 8. The ventilation system is in operation at all times during firing or cleaning. [NIOSH 76-130, p.24, II,1]

_____ 9. A hand-held ABC-type 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. [NIOSH 76-130, p.24, II,2]

_____ 2. No brooms are located in the range. [2-4e]

_____ 3. A range custodian is appointed for the range who is fully trained and aware of his/her responsibilities. [1-16]

G. Personnel protective equipment

_____ 1. All personnel in the range during firing wear ANSI approved eye protection. [2-5a]

_____ 2. All personnel in the range during firing wear ANSI approved hearing protection. [2-2b]

H. Posting of signs

_____ 1. The following signs are posted in or in the vicinity of the range: [2-6a]
- _____ 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 Must be Properly Worn During Firing
- _____ f. Proper Safety Glasses/Goggles Must 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: [2-6b]
- _____ a. Noise Hazardous Area
- _____ b. Danger Lead Hazard Area
- _____ c. Pregnant Females 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. [2-6c]

_____ 4. Each firing lane is numbered at the firing line and at the bullet trap visible to all firers. [2-6d]

_____ 5. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter during range operation. [2-6e]

I. Range SOP

_____ 1. The indoor firing range has a written SOP, which is approved by the State Safety Office. [2-7a]

_____ 2. The range SOP includes as a minimum the following: [2-7b]

_____ 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 2-6 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/firers: [1-16c]

_____ a. Name and age of firer.

_____ 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. [3-6]

_____ 3. The initial inspection report includes air-sampling data. [3-2b]

_____ 4. An OSHA compliance program is in place, which covers the required aspects. [4-1]

_____ 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. [1-15h]

_____ 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. [1-17d]

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.

RANGE INSPECTION CHECKLIST

Part 2, Ventilation Inspection
A. Existing Ranges

_____ 1. The range has an operational mechanical ventilation system. [2-2b(1)(a)]

_____ 2. The airflow at the firing line in each firing lane is between 50 and 75 fpm at any level. [NIOSH 76-130, p.21, I,1]

_____ 3. 100% of air is exhausted at or behind the bullet trap. [NIOSH 76-130, p.22,8]

_____ 4. Make-up air is introduced into the range behind the firers. [2-2b(1)(d)]

_____ 5. Supply and exhaust fans are electrically interlocked with the downrange lighting. [CEHND 1110-1-18, 3-4a]

_____ 6. Air that is introduced through vents into the plenum does not exceed a velocity of 600 fpm. [2-2b(1)(e)]

_____ 7. Air exiting through holes in the plenum wall has a velocity between 400 and 600 fpm. [2-2b(1)(f)]

_____ 8. 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. [2-2b(1)(g)]

_____ 9. The exhaust exceeds the make-up air by approximately 10% to form a negative air pressure in the range in relation to adjoining areas. [NIOSH 76-130, p.21,I,4]

_____ 10. 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)(5)(ii)]

_____ 11. 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)(5)(ii)]

_____ 12. The fan(s) in the ventilation system is a single speed fan only. [NIOSH 76-130, p.13 and DG 415-1, App. A, 3-2a]

_____ 13. A smoke test of the range shows laminar airflow and no turbulence in the range.

_____ 14. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [2-2b(1)(l)]

_____ 15. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [2-2b(1)(m)]

_____ 16. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [2-2b(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. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

_____ 3. Passive supply systems have opposing blade louvers.

_____ 4. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

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^3 (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: _____

Department of the Army and the Air Force ***NGR 385-15**
National Guard Bureau
Arlington, VA 22202-3231
3 November 2006

Safety

Policy and Responsibilities for Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges

By Order of the Secretaries of the Army and the Air Force:

H STEVEN BLUM
Lieutenant General, USA
Chief, National Guard Bureau

Official:

GEORGE R. BROCK
Chief, Plans and Policy Division

History. This printing publishes a revision of NGR 385-15.

Summary. This regulation prescribes policy and responsibilities for inspection, evaluation and operation of Army National Guard (ARNG) indoor firing ranges and .has been extensively revised. As no regulation/guidance can foresee all situations that might arise, the following is written in a broad scope and is intended to be interpreted as to the *intent* of the law.

Applicability. This guidance applies to all persons responsible for the operation of ARNG indoor firing ranges.

Proponent and exception authority. The proponent of this regulation is Chief, NGB-AVS-S. The proponent has the authority to approve exceptions to this regulation that are consistent with controlling law and regulation.

Management control process. This regulation is subject to the requirements of Army Regulation (AR) 11-2 and identifies key management controls that must be evaluated.

Supplementation. States are authorized to supplement contents of this regulation, except statutory and Department of Defense (DOD) directed requirements. Supplements will not be less stringent than regulatory requirements contained here within. If supplements are issued, States will furnish copies to NGB-AVS-S.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to NGB-AVS-S (NGR 385-15), ARNG Readiness Center, 111 South George Mason Drive, Arlington, VA 22204-1382.

Distribution: A

Table of Contents

* This regulation supersedes NGR 385-15, dated 30 March 1990.

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Chapter 1
General Provisions

Section I
Introduction

1-1. Purpose
This regulation 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 (IFRs). This regulation does not cover operations or safety in shoot houses. This regulation supplements AR 385-10, AR 385-63, and AR 385-64. Additionally, this regulation prescribes the procedural requirements for IFR rehabilitation and conversion which are contained in NG Pam 420-15.

1-2. References
Required and related publications and referenced and prescribed forms are listed in Appendix A.

1-3. Explanation of abbreviations and terms
Abbreviations and terms used in this regulation are explained in the Glossary.

1-4. Policy
a. Ammunition shall be Army classified for IFRs to be utilized for live fire training.
b. Detailed initial and periodic inspections of all IFRs shall be conducted as prescribed to ensure compliance with current safety and health standards.
c. ARNG or civilian personnel shall not use any IFR, which has been classified as *unsafe*.
d. A Department of the Army (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 IFRs for purposes other than small arms weapons training and target practice is strictly *prohibited.*

Section II
Responsibilities

1-5. 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 and DA Pam 385-63. Since there is some variation within NGB in the way staff implement and communicate policies associated with IFRs due to their complex nature, funding issues should be coordinated with NGB-AVS, NGB-ART, NGB-ARI, and NGB-ARE,. This will assist in proper usage of funds and performance in implementing and delivering consistent guidance on these issues.

1-6. Chief, Aviation and Safety Division (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 and DA Pam 385-63.
b. Coordinate with other Headquarters, Department of the Army (HQDA) staff agencies and appropriate State staff on matters pertaining to the ARNG Range Safety Program.

1-7. Chief, Safety and Aviation Standardizations Branch (NGB-AVS-S)
The Chief, NGB-AVS-S shall --
a. Develop, implement, and manage the ARNG Range Safety Program.
b. Ensure that the design of all ranges to be constructed or remodeled are reviewed for compliance with safety and occupational health standards and make recommendations to appropriate approval authority.
c. Determine and publish the training requirements for the persons who will conduct physical safety inspections of the range, which will include certification to perform inspections, evaluations, and determinations of

IFRs IAW with OSHA standards and other nationally accepted standards for maintenance, cleaning, conversion, ventilation, and air sampling of IFRs.

1-8. Chief, Training Division (NGB-ART)
The Chief, NGB-ART shall provide weapons training strategies consistent with AR 350-38 and the Standards and Training Commission.

1-9. Chief, Installations Division (NGB-ARI)
The Chief, NGB-ARI shall --

a. Authorize Federal funding of sustainment and/or conversion of IFRs in accordance with NGR 5-1.

b. Provide the design standards for the construction of IFRs.

c. Review designs of new and remodeled IFRs for adherence to required performance standards, with accompanying simultaneous review by the Safety and Aviation Standardizations Branch and Office of the Surgeon.

1-10. Chief, Office of the Chief Surgeon (NGB-ARS)
The Chief, NGB-ARS shall –

a. Serve as an advisor to The Adjutants General on the ARNG Occupational Health and Industrial Hygiene Program.

b. Ensure that IFR medical surveillance is performed IAW 29 CFR 1910.1025 and Department of Defense (DOD) 6055.5-M.

c. Ensure that active IFRs are properly evaluated and IFR classifications are based upon ventilation measurements and air monitoring results IAW Federal regulations and standards.

1-11. Chief, Environmental Programs Division (NGB-ARE)
The Chief, NGB-ARE shall --

a. Implement policy and guidance related to disposal of containerized hazardous lead-contaminated dust, sand, and debris resulting from clean-up and remediation efforts from IFRs.

b. Review projects for disposal of containerized hazardous lead-contaminated dust, sand, and debris resulting from clean-up and remediation efforts from IFRs.

1-12. NGB Regional Industrial Hygienists
NGB Regional Industrial Hygienists shall –

a. Be certified to perform inspections, evaluations, and determinations of IFRs IAW with OSHA standards, other nationally accepted standards, and accepted IH practices for maintenance, cleaning, conversion, ventilation, and air sampling of IFRs.

b. Conduct inspections to ensure that exposure monitoring and ventilation measurements are conducted in IFRs initially, every 2 years, or 480 hours of operation, whichever comes first.

c. Conduct inspections to ensure that workers' exposure data is maintained on DA Form 4700 (Medical Record-Supplemental Medical Data) IAW AR 40-66, paragraph 3-2a, and DOD 6055.5-M for 40 years or the duration of employment plus 20 years, whichever is longer, IAW 29 CFR 1910.1025(n)(1) & (2).

d. Makes final classification recommendation to the SOHM on whether the range is *safe*, *limited use* or *unsafe* based on ventilation measurements and air sampling.

e. Review in a timely manner the preliminary design of all new, restoration and modernization projects dealing with IFRs to ensure current safety and occupational health related compliance requirements are met.

1-13. The State Adjutant General
The State Adjutant General shall --

a. Establish, supervise, and direct a safety and occupational health program for users of IFRs.

b. Make final classification on whether IFRs are *safe*, *limited use* or *unsafe* based on safety hazards, ventilation measurements and air sampling. Ensure that 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 IFRs.

d. Ensure that facilities with active, inactive or converted IFRs establish a Lead Hazard Management Program to prevent lead exposure to children six years and under, pregnant women and workers in accordance with all applicable Federal and State laws and regulations.

e. Ensure that all inspections, evaluations, and determinations of IFRs will be completed by trained personnel certified IAW with OSHA and other nationally accepted standards for use, maintenance, cleaning, or conversion of IFRs.

1-14. State Construction and Facilities Management Officer (CFMO)

The CFMO shall –

a. Be the only individual within the State who has the authority to classify work, which is the final step before project approval and the commencement of the activities of maintenance, repair, or construction. Recommends approval and oversees all projects, regardless of funding source or project initiator, including troop construction projects.

b. Coordinate the approval of State sustainment, restoration and modernization projects, including self-help, to be executed by the Construction and Facilities Management Office, troop units, and other State ARNG activities and tenants (including private sector entities) to ensure technical sufficiency and compliance with statutes, regulations, and the State's Real Property Development Plan; and is the sole source of work classification for all work accomplished on all State facilities.

c. Certify and process NGB Forms 420-R or DD Forms 1390/1391 (FY __ Military Construction Program/FY __ Military Construction Project Data) for sustainment, restoration, and modernization projects based upon the dollar thresholds in NGR 420-10.

d.. Ensure that any restoration or modernization projects dealing with IFRs are first reviewed by the Joint Service Reserve Component Facility Board and that designs are reviewed by the Regional Industrial Hygienist prior to proceeding beyond preliminary design to ensure current safety and occupational health related compliance requirements are met.

e. Include performance and testing specifications in the contract documents for the construction and modification of all IFRs.

f. Before accepting the completed project require the contractor to demonstrate through testing that the range meets the various airflow requirements of this regulation.

g. Control all cleanup efforts and ensure that they are conducted according to current industry standards and NG Pam 420-15.

1-15. State Safety and Occupational Health Manager (SOHM)

The SOHM shall --

a. Perform or coordinate performance of all inspections and evaluations of IFRs.

b. Determine whether the range is *safe*, *limited use* or *unsafe* based on the physical safety inspection.

c. Review and approve all IFR Standing Operating Procedures (SOP) to ensure that all requirements are met. An example SOP can be found at Appendix B of this regulation.

d. Ensure that the design of all ranges to be constructed or remodeled is reviewed for compliance with safety and occupational health standards and that recommendations are made to appropriate approval authority.

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 visitor's log.

h. Provide training on safe use and requirements to the Range Safety Officer (RSO).

i. Ensure that training programs identify the hazards and preventive measures for all personnel with a potential for exposure to lead are instituted.

j. Coordinate with Joint Forces Headquarters staff as required.

k. Ensure that exposure monitoring and ventilation measurements in IFRs initially completed, then every 2 years, or after 480 hours of operation, whichever comes first.

l. Ensure that an initial evaluation of new IFRs has been conducted, and that each active range is reevaluated every two years or every 480 hours of operation, whichever comes first. An IFR will be reevaluated, prior to use, 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*.

1-16. State Surgeon Office

The State Surgeon Office shall –

a. Institute a medical surveillance program for individuals who are or may be exposed to lead above the action level for more than 30 days per year IAW 29 Code of Federal Regulations (CFR) 1910.1025(j)(1)(i) and DOD 6055.5-M.

b. Ensure that military and civilian personnel exposure monitoring (air sampling results) and medical surveillance records are maintained in accordance with 29 CFR 1910.1025 (n)(1) & (2) and AR 40-66 requirements.

1-17. State Environmental Office

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

1-18. Readiness Center/Facility Commanders

Commanders of facilities with IFRs shall maintain and be familiar with AR 385-63 and DA Pam 385-63, and the provisions of this regulation, to ensure that --

a. A Safety Compliance Program is developed for IFRs.

b. Indoor firing ranges are secured when not in use.

c. A Range Control Officer (RCO) is appointed for all IFRs under his/her area of command and that all RCOs have been properly instructed and are competent in the performance of their duties as outlined in this regulation and DA Pam 385-63.

d. The RCO of the IFRs maintain the visitors log and follow procedures IAW paragraph 1-19 of this regulation.

e. All non-military organizations using IFRs 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 SOHM.

g. All required signs are posted IAW Section 3-2 of this regulation.

h. All individuals using IFRs 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 5-3 for record maintenance requirements.

i. RCOs are enrolled in respiratory protection and medical surveillance programs as required by AR 11-34, 29 CFR 1910.1025 and 29 CFR 1910.134.

j. RCOs 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, carpet or mat covered in porous materiel, or furniture, such as tables, chairs or storage cabinets, is stored or maintained in the range.

l. All RSOs 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 IFR policies and procedures.

m. The range ventilation system is checked and air sampling is performed every 480 hours of operation, after changes or additions have been made to the range, or every two years, whichever comes first.

n. Personnel do not fire ammunition in excess of the allowable time as dictated by established exposure limits. (See Table 1-1).

o. Exposure records shall be maintained IAW paragraph 5-5 when personnel are exposed to airborne lead concentrations.

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 IFR 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.

s. If a range is to be converted to another use, refer to NG Pam 420-15 and contact the SOHM.

Table 1-1
Lead Exposure Limits. Breathing Zone Exposure Limits for Intermittent Atmospheric Lead Exposures

	Maximum Hours of Allowable Exposure Per Day For:		
Concentrations (in mg/m^3)	**A. Guardsmen exposed less than 30 days per year**	**B. Guardsmen on marksmanship teams or Guardsmen exposed more than 30 days per year and all non-military personnel**	**C. *Range Users under 17 years of age or younger**
0.000 - 0.029	8	8	4
0.030 - 0.039	8	6	3
0.040 - 0.049	8	4.5	2
	Limited Use Ranges	Limited Use Ranges	Limited Use Ranges
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

- These values are the actual concentrations measured over the sampling period and are not 8-hour time-weighted averages.
- Adherence to these guidelines shall prevent overexposure to lead in indoor firing ranges.

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

1-19. IFR Range Control Officers (RCO)
RCO shall --

a. Be properly instructed and are competent in performance of their duties as outlined in this regulation and DA Pam 385-63.

b. Ensure that all individuals using the IFR understand the range safety regulations, rules, and SOP.

c. Ensure that all cleaning procedures are performed IAW the requirements of this regulation and the procedures prescribed in NG Pam 420-15. This includes documentation of dates, names of personnel and time on the range for all cleaning procedures. See paragraph 5-3 for record maintenance requirements.

d. Maintains and updates files of current and historical usage of IFR.

e. 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. Appendix C contains the recommended format to the visitation log.

f. Forward a copy of the visitor log to the SOHM on a quarterly basis.

g. Obtain a permission and release of liability certificate prior to any organization or person before being allowed to use the IFR. Sample permission and release of liability certificate see Appendix D.

1-20. Commanders and Supervisors
Commanders and Supervisors 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 RCO.

c. Provide the State Occupational Health Program Manager with a list of personnel firing in ranges classified as "*limited use*" ranges for more than the prescribed times listed in Table 1-1. See paragraph 5-3 for record maintenance requirements.

d. Establish weapons clearing procedures.

e. Designate Officer In-Charge or Non-Commissioned Officer In-Charge (OIC/NCOIC) and RSOs in writing for each firing exercise.

f. Individuals that are appointed as the OIC/NCOIC or RSO are qualified to perform their assigned duties as outlined below and IAW DA Pam 385-63.

g. Provide the State Occupational Health Program Manager with a list of IFR RCOs and RSOs.

h. Ensure all IFR RCOs and RSOs are enrolled in the Medical Surveillance and Respiratory Protection Programs, IAW DOD 6055.5-M.

i. Ensure that the RSO is: competent and properly instructed in the performance of their duties; knowledgeable in the weapon system for which they are held responsible and in safe ammunition handling and use procedures; and certified by the established State Safety Office safety certification program in accordance with DA Pam 385-63. All training will be documented.

j. Ensure that a training program that identifies the hazards and preventive measures for all personnel with a potential for exposure to lead is instituted.

1-21. IFR Officer In-Charge or Non-Commissioned Officer In-Charge (OIC/NCOIC)

IFR OIC/NCOIC shall be designated by the commander or supervisor of all using units or groups 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 duties of the range OIC/NCOIC shall include but are not limited to the following:

a. Receives 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.

b. Ensures the overall safe conduct of training and the proper use of the facility.

c. Ensures that all participants are familiar with the verbal commands, hand signals, weapons clearing procedures, range procedures and safety requirements.

d.

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

e. Be familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing. Sample IFR Accident Prevention Plan is located at Appendix E.

f. Ensures that at least three individuals are present on the range when the range is in use.

g. Ensures that all individuals using the range have signed-in on the roster maintained by the Readiness Center/facility Commander.

h. Ensures that the range has a working telephone, or that other means of emergency communication is available.

i. Ensures that appropriate emergency medical personnel have been notified and that medical support is available.

j. Implements risk management in all phases of the training events. A completed risk assessment will be submitted prior to authorization to the RCO before the range is to be used.

k. Ensures that all weapons and ammo used on the ranges are authorized by the RCO.

l. Ensures that all weapons must be safety checked before firing.

m. Ensures that the RSO is physically present at the IFR training event.

n. Ensures that weapons malfunctions/jams are cleared only at the direction of the RSO in accordance with the procedures established in the operators' manual for the weapon.

o. Ensures that all ammunition malfunctions are reported to RCO IAW AR 75-1.

p. Stops all training in the event of a serious accident or injury. Ensures that all accidents are investigated and reported IAW AR 385-40.

q. Ensures that weapons may only be fired from designated firing positions.

r. Ensures that firers confine their firing to targets in their lane.

s. Ensures that the required hearing and eye protection is available and used.

t. Ensures 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.*

u. Conducts a final inspection of the range. Secures the range, and turns the keys and shooters' logs into the RCO or his/her designated representative.

1-22. Range Safety Officer (RSO)

The RSO shall be designated by the commander or supervisor of all using units or groups in the grade of E-5 or above to be the responsible for the safe conduct of firing and proper use of the facilities. RSO will have no other duties during that period of training. The duties of the RSO shall include but are not limited to the following:

a. Receives training and a thorough briefing from the RCO, and conducts an inspection of the range with the RCO, or his/her designated representative.

b. Be knowledgeable of the weapons to be used and ensures that only authorized weapons and ammunition are used. Ensures that the proper operators' manuals are available for each individual using the range.

c. Is physically present during all phases of IFR training events.

d. Ensures that all personnel wear the proper hearing and eye protection as required.

e. Ensures that weapons and personnel are properly positioned.

f. Ensures that personnel do not leave the firing line without the permission of the RSO.

g. Ensures that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the RSO to do so.

h. Ensures the following: 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.

i. Ensures that weapons malfunctions/jams are cleared only at the direction of the RSO in accordance with the procedures established in the operators' manual for the weapon.

j. Reports all accidents to the OIC/NCOIC.

k. Ensures that weapons are cleared and checked during temporary suspension of firing.

l. Ensures that firing is stopped promptly when an unsafe act is observed or reported.

m. Does not permit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

n. Limits firing time, if applicable. This limitation shall be based on air-sampling results for individuals using the range and ventilation measurements. Contacts the SOHM to determine if the range has time limitations placed upon it.

o. Ensures that the approved risk management plan is followed and not deviated from.

p. Stops all firing in the event of a serious accident or injury.

q. Ensures that all weapons are cleared prior to being removed from the firing line.

r. Ensures that all individuals on the range thoroughly wash their hands and face immediately after leaving the range.

Chapter 2
Procedures, Classification and Use

2-1. Procedures, Classification and Use
Indoor firing ranges have been built in readiness centers for many years. Each range design reflects the emphasis and technology on protecting the health and safety of the shooter that was current at the time of design and construction. 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. See Figure 2-1.

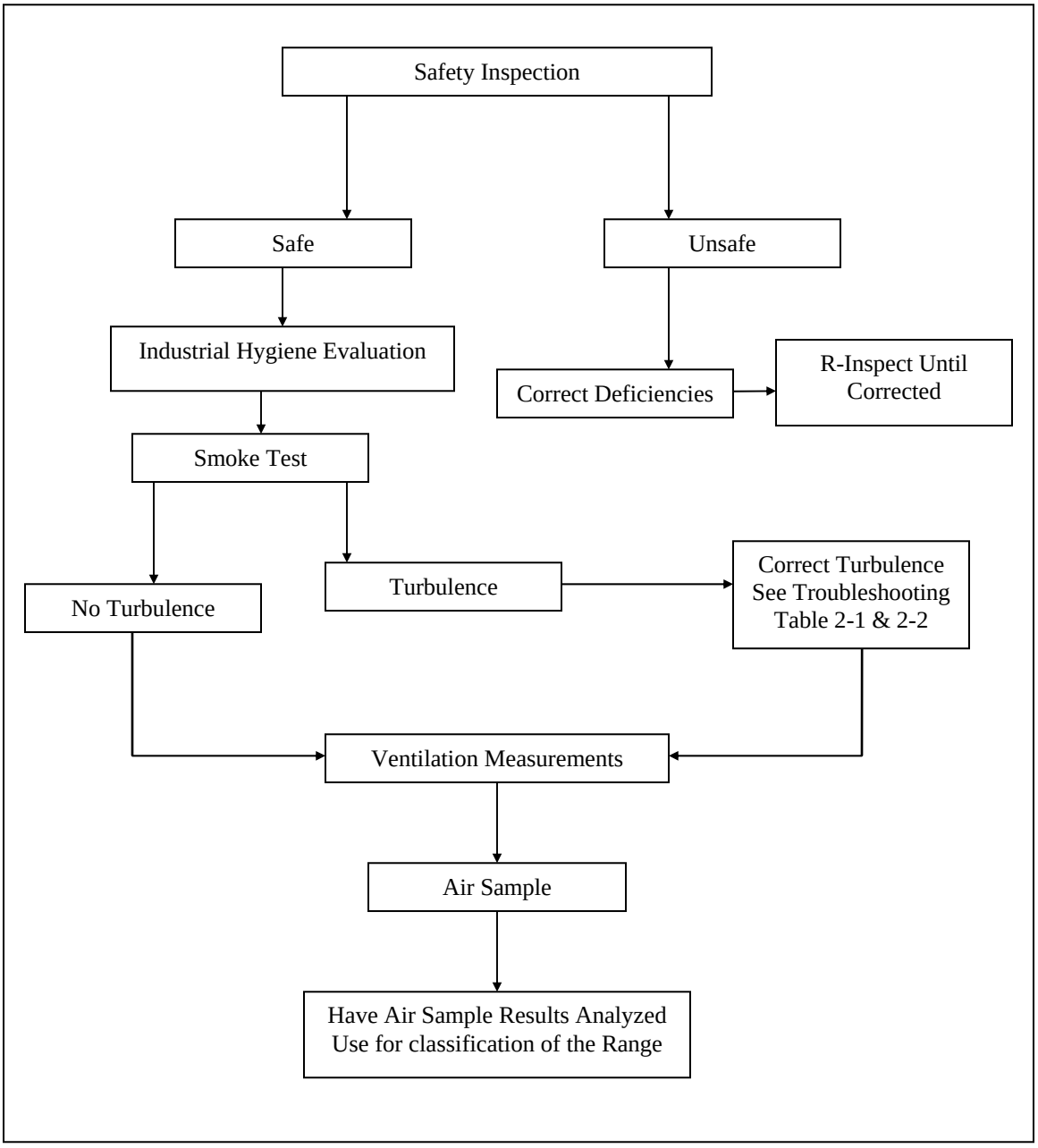

Figure 2-1. Indoor Firing Range Evaluation

Table 2-1
Non-powered makeup air system

	Observed Condition	Possible Causes	Corrective Action
1.	Low average velocity at firing line and neutral or slightly negative pressure differential	Exhaust fan speed rotations per minute (rpm) is set too low, fan is not designed to provide sufficient airflow cubic feet per minute (cfm), or fan is not operating properly (i.e., fan belt loose/slipping/worn, fan wired/installed backwards, etc.).	Increase the exhaust fan speed (rpm), replace fan with one capable of providing 50 feet per minute (fpm) average velocity at the firing line, or correct operating problems (i.e., replace fan belt, install/wire fan correctly).
2.	Low average velocity at firing line and negative pressure differentials greater than -0.1 inches wg.	Exhaust fan speed (rpm) set too low, fan is not designed to provide sufficient flow (cfm), or fan is not operating properly and one or more of the following: (1) plenum wall has insufficient open area, (2) makeup air damper has insufficient effective (open) area, or (3) makeup air damper not opening correctly.	Increase the exhaust fan speed (rpm), replace exhaust fan with one capable of providing 50 fpm average velocity at the firing line, or correct any operating problems and (1) increase open area of plenum wall (increase # or size of holes), (2) replace damper with one that has larger effective (open) area, or (3) repair damper.
3.	High average velocity at firing line and high negative pressure differential	Exhaust fan speed is set too high. Exhaust fan is designed to provide more air volume (cfm) than required to obtain 50 fpm at the firing line. The makeup air damper or plenum wall may have insufficient open area.	Lower the exhaust fan speed (rpm). Replace the fan with one capable of providing 50 fpm average velocity at the firing line. Increase the open area of the plenum wall or makeup air damper as necessary.
4.	High average velocity at firing line and neutral or slight negative pressure differential	Makeup air damper or plenum wall has too much open area and either: (1) exhaust fan speed is set too high, or (2) exhaust fan is designed to provide more air volume (cfm) than required to obtain 50 fpm at the firing line.	Replace the makeup air damper or plenum wall with one that has less open area and: (1) lower the rpm of the existing exhaust fan, or (2) replace the fan with one that provides an average velocity of 50 fpm at the firing line.

Table 2-1
Non-powered makeup air system (Continued)

	Observed Condition	Possible Causes	Corrective Action
5.	Turbulence at firing line	Air velocity through plenum wall is too high. Holes in plenum wall are different sizes or are not uniform Plenum does not extend full height and width of range Makeup air is not distributed into plenum uniformly (makeup air dampers on the side of the plenum are known to create this problem). Abrupt changes in ceiling height or wall configuration at or near the firing line.	Reduce air velocity through the plenum wall to 400-600 fpm by enlarging the holes to approximately 1-inch diameter. Make holes in plenum wall uniform and approximately 1-inch diameter. Extend perforated plenum wall the full height and width of the range. Add baffles or filters to provide uniform entry of makeup air into the plenum Provide a smooth transition in ceiling height or wall configuration.

Ventilation Troubleshooting Table
Information in this Table was Provided by USACHPPM

Table 2-2
Powered makeup air system

	Observed Condition	Possible Causes	Corrective Action
1.	Low average velocity at firing line and neutral or slight negative pressure differential	Exhaust and makeup air fans speed (rpm) is set too low. Exhaust and makeup air fans are not designed to provide sufficient airflow (cfm). Fans are not operating properly (i.e., fan belt loose/slipping/worn, fan wired/installed backwards, etc.).	Increase the speed (rpm) of the fans. Replace existing exhaust fan and makeup air unit with ones capable of providing 50 fpm average velocity at the firing line and 10 percent more exhaust than makeup air. Correct operating problems (i.e., replace fan belt, install/wire fan correctly).
2.	Low average velocity at firing line and negative pressure differential greater than -0.1 inches water gage (wg).	Makeup air fan not designed to provide sufficient flow (cfm), operating at low speed (rpm), or not operating properly. Plenum wall may have insufficient open area also.	Replace makeup air fan with one capable of providing 50 fpm average velocity at the firing line, increase the speed (rpm) of the existing makeup air fan , or correct any operating problems. Increase the open area of the plenum wall to provide 400-600 fpm average velocity through the holes.

Table 2-2
Powered makeup air system (Continued)

3.	Low average velocity at firing line and positive pressure differential (i.e., +0.1 inches wg.)	Exhaust undersized, set at too low a speed (rpm), or not operating properly and makeup air fan undersized or set at low speed (rpm). Makeup air volume exceeds exhaust air volume. Electrical interlock not in place or not functioning and makeup air unit undersized, set at a low speed or not operating properly.	Increase speed, repair, or replace makeup air fan to provide 50 fpm average velocity at the firing line and increase speed or replace exhaust fan to provide 10 percent more exhaust air than makeup air. Repair or install electrical interlock such that the exhaust fan starts prior to makeup air fan and repair/replace makeup air fan.
4.	Correct average velocity at firing line and high negative pressure differential	Plenum wall has insufficient open area.	Increase open area of plenum wall (increase # or size of holes).
5.	Correct average velocity at firing line and neutral pressure differential	Plenum wall has too much open area.	Decrease open area of plenum wall (decrease # or size of holes).
6.	High average velocity at firing line and positive pressure differential	Makeup air fan speed is set too high or fan oversized. Electrical interlock not in place or not functioning and makeup air fan running at too high a speed (rpm) or oversized.	Lower the makeup air fan speed (rpm) or replace the fan to provide 50 fpm average velocity at the firing line. Repair or install electrical interlock such that exhaust fan starts prior to makeup air fan and alter rpm/replace makeup air fan.
7.	Correct average velocity at firing line and positive pressure differential	Exhaust fan undersized, set at a low speed (rpm), or not operating properly (i.e., worn or broken belt, installed backwards, etc.). Electrical interlock not in place or not functioning.	Alter rpm or replace exhaust fan to provide 10 percent more exhaust air than makeup air. Repair or install electrical interlock such that exhaust fan starts prior to makeup air fan.

Table 2-2
Powered makeup air system (Continued)

8.	Turbulence at firing line	Air velocity through plenum wall is too high. Holes in plenum wall are different sizes or are not uniform. Plenum does not extend full height and width of range. Makeup air is not distributed into plenum uniformly (i.e., supply diffusers directed right at plenum wall). Abrupt changes in ceiling height or wall configuration at or near the firing line. Obstruction to airflow inside plenum, near plenum wall or firing line	Reduce air velocity through the plenum wall to 400-600 fpm by enlarging the holes to approximately 1-inch diameter. Make holes in plenum wall uniform and approximately 1-inch diameter. Extend perforated plenum wall the full height and width of the range. Modify direction of makeup air supply diffusers or add baffles or filters to provide uniform entry of makeup air into the plenum. Provide a smooth transition in ceiling height or wall configuration. Remove obstructions to airflow or baffle to reduce effect.

Ventilation Troubleshooting Table
Information in this Table was Provided by USACHPPM

2-2. Classification of Ranges

Based on inspection data collected on the range inspection checklist (Appendix F), 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. (Table 1-1). *Unsafe* ranges are not authorized for use under any conditions.

a. Building envelope. (Design standards may be found in National Guard Bureau Design Guide (DG) 415-1, 2-3.3.1 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 Appendix B of NG Pam 420-15 for wipe sample procedures used to determine if lead dust is migrating from the range).

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

(d) Carpet, drapes or other fiber like material 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 Appendix F of this document.

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 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 IFR does not enter into another part of the building or any other air supply system.

(f) The design performance of the exhaust fans exceeds the design performance of the make-up air fans by approximately 10 percent.

(g) Air is not re-circulated in the firing range unless equipped with monitoring equipment as specified in paragraph 4-4c of this regulation.

(h) The differential pressure, as measured from 6 inches inside the range entrance to 6 inches outside the range, is at least -. 05 inches of wg but does not exceed -.20 inches of wg.

(i) A smoke test of the range shows that the airflow in the range is in plug flow and that there is no turbulence at the firing line.

(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 forced draft and induced draft fans shall be interlocked to one switch.

(l) The door to the outside must open out.

(m) Ensure that gaps greater than ½ inch around or below the entrance of a doorway to the range are sealed.

(n) 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 adjacent 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 inches of wg or in excess of -. 2 inches of wg.

(h) The range is under positive pressure.

(i) Gaps greater than ½ inch around or below the entrance of a doorway to the range that are not sealed.

(j) 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, 50 foot-candles behind the shooter and 60 foot-candles at the firing line.

(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 20 foot-candles is provided behind the bullet trap for maintenance.

(2) *Unsafe* ranges.

(a) Illumination is below 100 foot-candles on targets, 50 foot-candles behind the shooter and 60 foot-candles at the firing line.

(b) Portions of the lighting fixtures are not protected by baffles.

(c) Electrical hazard exists in the range.

d. Bullet traps.

(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 paragraph 2-3.3.1, and this regulation.

(c) Forward edges in an 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. Welded seams are ground smooth.

(c) Any type of portable bullet stop is used.

(d) Forward edges in an 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 milligrams per cubic meter (mg/m^3)over an 8 hour period, see Table 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DOD personnel, lead levels do not exceed 0.03 mg/m^3 over an 8 hour period, see Table 1-1.

(c) For personnel 17 years of age or younger, see Table 1-1.

(2) Limited use ranges**.**

(a) For personnel exposed less than 30 days per year, lead levels exceed 0.05 mg/m^3 for an 8 hour period but do not exceed 1.0 mg/m^3 in any breathing zone or general area sample, see Table 1-1. Personnel exposures shall be controlled by limiting the shooters to the times described in Table 1-1.

(b) For personnel exposed more than 30 days per year and for all non-DOD personnel, lead levels exceed 0.03 mg/m^3 over an 8 hour period but do not exceed 1.0 mg/m^3 in any breathing zone or general area sample, see Table 1-1.

(3) *Unsafe* ranges**.**

Lead levels in air sample results exceed 1.0 mg/m^3 in any breathing zone or general area samples, see Table 1-1.

2-3. 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 NG Pam 420-15.

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 NG Pam 420-15, paragraph 3-3).

e. A hand-held ABC-type fire extinguisher is located near the entrance door, inside the firing range.

2-4. 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. The 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 *no*t permitted.

e. Dry sweeping of IFRs 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, "Shot" type rounds that disperse pellets & BBs, magnum (high velocity in excess of design specifications) and armor piercing rounds are *prohibited* in all IFRs except for the following:

(1) Air Rifles owned by the Junior Reserve Officer Training Corps (JRROTC) program (Daisy Model 873 .177 caliber Air Rifle or similar) that are purchased by the JRROTC for Marksmanship training specifically. These are considered Army Weapons.

(2) JRROTC students will follow guidance published in the JRROTC Marksmanship Instructor Course, and instructors will be qualified per JROTC published standards.

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 IFRs 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).

Chapter 3
Personal Protective Equipment

3-1. Personal Protective Equipment (PPE)

a. Eye protection. All personnel in an IFR during firing shall wear eye protection that meets the requirements of American National Standards Institute (ANSI) Z87.1-2004, Practice for Occupational and Educational Eye and Face Protection.

b. Hearing protection. All personnel in an IFR during firing shall wear ANSI approved hearing protection. When noise levels exceed 165 dBP, personnel must wear earplugs in combination with noise mufflers, DA Pam 40-501.

c. Respiratory protection. Required National Institute for Occupational Safety and Health (NIOSH) respiratory protection requirements for IFR conversions or cleanup operations are contained in NG Pam 420-15, paragraph 2-5.

3-2. Posting Warning Signs

a. The following signs shall be posted in or in the vicinity of IFRs 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) Storage of furniture or 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) Children under the age of six, pregnant women or women who are breastfeeding 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 and be visible to all shooters. This is to ensure that 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 385-63.

3-3. Range Standing Operating Procedures (SOP)

a. Each IFR shall have a written SOP, which is approved by the SOHM, see Appendix B.

b. Range SOPs shall include, as a minimum, the following:

(1) The requirement for establishment and maintenance of a log of visitors for the IFR. 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 RSO.

(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 paragraph 3-2 of this regulation.

(8) Cleaning and maintenance requirements.

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

(10) Ammunition/Weapon Malfunction reporting procedures IAW AR 75-1.

(a) Name and phone number of supporting Quality Assurance Specialist – Ammunition Surveillance.

(b) Name and phone number of Logistics Assistance Representative – Weapons.

(c) DA Form 4379 (Ammunition Malfunction Report).

(11) Special Packaging Instruction, DD Form 2169 (No. AM 1305 Demilitarization (5.56mm thru .50 caliber) – Packaging, packing and marking instructions for the preparation of various quantities of small arms ammunition for demilitarization due to loss of ammunition lot integrity or serviceability).

(12) Ammunition accountability briefing using DA Form 5515 (Training Ammunition Control Document).

(13) Amnesty Ammunition Policy and unexploded ordnance Safety Awareness Briefing.

(14) User Signature Page to document acknowledgement of procedures.

Chapter 4
Indoor Firing Range Inspections

4-1. Inspection Requirements

The first part of each inspection shall be the physical safety inspection conducted by the SOHM. Once the firing range has passed this portion of the inspection, the State Safety Office will contact an NGB Regional Industrial Hygiene Office for the ventilation survey and air sampling completion requirements.

4-2. Initial Inspections

a. An initial inspection of all new and renovated IFRs 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 Appendix F shall be used for this purpose. See paragraph 1-15 for record maintenance requirements.

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

4-3. Safety Requirements

a. A safety inspection of each active range shall be made annually to ensure that 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 Appendix F shall be used for this purpose.

b. In accordance with DA Pam 385-63, the annual inspection shall be performed within 45 days of the anniversary date of the initial inspection or the last annual inspection. See paragraph 4-7 for record maintenance requirements.

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

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

4-4. Ventilation Requirements

a. Measure ventilation every 480 hours of operation, after changes or additions have been made to the range, or every two years, whichever comes first.

b. Evaluate ventilation IAW procedures for supply and exhaust ventilation systems, firing line velocities and static pressure readings.

c. If air from the IFR exhaust ventilation system is re-circulated 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).

4-5. Air Sampling Requirements

a. Initial air sampling to determine airborne lead dust levels during prescribed firing procedures shall be conducted for all IFRs prior to routine use.

b. Air sampling shall be conducted for each type of ammunition to be used in the range.

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, after 480 hours of operation, or every two years, whichever occurs first.

d. The SOHM is responsible for ensuring that IFRs are measured for ventilation and air sampling to determine airborne lead concentrations. The inspector must be by a person certified and designated by a Regional Industrial Hygienist to perform inspections, evaluations, and determinations of IFRs IAW with OSHA standards, other nationally accepted standards, and accepted IH practices for maintenance, cleaning, conversion, ventilation, and air sampling of IFRs..

4-6. 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, to the SOHM, and to the CFMO (for project planning purposes). 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 4-2 above). Subsequent inspections shall be made as a follow-up check against results of previous inspections to ensure that required corrective actions have been accomplished, and there are no adverse changes to the buildings' integrity, safety equipment, environment or safe operating procedures.

4-7. Records Maintenance

The SOHM shall maintain a record of all inspections for each IFR 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.

Chapter 5
Range Operation and Control of Potential Lead Poisoning

5-1. Control of Potential Lead Poisoning [Occupational Safety and Health Administration (OSHA) Lead Standard]

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:

a. A description of each operation where lead is emitted.
b. Methods used to achieve compliance.
c. Report of the technology considered in meeting the permissible exposure limit.
d. Air monitoring data, which documents the source of air emissions.
e. A detailed schedule for implementation of the program.
f. Work practices including PPE, housekeeping, hygiene facilities and practices.
g. Administrative control schedule.

h. Personnel enrollment in medical surveillance.

i. Other relevant information.

5-2. Alternative Ammunition

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 HQDA and ARNG 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.

5-3. Maintenance Requirements

a. The following are minimum maintenance requirements, which shall be performed every three months by the RCO 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 differential pressure and compare it to the baseline differential pressure reading for every filter or filter set in the range and between the range and the outside. Differential pressure readings above the baseline on filter systems indicate not enough airflow and the requirement to change or clean the filters. Any other changes shall be reported to the State Safety and Occupational Health Office for further evaluation.

(3) Inspect louvers, if applicable, to ensure that 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. Bullet trap will be inspected after every firing event for individuals who are not organic ARNG soldiers.

b. The bullet trap will be cleaned every 480 hours of operation at a minimum, or when the trap is three quarters full.

c. The range ventilation system will be operational during all bullet trap cleaning procedures.

d. All personnel involved in cleaning of the bullet trap will wear a NIOSH (P-100) approved respirator, and proper personal protective equipment.

e. All debris from the bullet trap will be collected, package and turned in, IAW guidance from the environmental office.

5-4. Housekeeping

The commander/supervisor must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust for all active IFRs classified as *safe* or *limited use* . Routine housekeeping and maintenance is essential to keeping the range operating properly, and to controlling associated hazards.

a. Periodic cleaning.

(1) The ventilation system will be in operation during all cleanup operations, to ensure that a negative pressure environment is maintained.

(2) Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. When the wet method is utilized, pour the lead contaminated water into a 55 gallon plastic drum. Allow the water to evaporate until lead deposits or sludge appears.

(3) Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

(4) When performing the cleaning, clean the floor and all horizontal surfaces behind the firing line to the plenum wall and vacuum fifteen feet in front of the firing line.

(5) Cleaning should be performed every three months, or when there is a visible accumulation of lead dust.

b. Annual cleaning.

(1) The ventilation system will be in operation during all cleanup operations, to ensure that a negative pressure environment is maintained.

(2) Wet cleaning methods or vacuum cleaning with HEPA filtration shall be utilized during normal cleaning operations. When the wet method is utilized, pour the lead contaminated water into a 55 gallon plastic drum. Allow the water to evaporate until lead deposits or sludge appears.

(3) Dry sweeping, dusting, wiping or blowing with compressed air *shall not* be permitted.

(4) An approved NIOSH respirator (P-100) for lead exposure *shall be* used during cleaning operations.

(5) 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.

(6) 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.

(7) 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. Contact the ARNG State Environmental Office for disposal instructions.

(8) 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 ¾ full. Spent cartridge cases shall be collected and processed in accordance with ammunition inventory and accountability procedures, AR 710-2, and DA Pam 710-2-1.

(9) Prior to converting an IFR to other uses, the entire range area shall be properly decontaminated of any lead residue. Cleaning and decontamination instructions are prescribed in NG Pam 420-15, paragraphs 2-3, 3-2, 3-3, and 3-4.

5-5. Maximum Exposure Hours

a. Personnel exposure limits for intermittent atmospheric lead contamination are contained in a table of lead exposure limits (Table 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.

b. Intermittent exposures to lead in IFRs 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^3 or less.

c. 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^3. These records shall contain the airborne lead concentrations and the amount of time spent on the range for each individual.

d. Other potential lead exposure, including off duty firing, may contribute to an individual's overall exposure and should be considered in establishing maximum allowable exposure time.

5-6. Extent of Use

a. The extent of use for any IFR *shall be* based on permissible exposure of all using personnel to concentrations of airborne lead dust.

b. Under no circumstances shall pregnant women, or women who are breastfeeding be permitted in an IFR, IAW 29 CFR 1910.1025, Appendix C, Section II (5).

c. Personnel 17 years of age and younger are *prohibited* from entering any range area with a lead concentration greater than 0.100 mg/m^3, IAW Table 1-1. For ranges with lead concentrations less than 0.100 mg/m^3, follow the guidelines in Table 1-1.

d. Use of the IFR by non-military organizations shall be approved and documented in writing by the SOHM.

Appendix A
References

Section I
Required Publications

This section contains no entries.

Section II
Related Publications

American Conference of Governmental Industrial Hygienists (ACGIH)
Industrial Ventilation, current edition, "A Manual of Recommended Practices"

American National Standards Institute (ANSI) Z87.1-2004
Practice for Occupational and Educational Eye and Face Protection

AR 11-34
The Army Respiratory Protection Program

AR 40-5
Preventive Medicine

AR 40-66
Medical Record Administration and Health Care Documentation

AR 75-1
Ammunition Malfunction Procedures

AR 350-38
Training Device Policies and Management

AR 385-10
The Army Safety Program

AR 385-40
Accident Reporting and Records

AR 385-63
Range Safety

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

AR 420-70
Buildings and Structures

AR 710-2
Supply Policy Below the National Level

ARNG Design Guide (DG) 415-1
Design Guide for Armories

CEHND 1110-1-18
USACE (U.S. Army Corp of Engineers) Design Manual for Indoor Firing Range

DA Pam 385-63
Range Safety

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)

DHEW NIOSH 76-130
Lead Exposure and Design Considerations for Indoor Firing Ranges

DOD 6055.5-M
Occupational Medical Surveillance Manual

NGR 5-1
National Guard Grants and Cooperative Agreements

NGR 385-10
Army National Guard Safety and Occupational Health Program

NGR 415-5
Army National Guard Military Construction Program Development and Execution

NGR 420-10
Construction and Facilities Management Office Operations

NG Pam 420-15
Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges (IFRs

TB MED 502
Occupational and Environmental Health, Respiratory Protection Program

TB MED 506
Occupational and Environmental Health, Occupational Vision

TC 25-8
Training Ranges

TC 25-8-1
Army Special Operations Forces Training Ranges

29 CFR Revision, Part 1910
Occupational Safety and Health Standards

Section III
Prescribed Forms

This section contains no entries.

Section IV
Referenced Forms

DA Form 11–2–R
Management Control Evaluation Certification Statement

DA Form 285-AB-R
U. S. Army Abbreviated Ground Accident Report (AGAR)

DA Form 4379
Ammunition Malfunction Report

DA Form 4700
Medical Record-Supplemental Medical Data

DA Form 4753
Notice of Unsafe or Unhealthy Working Condition

DA Form 5515
Training Ammunition Control Document

DD Form 1390
FY __ Military Construction Program

DD Form 1391
FY __ Military Construction Project Data

DD Form 2169
Packaging Instruction, Special

NGB Form 420-R
OMNG Project Request

Appendix B
Example of Indoor Firing Range (IFR) SOP

STATE OF _____, DEPARTMENT OF MILITARY AFFAIRS
XXXX SOUTH MAIN STREET
SOMEWHERE, _____ XXXXX-XXXXX
_____ READINESS CENTER INDOOR FIRING RANGE
STANDING OPERATING PROCEDURE (SOP)

B-1. References.

a. AR 385-10, Army Safety Program, 29 February 2000.

b. AR 385-40, Accident Reporting and Records, 1 November 1994.

c. AR 385-63, Policies and Procedures for Firing Ammunition for Training, Target Practice and Combat, 19 May 2003.

d. DA Pam 385-63, Range Safety, 10 April 2003.

e. NGR 385-10, Army National Guard Safety And Occupational Health Program, 7 October 1988.

f. NGR 385-15, Policy, Responsibilities, And Procedures For Inspection/Evaluation And Use Of ARNG Indoor Firing Ranges, 30 March 1990.

g. Title 29 Code of Federal Regulations (CFRs), Part 1910.1025, Lead, Toxic and Hazardous Substances, Occupational Safety and Health Administration, Department of Labor.

h. Title 29 CFR, Part 1200, Hazard Communication, Toxic and Hazardous Substances, Occupational Safety and Health Administration, Department of Labor.

i. Title 29 CFR, Part 1926, Safety and Health Regulations for Construction, Occupational Safety and Health Standards, Occupational Safety and Health Administration, Department of Labor.

j. Title 29 CFR, Part 1960, Training, Basic Program Elements for Federal Employees OSHA, Parts 1960, Occupational Safety and Health Standards, Occupational Safety and Health Administration, Department of Labor.

k. Technical Guide 141, Industrial Hygiene Sampling Guide, February 2005.

B-2. Purpose.

The _____ Readiness Center IFR SOP is published to establish procedures to minimize the exposure of lead 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.

B-3. Review and Update.

This SOP will be approved upon appointment of a new commander and then 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.

B-4. General.

a. Each Officer In-Charge or Non-Commissioned Officer In-Charge (OIC/NCOIC) of range operations and the range safety officer (RSO) shall maintain a current copy, and be familiar with the provisions of this SOP, DA Pam 385-63 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.

c. All Range Control Officers (RCOs), OIC/NCOIC, and Safety Officers must be trained in the operations of the specific range and weapon and ammo safety.

B-5. Range Control.

a. The _____ Readiness Center Commander shall appoint, in writing, a Commissioned Officer, Warrant Officer, or a Senior NCO, E-7 or above, to the position of RCO.

b. The RCO is responsible to perform the following:

(1) Providing safe, functional ranges and training facilities, assigning priorities, notify Readiness Center personnel of times when the range shall be in use, coordinate and schedule all activity on the firing range, and issuing range equipment and targets.

(2) Enforcing the facility range safety program and SOP.

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

(4) Ensuring that the range is secured when not in use.

(5) Ensuring that nothing is stored at the range.

(6) Ensuring that all OIC/NCOICs and RSOs are thoroughly familiar with the weapons in use, and that the appropriate operators' manuals for the weapons are on hand.

(7) Ensuring that all accidents and incidents involving weapons and ammunition are investigated and reported by the unit leadership in accordance with AR 385-40 and NGR 385-10.

(8) Preparing a range OIC/NCOIC 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 NGR).

(9) Ensuring that mandatory signs listed in NGR 385-15, paragraph 3-2a are posted as required.

(10) Ensuring that all OIC/NCOICs and RSOs are trained on the proper operation for the range and weapons safety.

(11) Ensuring that all units, individuals, or organizations submit a complete risk assessment prior to authorization and use of a range.

(12) Ensuring that the required Personal Protective Equipment (PPE), such as hearing protection, is provided by the using unit and is used.

(13) Maintaining a Lead Abatement Plan. Ensuring that Industrial Hygiene has evaluated the range annually for lead. Maintaining all reports and evaluations.

(14) Maintaining and updating files of current and historical on the usage of the IFR.

B-6. RCO Qualifications.

His or her commander may appoint any individual in the rank of E-7 and above to be the RCO. Appointment orders for all RCOs shall be maintained on-file at the facility.

a. Commanders of each facility shall ensure that all RCOs have been properly instructed and are competent in performance of their duties as outlined in this SOP and DA Pam 385-63.

b. All RCOs shall attend the Range Safety Course.

c. 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.

B-7. Range OIC/NCOIC.

The commander or supervisor of all using units or groups shall designate an OIC/NCOIC 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 as outlined below and IAW DA Pam 385-63. The duties of the range OIC/NCOIC 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 familiar with the Accident Prevention Plan and have a current copy on hand prior to commencement of firing.

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

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

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

(9) 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.

(10) Implement risk management in all phases of the training events. A completed risk assessment will be submitted prior to authorization to the RCO before the range is to be used.

(11) Ensure that all weapons and ammo used on the ranges are authorized by the RCO.

(12) Ensure that all weapons must be safety checked before firing.

b. During Firing.

(1) Ensure that the RSO is physically present at the IFR training event.

(2) Ensure that weapons malfunctions/jams are cleared only at the direction of the RSO in accordance with the procedures established in the operators' manual for the weapon.

(3) Ensure that all ammunition malfunctions are reported to RCO IAW AR 75-1.

(4) Stop all training in the event of a serious accident or injury. Ensure that all accidents are investigated and reported IAW AR 385-40.

(5) Ensure that medical support is available.

(6) Ensure that weapons may only be fired from designated firing positions.

(7) Ensure that firers confine their firing to targets in their lane.

(8) Ensure that the required hearing and eye protection is available and used.

c. After Firing.

(1) 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.*

(2) 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.

B-8. RSO.

The commander or supervisor of all using units or groups shall designate an RSO in the grade of E-5 or above to be the responsible for the safe conduct of firing and proper use of the facilities. RSO will have no other duties during that period of training. The commander/supervisor shall ensure that all appointed individuals are qualified to perform their assigned duties as outlined below and IAW DA Pam 385-63. The duties of the RSO shall include but are not limited to the following:

a. Prior to firing.

(1) Receive training and a thorough briefing from the RCO, and conduct an inspection of the range with the RCO, or his/her designated representative.

(2) 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.

(3) Be physically present during all phases of IFR training events.

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

(5) Ensure that weapons and personnel are properly positioned.

b. During Firing.

(1) Ensure that personnel do not leave the firing line without the permission of the RSO.

(2) Ensure that the muzzle of each weapon is pointed downrange at all times. Personnel may holster their handguns after being cleared by the RSO to do so.

(3) Ensure that revolvers, when not in use, 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 RSO in accordance with the procedures established in the operators' manual for the weapon.

(5) Report all accidents to the OIC/NCOIC.

(6) Ensure that weapons are cleared and checked during temporary suspension of firing.

(7) Ensure that firing is stopped promptly when an unsafe act is observed or reported.

(8) Prohibit persons to walk in front of the firing line during firing. Lanes with inoperable target retrieval systems shall not be used.

(9) 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 and Occupational Health Manager (SOHM) to determine if the range has time limitations placed upon it.

(10) Ensure that the approved risk management plan is not deviated.

(11) Stop all firing in the event of a serious accident or injury.

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.

B-9. Range Restrictions.

a. Weapons authorized: _____

b. Ammunition authorized: The _____ Readiness Center is restricted to firing the following ammunition based upon manufacturer specifications:

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 SOHM.

c. Pellets, BBs, "Shot" type rounds that disperse pellets & BBs, magnum and armor piercing rounds are *prohibited* in all IFRs except for the following:

(1) Air Rifles owned by the Junior Reserve Officer Training Corps (JRROTC) program (Daisy Model 873 .177 caliber Air Rifle or similar) that are purchased by the JRROTC for Marksmanship training specifically. These are considered Army Weapons.

(2) JRROTC students will follow guidance published in the JRROTC Marksmanship Instructor Course, and instructors will be qualified per JROTC published standards.

d. Dry sweeping of the range is prohibited.

e. Trick shooting including, quick draw, cross shooting (shooting outside a single lane) and hip shooting is prohibited.

f. Storage of any item in the range is prohibited.

g. Smoking and consumption of food or beverages is prohibited.

h. Proper hearing and eye protection shall be worn during firing.

i. Civic groups with individuals under 17 years of age or younger are required to have written permission from the ARNG SOHM prior to firing.

j. Personnel shall not be allowed in the observation/plenum area during firing.

B-10. Medical Support:

Combat Life Saver with an aid bag.

B-11. Equipment Requirements:

a. Current Risk Assessment	Using Unit
b. Range SOP	Issued by Range Control
c. Targets	Issued by Range Control
d. Safety Paddles	Issued by Range Control
e. Clearing Rods	Issued by Range Control
f. Stapler/Staples	Issued by Range Control
g. FM and TM's	Using Unit
h. Hearing and Eye Protection	Using Unit

B-12. Personnel Requirements

a. OIC/NCOIC: E-6 or above.
b. RSO: E-5 or above.
c. Safety NCO's as determined by the OIC.
d. Combat Life Saver

B-13. 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.
(2) Danger Lead Hazard Area.
(3) Pregnant women are not permitted in this area.

B-14. Authorized Use of the Range.
Utilization of the _____ Readiness Center 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 _____.

B-15. Release of Liability.
a. The military Range Control Officer shall obtain a signed Release of Liability (Appendix D of this NGR) 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 NGR) form signed by a parent or guardian. *The ARNG SOHM shall be notified prior to minors firing on ARNG ranges.*

B-16. 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/Readiness Center

Commander

Appendix C
Indoor Firing Range Visitor and Limited Use Log

Name (Print) First, Mi, Last	Range In	Times Out	Number Rounds Fired	Caliber

Range Control Officer

Date of Range Use

Unit Designation
-Limited Use Log Visitor Log

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 Readiness Center; 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: _____

Appendix E
Indoor Firing Range Accident Response Plan

E-1. Occurrence of injury or mishap.
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 by phone at _____, or the staff duty officer, and the State Safety and Occupational Health Office by phone at _____.

f. The RCO, with the assistance of the SOHM, shall investigate the mishap and file a U.S. Army Accident Report, DA Form 285-AB-R "Abbreviated Ground Accident Report" as appropriate, in accordance with AR 385-40.

E-2. Reporting injury or mishap.
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.

Appendix F
Indoor Firing Range Inspection Checklist

Section I
Introduction

See paragraph 2-2 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 Control Officer _____ Telephone _____

Section II
Physical Safety Inspection
Indicate steps completed by checking off items.

F-1. Building Envelope

a. Each firing lane is at least 4 feet wide. [2-2a(1)(a)]

b. Pipes, conduits, and other projecting surfaces are baffled or covered by a material that shall protect these items and prevent ricochets. [2-2a(1)(b)]

c. Pipes, conduits and walls are sealed to prevent migration of lead dust from the range into other areas. [2-2a(2)(b)]

d. There are no open floor drains in the range. [2-2a(2)(c)]

e. There is no carpet, drapes or other fiber-like material in the range. [2-2a(2)(d)]

f. No windows or doors are located in front of the firing line. (Except access door to the back of the bullet trap) [2-2a(2)(e)]

g. The interior surfaces or the range floor, walls, and ceiling have no protruding edges or devices. (DG 415-1, 2-3.3.1)

h. The roof provides ballistic security. (DG 415-1, 2-3.3.1)

i. The walls provide ballistic security. (DG 415-1, 2-3.3.1)

j. Interior mortar joints are flush with the interior surface. (DG 415-1, 2-3.3.1)

k. The plenum wall is adequately supported and thick enough to avoid flexing. (DG 415-1, 2-3.3.1)

l. The entrance door to the range is weather-stripped unless the door acts as passive make-up air intake. (DG 415-1, 2-3.3.1)

F-2. Range Lighting

a. Lighting is uniform, non-glaring and does not cause shadows. [2-2c(1)(a)]

b. Illumination is at least 100 foot candles on the targets, 50 foot candles behind the shooter and 60 foot candles of task lighting at the firing line. [2-2c(1)(b)]

c. All lighting is protected by baffles and placed so that the shooter has an unobstructed view down range. [2-2c(1)(c)]

d. Downrange lighting begins approximately 18 feet from the firing line and ends approximately 8 feet from the target line. [2-2c(1)(d)]

e. Emergency lights are provided behind the firing line and are in working condition. [2-2c(1)(e)]

f. Exit lights are provided and working as required. [2-2c(1)(f)]

g. Lighting of at least 20 foot-candles is provided behind the bullet trap for maintenance (if applicable). [2-2c(1)(g)]

h. No known electrical hazards exist in the range. [2-2c(2)(c)]

F-3. Bullet traps

a. A bullet trap is permanently installed in the range. [2-2d(1)(a)]

b. Bullet traps are of a commercial design that complies with the requirements of CEHND 1110-1-18, NGB-ARI, and this regulation. [2-2d(1)(b)]

c. The thickness of inclined plate type bullet trap shall be adequate to attenuate the maximum caliber of ammunition authorized to be fired on the range. [2-2d(1)(b)]

d. All plate type bullet traps are designed to prevent ricochets by directing the projectiles in the same direction they are traveling. [2-2d(1)(b)]

e. Forward edges in a louver or venetian blind type bullet trap are maintained in a knife edge condition to prevent ricochets. [2-2d(1)(c)]

f. Steel bullet traps are not bowed, punctured or severely pitted. [2-2d(2)(a)]

g. Plates in the bullet trap are flush with the other plates. Welded seams are ground smooth. [2-2d(2)(b)]

F-4. Targets and target carriers

a. A target retrieval system is operable in all lanes. [2-2e(1)(a)] (Any one firing lane without a retrieval system shall not be used for firing)

b. The target retrieval system is constructed in such a manner as to minimize flat surfaces exposed to the firing line. [2-2e(1)(a)]

c. Only paper targets are used in the range. [2-2e(1)(b)]

F-5. Range use

a. The range is not used for any purpose other than firing. (2-3a)

b. The ventilation system is in operation at all times during firing or cleaning. (2-3c)

c. No equipment or furniture is stored or maintained in the range, plenum area or behind the bullet trap. (2-3d)

d. A hand-held ABC-type fire extinguisher is located in a recessed cabinet near the entrance door, inside of the firing range. (2-3e)

e. Personnel are *not* permitted in the plenum area during firing even if designed for observation. (2-4a)

f. All areas directly in front of the plenum walls are kept clear at all times. (2-4c)

g. Individuals other than maintenance and inspection personnel are not allowed to walk downrange. (Except in regularly cleaned area as needed to pick up brass) (2-4f)

h. 8. Pellets, BBs, magnum and armor piercing rounds are not used in the range. (2-4g)

i. No additional clothing or equipment is brought into the range. (2-4h)

F-6. Range maintenance

a. Dry sweeping does not occur in the range. (2-4e)

b. No brooms are located in the range. (2-4e)

c. An RCO is appointed for the range who is fully trained and aware of his/her responsibilities. (1-19)

F-7. Personnel protective equipment

a. All personnel in the range during firing wear ANSI approved eye protection. (3-1a)

b. All personnel in the range during firing wear ANSI approved hearing protection. (3-1b)

F-8. Posting of signs

a. The following signs are posted in or in the vicinity of the range: (3-2a)

(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) Storage of furniture or other items of equipment is *not* permitted in the range

b. The following signs are posted on the entrance door to the range: (3-2b)

(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, is located outside of the firing range to alert individuals that the range is in use. (3-2c)

d. Each firing lane is numbered at the firing line and at the bullet trap and be visible to all shooters. (3-2d)

e. A warning sign is posted outside of the access door to the bullet trap, which warns personnel not to enter. (3-2e)

F-9. Range SOP

a. The IFR has a written SOP, which is approved by the SOHM. (1-15c and 3-3a)

b. The range SOP includes as a minimum the following: (3-3b)

(1) The requirement for establishment and maintenance of a log of visitors for the IFR.

(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 RSO.

(3) Work practices including required, recommended, 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 3-2 of this regulation.

(8) Cleaning and maintenance requirements.

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

F-10. Recordkeeping

a. A visitors log is maintained which includes the following information for all visitors/shooters: [(3-3b(1)]

(1) Name and age of shooter.

(2) Organization (if civilian, include address and phone number).

(3) Sign in and sign out times.

(4) Type of ammunition used and number of rounds fired.

b. Copies of initial and other previous inspections are available. (4-2a)

c. The initial inspection report includes air-sampling data. (4-2b)

d. An OSHA compliance program is in place, which covers the required aspects. (1-18a)

e. All individuals using the IFR 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. (1-18h)

f. RCOs have documentation to show that they have been educated to the health effects from exposure to lead dust. (1-18j)

g. RSOs are designated. (1-20e)

F-11. New and Renovated Ranges

a. No doors are installed in the plenum wall.

b. Plenum area is at least 4 feet deep.

c. An access door is installed behind the bullet trap.

d. Only escalator or rubber bullet traps are installed.

Section III
Ventilation Inspection

F-12. Existing Ranges

a. The range has an operational mechanical ventilation system. [2-2b(1)(a)]

b. The minimum ventilation rate at the firing line in each firing lane is 50 fpm at all levels. [2-2b(1)(b)]

c. The ventilation system is so constructed that air exhausted from the IFR does not enter into another part of the building or any other air supply system. [2-2b(1)(e)]

d. The design performance of the exhaust fans exceeds the design performance of the make-up air fans by approximately 10 percent. [2-2b(1)(f)]

e. If air is re-circulated in the range, it is installed with a HEPA filter with a reliable back-up filter. [29 CFR 1910.1025(e)(4)(ii) and 4-4b]

f. If air is re-circulated 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) and 4-4b]

g. The fan(s) in the ventilation system is a single speed fan only. (DG 415-1,2-3.3.1)

h. A smoke test of the range shows laminar air flow and no turbulence in the range. [2-2b(1)(i)]

i. In non-powered systems, the supply air louvers and exhaust fan are electrically interlocked. [2-2b(1)(j)]

j. In power systems, the supply and exhaust fans are electrically interlocked. The make-up air fan should start slightly after the exhaust fan. [2-2b(1)(k)]

k. Gaps greater than ½ inch around or below the entrance of a doorway to the range are sealed. [2-2b(1)(m)]

l. Range air temperature is between 65 degrees and 80 degrees Fahrenheit. [2-2b(1)(n)]

F-13. New and Renovated Ranges

a. A manometer is installed in the duct work leading to the exhaust fan, which is capable of measuring at least 2.0 inches of static pressure.

b. Supply and exhaust fans are electrically interlocked with the downrange lighting.

c. The face velocity on supplied make-up and exhaust ducts does not exceed 2000 cfm per square foot of duct space.

d. Passive supply systems have opposing blade louvers.

e. Turning vanes are installed in all duct elbows, which have between 60° and 90° angles.

Section IV
Air Sampling

a. The physical safety inspection, Part 1 of the range inspection checklist, was completed and all requirements met on: _____.

b. The ventilation inspection, Part 2 of the range inspection checklist, was completed and all requirements met on: _____.

c. Air sampling has been scheduled for: _____.

d. Air sampling was completed on: _____ for the following types of ammunition: _____.

e. Air sample results do not exceed: _____mg/m^3 (results are attached).

f. For military personnel exposed less than 30 days per year, this range is classified as: _____ (*safe, limited use, unsafe*).

g. 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*).

h. For personnel under 17 years of age, this range is classified as: _____ (*safe, limited use, unsafe*).

Indoor Firing Range Inspected By (Print Name): _____
Signature: _____
Position: _____ Date: _____
Next Inspection Due By: _____

Appendix G
Management Control Evaluation Checklist

G-1. Function
The function covered by this checklist is the inspection, evaluation, and operation ARNG Indoor Firing Range Program.

G-2. Purpose
The purpose of this checklist is to assist commanders, managers, and supervisors in evaluating the key management controls outlined below. It is *not* intended to cover *all* controls.

G-3. Instruction
Answers must be based on the actual testing of key management controls (e.g., document analysis, direct observation, sampling, simulation, other). Answers which indicate deficiencies must be explained and corrective action indicated in supporting documentation. These management controls must be evaluated at least once every five years. Certification that this evaluation has been conducted must be accomplished on DA Form 11–2–R (Management Control Evaluation Certification Statement).

G-4. Test questions
a. Has the range been inspected to determine if it *safe*, *limited use*, or *unsafe*?
b. Are the RCO and RSO qualified and trained?
c. Is a visitor log maintained?
d. Does the IFR have a SOP?
e. Is the IFR being used for any other purpose than for firing?
f. Are individuals who require medical surveillance in a medical surveillance program?
g. Are eye and hearing protection provided to all when the range is in use?
h. Are all hazardous waste generated from range operation, cleaning and maintenance removed and disposed IAW federal and State regulations?

G-5. Comments
Help make this a better test for evaluating management controls. Submit comments to NGB-AVS-S (NGR 385-15), ARNG Readiness Center, 111 South George Mason Drive, Arlington, VA 22204-1382.

Glossary

Section I
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

CFMO
Construction and Facilities Management Officer

DA
Department of the Army

DA Pam
Dept of the Army Pamphlet

DARNG
Director, Army National Guard

DG
Design Guide

DOD
Department of Defense

fpm
feet Per Minute

HEPA
High Efficiency Particulate Air

HQDA
Headquarters Department of the Army

IAW
In Accordance With

IFR
Indoor Firing Range

JRROTC
Junior Reserve Officer Training Corps

mg/m^3
Milligrams per cubic meter

NIOSH
National Institute for Occupational Safety and Health

NGB
National Guard Bureau

NGR
National Guard Bureau Regulation

OIC/NCOIC
Officer In-Charge or Non-Commissioned Officer In-Charge

OSHA
Occupational Safety and Health Administration

Pam
Pamphlet

PPE
Personal Protective Equipment

RCO
Range Control Officer

rpm
revolutions per minute

RSO
Range Safety Officer

SOHM
State Safety and Occupational Health Manager

SOP
Standing Operating Procedure

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

TB MED
Technical Bulletin, Medical

TG
Technical Guide

wg
water gauge

Section II
Terms

Back splatter
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 back splatter.

Breathing zone
The imaginary globe of two feet radius surrounding the head.

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, ventilation requirements, air-sampling principles and terminology. He/she can collect air samples correctly use diagnostic ventilation evaluation equipment and interpret results. He/she can provide appropriate guidance in the abatement of known hazards and has the authority to do so. He/she has received written authorization from the regional industrial hygiene office to properly evaluate indoor firing ranges.

General area
Collection of and later analysis of airborne contaminants in a given work environment. As the sampling pump and collection media are not attached to a worker, the concentrations found represent average concentrations in that area but may not representative of the actual exposure of the worker.

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.

Industrial hygiene
The science and art devoted to the anticipation, recognition, evaluation, and control of those environmental factors or stresses, arising in or from the workplace, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among workers.

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.

Ranges classified as:
a. *Safe*: Are IFRs that after inspection and/or periodic inspection meet all safety requirements, ventilation requirements, and lead exposure requirements.
b. *Limited*: Lead concentrations are above 0.05 mg/m^3 for an 8 hour period but do not exceed 1.0 mg/m^3 in any breathing zone or general area sample.
c. *Unsafe*: Are IFRs that after inspection and/or periodic inspection do not meet all safety requirements, ventilation requirements, and lead exposure above 1.0 mg/m^3.

Ricochet
A ricochet occurs when the main body of the bullet is deflected off the surface of the bullet trap.

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 that the smoke does not circle back behind the firing line.

Section III
Special Abbreviations and Terms

This section contains no entries.