

**National Guard Regulation 385-63**

**Safety**

# **Army National Guard Range Safety Program, Policy, and Standards**

**Departments of the Army and the Air Force  
National Guard Bureau  
Arlington, VA 22202-3231  
8 June 2007**

**UNCLASSIFIED**

# *SUMMARY of CHANGE*

NGR 385-63

Army National Guard Range Safety Program, Policy, and Standards

This is a new Army National Guard regulation

- Establishes policy and procedures for use of a firing range and firing ammunition, explosives, and lasers.
- Incorporates the use of composite risk management for range operations (para 1-1).
- Establishes policy for the use of non-standard ammunition (para 1-4).
- Outlines range and training area operating procedures that must be addressed (para 1-4).
- Specifies responsibility for the Director, Army National Guard, to implement the Army National Guard Range Safety Program and sub-delegate deviation authority to the Adjutant General (para 1-5).
- Specifies responsibility for the Chief, Aviation and Safety Division, for staff oversight Army National Guard Range Safety Program (para 1-6).
- Specifies responsibility for the Chief Safety and Aviation Standardization Branch, to develop, implement, and manage Army National Guard Range Safety Program. Provide guidance on range deviations. Maintain a central register of all ranges and review range designs plans (para 1-7).
- Specifies responsibility for the Adjutant General, to establish a Range Safety Program within the State. Compliance with Army standards for surface danger zone criteria is met (para 1-8).
- Specifies responsibility for the State Construction and Facilities Management Officer, for reviewing and approving functionality, operability, and maintainability characteristics of all range construction projects for the State (para 1-9).
- Specifies responsibility for the State Safety and Occupational Health Manager, to manage the State's Range Safety Program to ensure compliance with Army policies. Is the point of contact for development and review of range deviation(s), and design review of range construction, modification, and renovation. Conduct periodic inspections of ranges to ensure compliance with all range safety requirements and surface danger zones (para 1-10).
- Specifies responsibility for the Army National Guard Center or Activity Commander, to implement the range safety program in consonance with the State Range Safety Program by appointing a Range Control Officer-in-Charge. Ensure routine monitoring of units during training by range control, safety and Quality Assurance Specialist-Ammunition Surveillance personnel, as required by Army policy. Develop installation level range regulations and/or standard operating procedures. Ensure that all users declare the type and quantity of ammunition to be expended, and that local ammunition supply points has appropriate documentation for units that arrive with their own ammunition (para 1-11).
- Specifies responsibility for the Range Control Officer, to provide oversight for all range safety matters. Develop safety range clearance procedures and establish and implement all feasible access controls and security measures to deter unauthorized access to ranges and impact areas. Ensure that commanders using laser comply with Army standards (para 1-12).

- Establishes prohibitions on Army National Guard ranges (para 2-3).
- Establishes the policy on the use of non-Department of Defense property (para 2-4).
- Integrates the use of composite risk management into all range operations (para 2-6).
- Outlines requirements for deviations from range standards and procedures (para 3-1).
- Outlines the delegation of authority (para 3-2).
- Prescribes the range deviation process (para 3-3).
- Annual inspection and evaluation of all ranges located on Army National Guard training centers (para 3-6).
- Outlines the surface danger zone considerations (para 4-1).
- Establishes laser range safety requirements (para 4-3).
- Establishes shoot house safety requirements (para 4-4).
- Establishes range clearance and unexploded ordnance operations (para 4-5).
- Outlines Federal aviation airspace coordination requirements (para 5-1).
- Outlines requirements for medical support (para 6-3).

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Arlington, Virginia 22204-1382  
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NGR 385-63

**Safety**

**Army National Guard Range Safety Program, Policy, and Standards**

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**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**

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**History.** This is a new regulation.

**Summary.** This regulation provides policy and responsibilities for the Army National Guard (ARNG) Range Safety Program. It prescribes standards and procedures for firing ammunition, explosives, and lasers.

**Applicability.** This guidance applies to all ARNG units, units of other components or services, government agencies and private organizations/groups when training (firing) on ranges owned or operated by the ARNG, or where range safety criteria is not as stringent as outlined in this policy. This regulation applies to ARNG units training on other component's ranges when that component's standards are less stringent than those contained in this policy.

**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.** Supplementation of this regulation is prohibited without prior written approval of the Chief, National Guard Bureau (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 385-63), ARNG Readiness Center, 111 South George Mason Drive, Arlington, VA 22204-1382.

**Distribution.** A

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## Chapter 1 General Provisions

### Section I Introduction

#### 1-1. Purpose

This regulation provides guidance for application of composite risk management (CRM) in range operations. It is to be used in conjunction with AR 385-63, Department of the Army (DA) Pamphlet (Pam) 385-63, AR 385-64, DA Pam 385-64, and NGR 385-15, which prescribe general safety policies and procedures for training with ammunition, explosives, missiles, rockets, and lasers. The Surface Danger Zones (SDZs) prescribed in DA Pam 385-63, and the provisions of the applicable regulations referenced above, represent minimum safety requirements. These requirements are adequate and effective only when employed with properly functioning safety equipment and devices, and when trained and competent personnel follow published procedures. When the standards of DA Pam 385-63 or NGR 385-63 conflict with other military service, or Federal agency standards, the standards providing higher degree of protection apply.

#### 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. It is the policy of the ARNG to design and utilize firing ranges and associated ammunition and explosives in a responsible manner, consistent with current Environmental and Occupational Safety and Health laws and regulations so a range deviation is not required. Whenever SDZs are updated and published the most current SDZ will be used and complied with.

b. The use of nonstandard ammunition and explosives is prohibited. Exceptions are outlined in AR 385-63.

c. All range and training area operating procedures must address, at a minimum:

- (1) Access and egress control
- (2) Control and coordination of training facilities
- (3) Environmental compliance
- (4) Composite risk management
- (5) Communications
- (6) Accident reporting
- (7) Fire-fighting
- (8) Ammunition and munitions handling
- (9) Medical support
- (10) Special Use Airspace (SUA)
- (11) Range safety requirements and procedures
- (12) Severe weather conditions and precautions
- (13) Restricted areas

d. To the extent practical, ARNG personnel will strive to minimize both potential explosive hazards and harmful environmental impacts, and promote resource recovery and recycling.

e. The ARNG Range Safety Program, under the purview of this regulation will –

- (1) Support/enhance safe, realistic live-fire training, enabling ARNG personnel to train as they fight.
- (2) Protect personnel and property while improving combat readiness training, and aid in the prevention of fratricide in combat.
- (3) Protect civilian and military populations who live and work in the vicinity of live-fire training ranges.
- (4) Prevent related injuries and property damage by introducing CRM early in the planning process for routine training on live-fire ranges, new range construction, and range renovation, or modification.

f. Any accident or incident occurring under an approved ARNG deviation will be cause for automatic termination (invalidates or voids) of the deviation, until an accident investigation, performed in accordance with (IAW) AR 385-40, is completed and the deviation has been revalidated by the approving authority the Adjutant General (TAG).

g. Range deviations will not be used to circumvent compliance with safety criteria, as this practice can potentially corrupt the CRM process.

## **Section II Responsibilities**

### **1-5. Director, Army National Guard (DARNG)**

The Director, ARNG, establishes policy and provides resources necessary to implement the ARNG Range Safety Program per AR 385-10, AR 385-63, and DA Pam 385-63. The DARNG does not have the authority to grant exceptions to the prohibitions listed in paragraph 2-3 of the regulation. The DARNG has sub-delegated deviation authority to TAGs as outlined in paragraph 3-2 of this regulation.

### **1-6. Chief, Aviation and Safety Division (NGB-AVS)**

The Chief, Aviation and Safety Division (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 IAW regulatory guidelines to include AR 385-63 and DA Pam 385-63.

b. Coordinate with other Headquarters, Department of the Army (HQDA) staff agencies and TAGs on matters pertaining to the ARNG Range Safety Program.

### **1-7. Chief Safety and Aviation Standardizations Branch (NGB-AVS-S)**

Chief Safety and Aviation Standardizations Branch (NGB-AVS-S), is responsible to –

a. Develop, implement, and manage the ARNG Range Safety Program IAW AR 210-20, AR 385-63, DA Pam 385-63, and this regulation.

b. Review and provide recommendations to appropriate approval authority for the following:

(1) Range SDZ placement on range construction plans submitted to NGB-ARI-C in the course of project development and approval.

(2) Provide guidance for Range deviations as outlined in AR 385-63 and DA Pam 385-63.

(3) Laser range facilities, to include providing coordination support for evaluation and approval actions.

c. Maintain a central register of all range deviations and provide assistance and coordination for development of range deviations as requested by State Safety and Occupational Health Managers (SOHM).

d. Review range design plans (to include support structures and facilities) to ensure that safety requirements are adequately addressed prior to new range construction or modification or renovation of firing ranges and/or weapons training facilities.

### **1-8. The Adjutant General (TAG)**

The Adjutant General (TAG) is responsible for establishing a Range Safety Program within the State. The TAG ensures that ranges and their facilities comply with SDZ and other safety criteria outlined in AR 385-63, DA Pam 385-63, AR 385-64, and AR 11-9. The TAG is the approval authority for placement of all SDZ as prescribed in DA Pam 385-63; recommended by both the Training Center Commander and the SOHM.

### **1-9. State Construction and Facilities Management Officer**

The State Construction and Facilities Management Officer is responsible to –

a. Review and approve functionality, operability, and maintainability characteristics of all range construction projects for the State.

b. Lead the development, justification, and execution of all range construction projects in design and construction for the State.

c. Coordinate fully with all facility users, functional proponents, and other appropriate State staff elements to ensure that the maximum functionally and usability of each range project and to ensure that the project complies with all

statutory, regulatory, and code requirements (e.g., environmental, range safety, explosive safety, safety and occupational health).

- d. Ensure that the SOHM is apprised of all pending range construction projects and all construction that will be located adjacent to existing ranges.
- e. Ensure that all SDZs are identified on the master plan for the each ARNG Training Center. This should be assessed annually or whenever the master plan is updated or reviewed for action.
- f. Coordinate development of associated construction documents (DD Form 1390/91s) and SDZs with the SOHM, as appropriate.
- g. Ensure that range construction conforms to latest U.S. Army Engineer planning criteria as established by Training Circular (TC) or other official means of communication.

#### **1-10. State Safety and Occupational Health Manager (SOHM)**

The State SOHM will on behalf of the TAG –

- a. Manage the State's Range Safety Program to ensure compliance with Department of Defense (DoD), DA and ARNG policy.
- b. Serve as the State's point of contact for development and review of range deviation(s), and design review of range construction, modification, and renovation.
- c. Conduct periodic inspections of ranges to ensure compliance with all range safety requirements. This includes annual reviews of each range's existing and approved SDZ. If the range has an existing deviation, compliance with deviation controls and conditions will also be reviewed.
- d. Ensure that all firing ranges that are owned by, licensed to, operated by or leased for the State comply with the safety provisions contained in AR 385-10, AR 385-63, DA Pam 385-63, AR 385-64, AR 11-9, NGR 385-15, NG Pam 420-15 (as applicable), and this regulation.
- e. Review and recommend approval by the approving authority for siting of ranges using standard SDZ criteria for direct fire and indirect fire ranges owned and/or operated by the State prior to any member of the armed services conducting live fire training.
- f. Conduct annual review of all range deviations to assess the State's ability to eliminate the need for deviation by range redesign, or rebuilding.
- g. Evaluate the overall effectiveness of the Range Safety Program annually to ensure that the range safety program is being implemented in accordance with AR 385-63, DA Pam 385-63, and state range regulations and procedures, and this regulation.
- h. Review local range safety policies and operating procedures annually.
- i. Coordinate through NGB-AVS-SG for Director, Army National Guard Safety and Standardization design review of proposed ranges, prior to construction of a range facility that cannot comply with standard SDZ criteria.
- j. Participate in final acceptance inspection of all firing ranges, weapons training facilities, and related structures following new construction, renovation, modification, repair, or renovation.
- k. Review proper use of SUA and airspace outside SUA utilized for live-fire training.
- l. Take appropriate action(s), including closing (suspension of live-fire operations), to control hazards on ranges determined to be unsafe.
- m. Ensure, through State regulation, policy, or Standing Operating Procedure (SOP), that risk assessments are performed prior to conduct of operations on all assigned ranges.
- n. Establish a laser range safety program that complies with AR 11-9, AR 385-63, DA Pam 385-63, and this regulation.
- o. Assist assigned Training Center Commanders, Range Control Officers, Public Affairs Officers, and explosive ordnance disposal (EOD) teams as required, in developing and implementing an on and off-post range safety and dud awareness educational program targeted to children (kindergarten through 12th grade.), and the general public.
- p. Monitor the Officer in Charge (OIC) and Range Safety Officer (RSO) training program effectiveness.

#### **1-11. ARNG Training Center or Activity Commander**

The ARNG Training Center or Activity Commander (or other responsible position for range operations) will –

- a. Appoint a Range Control OIC to implement the range safety program in consonance with the SOHM.
- b. Ensure routine monitoring of units during training by range control, safety and Quality Assurance Specialist-Ammunition Surveillance (QASAS) personnel, as required by AR 385-63, and DA Pam 385-63. Develop installation level range regulations and/or SOPs. Ensure that all users declare the type and quantity of ammunition to be expended,

and that local ammunition supply points (ASP) has appropriate documentation for units that arrive with their own ammunition. With regard to Joint Munitions Command electronic notices of Ammunition and Explosives (AE) suspended and/or restricted from use (TB 9-1300-385) and AE malfunctions (AR 75-1) shall:

(1) Ensure that each range control office provides the Joint Munitions Command an email address for receipt of AE messages that require immediate action.

(2) Ensure that each AE range control office forward units occupying ranges all relevant AE messages and information.

(3) Ensure that reports of AE malfunctions that occur on ARNG ranges or training areas are properly reported IAW AR 75-1.

c. Withdraw or suspend installation training complex privileges for willful violation of State and/or installation range requirements.

d. Ensure that incidents and accidents involving weapons or ammunition are reported and investigated IAW AR 75-1 and AR 385-40.

e. Establish medical support SOP for all range operations.

f. Provide explosives safety training including unexploded ordnance (UXO) identification and notification procedures. Procedures must include actions to be taken if individuals authorized access to areas known or suspected of containing UXO, encounter them.

g. Restrict authorized access to areas known or suspected of containing UXO to personnel trained in UXO identification and procedures to be taken should UXO be encountered. UXO trained personnel will include fire prevention and emergency response personnel. Ensure that installation master plan map identifies all UXO restricted areas, impact areas, ranges, and SDZs.

h. Ensure that all ranges and UXO areas have warning signs and fencing as outlined in DA Pam 385-63, Chapter 2.

i. Ensure (to the extent practical) that targets placed on ranges do not contain hazardous materials (such as, petroleum, oils, lubricants, radium dials, and batteries).

j. Establish safe and practical methods for recycling or disposing of range residue IAW DoD Manual 4160.21-M.

k. Ensure that range residue, to include cartridge cases, ordnance-derived waste and targets, do not contain ammunition, explosives or other dangerous articles prior to release from DoD control.

l. Prohibit controlled burning of vegetation on ranges as a method to clear UXO. Controlled burns are authorized to control dense brush or undergrowth or to clear a range of vegetation to make UXO operations safe for personnel conducting the clearance operation. In such cases, Fire Prevention and Protection personnel will be notified and pre-positioned as appropriate.

m. Establish procedures to promptly respond to a release or substantial threat of release on or off range when such a release poses an imminent and substantial threat to human health or the environment.

n. Ensure the following actions for ranges other than those suspected of containing improved conventional munitions (ICMs) or submunitions:

(1) DCSOPS (DAMO-TR), Director of Army Safety, Deputy Chief of Staff of Logistics (DALO-AMA), NGB-ARE, and NGB-AVS-S are informed of any ranges or other areas known or suspected of containing ICMs or submunitions.

(2) Ranges or other areas known or suspected to contain ICMs or submunitions are clearly marked and entry to these areas restricted and access is controlled.

o. Prohibit all activities on ranges or other areas known or suspected of containing ICMs or submunitions unless a deviation, approved by the Director of Army Safety, the DCSOPS (DAMO-TR), is obtained. Coordination with NGB-ARE is required to obtain such deviations.

p. Comply with the requirements of AR 385-63, DA Pam 385-63, DA Pam 385-64, and this regulation for requesting deviations to the restrictions on maintenance, characterization, or clearance of ranges or other areas known or suspected to contain UXO, ICMs or submunitions.

q. Establish and conduct an aggressive education program for all ARNG/installation personnel, Public Affairs Office, their families (as appropriate), and the general public on the dangers of dud ammunition and other UXO.

r. Ensure that the requirements for malfunction or misfire incident reporting are included in the Range Control SOP. The SOHM and QASAS must be notified as required by appropriate technical and regulatory guidelines, see AR 75-1, AR 385-63, and DA Pam 385-63.

**1-12. Range Control Officer**

The Range Control Officer is responsible for --

- a. Range Control Officer duties shown in DA Pam 385-63, paragraph 1-6b.
  - b. Publish (electronic), update and distribute range activity schedule to appropriate training site staff that have a need to know (ASP, QASAS, Safety, Fire Department, etc). Schedule should include any future range reservations identifying unit identification code and type/quantity ammunition forecasted for expenditure.
  - c. Develop installation level range regulations and/or SOPs.
  - d. Develop safety SOP for range clearance operations using the CRM process and the requirements of AR 385-63 and DA Pam 385-63.
  - e. Prohibit unauthorized personnel from entering the impact area(s).
  - f. Maintain a permanent record of all munitions expended to include an estimated dud rate, by type, quantity, DoD Identification Code, location and using organization. Permanent records must include documentation of all UXO clearance operations or EOD incidents on the range.
  - g. Establish and implement all feasible access controls and security measures to deter unauthorized access to ranges and impact areas.
  - h. Ensure that all ranges owned and/or operated by the Training Center (or state) have approved SDZs prior to allowing any member of the armed forces to conduct live-fire training. All SDZs must have the concurrence of the SOHM.
  - i. Develop initial placement of standard SDZs for new ranges. Submit SDZ placement diagrams to SOHM for review and concurrence prior to submission to approval authority.
  - j. Upon determination that a range deviation is required, compile the required information IAW DA Pam 385-63, this regulation and in coordination with the SOHM.
  - k. Comply with AR 11-9, AR 385-63, DA Pam 385-63, State Laser Range Safety program requirements, and this regulation in establishing ranges and non live-fire training areas for laser use.
  - l. Ensure that firing or lasing unit commanders –
    - (1) Determine, select, train, and safety certify the personnel needed to assist them in complying with AR 385-63, DA Pam 385-63 (e.g., Laser RSO, and Laser Range Safety Noncommissioned Officer operators).
    - (2) Develop SOP for laser operations. Instruct personnel involved in laser operations to provide an understanding of the hazards for specific devices, allay unfounded fears, and prescribe the personal protective equipment to be used, as required by the State Laser Range Safety Program.
    - (3) Ensures that the Laser RSO or Laser Range Safety Noncommissioned Officer –
      - (a) Becomes familiar with AR 385-63, DA Pam 385-63, this chapter and the Field Manuals (FMs) and Technical Manuals applicable to the devices to be used.
      - (b) Briefs the unit personnel who work with the devices, including an explanation of laser-related hazards and safety devices.
      - (c) Knows the azimuths and elevations of each range, firing position, and targets to be used.
      - (d) Ensures that protective eyewear is used when required for all range personnel to include visitors.
      - (e) Ensures compliance with the unit SOP for laser operations.
      - (f) Maintains continuous communications with personnel in the target area, and ceases lasing operations immediately if communication is lost.
      - (g) Ceases lasing operations immediately if positive control of laser beam is lost.
      - (4) Requires personnel who have received eye or other overexposure to seek medical treatment as prescribed by paragraph 4-3a(5) of this regulation.
      - (5) Ensures that at least one soldier watches downrange for vehicles or aircraft beyond the target area.
- WARNING: BINOCULARS WILL NOT BE USED FOR THIS SURVEILLANCE AND THE LOOKOUT MUST NOT LOOK DIRECTLY AT THE TARGET DURING LASING.**
- (6) Provides adequate control of the target area to prevent unauthorized entry.

## Chapter 2 Range Operations

### 2-1. Range Construction and Standard Surface Danger Zones

a. The goal of all range construction projects for the ARNG is to provide tough, realistic, battle focused training for the service personnel who use them. All ARNG ranges will be designed IAW the latest Army Corps of Engineer guidance published in TC 25-8, and other pertinent sources of information. When designing and constructing ranges, engineers and design teams will:

- (1) Remove as many hazards as possible by engineering.
- (2) Remove remaining hazards through legislation or regulations.
- (3) Remove remaining hazards through CRM and leadership at the appropriate level.

b. All new range construction and modifications to existing ranges, to include use of new weapons for which the existing range was not initially designed, shall have SDZs plotted IAW DA Pam 385-63. The ArcGIS range management tool kit may be used to determine the SDZ.

c. The SOHM may only concur with or approve SDZs that meet the standards contained within AR 385-63, and DA Pam 385-63. If the State proposes to construct a nonstandard range that does not comply with established SDZ criteria, assistance shall be requested from the Chief, Safety and Occupational Health Branch (NGB-AVS-S) to obtain support from Army safety agencies to develop the nonstandard SDZ, as required.

d. Bat wing SDZs will be applied where ricochet hazards exist. The bat wing SDZ should be considered when designing ranges that involve fire and movement, or where ricochet hazards outside the range complex boundary may endanger nonparticipating personnel, or the general public. If a range has a ricochet hazard and the range does not meet the bat wing criteria a deviation must be prepared and approved IAW with chapter 3 of this regulation.

### 2-2. Training Aids, Devices, Simulators, and Simulations and Improvised Explosives Device Simulators

Ammunition that has been modified or is being used for other than its intended purpose can cause serious injury or death and is a violation of Army regulations.

- a. Army policy regarding Training Aids, Devices, Simulators, and Simulations is contained in AR 350-38.
- b. Use of "Demolition Effects Simulators" by other than MOS qualified Soldiers and for other than their intended use for purposes of training is not authorized.
- c. Using and/or modifying an ammunition/explosive item is prohibited.
- d. The construction of Improvised Explosive Device as simulators for the purpose of enhancing training realism (i.e. attaching practice grenade simulators/fuzes inside packages of flour) is prohibited.

### 2-3. Prohibitions

Unless approved by the Chief of Staff, U.S. Army, and the following activities are expressly prohibited on ARNG ranges or training areas:

- a. Firing of ICMs for training and demonstration by any DoD organizations. This is an absolute prohibition for the ARNG, and will not be circumvented.
- b. Firing of ammunition, pyrotechnics, missiles, and/or rockets over ASPs, field ASPs, or any ammunition storage areas.
- c. Firing of ammunition, pyrotechnics, missiles, and/or rockets over Ammunition Holding Areas.
- d. Firing of Depleted Uranium ammunition.
- e. Placing of unprotected personnel in designated areas of the SDZ as identified in DA Pam 385-63, except as outlined in paragraphs 3-1 and 3-4 of this regulation.
- f. Overhead fire above unprotected personnel with ammunition, pyrotechnics, missiles, and/or rockets unless specifically authorized by DA Pam 385-63 and for lots cleared in appropriate appendices of TB 9-1300-385.
- g. The use of ranges or training areas known or suspected to contain UXO for recreational purposes.
- h. Entry into High Explosives dud contaminated areas to extinguish fires:
  - (1) This is considered an extremely high-risk operation that requires a thorough risk assessment and approval by TAG of the State/Territory.
  - (2) Supporting Fire and Emergency Services should be notified of the presence of UXO and the prohibition against fighting fires in such circumstances.
  - (3) Operations orders, emergency response plans, contingency plans, pre-accident plans, local policies and SOPs must properly address this prohibition.

- i. Live mine training other than that permitted by DA Pam 385-63, including –
  - (1) Burying live mines for training purposes.
  - (2) Trip wires, booby traps, or tilt rods used separately or collectively with live mines in training.
  - (3) Conducting live mine and practice mine training concurrently/simultaneously at the same location.
- j. Arming/disarming live mines more than 25 iterations per mine IAW Chapter 17-9b(1), DA Pam 385-63.
- k. Training with non-self-destructing (NSD) antipersonnel land mines except as authorized by the National Command Authority. ARNG requests for National Command Authority approval for use of NSD antipersonnel land mines will be furnished to the Director, Army National Guard, ATTN: NGB-AVS-S for historical purposes. When training with NSD antipersonnel land mines the following additional restrictions apply:
  - (1) No training with live M14 mines is authorized on ARNG ranges or training areas.
  - (2) No training with the M16 anti-personnel mine without the positive safety pin installed in the M605 fuze is authorized on ARNG ranges or training areas.
  - (3) No training with the M16 anti-personnel mine using pre-1957 M605 fuzes is authorized on ARNG ranges or training areas.

#### 2-4. Use of non-DoD Property

- a. This regulation does not preclude the use of property not on the Facilities Inventory and Support Plan for ARNG military activities. AR 405-10, AR 405-80, and NGR 405-80 contain mandatory guidance regarding acquisition of real property and the necessary approval requirements.
- b. Interservice/Intragovernmental Support Agreements, prescribes specific ARNG criteria for establishing agreements between the ARNG and non-DoD agencies.
- c. ARNG-operated ranges and training areas owned by non-DoD entities, to include private landowners, subject to the terms of any agreements with the owner for leasing or operation of the range or training area, are subject to the requirements of HQDA.
- d. All SDZs for the ARNG will be wholly contained on property owned or leased by the State in which the SDZ is located.
- e. The SDZs for non-DoD owned training areas must meet the requirements of this regulation, AR 385-63, DA Pam 385-63 and applicable regulations of other military services using the land in conjunction with the ARNG.
- f. SDZs must meet applicable environmental and local regulations.
- g. A formal agreement between the State and the owner(s) of the non-DoD owned property is mandatory, as prescribed by AR 385-63, DA Pam 385-63, AR 405-80, NGR 405-80, and NGR 5-1.
- h. All ARNG agreements to utilize non-DoD owned property must contain provisions to control access to training area(s) by authorized personnel, preclude entry of unauthorized personnel, and ensure decontamination of training area(s) prior to release from ARNG control.
- i. ARNG commanders that require the use of non-DoD owned ranges or facilities for training will –
  - (1) Submit a request for Safety review and certification of the non-DoD owned range or facility to the SOHM.
  - (2) Provide the SOHM with maps and/or drawings of the range or facility that depict overlaid SDZs for the desired weapons systems.
  - (3) Provide the SOHM with the specific training scenarios projected for the range or facility.
  - (4) Develop an SOP, and/or revise an existing SOP to include specific operational requirements for the range or facility. Provide SOP to the SOHM.
  - (5) Provide the SOHM with copies of applicable support and/or land use agreements for the range or facility.
  - (6) Provide SOHM with a point of contact for non-DoD owned range or facility.
  - (7) Ensure that the non-DoD owned range or facility meets the requirements of AR 350-19.
  - (8) Implement hazard controls prescribed in the range certification and approval, and as recommended by the SOHM.
- j. The SOHM will –
  - (1) Review the request for ARNG use of non-DoD owned range or facility for completeness.
  - (2) Conduct a range safety inspection.
  - (3) Perform a risk assessment of the proposed range or facility, using DA Form 7566.
  - (4) Provide a recommendation to the TAG for approval/non approval of the request, based on inspection findings and NGB-AVS-S review comments and recommendations.
  - (5) Provide applicable commanders with copies of approval/non approval memorandum.

- (6) Maintain copies of non-DoD range or facility certifications on-file.
- (7) Perform annual range safety or facility inspections to ensure continued safe use by ARNG personnel.

## **2-5. Other Army Components/Military Services/Agencies**

Army Components (U.S. Army Active and U.S. Army Reserve), and Military services other than ARNG as well as local, state and Federal agencies may use ARNG ranges and training areas at the discretion of TAG or designated representative.

- a. Agencies that require the use of ARNG ranges and training areas must comply with this regulation, AR 350-19, AR 385-63, DA Pam 385-63, MIL-HNDBK-828A (as appropriate), and NGR 5-1.
- b. Requests for use of ARNG ranges and training areas shall include all technical data regarding the munitions, weapons systems, and tactics to be used. This will augment the review process and aid in determining the adequacy of the range or training area for the proposed operation and ensure the proper application of the CRM process.
- c. Intraservice/Intragovernmental Support Agreements, prescribes specific ARNG criteria for establishing agreements between the ARNG and non-DoD agencies.
- d. Storage and/or disposal of Non-DOD Hazardous Materials (Ammunition & Explosives) requires NGB-AVS-SG review and DARNG approval.

## **2-6. Composite Risk Management**

The CRM process described in FM 5-19, FM 3-0, and AR 385-10, will be used to manage risks during all ARNG live-fire-training activities. Additionally, CRM will be used to identify range hazards and implement appropriate controls in the development of installation and unit range regulations and SOPs.

- a. When the application of the CRM process results in deviation to the SDZ requirements –
  - (1) Modification of the prescribed firing procedures is authorized provided the provisions of this regulation and AR 385-63 and DA Pam 385-63 are met.
  - (2) Personnel not directly participating in the actual conduct of training are authorized within the SDZ, provided the provisions of paragraph 3-3 of this regulation and AR 385-63 and DA Pam 385-63 are met.
- b. Personnel and units using ARNG ranges or training areas will employ CRM procedures to identify operational hazards and implement appropriate controls in order to minimize mission risk.
- c. ARNG units will document the formal CRM process for major training exercises, such as Combined Arms Live Fire Exercise scenarios, prior to execution and for all operations with high or extremely high residual risk.
- d. The DARNG is the sole approval authority for ARNG operations where the residual risks is extremely high, after the implementation of hazard controls per AR 385-63.
- e. TAG or designated representative may approve the following activities on ARNG ranges provided a risk assessment has been performed IAW this regulation, FM 3-0, FM 5-19, AR 385-10, and in keeping with the requirements of AR 350-19 –
  - (1) Recreational activities on ARNG ranges or training areas:
    - (a) At locations other than temporary or permanent (dud-producing) contaminated impact areas: Outdoor recreational activities in such areas are expressly prohibited, without exception, by paragraph 4-20 of AR 350-19.
    - (b) Hunting, fishing, prospecting, or other recreational activities are expressly prohibited in officially designated or marked dud-contaminated impact areas on ARNG ranges or training areas.
    - (c) Range Control/Safety, and the SOHM, in coordination with the State Environmental Office (natural resources managers) shall determine recreational use area boundaries in and adjacent to impact areas in accordance with this regulation, AR 385-63, DA Pam 385-63, AR 200-3, and NGR (AR) 200-3. Designated recreational areas shall be posted to applicable range, training area, and/or installation maps and included in the range safety briefings, as appropriate.
    - (d) Risk assessment As developed for outdoor recreational activities on ARNG ranges or training areas, must be reviewed as appropriate by the Range Control and/or Safety Officer, Installation or Garrison Safety Officer, Training Center Commander, and the SOHM. DA Form 7566 will be used to document risk assessments performed in support of such activities.
  - (2) The properly supervised firing of military weapons by minors for the purpose of marksmanship training and familiarization.

## Chapter 3 Deviation and Delegation of Authority

### 3-1. Deviations from Range Standards and Procedures

The ARNG goal is no deviations from standards published in AR 385-63 and DA Pam 385-63. In the event that ranges cannot meet the requirements of the DA Pam 385-63, states may authorize a deviation IAW AR 385-63, DA Pam 385-63, and this regulation.

#### a. Range Deviation Central Register.

(1) NGB-AVS-SG and each State Safety Office will maintain central registers of range deviations from the standards of DA Pam 385-63 IAW AR 385-63.

(a) ARNG AE Central Register is available through Guard Knowledge Online to point of contacts determined by the appropriate State Safety Manager. Access is controlled by NGB-AVS-S.

(b) Range deviations are just one part of each State/Territory Central Register.

(c) It is ARNG intent to use the AE Central Register to distribute and coordinate ARNG standards, minimize duplication of effort and facilitate execution of the Army Explosive Safety Program throughout the ARNG.

(2) Each State will identify ranges with approved deviations in their Planning Resource for Infrastructure Development and Evaluation (PRIDE) database.

(a) PRIDE is the official NGB database of record for all Real Property.

(b) The program is unique to the Army National Guard and is commercial off the shelf software providing computer-aided facility management.

(c) PRIDE provides a centralized database for compliance with the Chief Financial Officer's Act.

(d) It is an integrated product also providing real property inventory, work order processing, budgeting, project management, and reporting capabilities.

b. The CRM procedures outlined in paragraph 2-6 of this regulation shall be applied to all ARNG deviations from established range standards and procedures.

c. The following personnel may grant ARNG deviations for SDZs provided they meet the criteria mandated in DA Pam 385-63, with concurrence from NGB-AVS-S:

(1) Director, Army National Guard.

(2) TAG, under the delegation of authority from the Director, Army National Guard, as prescribed in paragraph 3-2 below.

### 3-2. Delegation of Authority

As prescribed by AR 385-63 the Director, Army National Guard has sub-delegated deviation authority to TAG. In keeping with that requirement, this chapter serves as the ARNG's written (formal) delegation of authority. This authority may not be further delegated. ARNG deviations are considered valid –

a. When all criteria mandated in AR 385-63 and DA Pam 385-63 have been met that allow deviations for SDZs.

b. When they establish effective alternative hazard controls to the applicable safety criteria.

c. If the proper reviews by the SOHM, and NGB-AVS-S have been performed.

d. When they are applied only to ARNG personnel, ranges and training areas.

e. When they are reviewed annually by the SOHM for applicability, and renewed as necessary, and entered in the Central Registry at NGB-AVS-S.

f. When the original conditions requiring deviation have not changed. Changes in conditions require renewal.

### 3-3. The Range Deviation/Deviation Process

a. The Range Deviation process provides a tool for commanders to determine the best method to reduce the risk of personnel exposure to hazards when standard safety and SDZ criteria cannot be implemented. It is the goal of the ARNG to remove all deviations from ARNG ranges. Commanders at all levels should strive to remove deviated ranges within the frame work of their five year installation plan. The Range Deviation process does not guarantee that a control exists, but provides a framework to determine if one does exist and how to implement that control. In the case of public exposure, a range deviation will NOT be used to allow training to continue without a viable reduction in hazard exposure using effective physical controls.

b. The authority to grant deviations from range criteria for ARNG is the Director, Army National Guard per AR 385-63. Paragraph 3-2 of this regulation describes the conditions of the Director, Army National Guard's delegation of this authority to TAGs.

c. When a deviation is required, the State will forward a range deviation packet constructed IAW DA Pam 385-63 for review and admittance to the Central Registry to Chief, NGB, ATTN: NGB-AVS-S, 111 South George Mason Drive, Arlington, VA 22204-1382. Deviations will not be valid until admitted into the central registry maintained by NGB-AVS-S.

d. Range deviations are effective for one year, and shall be renewed annually if required for periods beyond one year. Range deviations will not be renewed unless relevant range failures or safety deficiencies have been corrected, and/or corrective actions are scheduled. Submissions for renewal of an existing deviation that has no material changes consist of only the deviation memorandum signed by the approval authority. If there are changes to the range facility since approval of the active deviation, the specific changes must be submitted to NGB-AVS-S for review. The deviation memorandum will accompany these submissions. All initial deviations and deviation renewals will be reported to NGB-AVS-SG for inclusion in the Central Register of range deviations.

e. Range deviations will be reviewed annually by the SOHM, who will ensure that all required documentation which is part of the original deviation approval is still on hand and valid. Bat wing SDZs will be provided as part of the review packet to evaluate all hazard exposure issues.

f. Range deviations are required when standard safety and/or SDZ criteria cannot be met. The criteria listed in AR 385-63 and DA Pam 385-63 will be applied to all ARNG ranges.

(1) When standard SDZ criteria cannot be met, and the ability exists to physically reduce SDZ dimensions using terrain, artificial barriers, or other compensating factors.

(2) When it is possible to reduce exposure to hazards and their attendant risks to an acceptable level by modifying prescribed firing procedures. These modifications should be based on what is required by participating soldiers to increase training realism as compared to the units and soldier's state of training readiness to safely execute the training.

(3) When personnel are not directly participating in the actual conduct of training, yet CRM analysis and positive controls support allowing these personnel within the SDZ.

g. A range deviation is not required for hazards associated with roads within a SDZ when only military personnel normally access these roads and access can be controlled by implementing administrative procedures (SOPs). At a minimum, the commander will establish local policies and procedures to ensure barrier systems are used to preclude non-participating personnel from entering SDZs. This road control system will be periodically checked to ensure serviceability that it is opened and closed under positive control, and that appropriate notice to the using units and the public (i.e., hunters) is made at least 24 hours in advance of SDZ closure. The road closure system (gates or barriers) will be checked daily before firing to ensure that access remains positively controlled.

h. Range deviations will not be granted when:

(1) Property not directly controlled by DoD or the State falls within the SDZ (such as a public road).

(2) Public exposure cannot be reduced either through SDZ reduction or closure of the specific portion of the road or public land area that is within the SDZ (hazard area).

i. If an incident occurs on a deviated range that calls into question the validity of the deviation, the deviation will be revoked until the situation can be evaluated and a new deviation developed to address the incident. Such an incident can include a projectile strike inside the confines of the standard SDZ if controls placed in the deviation process were to reduce or eliminate such a strike.

j. Preparation and submission of the range deviation is outlined in paragraph 3-5 below.

### 3-4. Deviation Limitations

ARNG deviations established under the provisions of this regulation are limited to –

a. Reducing SDZ dimensions when terrain, artificial barriers, or other compensating factors that makes a smaller SDZ safe.

b. Modifying prescribed firing procedures for the purpose of increasing training realism:

(1) When modifications do not sacrifice or violate safety criteria.

(2) When modified procedures continue to meet doctrinal training requirements.

(3) When the increased risks are identified, documented, and incorporated into the SDZ as appropriate.

c. Allowing non-participating personnel into the SDZ, when hazard controls adequately reduce and/or eliminate personnel exposure.

d. An effective life of one year from the date of the authorizing official's signature IAW AR 385-63 and DA Pam 385-63. Expired deviations may be renewed by the approval authority provided the conditions cited in the original deviation have not changed, per paragraph 3-2f above.

e. ARNG personnel, ranges and training areas. They do not apply to:

- (1) Other Federal agency directives, regulations, and standards such as airspace, water traffic, Occupational Safety and Health Administration, Department of Transportation, and Nuclear Regulatory Commission.
- (2) Environmental laws, regulations, statutes, and requirements including AR 200-1, AR 200-2, and AR 200-3.

### 3-5. Preparation of the Range Deviation

ARNG range deviations will be developed IAW DA Pam 385-63 and this regulation. Specific requirements, authorizations, and limitations are prescribed in paragraphs 3-1 thru 3-4 above. The range deviation packet will consist of the following items:

a. Deviations applied to SDZs extending beyond installation boundaries must be able to sufficiently document the ability of installation boundaries to contain projectiles, hazardous fragments, laser beams and both vertical and horizontal ricochets sufficiently within the installation boundaries and areas under military control. Installations must be able to prove an unlikely escapement probability (1:1,000,000) for SDZs that extend beyond installation boundaries.

b. DA Form 7566 signed by the appropriate level of command, based on the residual risk assessment. This form will address:

(1) Description of the existing condition(s) and the attendant hazard(s) (block 6, DA Form 7566). These conditions and hazards can include such factors as buildings, roads, property boundaries, within the standard bat wing SDZ. These hazards shall be identified on the map of the range. Specific controls for these hazards shall also be listed, and these controls shall be valid and reduce the severity of the hazards. The primary purpose of this form is to form a complete description of the condition(s) that supports the deviation. Examples of these conditions can include placement of gates or roadblocks, terrain containment analysis, or closing an adjacent training area or range during firing. These conditions (controls) will be annotated on DA Form 7566 as described above.

(2) The initial risk level for ranges is always based on command assessment of the hazards present. The greater the hazard, such as a road which runs through the SDZ, increases the hazard risk level proportionately.

(3) Control measures taken to eliminate hazards and/or minimize risk (block 8, DA Form 7566). Cite specific actions, such as paragraphs from the installation or range SOP that controls the hazard. An example of a hazard and its control measure would be a road that enters the SDZ and the positioning of a locked gate or road guard. Controls can include, but are not limited to, such actions as topographic containment, gates, guards, and artificial limiting of the elevation. All controls identified shall relate directly to a cited hazard. Controls shall clearly reduce the severity of the hazards.

(a) Residual risk levels are decided by the control(s) put in place to reduce the initial hazards (block 9, DA Form 7566). The remaining risk levels will normally be one level below the initial risk level. Remaining risk levels two or more levels below the initial risk level are rare, and require detailed justification (block 8, DA Form 7566).

(b) The supervision of controls (block 11, DA Form 7566) shall identify a responsible duty position, not the name of a specific person. The position shall be specific, and preferably be a commander or other leader within the unit or Training Center chain of command.

c. The Deviation Request. This request is addressed from the Training Center Commander, thru the SOHM, to TAG. The SOHM will forward the request with all supporting documentation to NGB-AVS-S for review. NGB-AVS-S will provide review comments and recommendations to the SOHM for implementation prior to final TAG approval. Multiple ranges can be included in this request. The request shall include:

(1) Memorandum citing chapter, paragraph, and subparagraph of the specific condition requiring deviations, and name and number of the firing range, training facility, or maneuver area involved. Include a statement as to why deviation is necessary, the impact on training if not granted, and include pertinent data that supports the deviation need.

(2) Appropriate SOPs and published guidance governing the specific firing range, training facility, or maneuver area for which the deviation applies.

(3) Scaled topographical map depicting standard SDZ and requested deviation, the use of the geographic information system is highly encouraged for this process.

(4) Map coordinates of the firing position, target location, and quadrant or elevation of fire noted with appropriate datum information (NAD27, WGS84, etc). The firing position, direction of fire, and SDZs will be plotted on the scaled map with distances shown in meter of the weapon system to be fired, the target, and natural terrain backstop or artificial barrier. A cross-sectional terrain profile showing the natural terrain backstop downrange will also be submitted.

Terrain profiles only need to be drawn for the condition(s) requiring deviation and if profiles truly support justification for the deviation. Automated SDZ trajectory profiles may be submitted in lieu of developing terrain profiles through manual means.

(5) Plan and associated costs to remove the requirement for a deviation as addressed in the installation five year plan, or reasons why there can be no mitigation.

d. The Deviation Memorandum. The approval authority signs this memorandum. Only one range will be addressed on each Deviation Memorandum. This memorandum is intended to be a one-page document (with attachments) and will include:

(1) The name and designation of the firing range.

(2) The training facility, or maneuver area, where the range is located.

(3) The specific condition requiring deviation.

(4) A short description of the condition(s) that supports the deviation such as terrain, road closure or gate guards, closing an adjacent range or training area, etc.

(5) A short statement of why a deviation is necessary and impact on training if not granted.

(6) A Scaled Topographical SDZ Zone Map/Drawing depicting the existing topography, all man-made structures, SDZ of the weapon(s) being fired, firing positions, and the direction of fire. The map shall include the following details and information:

(a) Name and location of range.

(b) Type(s) of weapon to be fired.

(c) Specific Type(s) of ammunition to be fired, such as all types of 5.56mm, etc.

(d) The bat wing SDZ for the ammunition/weapon combination violating the safety criteria shall be drawn directly on the topographic map. The use of the bat wing SDZ enables clear visualization of all exposures. The Cone shaped SDZ may be used under the conditions prescribed in paragraph 2-1 of this regulation.

(e) Each hazard/target that is identified on the map that is within the limits of the SDZ shall have a valid control identified in the CRM form.

(f) Memorandum of Acceptance of the Deviation to the Central Registry.

### **3-6. Range Inspection and Evaluation**

a. All ranges located on Training Centers managed by the State shall be inspected annually and certified by the SOHM or qualified individual for compliance with AR 385-63, DA Pam 385-63, and this regulation.

b. The SOHM and the site commander (or designated representative) will jointly perform a safety acceptance inspection of newly constructed, modified, or renovated ARNG ranges or training areas before use.

c. The site commander (or designated representative) will conduct periodic inspections of ARNG ranges and training areas to ensure that ranges remain safe. The site commander's periodic inspection is separate from the SOHM's annual inspection.

d. QASAS will perform regular review of field ASP storage procedures and assess unit transportation, handling, accountability, and safe operating procedures for munitions during training.

## **Chapter 4**

### **Special Range Requirements**

#### **4-1. Surface Danger Zone Considerations**

a. All SDZs will be plotted IAW AR 385-63 and DA Pam 385-63 using the most current approved changes.

b. SDZs will not be reduced unless:

(1) The range is a baffled range that has been designed IAW Army Corps of Engineers standards and meets the requirements of AR 385-63 and DA Pam 385-63.

(2) The range has a valid deviation IAW AR 385-63, DA Pam 385-63, and this regulation.

c. Small arms ranges often use several different types of munitions for the same weapon or group of weapons with each type of munitions having its own distinct SDZ. The greatest measure of safety can be obtained by computing the SDZ using the largest dimensions applicable to the gun/weapon system for which the range is designed. When developing a range SDZ for weapons that fire several different types of ammunition (small arms), use the largest SDZ dimensions from each type of ammunition to construct the SDZ. For example, small arms ammunition "A" has a maximum range distance "X" of 3437 meters, and small arms ammunition "B" has a distance "X" of 3,100 meters. Use the largest distance, ammunition "A", in developing your SDZ. The same approach applies to the distances "Y", area

“W” and angles “P” and “Q” as listed in the applicable SDZ tables of DA Pam-385-63. This ensures that the range is viable for all types of ammunition that apply to the weapon to be used on that specific range.

#### 4-2. Indoor Firing Ranges

- a. Army National Guard indoor firing ranges shall be operated and maintained IAW NGR 385-15, NG Pam 420-15, and DA Pam 385-63.
- b. ARNG indoor firing ranges shall comply with applicable Occupational Safety and Health Administration and Environmental Protection Agency standards.

#### 4-3. Laser Range Safety

a. General. The fundamental concept of laser range safety is to prevent direct and collateral injury and/or damage resulting from laser use. Personnel using or supervising the use of lasers must be thoroughly familiar with all aspects of laser operations and associated dangers. The following guidelines will be used in conjunction with the guidance provided in referenced publications when employing lasers.

(1) MIL-HDBK-828A, Laser Range Safety and Joint Pub 93-09.1, Joint Laser Designation Procedures, are definitive guidance for laser operations, characteristics, and general procedures. MIL-HDBK-828A may be ordered through:

Standardization Documents Order Desk  
Bldg. 4D  
700 Robbins Avenue  
Philadelphia, PA 19111-5094

(2) Tactical lasers will be treated as direct-fire weapons. Precautions associated with direct-fire weapons shall be applied to all lasers operated on military ranges.

(3) Range managers will establish boundaries for laser range operations and strictly control laser use in training to conform to the provisions of this policy and applicable technical manuals. TAG may approve deviations for laser SDZ criteria after applying CRM analysis and minimizing hazards. Procedures are the same for other direct fire weapons.

(4) AR 11-9, and AR 40-5 outline general laser radiation safety requirements. A laser safety orientation will be given to all personnel who use or work with laser devices to include an explanation of hazards and safety requirements before they commence laser operations.

(5) Personnel suspected of experiencing potentially damaging eye exposure from laser radiation will be evacuated immediately to the nearest medical facility and undergo an eye examination. Pertinent medical guidance for such emergencies is available from the Walter Reed Army Institute of Research Detachment at Brooks Air Force Base [DSN 240-4620 or commercial (210) 536-4620]. The expeditious examination and treatment of laser eye injuries is critical in minimizing loss of visual acuity. Report laser overexposure incidents IAW AR 40-5, AR 385-40, and TB MED 524.

(6) Intrabeam viewing of either direct or reflected beams from a flat mirror-like surface (specular reflection) from lasers can expose the unprotected eye to a potential hazard and shall be prevented. Flat mirror like (specular) surfaces will be removed from all targets designated as laser targets prior to engagement, and remove all specular surfaces from around the target to the distance required by area S.

(7) Personnel will not deliberately view direct laser radiation with optical instruments within the nominal ocular hazard distance - optical (nominal ocular hazard distance - optical - referred to in previous publications and nominal ocular hazard distance - magnified) unless optical devices are considered Laser Safe for the type of laser being used. The resulting amplification of laser energy significantly increases the probability of eye injury.

(8) Night vision devices will not be used for laser eye protection. These devices are not “cover-all” goggles. Laser energy may enter the eye from reflections or from around the tubes. These devices can be bloomed (white out), damaged, or destroyed from exposure to laser radiation.

(9) Dazzle or momentary flash blindness can occur from visible laser exposures below maximum permissible exposure levels. Laser eye protection may not attenuate the radiation sufficiently to eliminate these effects. Appropriate precautions will be taken if personnel performing critical tasks, such as flying aircraft, may be exposed to laser radiation levels that may cause dazzle or momentary flash blindness.

(10) Laser-guided munitions and other laser detectors may unintentionally acquire radiation sources within the field of detection other than the target. Fields of detection vary and are specific to individual weapons and detectors/sensors. Training will be planned to ensure that the angle between the laser designator line of sight and laser detectors (for example, laser-guided munitions, laser-spot tracker) will not allow the munitions to impact on the laser source or scattered radiation from the laser platform.

(11) Extreme caution will be taken when using a target-designating laser in conjunction with ordnance delivery aircraft. The potential exists for the on-board laser seeker to lock onto the designator or its radiated energy (i.e., beam or reflected beam) instead of the target. The following procedures will be followed to reduce this risk:

(a) The pilot of the attacking aircraft will have positive knowledge of the location of the designator and the target area before releasing munitions.

(b) Approach paths will be designated and briefed to both the designating/Forward Air Controller personnel and the aircrews prior to conducting the mission. Aircraft approach paths will be planned to preclude crossing laser designator beams with the laser seeker. The laser seeker should intersect the designator beam well forward of the laser firing point, angling toward the target.

(c) Only mission-essential personnel will be within the area of effects for the weapon employed from the designator and/or direct or reflected beam of the laser designator during operations.

(d) Munitions will not be launched or released on a heading toward the laser designator. See applicable technical manuals for recommended employment procedures.

b. Laser Range Approvals.

(1) Approval for Laser Ranges is granted by the SOHM after review and concurrence by NGB-AVS-S and U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) (Laser/Optical Radiation Program).

(2) Submission of a request for approval of a laser range is initiated by the Training Center Commander to the SOHM. The SOHM will forward the packet through NGB-AVS-S to USACHPPM for analysis. NGB-AVS-S will provide the SOHM with the recommendation as well as precautions that shall be followed during laser operations on the range in question.

(3) Submission shall include the following:

(a) Map of the proposed range area that identifies the firing point, direction of fire, and types of lasers to be used (by National Stock Number, model number and manufacturer).

(b) General geographical analysis of the proposed range. This analysis should focus on flat, reflective surfaces capable of reflecting a laser beam.

c. Laser Range Usage.

(1). Laser devices will only be used on ranges approved for such use. Evaluation requirements for laser ranges are in MIL-HDBK-828A.

(2) Warning signs are posted for laser activity.

(3) Practice in lasing with unfiltered class 2, 3, 3b, 4, or military exempt lasers (i.e., use of only the lasing device) during non live firing exercises in training areas may be conducted only at installation/community training complexes that meet safety requirements. These facilities must be certified for such practice in accordance with paragraph 4-2 of this regulation and NGR 385-15.

(4) A survey of the proposed lasing and target area will be accomplished to determine laser elevation and azimuth limits within the SDZ. Laser targets will not be located on the skyline (above a backstop). Restrictions will be applied to prevent lasing above the target line. Existing range limit markers may be used if they provide an adequate margin of safety.

(5) Unprotected personnel will not be permitted in established laser impact areas as shown in the SDZ for the range.

(6) Range managers will be familiar with the tactics and technical aspects of all laser devices used on ranges under their control. Weapons employment may seriously affect range safety analysis. It is essential that the range safety officer and manager understand the details of proposed employment tactics. The following are examples of tactics that can affect range safety.

(a) Computer bombing systems often use target designation laser range finder capability to perform computer-controlled auto-release of weapons. For the Marine Corps, a Night Targeting System is mounted on the AH-1W Cobra helicopter and shall range the ground prior to target to compute the release point. Selected aircraft such as F-15Es and F-16s may use LANTRIN lasers to range the ground during constant-computing impact point

operations as much as one mile short of the actual target to compute the bomb release point. This area short of the target must be included in the laser hazard area and cleared of specular reflectors.

(b) Laser-guided munitions delivery tactics may involve two separate lasing operations. The designation laser may be used for target identification and ranging. After bomb release, the delivery aircraft may turn away from the target before turning on the laser designator to guide the weapon to the target. The incident angle of the laser may be off set as much as 90° from the initial aircraft heading.

d. Force on Force tactical exercises involving multiple integrated laser engagement system (MILES) do not require SDZ construction, however nominal ocular hazard distance restrictions in MIL-HDBK-828A apply. Tactical exercises involving force-on-force components using laser devices other than MILES may be approved by TAG. Available sources of technical information include the following agencies:

(1) USACHPPM Laser/Optical Radiation Program Manager, DSN 584-3932 or commercial (410) 671-3932.

(2) Deputy Director for Army Radiation Safety, HQDA (DACS-SF), DSN 225-7291 or commercial (703) 695-7291.

#### **4-4. Shoot Houses and Breach Houses**

Shoot houses and breach houses are range facilities used to conduct live fire training for urban operations. Shoot houses generally use standard small arms and their ammunition. Breach houses employ the use of both small arms and small explosive charges. Shoot houses and breach houses will be designed as outlined in TC 25-8. The "Huntsville" design for shoot houses is recognized as a zero SDZ facility. All other shoot houses must document the ability to prevent any escapement of user's rounds, or post a 360 degree SDZ.

#### **4-5. Range Clearance and UXO Operations**

a. ARNG Range Clearance and UXO operational requirements are contained in AR 385-63, DA Pam 385-63, AR 385-64, and DA Pam 385-64.

b. A hazard assessment using DA Form 7566 will be conducted prior to all ARNG Range Clearance or UXO operations. The hazard assessment will include –

- (1) The rationale for the clearance.
- (2) The number of personnel involved.
- (3) Support requirements (for example, medical or fire prevention and protection support).
- (4) The types of ordnance anticipated to be encountered.
- (5) Expected UXO densities.

c. The Range Control OIC or Training Center Commander should contact their supporting EOD organization for assistance in developing the CRM worksheet and developing range-clearing procedures.

#### **4-6. Blank Ammunition**

a. Live and blank ammunition will not be issued simultaneously to individual troops or crews of combat or combat support vehicles prior to the initiation of a force-on-force training exercise.

b. Prior to initiating force-on-force training, commanders will ensure that there is no live ammunition on board vehicles or in possession of troops. A reasonable period of time shall be allocated to ensure that no live ammunition remains with soldiers preparing to receive blank munitions for field training.

c. An OIC/RSO in the rank of E-5 or above is required when using blank ammunition.

d. Weapons that are firing blank ammunition must have the blank firing adapter affixed to the weapon. This provides clear notice that blanks are in use, and prevents possible projection of particles directly at a soldier during training operations.

e. Blank ammunition must never be fired directly at anyone who is closer than 5 meters from the muzzle of the weapon.

f. Lead (Pb) exposure from blank ammunition fired indoors. Soldiers are subjected to significant lead exposure when firing blanks in confined spaces, such as within the confines of a Military Operations in Urban Terrain (MOUT) building. This exposure is due to primers containing lead styphnate. Monitoring of lead level exposure may be required for soldiers who train repetitively within these facilities. Contact supporting State Medical authority (i.e., State Surgeon) for guidance on lead exposure monitoring and prevention requirements.

## Chapter 5 Aviation and Waterway Requirements

### 5-1. Federal Aviation Administration Airspace Coordination

- a. The Federal Aviation Administration is responsible for all air space across the United States. Coordination for SUA will be made by TAG, with assistance from NGB-AVS-O if necessary, to the appropriate Department of the Army Regional Representative.
- b. SUA will be requested from the DA Regional Representative when:
  - (1) Any activity considered hazardous to non-participating aircraft or requiring SUA to segregate it from other users of the National Airspace System, or in airspace of host countries. Training will not be conducted until such SUA has been designated and activated for that purpose.
  - (2) Activity that includes, but is not limited to; artillery fire, mortars, missiles and rockets, air-to-ground weapon systems, aerial target practice, laser operations, demolition and explosive devices, electronic warfare devices, remotely piloted/unmanned aerial vehicles, small arms ranges and any other activity considered to be hazardous or non compatible with other users of the airspace.
  - (3) Any activity, over 150 feet (45 meters) above ground level.
- c. Before firing any explosive device or weapon under conditions in which the hazard/maximum ordinate, including ricochet ordinate, will exceed 150 feet (45 meters), appropriate SUA shall be activated.
- d. TAG will appoint air traffic and airspace officers as needed IAW AR 95-2.

### 5-2. Coordinating Use of Navigable Waterways

- a. Water traffic requirements that apply to firing over navigable waters, to include intercoastal waterways, can only be waived by U.S. Army Corps of Engineers (USACE). Training Center Commanders will notify the USACE Division or District commanders and the U.S. Coast Guard District Office of:
  - (1) Waterway involved.
  - (2) Operations to be conducted.
  - (3) Sector of waterway needed for closure.
- b. Federal laws that protect water traffic on navigable waterways, authorize Secretary of the Army to prescribe regulations for use and navigation of waterways endangered or likely to be endangered by firings and target practice. USACE will have notice of the restricted SDZ published in Part 334, Title 33, Code of Federal Regulation.
- c. Training Center Commanders will not authorize firing until notice of the restricted danger zone is published in 33 Code of Federal Regulation 334 and navigation maps have been revised. Installation/community commanders will enforce closed waterways by radar and/or surface vessel surveillance. Firing will not commence until the U.S. Coast Guard has marked the restricted danger zone with buoys.
- d. Munitions containing phosphorus, including guided missiles or rockets, will not be fired or dropped into any inland waterway, lake, bay, wetlands, or other body of water.

## Chapter 6 Additional Range Requirements

### 6-1. Explosives Safety Compliance

The ARNG Explosives Safety Program ensures safe and proper storage and handling of AE. AR 385-64 establishes ARNG ammunition and explosives safety policy, responsibilities, and standards for AE. The following specific provisions apply to all ARNG ranges and training areas –

- a. Ranges with established Ammunition Handling Areas, configuration and issue areas must comply with the provisions of AR 385-64 and DA Pam 385-64.
- b. An Explosives Storage License must be issued by the SOHM for facilities that meet the criteria established in DA Pam 385-64. These sites may also be required to have a DoD Explosives Safety Board approved explosives safety site plan IAW AR 386-64 and DA Pam 385-64.
- c. Other applicable mandatory ammunition and explosive safety requirements and provisions related to ranges and training areas are contained in Chapter 3 of DA Pam 385-63.

## 6-2. Training

There are currently no mandatory Army Military Occupational Specialty specific or Additional Skill Identifier training requirements for Range Control personnel. However, in keeping with the provisions of AR 350-19, AR 385-63, DA Pam 385-63, TC 25-8 and Training and Doctrine Command regulations, ARNG commanders must ensure that selected range control personnel receive range safety training and are competent with the weapons being fired on a range. At least one member of the "On-Duty" Range Control organization shall be a graduate of an Army Range Safety Course. This course shall encompass general range safety and hazard control methods, SDZ preparation, Range Planning, and Army Range Deviation/Deviation Requirements. The following courses are recommended for ARNG Range Control personnel:

- a. Composite Risk Management Training.
- b. Explosives Safety Training and/or the U.S. Army Explosives Safety Course (AMMO-63) offered in Computer Based Training format or resident, by the U.S. Army Defense Ammunition Center.
- c. Hazardous Materials/Hazardous Waste General Awareness Training (Ammunition and Explosives).
- d. Range Safety Level-II, administered by the U.S. Army Training and Doctrine Command.
- e. UXO Hazard Awareness Training, as prescribed by AR 385-63 and DA Pam 385-63.
- f. UXO Recognition Qualification as provided by supporting EOD, when a UXO Recognition Training Program is implemented IAW AR 385-63.
- g. Range Control Operations Course, administered by NGB.

## 6-3. Medical Support and Coordination

Training performed on ARNG ranges and training areas will be coordinated with the servicing medical activity to ensure that all reasonable measures to prevent adverse health effects (for example, hearing loss) are incorporated into range regulations and standard operating procedures.

- a. Review of range and training area construction projects including, new construction, and renovation/modification of existing ranges and facilities, shall also be coordinated with local safety and medical representatives to avoid creating potential hazards or exacerbating existing constraints.
- b. Medical support requirements including, Medical Evacuation, Combat Lifesaver, Advanced Trauma Life Support and/or Medics, for ARNG ranges and training areas are contained in Medical Command (MEDCOM) Pam 40-12. The MEDCOM Pam 40-12 traditionally applies only to Annual Training for Reserve Components. However, the provision of the Medical Support Matrix contained in Chapter 3 of the MEDCOM Pam 40-12, prescribe the minimum medical support requirements for various routine training activities. As such, they can and should be logically applied to all live-fire range and training area activities and included in associated procedures.

## 6-4. Communications

Effective communications are required to control firing, coordinate requests for medical assistance, and announce unsafe conditions. Paragraph 4-9 in AR 350-19 and TC 25-8 outlines additional communications requirements and procedures recommended for effective range operations. The minimum requirements are—

- a. Establishment of primary and secondary two-way communications between range control and using units for all live fire and weapons training activities within the installation training complex for each live-fire range and weapons training facility.

(1) Units losing communication with the range control organization will cease firing/training operations until contact is re-established.

(2) Units occupying bivouac sites or non live-fire training areas must maintain at least primary two-way communications with range control.

- b. During special exercises when units are operating under the control of their higher headquarters (for example, tactical operations center), adequate communications with using units and the range control organization will be maintained as prescribed above.

## **Appendix A References**

### **Section I Required Publications**

#### **AR 385-63**

Range Safety (Cited in paragraphs 1-1, 1-4b, 1-5, 1-6a, 1-7a, 1-7b(2), 1-8, 1-10d, g & n, 1-11b, p & r, 1-12d & k, 1-12l(1) & (3)(a), 2-1c, 2-4e & g, 2-5a, 2-6a(1) & (2), 2-6d, 2-6e(1)(c), 3-1, 3-1a(1), 3-2, 3-2a, 3-3b & f, 3-4d, 3-6a, 4-1a, 4-1b(1) & (2), 4-5a, 6-2, 6-2e & f)

#### **DA Pam 385-63**

Range Safety (Cited in paragraphs 1-1, 1-5, 1-6a, 1-7a, 1-7b(2), 1-8, 1-10d, g & n, 1-11b, h, p & r, 1-12a, d, j & k, 1-12l(1) & (3)(a), 2-1b & c, 2-3e, f, I, & j, 2-4e & g, 2-5a, 2-6a(1) & (2), 2-6e(1)(c), 3-1, 3-1a(1), 3-1c, 3-2a, 3-3c & f, 3-4d, 3-5, 3-6a, 4-1a, 4-1b(1) & (2), 4-1c, 4-2a, 4-5a, 6-1c, 6-2, 6-2e)

### **Section II Related Publications**

#### **AR 11-9**

The Army Radiation Safety Program

#### **AR 40-5**

Preventive Medicine

#### **AR 75-1**

Malfunctions Involving Ammunition and Explosives (RCS CSGLD--1961(MI))

#### **AR 95-2**

Airspace, Airfields/Heliports, Flight Activities, Air Traffic Control, and Navigational Aids

#### **AR 200-1**

Environmental Protection and Enhancement

#### **AR 200-2**

Environmental Effects of Army Actions

#### **AR 200-3**

National Resources -- Land, Forest, and Wildlife Management

#### **AR 210-20**

Real Property Master Planning for Army Installations

#### **AR 350-19**

The Army Sustainable Range Program

#### **AR 350-38**

Training Device Policies and Management

#### **AR 385-10**

The Army Safety Program

**AR 385-40**

Accident Reporting and Records

**AR 385-64**

U.S. Army Explosives Safety Program

**AR 405-10**

Acquisition of Real Property and Interests Therein

**AR 405-80**

Management of Title & Granting Use of Real Property

**DA Pam 385-64**

Ammunition and Explosives Safety Standards

**DoD Manual 4160.21M**

Defense Materiel Disposition Manual

**FM 3-0**

Operations

**FM 5-19**

Composite Risk Management

**Joint Pub 93-09.1**

Joint Laser Designation Procedures

**MEDCOM Pam 40-12**

Medical/Dental Site Support Plan to Annual Training

**MIL-HDBK-828A**

Military Handbook, Laser Range Safety

**NG Pam 415-5**

Army National Guard Military Construction Program Execution

**NG Pam 420-10**

Construction and Facilities Management Office Operations

**NG Pam 420-15**

Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges

**NGR 5-1**

National Guard Grants and Cooperative Agreements

**NGR (AR) 200-3**

State and Federal Environmental Responsibilities

**NGR 385-15**

Responsibilities and Procedures for Inspection and Evaluation of ARNG Indoor Firing Ranges

**NGR 405-80**

Army National Guard Program

**NGR 415-5**

Military Construction Program Development and Execution

**NGR 420-10**

Construction and Facilities Management Office Operations

**TB 9-1300-385**

Munitions Restricted or Suspended.

**TB Med 524**

Control of Hazards to Health from Laser Radiation

**TC 25-8**

Training Ranges

**Section III**

**Prescribed Forms**

This section contains no entries.

**Section IV**

**Referenced Forms**

**DA Form 7566**

Composite Risk Management Worksheet

**DD Form 1390**

FY \_\_ Military Construction Program

**DD Form 1391**

FY \_\_ Military Construction Project Data

**Appendix B**

**Management Control Evaluation Checklist**

**B-1. Function**

The function covered by this checklist is the ARNG Firing Range Program.

**B-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.

**B-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).

B-4. Test questions

- a. Range Safety Programs - Range safety programs are established and documented. Is a range safety program documented?
- b. Composite Risk Management - Commanders and leaders are provided a risk assessment before range operations. Conscious CRM decisions are made at the proper level of decision-making. Are risk decisions made at the proper command level and documented?
- c. Deviations - Deviations are processed when the conditions described in Paragraph 3-2 are met. Are all conditions described in Chapter 3 allowed only under an approved deviation?
- d. Does the range have a SOP?
- e. Ranges approved for Lasers, is there a Laser/Optical Radiation Program in place?
- 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?

B-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**

**AE**

Ammunition and Explosive

**AR**

Army Regulation

**ARNG**

Army National Guard

**ASP**

ammunition supply point

**CRM**

composite risk management

**DA**

Department of the Army

**DA Pam**

Department of the Army Pamphlet

**DoD**

Department of Defense

**EOD**

explosive ordnance disposal

**FM**

Field Manual

**HQDA**

Headquarters, Department of the Army

**IAW**

in accordance with

**ICMs**

improved conventional munitions

**MEDCOM**

Medical Command

**MILES**

multiple integrated laser engagement system

**MOUT**

Military Operations in Urban Terrain

**NGB**  
National Guard Bureau

**NSD**  
non-self-destructing

**OIC**  
Officer in Charge

**Pam**  
pamphlet

**PRIDE**  
Planning Resource for Infrastructure Development and Evaluation

**QASAS**  
Quality Assurance Specialist – Ammunition Surveillance

**RSO**  
Range Safety Officer

**SDZ**  
surface danger zone

**SOHM**  
Safety and Occupational Health Manager

**SOP**  
Standing Operating Procedure

**SUA**  
Special Use Airspace

**TAG**  
The Adjutants General

**TC**  
Training Circular

**USACE**  
U.S. Army Corps of Engineers

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

**UXO**  
Unexploded Ordnance

## **Section II**

### **Terms**

#### **140 dBP contour**

The distance at which the impulse noise produced by the weapon or explosive is 140 decibels peak level. See also hearing hazard zone.

#### **Ammunition lot**

A quantity of components, each of which is manufactured by one manufacturer under uniform conditions, and which is expected to function in a uniform manner. The lot is designated and identified by assignment of an ammunition lot number and preparation of an ammunition data card.

#### **Angle P**

The area beginning at the firing point located to the left and right of the dispersion area, which contains projectiles after making initial contact with the target medium.

#### **Angle Q**

The area beginning at distance Y, located to the left and right of the dispersion area, which contains projectiles after making initial contact with the target medium.

#### **Approved hearing protector (or protection)**

Hearing protector types that are approved for use by the Army and are listed in DA PAM 40-501.

#### **Area A**

The secondary danger area (buffer zone) that laterally parallels the impact area or ricochet area (depending on the weapon system) and contains fragments, debris, and components from frangible or explosive projectiles and warheads functioning on the right or left edge of the impact area or ricochet area.

#### **Area B**

The secondary danger area (buffer zone) on the downrange side of the impact area and area A which contains fragments, debris, and components from frangible or exploding projectiles and warheads functioning on the far edge of the impact area and area A.

#### **Area C**

The secondary danger area (buffer zone) on the up range side of the impact area and parallel to area B which contains fragments, debris, and components from frangible or exploding projectiles and warheads functioning on the near edge of the impact area.

#### **Area D**

The safe area between areas C and E for indirect, overhead fire of unprotected personnel in training.

#### **Area E**

The danger area between an indirect fire weapon system and area D. This area is endangered by muzzle debris, overpressure, blast, and hazardous impulse noise. Personnel in service batteries firing from approved tactical configurations may occupy area E.

#### **Area F**

The danger area to the rear of a weapon system that is endangered by back-blast debris, overpressure, blast, and hazardous impulse noise.

#### **Area H**

The area to the rear of a weapon system (for example, TOW missile) that contains warhead particles (collapsed shape charge and warhead fragments) during an "eject only" firing event.

**Area I**

The area immediately in front of certain missile weapon systems designated as the initial zone of impact for “eject only” firing events. Area I may not be occupied under deviation.

**Area S**

The radius of S value around a laser target from which all specularly reflective surfaces must be removed, covered, painted, or destroyed before laser operations commence.

**Area T**

The area within an established laser SDZ measured from the laser device to t meters downrange where no object will be lased. Personnel should avoid direct exposure to unprotected skin up to t meters from the laser device. Exposure hazards to the eye are far greater within area T than those exposure hazards to the skin.

**Army Special Operations Forces**

Those active and reserve component Army forces designated by the Secretary of Defense that are specifically organized, trained, and equipped to conduct and support special operations.

**Assistant range safety officer**

Officer, warrant officer, or noncommissioned officer designated and briefed by the OIC and RSO, who assists the RSO in carrying out the safety responsibilities for the range or activity.

**Backstop, laser**

Opaque structures or terrain in the controlled area of a laser SDZ such as a hill, dense tree line, or a windowless building that would completely obstruct any view beyond it and completely terminate a laser beam that may miss the target.

**Barrier**

A permanent or temporary impediment to foot and or vehicular traffic which personnel are prohibited to pass without approval from range control. A barrier may be sentinel, wire fencing, gate, sign, or other access-limiting device.

**Buttoned-up**

All hatch covers are in a closed and secure position.

**Cease-fire**

A command given by anyone observing an unsafe firing condition on any training complex to immediately terminate an active (hot, wet) firing status of a weapon system(s).

**Central register**

An official record of range deviations held at the respective major Army Command.

**Certified ammunition**

Ammunition, to include fuzes, propellants, and projectiles, which have been cleared by the U.S. Army Materiel Command for overhead fire of unprotected personnel.

**Clearing Zone**

The established safety buffer area around a weapon-clearing barrel. The clearing zone is designated with brightly colored markings and covered with rubber or other resilient matting to prevent dropped ammunition from functioning.

**Cold firing status**

A firing condition where authorization to fire a weapon system has not been given or has been revoked by the installation range control office. Also referred to as a dry firing status.

**Combined arms live-fire exercises (Army)/combined arms exercise (Marine Corps)**

A combat exercise in which Army/Marine Corps combined arms teams in combat formation conduct coordinated combat firing and maneuver practice in executing the assault, seizure, and defense of appropriate objectives. Tactical air support

may be included. As it relates to range safety, commanders down the entire chain of command are responsible for the safety of their personnel.

**Composite risk management**

A holistic approach to preserving readiness that applies 24/7 to soldiers, ARNG civilian employees, and contract workers.

**Composite risk management process**

Composite risk management is the process of identifying and controlling hazards to protect the force. It is a five-step process representing a logical thought process from which users develop tools, techniques and procedures for applying risk management in their areas of responsibility. It is a closed loop process applicable to any situation and environment. The five steps are:

- a. **Identify Hazards:** Identify hazards to the force. Consider all aspects of the current and future situations, environment and known historical problem areas.
- b. **Assess Hazards:** Assess hazards to determine risks. Assess the impact of each hazard in terms of potential severity and probability.
- c. **Develop Controls and Make Risk Decisions:** Develop control measures that eliminate the hazard or reduce its risk. As control measures are developed, risks are reevaluated until all risks are reduced to a level where benefits outweigh potential costs and are accepted by appropriate authority.
- d. **Implement Controls:** Put controls in place that reduce the risk.
- e. **Supervise and Evaluate:** Enforce standards and controls. Evaluate the effectiveness of the controls and adjust/update as necessary.

**Conservation**

The protection, improvement, and use of natural resources according to principles that will provide optimum public benefit and support of military operations.

**Contaminated area**

Any area where there are known or suspected unexploded munitions (dud ammunition or explosives) regardless of type.

**Control tower**

A structure usually situated behind the firing line or position from which range operations of a training event is controlled.

**Cookoff**

A functioning of any or all of explosive components due to high temperatures within a weapon system.

**Crew-served weapon system**

Any weapon system requiring two or more personnel to fire the system.

**Cross-sectional terrain profile**

A profile of the SDZ being considered for deviation at a point laterally downrange where a hill mass is expected to attenuate projectiles and/or hazardous fragments.

**Decibel peak level**

A logarithmic method of expressing the peak pressure caused by an explosion.

**Dedicated impact area**

See impact area.

**Deviation**

A departure from the requirements of DA Pam 385-63, Range Safety and the policy in AR 385-63/MCO 3570.1B, Policy and Procedures for Firing Ammunition for Training, Target Practice, and Combat.

**Deviation authority**

The authority to depart from established Army range safety standards. IAW DA Pam 385-63, the Director Army National Guard has full authority to make such departures.

**Direct fire**

Fire delivered on a target when the weapon system is laid by sighting directly on the target using the weapon system sighting equipment.

**Dispersion area**

The area within the SDZ located between the GTL and the ricochet area. This area accounts for human error, gun or cannon tube wear, propellant temperature, etc.

**Distance D**

Distance along specific angle, measured from the weapon target line, at the firing position down range for selected direct fire weapons. Distance D defines maximum projectile distance along this line.

**Distance L**

The distance downrange from the launch point where the launch dispersion angle intersects the flight corridor boundaries for the Patriot missile.

**Distance W**

The maximum lateral distance a projectile will ricochet after impacting within the dispersion area. Distance W defines the maximum lateral edge of the ricochet area.

**Distance X**

The maximum distance a projectile (to include guided missiles and rockets) will travel when fired or launched at a given quadrant elevation with a given charge or propulsion system.

**Distance Y**

The maximum distance downrange at which a lateral ricochet is expected to occur when a projectile is fired at a given quadrant elevation.

**Double hearing protector (or protection)**

Wearing earplugs in combination with noise muffs or noise attenuating helmets. Impulse levels can be so high that single hearing protection does not adequately protect hearing.

**Downrange**

A descriptive term used to address the orientation of personnel, materiel, or property relative to the direction or path of ammunition and or explosives (to include guided missiles and rockets) fired or launched from weapon systems. The direction of orientation is from the firing line or position toward the target.

**Dud**

An explosive item or component of a weapon system that fails to function as intended when fired.

**Dud producing**

Munitions with a historically high-rate of malfunctions that produce duds. An example would be the 40mm grenade.

**Eject only firing event**

A firing sequence where the launch motor of a missile functions, thereby, ejecting the missile out of the launcher, but the flight motor fails to ignite causing the missile to tumble. As the missile tumbles and strikes the ground, sufficient G-Force initiates the warhead causing warhead particles to be projected outward.

**Far edge**

The boundary of the impact area that borders the outside edge of area B and is farthest from the firing point or position.

**Field expedient explosive device**

A standard item of explosive that is combined with other standard explosive items or non-explosive items using techniques and procedures outlined in doctrinal publications (FMs and TMs.)

**Final safety acceptance inspection**

Major Army commands safety inspection of new construction or modification of a range prior to release from the contractor, or other contracting agent, Government or non-Government.

**Firing lane**

The area within which a weapon system is fired. It consists of a start fire line, cease fire-disarm line, and left and right limits of fire.

**Firing line**

The line from which weapon systems are fired downrange which consists of firing points or positions.

**Firing position**

The point or location at which a weapon system (excluding demolitions) is placed for firing. For demolitions, the firing position is the point or location at which the firing crew is located during demolition operations.

**Flak jacket**

Fragmentation body armor protective vests (CTA 50–900 Update.)

**Fork**

The change in angle of elevation necessary to produce a change to the center of impact equivalent to four probable errors.

**Guided missile**

An unmanned vehicle moving above the surface of the earth whose trajectory or flight is capable of being altered by an external or internal mechanism.

**Gun target line (GTL)**

An imaginary line drawn between the firing position and target position. Also referred to as the line of fire.

**HC smoke**

Hexachloroethane-zinc oxide used to generate screening smoke.

**Hangfire**

An undesired delay in the functioning of a firing system. A hangfire for a rocket occurs if the rocket propellant is ignited by the firing impulse but the rocket fails to exit the launcher within the expected time.

**Hazard**

Any actual or potential condition that can cause injury, illness, or death of personnel, damage to or loss of equipment, property or mission degradation; a condition or activity with potential to cause damage, loss or mission degradation.

**Hearing hazard, hearing hazard zone**

All personnel exposed to levels of 140 dBp and above must wear hearing protection. The area where the impulse noise levels are 140 dBp or higher and hearing protection is required.

**Hearing protection zone**

Area on the range within which all personnel must wear hearing protection during weapons fire. It may be larger than the hearing hazard zone, but never smaller.

**High-hazard impact area**

See impact area.

**Hot firing status**

A firing condition where authorization to fire a weapon system has been given by the installation range control office. Also referred to as a wet firing status.

**Impact area**

The ground and associated airspace within the training complex used to contain fired, or launched ammunition and explosives, and the resulting fragments, debris, and components from various weapon systems. A weapon system impact area is the area within the SDZ used to contain fired, or launched ammunition and explosives, and the resulting fragments, debris, and components. Indirect fire weapon system impact areas include probable error for range and deflection. Direct fire weapon system impact areas encompass the total SDZ from the firing point or position downrange to distance X.

a. **Temporary impact area.** An impact area within the training complex used for a limited period of time to contain fired or launched ammunition and explosives and the resulting fragments, debris, and components. Temporary impact areas are normally used for non-dud producing ammunition or explosives, and should be able to be cleared and returned to other training support following termination of firing.

b. **Dedicated impact area.** An impact area that is permanently designated within the training complex and used indefinitely to contain fired or launched ammunition and explosives and the resulting fragments, debris, and components. Dedicated impact areas are normally used for non-sensitive ammunition and explosives.

c. **High-hazard impact area.** An impact area that is permanently designated within the training complex and used to contain sensitive high explosive ammunition and explosives and the resulting fragments, debris, and components. High hazard impact areas are normally established as part of dedicated impact areas where access is limited and strictly controlled due to the extreme hazard of dud ordnance (that is, ICM, HEAT, 40-mm, and other highly sensitive ammunition and explosives.)

**Improved conventional munitions**

Munitions characterized by the delivery of two or more antipersonnel or antimateriel and or antiarmor submunitions.

**Indirect fire**

Fire delivered on a target when the weapon system is not in line of sight with the target.

**Installation**

An aggregation of contiguous or near contiguous, common mission supporting real property holdings under the jurisdiction of the DoD within and outside the continental United States. Examples include, but are not limited to, posts, camps, bases, and stations.

**Installation range control officer**

A commissioned officer, warrant officer, noncommissioned officer, or civilian who serves as the central point of control and coordination for all activities conducted within the installation/community training complex, and implements and enforces the installation/community range safety program. This may include the scheduling and maintenance of the training complex.

**Intrabeam viewing**

Looking directly into the path of a laser beam or reflected beam.

**Intraline distances**

The distance used for separating certain specified areas and locations within explosive establishments.

**Instructor pilot**

A qualified warrant or commissioned officer that is placed on military orders and is assigned the responsibility for the safe operation of assigned aircraft and associated weapon systems.

**Large rocket**

A stabilized, free ballistic trajectory, long range field artillery type rocket with a range capability of greater than 100 km when using a nonnuclear warhead.

**Laser**

A device capable of producing a narrow beam of intense light (LASER-light amplification by stimulated emission of radiation). See TB MED 524 and JCS Pub 3-09.1 for more information on lasers.

**Laser buffer zone**

A safety margin on either side, above, and below the approved target area extending to a distance at which the beam is terminated by a backstop extending across the target zone or the nominal ocular hazard distance limit is reached. A vertical buffer zone covers the angular distances below the highest point on a backstop or above the nonlasing area. The laser horizontal buffer zone covers the angular distance to the left of the left most target and to the right of the right most target.

**Laser range finder**

A range finder that employs a laser device to emit a pulsed laser beams that is aimed at the target. The range is determined automatically by electronically measuring the time it takes for the light beam to travel from the laser to the target, be reflected from the target, and return to the range finder.

**Laser safety eyewear**

Protective eyewear designed specifically to permit the user to be exposed to either a direct or reflected laser beam from a specific laser device without eye injury.

**Laser SDZ**

A V-shaped zone designed to contain a laser beam (while lasing) with buffer zones on either side, above, and below the approved target.

**Logistics assistance representative**

Department of Army civilian personnel in the grade of GS-11 and above who have received training in specific weapon systems and are qualified in accordance with AR 75-1 to assist in performing malfunction investigations.

**Low-angle fire**

Fire delivered at angles of elevation equal to or below the angle corresponding to the maximum range of the gun and ammunition.

**Malfunction**

Failure of an ammunition item to function as expected when fired, launched, or when explosive items function under conditions that should not cause functioning. Malfunctions include hangfires, misfires, duds, abnormal functioning and premature functioning of explosive items under normal handling, maintenance, storage, transportation, and tactical deployment. Malfunctions do not include accidents or incidents that arise solely from negligence, malpractice, or situations such as vehicle accidents or fires.

**Military operations in urban terrain**

A terrain complex where manmade construction impacts on the tactical options available to commanders. Military operations in urban terrain facilities replicate urban sprawl environments.

**Misfire**

A complete failure to fire that is not necessarily hazardous. Because it cannot be readily distinguished from a delay in functioning (hangfire), it must be handled as worst case in accordance with procedures for the weapon system.

**Mission-essential area**

The area within the SDZ located adjacent to the impact area that is allowed to be occupied only by essential personnel needed to accomplish the assigned task or mission.

**Mission-essential personnel**

Those individuals who are directly involved or in support of weapon systems firing without whom the firing mission could not take place.

**MOUT**

A terrain complex where manmade construction impacts on the tactical options available to commanders. MOUT facilities replicate urban environments.

**Navigable waterway**

Any body of water open to the free movement of marine vessels.

**Near edge**

The boundary of the impact area that borders area C and is nearest to the firing point or position.

**Nominal ocular hazard distance**

The Intrabeam distance within which the laser beams irradiance or radiant exposure falls below the applicable exposure limit.

**Nominal ocular hazard distance-optical**

The nominal ocular hazard distance when viewed with optical aids.

**Nominal ocular hazard distance-magnified**

The nominal ocular hazard distance for Intrabeam viewing through 7x50 binoculars that transmit 70 percent at 1064 nanometers and 85 percent at 694.3 nanometers.

**Nominal ocular hazard distance-single**

The nominal ocular hazard distance for a laser device operating in the single pulse mode.

**Nonstandard explosive item**

An explosive device, material, or component that has not been type classified by AMC, or is a standard explosive item that has been altered to change its characteristics and function.

**Officer in charge**

The officer, warrant officer, or noncommissioned officer responsible for personnel conducting firing or operations within the training complex.

**Overhead fire**

Weapon system firing that is delivered over the heads of unprotected personnel in training or personnel located anywhere in the SDZ.

**Primary danger area**

An area within the SDZ where hazards are known to exist and in which no unprotected soldier/Marine or materiel is permitted since injury or death to such personnel and damage to materiel is probable. Target, dispersion, and ricochet areas are primary danger areas.

**Probable error**

A measure of the impact distribution in the dispersion pattern around the center of impact dimensionally expressed in firing tables as one interval of the dispersion rectangle.

**Proper eye protection (or eye armor)**

Approved eye protection, as a minimum, when required by safety and or installation/community range regulations and or standing operating procedures.

**Proper hearing protection**

Approved single or double hearing protection, as a minimum, when required by safety or installation range regulations or standing operating procedures.

**Public traffic route distance**

The distance in feet used to separate any public highway, navigable stream, passenger railroad, or aircraft taxiway from potential explosion sites. (See DA Pam 385–64 for Quantity-Distance Tables.)

**QASAS**

Department of Army Civilian personnel in the grade of GS–09 or above who have received 2 years of ammunition training and are qualified in accordance with AR 75–1 to assist in performing malfunction investigations.

**Range**

- a. The distance between any given point and an object or target.
- b. An area reserved and normally equipped for practice in weapons delivery and/or shooting at targets. This includes Indoor Firing Ranges.

**Range error**

Difference between the range to the point of impact of a particular projectile and the range to the mean point of impact of a group of artillery projectiles fired with the same data.

**Range officer**

See installation range control officer.

**Range personnel**

Persons designated to assist the range control officer in executing the Installation Range Safety Program.

**Range Safety Officer (RSO)**

The officer, warrant officer, or noncommissioned officer who is the direct representative of the OIC of firing or other operations. The RSO is responsible to the OIC for insuring the adequacy of safety of firing, training operations, and ensuring compliance with laser range safety requirements and local standing operating procedures.

**Rear range**

A descriptive term used to address the orientation of personnel, materiel, or property to the rear of a weapon system.

**Residual risk**

The level of risk remaining after controls have been identified and selected for hazards that may result in loss of combat power.

**Ricochet area**

The area located to the left and right of the dispersion area that contains projectiles after making initial contact with the target medium. For SDZs having angles P and Q, it is also the area located to the left and right of the dispersion area. The ricochet area is defined by distance W.

**Right and left range**

A descriptive term used to address the orientation of personnel, materiel, or property within the SDZ relative to the GTL.

**Risk**

Chance of hazard or undesired consequences; the probability of exposure to chance of injury or loss from a hazard; risk level is expressed in terms of hazard probability and severity.

- a. **Exposure:** The frequency and length of time personnel and equipment are subjected to a hazard.
- b. **Severity:** The expected consequence of an event, in terms of degree of injury, property damage, or other mission impairing factors (loss of combat power, adverse publicity, and so forth) that could occur.
- c. **Probability:** The likelihood that a hazardous incident will occur.

**Risk decision**

The decision to accept or not accept the risk(s) associated with an action; made by the commander, leader, or individual responsible for performing that action.

**Risk management**

The process of identifying, assessing, and controlling risks arising from operational factors and making decisions that balance risk cost with mission benefits.

**Risk tolerance**

The level of risk the command is willing to accept.

**Safe area**

An area within the SDZ where the probability of injury is minimal to exposed soldiers/Marines or those provided with protective cover.

**Safety certification program**

A program established and maintained by the battalion/squadron commander to ensure that personnel under their command designated as OICs and RSOs are competent and qualified to carry out the responsibilities and duties of the respective positions.

**Secondary danger zone**

An area outside of the primary danger area which provides containment of fragments, debris, and components from frangible or high explosive projectiles and warheads functioning on the far edge of the primary danger area. Areas A, B, and C are secondary danger areas.

**Senior range safety officer**

The officer designated as the range safety officer for crew served guided missiles and heavy rockets, excluding direct fire antitank missiles and rockets.

**Single hearing protector (or protection)**

Wearing either earplugs or noise muffs or noise attenuating helmets.

**Special use airspace**

Airspace of defined dimension identified by an area on the surface of the earth wherein activities must be confined because of their nature and or wherein limitations that may be imposed upon aircraft operations that are not a part of those activities.

**Specularly reflective surface**

A mirror like surface capable of reflecting a laser beam.

**Subcaliber ammunition**

Practice ammunition of a caliber smaller than standard for the weapon system. Subcaliber ammunition is economical and may be fired in relatively smaller areas. It is used with special subcaliber equipment and devices to simulate firing conditions with standard ammunition.

**Submunitions**

Any munition that separates from parent munitions in order to perform its task. In this regulation, the term submunitions is further defined as a munitions payload consisting of small, individually fuzed munitions, for example, Army improved conventional munitions (ICM) or Air Force cluster bomb Units (CBUs).

**Surface danger zone**

The ground and airspace designated within the training complex (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems to include explosives and demolitions.

**Target area**

The point or location within the SDZ where targets (static/moving, point/array) are emplaced for weapon system engagement. For demolitions, it is the point or location where explosive charges are emplaced.

**Temporary impact area**

See impact area

**Training complex**

Firing ranges and weapons training facilities designated for firing ammunition and explosives, heavy rockets, and guided missiles for training and target practice, and nonlive-fire sites for maneuver exercises and operations.

**Training site**

A designated location to train, usually within the confines of the training complex. A specific firing range and or weapons training facility designated for firing ammunition and explosives, heavy rockets, and guided missiles for training and target practice, and nonlive-fire sites for maneuver exercises and operations. Also referred to as a Training Area.

**Trajectory safety officer**

The individual who assists the senior range safety officer, and is responsible for determining when crew served guided missiles and heavy rockets should be destroyed or thrust terminated.

**Unexploded ordnance (UXO)**

Ammunition and explosives which have been primed fused, armed, or otherwise prepared for action and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installations/communities, personnel, or materiel, and remains unexploded either by malfunction or design or any other cause.

**Unit commander**

A commander of an Army or Marine Corps element whose structure is prescribed by competent authority, such as a table of organization and equipment.

**Up range**

A descriptive term used to address the orientation of personnel, materiel, or property relative to the direction or path of ammunition and or explosives (to include guided missiles and rockets) fired or launched from weapon systems. The orientation is from the target area or impact area toward the firing line or position.

**Weapon system qualified**

An individual, military or civilian, who has completed a standard program of instruction for a particular weapon system.

**Weapon system knowledgeable**

An individual, military or civilian, who has completed a standard program of instruction for a particular weapon system or has completed familiarization training established by the installation commander. Familiarization training may involve live-fire training. Familiarization training should be approved by proponent school.



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