

**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 22202-1373
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UNCLASSIFIED

SUMMARY of CHANGE

NGR 385-63

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

This major revision of the Army National Guard Regulation 385-63 dated 8 June 2007:

- Establishes policy and procedures for use of a firing range and firing ammunition, explosives, and lasers.
- Specifies leader responsibilities for implementation and management of Army National Guard Range Safety Programs
- Outlines Army National Guard Range Operations, procedures, and Risk Management
- Incorporates Army National Guard Range Deviation authority and Processes
- Incorporates procedures for special range requirements
- Incorporates Training, Inspection, medical support and communication requirements
- Makes administrative changes (throughout)

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Safety

Army National Guard Range Safety Program, Policy, and Standards

By Order of the Secretary of the Army:

CHARLES W. WHITTINGTON JR.
Major General, USA
Acting Director, Army National Guard

Official:

Charles P. Baldwin
Deputy Chief of Staff

History. This is a revised regulation. This regulation supersedes NGR 385-63, Army National Guard Range Safety Program, Policy, and Standards, dated 8 June 2007.

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, ARNG-AV. 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 authorized, but will not be less restrictive than requirements within this regulation.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to ARNG-AVS (NGR 385-63), ARNG TARC Readiness Center, 111 South George Mason Drive, Arlington, VA 22204-1373.

Distribution. A

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Chapter 1

General Provisions

Section I

Introduction

1-1. Purpose

This regulation provides Army National Guard (ARNG) policy and range operational responsibilities for firing ammunitions, lasers, guided missiles, demolitions, explosives, rockets, and the delivery of bombs on ARNG ranges and/or live-fire training facilities. This guidance is supplemental and is to be used in conjunction with Army Regulation (AR) 385-63, Range Safety, and Department of the Army Pamphlet (DA Pam) 385-63 and DA Pam 385-64. When the policy and/or procedures of ARs, DA Pamphlets or National Guard Regulations (NGRs) conflict with this regulation or other military service, or Federal agency standards, the standards providing the most stringent criteria will be applied.

1-2. References

Required and related publications and referenced and prescribed forms are listed in appendix B.

1-3. Explanation of abbreviations and terms

Abbreviations and terms used in this regulation are explained in the Glossary, appendix C.

1-4. Management Control Evaluation

Periodic Management Control evaluations/inspections of ARNG ranges and training areas must be conducted to ensure the safe and effective implementation of range safety training, operations, processes and procedures. A Management Control Evaluation Checklist (appendix A) may be used for this purpose. The site commander's periodic inspection is separate from the SOHM's annual inspection.

1-5. Range Safety Policy

It is the policy of the ARNG to design and utilize firing ranges in a responsible manner, consistent with current Environmental and Occupational Safety and Health laws and regulations and to refrain from deviations from standards. Range safety programs will be established for all ARNG ranges in accordance with this regulation, current AR 385-63, AR 350-19, and DA Pam 385-63 and must—

- a. Enhance safe and realistic live-fire training, enabling the ARNG to effectively increase combat readiness.
- b. Protect personnel and property while improving combat lethality and readiness training.
- c. Protect civilian and military populations who live and work near live-fire operational ranges.
- d. Minimize, to the extent practical through the design and management of ranges, potential explosive hazards, hazardous exposures, and harmful environmental impacts.
- e. Prevent injuries, illness, and property damage by implementing Risk Management (RM) into range operations processes to enhance lethality and readiness.
- f. Enhance the sustainability of operational ranges through the implementation of effective range clearance programs, per Department of Defense Instruction (DODI) 3200.16.
- g. Establish range safety training and certification programs for range safety professionals and other personnel, as appropriate.

Section II

Responsibilities

Responsibilities are listed in section II of this chapter.

1-6. Director, Army National Guard (DARNG)

The Director, ARNG, administers and directs the ARNG Range Safety Program as an integral part of the overall ARNG Safety Program in accordance with AR 385-10, AR 385-63, and DA Pam 385-63 and is responsible for:

- a. Ensuring resources are provided to establish, evaluate, and maintain the range safety program throughout the

ARNG, per applicable directives.

- b. Ensuring resources are provided to review range design plans to ensure safety requirements are adequately addressed prior to new construction or modification/renovation of firing ranges and/or weapons training facilities.
- c. Ensuring the ARNG Central Registry for deviations is maintained throughout the ARNG.
- d. Ensuring Range Safety training is available for ARNG installations and units.
- e. The DARNG does not have the authority to grant exceptions to the prohibitions listed in paragraph 2-11 of this regulation.

1-7. Chief, Aviation and Safety Division (ARNG-AV)

The Chief, Aviation and Safety Division (ARNG-AV), has staff responsibility for resourcing, directing, and providing oversight of the ARNG Range Safety Program and to –

- a. Provide personnel resources necessary to successfully implement and manage an effective national range safety program throughout the ARNG IAW regulatory guidelines to include AR 385-63 and DA Pam 385-63.
- b. Identify resources necessary to fund the development and management of the ARNG Range Safety Program.
- c. Coordinate with other Headquarters, Department of the Army (HQDA) staff agencies and TAGs on matters pertaining to the ARNG Range Safety Program.
- d. Ensure the effective implementation of range safety training, operations, and evaluation processes and procedures are conducted and maintained throughout the ARNG.
- e. Ensure the implementation of proactive risk management in all range operations and training.
- f. Ensure range safety deviations from standards comply with regulatory guidance, are briefed annually to ARNG leadership, and maintained in the ARNG central registry.

1-8. Chief, Safety and Standardization Branch (ARNG-AVS)

- a. Chief Safety and Standardization Branch (ARNG-AVS), is responsible to –
- b. Develop, implement, and manage the ARNG Range Safety Program IAW AR 385-10, AR 385-63, DA Pam 385-63, and this regulation.
- c. Review and provide recommendations to appropriate approval authority for the following:
 - (1) Range Surface Danger Zone (SDZ) placement on range construction plans submitted to ARNG 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.
- d. Develop and maintain a central register of all ARNG range deviations. Review range design plans, including 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. Provide range safety training to ARNG installations and units, and others as required.
- e. Evaluate the overall effectiveness of the installation range safety program annually to ensure the range safety program is being implemented in accordance with this regulation/order and installation range regulations and procedures.
- f. Investigate or ensure range accidents are investigated by the appropriate command level.

1-9. The Adjutant General (TAG)

- a. The Adjutant General is synonymous to the *Senior Commander* as identified in AR 385-10 and DA Pam 385-10.
- b. The Adjutant General (TAG) is responsible for establishing a Range Safety Program within applicable States, territories, and D.C. and;
- c. Establishment of range safety policy for all ranges under their control.
- d. Provide personnel resources necessary to successfully implement and manage an effective range safety program IAW regulatory guidelines to include AR 385-63 and DA Pam 385-63.
- e. Identify resources necessary to fund the development and management of their respective State/Territories Range Safety Program.
- f. Ensure essential personnel involved with live-fire training receive appropriate range safety training which provides policies and techniques necessary for safe and efficient range operations.

- g. Establishment of review and approval procedures for conducting RM in accordance with established doctrine.
- h. Establish a certification program for installation range Officer In Charge (OIC)/Range Safety Officer (RSO).
- i. Ensures that ranges and their facilities comply with SDZ, policy deviation, and other safety criteria outlined in AR 385-63, DA Pam 385-63, and DA Pam 385-64.
- j. Appoint a Senior Range Safety Officer (SRSO) for Air Defense Artillery (ADA) guided missile and large rocket firing exercises.
- k. Ensure establishment and maintenance of a proactive 3Rs (Recognize, Retreat, Report) Explosive Safety Education Program for assigned and on and off-post personnel, and school children.
- l. Ensure procedures are developed to ensure all release of information to the public news media is made through the installation's public affairs office and in accordance with AR 360-1.
- m. Ensure public affairs office's community relations section participates in planning for and the execution of the explosives safety program.
- n. Ensure the establishment of a range clearance program per DODI 3200.16 to ensure safe and sustainable ranges.
 - o. 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 Safety and Occupational Health Manager (SOHM).
 - p. Is the approval authority for all deviations within their State/Territory, and the District of Columbia (D.C.). This authority shall not be further sub-delegated.
 - q. Validates the requirement for nonstandard ammunition and explosives.
 - r. Approval authority for the use of U.S. Army Special Operations Command (USASOC) nonstandard ammunition on their ranges.
 - s. Final safety acceptance surveys are conducted of all firing ranges, weapons training facilities, and related structures following new construction, modification, or renovation.
 - t. Appropriate actions, including closure, to control hazards on ranges determined to be unsafe.
 - u. Risk management is performed prior to conducting operations on assigned ranges.
 - v. Compliance with the prohibitions established in paragraph 2-11 of this regulation/order.

1-10. State Construction and Facilities Management Officer

- a. The State Construction and Facilities Management Officer is responsible to –
- b. Review and approve functionality, operability, and maintainability characteristics of all range construction projects for the State.
- c. Lead the development, justification, and execution of all range construction projects in design and construction for the State.
- d. Coordinate fully with all facility users, functional proponents, and other appropriate State staff elements to ensure that the maximum functionality 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).
- e. Ensure that the SOHM is apprised of all pending range construction projects and all construction that will be located adjacent to existing ranges.
- f. 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.
- g. Coordinate development of associated construction documents (DD Form 1390/91s) and SDZs with the SOHM, as appropriate.
- h. 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.

1-11. State Safety and Occupational Health Manager (SOHM)

- a. The State SOHM will on behalf of the TAG –
- b. Manage and provide oversight of the State's Range Safety Program to ensure compliance with Department of Defense (DoD), DA and ARNG policy.
- c. Establish a laser range safety program that complies with DA Pam 385-24, AR 385-63, DA Pam 385-63, and this regulation.
- d. Serve as the State point of contact for review and coordination of range surface danger zones, range deviation(s), and design review of range construction, modification, and renovation.

- e. 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.
- f. 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, DA Pam 385-64, DA Pam 385-24, and this regulation.
- g. Ensure, through State regulation, policy, or Standing Operating Procedure (SOP), that risk assessments are performed and appropriately accepted prior to conduct of operations on all assigned ranges.
- h. 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.
- i. Conduct annual review of all range deviations to assess the State's ability to eliminate the need for deviation by range redesign, or rebuilding.
- j. 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.
- k. Review local range safety policies and operating procedures annually.
- l. Inspect the installation training complex semiannually and high-risk training operations quarterly to support safety in training missions.
- m. Investigate or ensure range accidents are investigated by the appropriate command level.
- n. Maintain records of accidents occurring within or originating from the installation training complex in accordance with AR 385-10, DA Pam 385-40 as appropriate.
- o. Review proper use of SUA and airspace outside SUA utilized for live-fire training.
- p. Coordinate through ARNG-AVS for design review of proposed ranges, prior to construction of a range facilities with standard and non-standard SDZ criteria.
- q. Participate in final acceptance inspection of all firing ranges, weapons training facilities, and related structures following new construction, renovation, modification, repair, or renovation.
- r. Recommend appropriate action(s), including closing (suspension of live-fire operations), to control hazards on ranges determined to be unsafe.
- s. Assist assigned Training Center Commanders, Range Management Authorities, 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.
- t. Monitor the Officer in Charge (OIC) and Range Safety Officer (RSO) training program effectiveness.

1-12. ARNG Training Center or Activity Commander

- a. The ARNG Training Center or Activity Commander (or other responsible position for range operations) serves as the central point for control and coordination for all activities conducted within the installation training complex to ensure safety and unified operations in accordance with AR 385-10, DA Pam 385-10, and this regulation.
- b. The ARNG Training Center or Activity Commander will:
 - (1) Successfully complete the Interservice Range Safety (Intermediate) or Range Safety Course Level II.
 - (2) Ensure specific unit level range safety program responsibilities are accomplished IAW AR 385-10.
 - (3) Appoint a Range Management Authority to implement the range safety program in consonance with the SOHM.
 - (4) Implement a certification program for installation range Officer In Charge (OIC)/Range Safety Officer (RSO).
 - (5) Ensure routine monitoring of units during training by range operations, 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:

- (a) Ensure that each range operations office provides the Joint Munitions Command an email address for receipt of AE messages that require immediate action.
- (b) Ensure that each AE range operations office forward units occupying ranges all relevant AE messages and information.
- (c) Ensure that reports of AE malfunctions that occur on ARNG ranges or training areas are properly reported IAW AR 75-1.
- (d) Develop procedures to ensure all release of information to the public news media is made through the installation's public affairs office and in accordance with AR 360-1.
- (e) Ensure warnings are issued at least 24 hours in advance through the installation public affairs officer (PAO) to the public news media before firing operations that may involve possible hazards to the general public.
- (f) Withdraw or suspend installation training complex privileges for willful violation of State and/or installation range requirements.
- (g) Ensure that incidents and accidents involving weapons or ammunition are reported and investigated IAW AR 75-1 and DA Pam 385-40.
- (h) Establish medical support SOP for all range operations.
- (i) 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.
- (j) 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.
- (k) Ensure that all ranges and UXO areas have warning signs and fencing as outlined in DA Pam 385-63, Chapter 2.
- (l) Ensure (to the extent practical) that targets placed on ranges do not contain hazards materials (such as, petroleum, oils, lubricants, radium dials, and batteries).
- (m) Establish safe and practical methods for recycling or disposing of range residue IAW DoD Manual 4160.21-M.
- (n) 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.
- (o) 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 prepositioned as appropriate.
- (p) 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.
- (q) Implement a range clearance program per DODI 3200.16 that balances training requirements and high-tempo operations with the need to ensure safe and sustainable ranges.
- (r) Ensure the following actions for ranges other than those suspected of containing improved conventional munitions (ICMs) or submunitions:
 - (i) Coordination with the Deputy Assistant Secretary of the Army (Environmental Safety and Occupational Health), the DCS, G-3/5/7, and the Deputy Chief of Staff, G-4 (DCS, G-4) the Army risk assessment and deviation approval process for improved conventional munitions (ICM) and sub-munition clearance activities.
 - (ii) 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.
 - (iii) 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 ARNG- AVS is required to obtain such deviations.
 - (iv) 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.
 - (v) 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.

(vi) Ensure that the requirements for malfunction or misfire incident reporting are included in the Range Operations 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.

(vii) Maintain current maps and overlays of training complex impact area boundaries, danger zone diagrams, and ground hazards for dissemination of information to installation training complex users.

(viii) Maintain original records of current and historical danger zones, weapon system safety data, firing limitations, and survey data for firing points and impact areas within the installation training complex boundaries.

(ix) Will conduct a self-assessment of ranges in accordance with AR 385-10, DA Pam 385-63, and TB Med 524.

1-13. Range Management Authority

The Range Management Authority is responsible for:

- a. Range Management Authority duties outlined in AR 385-63 and DA Pam 385-63.
- 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 RM 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 DA Pam 385-24, 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) Require personnel who have received eye or other overexposure to seek medical treatment as prescribed by paragraph 4-3b of this regulation.
 - (5) Ensures that at least one soldier watches downrange for vehicles or aircraft beyond the target area.
 - (6) Provides adequate control of the target area to prevent unauthorized entry.

Chapter 2 Range Operations

2-1. Range Construction

- a. It is important that appropriate safety, industrial hygienist and range authority representatives participate in the planning, preparation and execution stages of design and construction of all ranges.
- b. 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 appropriate RM processes.
- c. ARNG range design plans (to include support structures and facilities) will be reviewed to ensure that safety requirements are adequately addressed prior to new construction, modification, or renovation of firing ranges and/or weapons training facilities.
- d. 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.
- e. Small arms (.50 Caliber or less) SDZ diagrams and tables provided in DA Pam 385-63 are the standard for the proper construction of small arms direct fire SDZs with or without exploding projectiles.
- f. 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.
- g. Final safety acceptance surveys are conducted of all firing ranges, weapons training facilities, and related structures following new construction, modification, or renovation.

2-2. Standard Surface/Weapons Danger Zones

- a. Danger zones are three-dimensional areas derived from computer modeling and/or laboratory data. Danger zone size and shape are dependent on the performance characteristics of the weapon system, ammunition, training requirements, geographical location, and environmental conditions. They should not account for human error. There are three types of danger zones.
 - (1) Laser surface danger zone (air-to-ground; ground-to-ground). A LSDZ consists of the target area in addition to horizontal and vertical buffer zones. It reflects the minimum land and air requirement, to include terrain mitigation, needed to safely employ a given laser.
 - (2) Surface danger zone (ground-to-ground). An SDZ delineates that portion of the earth and the air above in which personnel and/or equipment may be endangered by ground weapons firing or demolition activities. These SDZs are designed to make the probability of hazardous fragment or round escapement from installation boundaries unlikely and minimize the danger to the public, installation personnel, facilities/equipment, or property. The two basic SDZs are the cone and the "batwing." The batwing SDZ provides for greater containment of ricochets.
 - (3) Weapons danger zone (air-to-ground). A WDZ encompasses the ground and airspace for lateral and vertical containment of projectiles, fragments, debris, and components resulting from the firing, launching, and detonation of aviation-delivered ordnance. It reflects the minimum land and air requirement, to include terrain mitigation, needed to safely employ a given weapon.
- b. Danger zones published in DA Pam 385-63 represent Army minimum safety requirements. The goal of surface danger zones is to contain munitions and hazardous fragments with a probability of escapement from the danger zone not to exceed 1:1,000,000 (one in a million). The goal of weapon danger zones is to contain all munition fragments, broaches, ricochets, and debris with a probability of containment of 99.9999% (1:1,000,000 probability of escapement). If a round exits an approved danger zone, firing/delivery of that munition and weapon will cease locally until the cause of the round out of impact has been determined.
 - (1) Danger zones shall be created for all munitions/weapons used on operational ARNG ranges and updated as appropriate according to DA Pam 385-63 for all munitions and laser systems. Hazardous laser systems (such as,

class 3B and 4 lasers) will not be fired or employed on operational ranges except within the confines of approved laser SDZs (LSDZ) or approved by deviation.

(2) 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.

(3) Baffled firing ranges providing containment of projectiles, fragments, and ricochets designed and maintained in accordance with approved Corps of Engineers designs do not require application of danger zone restrictions outside of the baffled area.

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, or if a range has a ricochet hazard and does not meet the bat wing criteria, a deviation request must be submitted in accordance with chapter 3 of this regulation. Assistance may be requested from ARNG-AVS to obtain support to develop the nonstandard SDZ.

d. The danger zones for non-DOD training areas must meet the requirements of the facility and chapter 2-12. This regulation/order will be followed to the extent possible. Danger zones must meet applicable environmental and local regulations. A legal review of any formal agreement with the owner(s) of the non-DOD property is required. For ARNG organizations, use agreements will be submitted to the ARNG-AVS for coordination with USACE.

e. Specific guidelines for use agreements include:

- (1) Weapons and ammunition intended for use.
- (2) Procedures for range operations, to include ammunition accountability.
- (3) Agreement outlining the scope of accountability and liability in the event of property damage or injury to military or non-military personnel as a result of Army operations.
- (4) Airspace requirements, as required by Federal Aviation Administration.
- (5) Operational procedures to notify the public of training operations.
- (6) Risk management plan showing residual risk level for the operation (approved by the appropriate command level), control and supervision measures.
- (7) Specify positive control measures for access to the training area(s) by authorized personnel, and for excluding unauthorized personnel.
- (8) Specific procedures for decontaminating training area(s) prior to release from Army control if required.

2-3. Ammunition and Explosive Items

a. The ARNG Explosives Safety Program ensures safe and proper storage and handling of AE. DA Pam 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:

(1) Ranges with established Ammunition Handling Areas, configuration and issue areas must comply with the provisions of DA Pam 385-64.

(2) 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 385-64 and DA Pam 385-64.

(3) Other applicable mandatory ammunition and explosive safety requirements and provisions related to ranges and training areas are contained in Chapter 2-12 of DA Pam 385-63.

b. Standard ammunition and explosive items. Standard ammunition and explosive items have been type classified for use by the U.S. military and have a Department of Defense Identification Code and national stock number. Ammunition and explosive items may not be modified or altered to change their characteristics or intended functions and still be considered standard. If modified, this modification or alteration renders them nonstandard and subject to the policies and requirements of this regulation/order. Safety policies and procedures for standard ammunition and explosive items can be found in AR 385-10, DA Pam 385-64.

c. Nonstandard ammunition and explosive items. Nonstandard ammunition and explosive items have not been type classified for use by the U.S. military; or are standard demolitions or munitions that have been altered to change their characteristics to do an essentially different function from that which they were intended and manufactured, and then used as initially intended. Examples of this are adding excess increments to mortar or artillery ammunition, jamming variable-timed fuzes, increasing the propellant in small arms cartridges, or assembly of explosives components to inert rounds.

d. The DCS, G-3/5/7 validates the requirement for nonstandard ammunition and explosives. The final approval authority for their use on operational ranges rests with the senior commander or Adjutant Generals of States/Territories for the National Guard. Installation senior commanders or Adjutant Generals of States/Territories will be the approval authority for the use of USASOC nonstandard ammunition on their ranges.

2-4. Restricting Access To and Activities On Impact Areas

a. Unauthorized persons are prohibited from entering the Range training complex. When empowered, the installation RMA, is the approval authority for entry onto ranges and maneuver areas, and into any impact area (temporary, dedicated, or high hazard).

b. Unauthorized persons are prohibited from entering impact areas and other areas known or suspected to contain unexploded ordnance (UXO) by use of positive controls to include fencing and/or posting of UXO hazard warning signs. Commanders will ensure appropriate measures are used to restrict access to areas known or suspected to contain UXO. The commander will use risk management process to determine the level of risk appropriate to the type and extent of marking and/or fencing required to restrict access.

c. Where practical, positive means of excluding livestock (such as fences or gates) must be established unless a written agreement negating this requirement is in effect with livestock owners.

d. The installation RMA, a designated representative, and/or EOD personnel will brief operational personnel who are authorized range impact area access on the hazards associated with UXO and other hazards.

e. Access into temporary and/or dedicated impact areas will be strictly controlled. Those portions of temporary and dedicated impact areas authorized for training or other purposes will be surface cleared and validated of UXO before access is permitted. Cleared areas that become contaminated during live-fire exercises will be cleared when the exercise has been completed. Firing munitions into a UXO contaminated area for the purpose of clearing the area of UXO is not authorized. Training events that include firing mine clearing line charges or other similar munitions are not considered UXO clearing activities. Controlled burn activities to reduce ground cover to mitigate risks prior to a surface-clearing operation or contamination survey must be coordinated with appropriate installation staff offices. Fire will not be used to clear UXO.

f. Access to high-hazard impact areas will be limited to qualified EOD personnel, range operations, range maintenance, and safety personnel designated by the installation RMA.

g. High-hazard impact areas that have improved conventional munition (ICM) or sub-munition duds are permanently contaminated and will not be cleared by Army personnel or entered by Army range personnel for range maintenance. Operational Range Clearance contractors are authorized access into ICM-contaminated impact areas to conduct range clearance operations.

h. Entry into high explosive (HE) dud contaminated areas to extinguish fires may be an extremely high-risk operation that requires a thorough risk assessment and approval at the appropriate level of command.

i. Digging entrenchments, foxholes, slit trenches, or any other activities that disturbs earth within an impact area is not permitted unless authorized by the installation RMA. Maneuvers within a temporary impact area that include bivouac must prevent disturbing earth by driving poles, pegs, and so forth into the ground, trenching around tents, or any activity that could disturb a UXO located just beneath the ground surface. Open fires will not be permitted.

j. Unauthorized personnel are prohibited from handling UXO and munitions or removing them from the training complex. Procedures (for example, amnesty boxes) will be established for turn-in of ammunition and explosives (AE) items.

k. All normal vehicular and foot traffic approaches to ranges and impact areas will be guarded by range guards, properly instructed in their duties, or closed off by appropriate barriers, as determined by the installation RMA. When barriers are used, appropriate signs will be posted.

l. Aeronautical charts limit aerial access to ranges within restricted areas.

2-5. Posting Warning Signs, Markers, and Flags

a. Warning signs should comply with Section 200, Part 1926, Title 29, Code of Federal Regulations (29 CFR 1926) and DA Pam 385-11. Such signage should include a signal word (such as "Danger" or "Warning"), safety symbols that identify the hazard and hazard avoidance (such as a pictogram of an explosion and "Do Not Enter" symbol), and a text message (such as "Explosive Hazard, Keep Out") (refer to DA Pam 385-11). (Note: New signage, if constructed locally, shall be at least 33 centimeters (cm) by 43.5cm in overall size and of weather-resistant materials.) The sign will state "UNEXPLODED ORDNANCE - DO NOT ENTER" in two lines of red, sans-serif capital letters in the lower white section of the sign. Lettering will be at least 5cm high and of weather-resistant materials. Signs should be constructed with non-reflective paint to enable the use of lasers. Warning signs will

be posted around the installation training complex to warn and prohibit entry by unauthorized persons, and to alert authorized personnel entering a hazard area.

b. Signs at entry points to the training complex will prohibit trespassing and removal of items under penalties provided by law. Signs will also emphasize the dangers associated with unlawful entry and handling of dud ammunition.

c. Warning signs will be placed to ensure they are visible to individuals attempting to enter training complex live-fire areas at any point around its perimeter. They will be placed at 200m intervals or less, if practicable, or in a way that will ensure that a person cannot enter the range without seeing at least one sign within a legible distance.

d. Commanders will ensure UXO hazard signs are posted at a maximum of 200m intervals around all UXO locations.

e. Safety (danger, warning, caution) signs and signals will be used to warn personnel approaching a firing area. Scarlet danger flags supplemented by blinking red lights at night or during reduced visibility will be displayed from a prominent point, normally at the range entrance.

f. Signs warning personnel of the danger from projectiles, bombs, lasers, and UXO will be posted near the firing area at all times.

g. Internal and external limit of fire markers will be placed to denote right and left limits of fire. For the Army, internal and external limit of fire markers will be placed on direct-fire ranges only. See Training Circular (TC) 25–8 for limit-of-fire design requirements. When required, limit-of-fire markers shall be illuminated to ensure proper target area identification at times of limited visibility. Limit-of-fire markers should be thermalized when thermal weapons sights are used. In accordance with DA Pam 385–11, appropriate hearing protection, eye protection, and laser warning signs will be posted at each range and firing line.

h. Individual vehicles, tanks, fighting vehicles, and armored personnel carriers may display flags to show the vehicle's weapon status in accordance with the appropriate field manual. See paragraph DA Pam 385-63 for more information.

2–6. Controlling Other Range Usage

a. When the installation training complex is authorized for use by non-military organizations such as schools; county, municipal, State, or Federal agencies; organized clubs (including rod and gun clubs) or civic associations, the following requirements apply:

(1) The organization will comply with requirements and procedures established by AR 385–63, this regulation, and local range regulations and SOPs.

(2) Requests for use will be coordinated with the installation RMA, appropriate safety office(s), and the Judge Advocate General; and submitted to the Adjutant General (senior commander) for approval.

(3) Requests will identify if non-DOD associated minors will be involved in live-fire activities. If so, the activity must be an approved course of marksmanship training, unless otherwise approved by the senior commander.

(4) A written agreement must be completed between the installation and the non-military organization, detailing all rights and responsibilities of each party, liabilities, procedures, and regulatory and procedural requirements. For the Army, this agreement will be incorporated into the report of availability as required by AR 405–80.

(5) The non-military organization will designate an OIC and RSO. Personnel designated as OICs and RSOs will complete a pistol and rifle course approved by the National Rifle Association, or equivalent (for example, U.S. Pistol Shooters Association). The senior commander, based on input from the RMA, safety office, Judge Advocate General, and other staff agencies, as appropriate, will determine the equivalency.

(6) The installation RMA will ensure designated OICs and RSOs are briefed on their duties and responsibilities.

b. Military Family members engaging in authorized live-fire activities such as marksmanship training or participating in activities involving weapons firing, such as organizational or Family days, will comply with this regulation, installation range regulations, and SOPs. Requests for these activities will specify if minors will be involved. Unit will maintain a roster of all Family members for tracking and identification purposes. Civilian personnel, such as military Family members and local populace, must receive authorization from the installation RMA to enter the training complex to participate in or observe capabilities exercises, fire power demonstrations, training courses, competitions, or other types of live-fire exercises. Such personnel will remain in designated safe areas as determined by the installation RMA.

- c. Inspection team members or other official observers required to be on the firing line, firing position, or firing area will position themselves in safe areas as determined by the installation RMA. These personnel must wear appropriate safety equipment as specified by the local range regulations and the installation RMA.
- d. Civilians, to include Family members and DOD civilians, must have approval from the installation RMA to fire weapons within the installation training complex.

2-7. Special Use Airspace and Small Arms Range Safety Areas

- a. Small Arms Range Safety Areas (SARSAs) are areas the commander establishes to contain small arms range activities that could be hazardous to non-participating aircraft. SARSAs are not Special use Airspace(SUA).
- 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. 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.
 - (4) 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.
 - (5) TAG will appoint air traffic and airspace officers as needed IAW AR 95-2.
- c. Commanders will ensure that users of ARNG small arms ranges that are located outside restricted airspace or CFAs follow the SARSA policy and procedures established below:
- d. To protect aircraft, the commander or designated representative will establish or abolish SARSAs at each small arms range not located within SUA as required by DA Pam 385-63.
- e. The data in DA Pam 385-63 tables 4-1 through 4-32, will be used as the basic vertical component for each weapon system used on the range.

2-8. Coordinating Use of Navigable Waterways

- a. ARNG senior commanders will coordinate use of navigable waterways IAW DA Pam 385-63.
- b. U.S. Army Corps of Engineers (USACE) maintains notices of the restricted danger zones published in 33 CFR 334. USACE is the only entity authorized to waive water traffic requirements that apply to the live-fire of military munitions over navigable waters, to include inter-coastal waterways. Senior commanders will notify the USACE division or district commanders and the applicable U.S. Coast Guard District Office of—
 - (1) Waterway involved.
 - (2) Operations to be conducted.
 - (3) Sector of waterway needed for closure.
- c. 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.
- d. The senior commander will not authorize firing until notice of the restricted danger zone is published in 33 CFR 334 and navigation maps have been revised. Additionally, the senior commander 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.
- e. Military munitions containing phosphorous, including guided missiles or rockets, will not be fired or dropped into any inland waterway, lake, bay, wetlands, or other body of water.

2-9. Range Intrusion Assessments

- a. The Installation Range Management Authority, in coordination with other garrison staff, will conduct range intrusion assessments of the existing range complex and/or individual ranges to determine if there is a need for intrusion detection systems. Assessments must also be conducted as ranges are added or modified.
- b. Installations will assess the risk of intrusion using a range intrusion assessment tool approved for use by the Army. Based on the risk assessment results, the Installation Range Management Authority will identify specific surveillance systems and associated costs.

c. The risk levels, surveillance systems, and cost(s) to acquire the intrusion detection system(s) will be identified in the Range operations work plan under safety and will be forwarded to the Command for validation. The Command will forward the validated intrusion detection system requirements to the SRP Lead Agent, TCM Ranges, Training Support Systems Division (DAMO-TRS) for approval and funding.

2-10. Training Aids, Devices, Simulators, and Simulations and Improvised Explosives Device Simulators

- a. 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.
- b. Army policy regarding Training Aids, Devices, Simulators, and Simulations is contained in AR 350-38.
- c. 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.
- d. Using and/or modifying an ammunition/explosive item is prohibited.
- e. 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.

2-11. Prohibitions

a. Unless approved by the Director, Army Staff, the following activities are expressly prohibited on ARNG ranges or training areas:

(1) Unless specifically approved by the DCS, G-3/5/7 and the ACSIM, Army organizations are prohibited from training with or conducting demonstrations using ICM or sub-munitions. This approval authority will not be delegated to the DARNG.

(2) Unless approved by the DARNG or DDARNG, Overhead fire above unprotected personnel with ammunitions/explosives is prohibited unless specifically authorized by DA Pam 385-63.

(3) Unless approved by the DCS, G-3/5/7 and the ACSIM, firing ammunitions/explosives over any ammunition storage area is prohibited unless specifically authorized by DA Pam 385-63.

b. Unless approved by the DCS, G-3/5/7 and the ACSIM, or the CMC, the following activities are prohibited:

(1) Firing depleted uranium ammunition on operational ranges. The exceptions are those ranges specifically designated Nuclear Regulatory Commission-licensed target or impact areas. For the Army, the approving authority must have visibility of all of the implications of firing depleted uranium, weigh the costs and benefits from the Army perspective, and be in a position to commit the Army to dealing with the regulatory requirements, environmental remediation, and potential negative publicity.

(2) The use of ranges, impact areas, buffer zones, or live-fire training areas that contain or may contain UXO for hunting or other recreational purposes.

(3) Burying live mines for training purposes.

(4) Trip wires, booby traps, or tilt rods used separately or collectively with live mines in training.

(5) Live-mine and practice-mine training taking place concurrently at the same location.

(6) Disarming/arming live mines more than 25 iterations per mine.

(7) Training with non-self-destructing antipersonnel land mines except as authorized by the National Command Authority. When training with non-self-destructing antipersonnel land mines is authorized, the following training is prohibited:

(8) Training with live M14 mines.

(9) Training with the M16 antipersonnel mine without the positive safety pin remaining in the M605 fuze.

(10) Live-fire and blank firing taking place concurrently at the same location supervised by the same OIC/RSO.

(11) Special precautions should be taken when units transition from live-fire to blank round training.

c. In addition to actual operation of military vessels, aircraft, vehicles, and crew-served weapons systems, civilian visitor participation in the following activities is prohibited:

(1) Throwing live hand grenades.

(2) Using diversionary devices (for example, flash bangs and/or pyrotechnics).

(3) Participating in live firing in a shooting house (for example, close quarters battle).

(4) Participating in live firing on maneuver ranges while units are maneuvering.

(5) Fast rope/rappelling from helicopters/special purpose insertion extraction rigging.

- (6) Parachuting.
- (7) Other activities, as determined by a commander that could cause, or reasonably be perceived as causing, increased safety risks.
- (8) Live mine training other than that permitted by DA Pam 385-63, including:
 - (a) Burying live mines for training purposes.
 - (b) Trip wires, booby traps, or tilt rods used separately or collectively with live mines in training.
 - (c) Conducting live mine and practice mine training concurrently/simultaneously at the same location.
 - (d) Arming/disarming live mines more than 25 iterations per mine IAW Chapter 17-9b (1), DA Pam 385-63.
- d. 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: ARNG-AVS 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.

2-12. Use of Non-DoD Property

- a. The use of non-DOD property (property not under jurisdiction, custody, or control of the Secretary of Defense) for live-fire exercises requires the approval of the DARNG. 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 and ARNG policy.
- 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. Non-DoD owned training ranges must be utilized as the specific range is designed and approved for use. It also must comply with the Army and NGB regulatory requirements as intended for DOD use.
- 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.
 - 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 DD Form 2977.
 - (4) Provide a recommendation to the TAG for approval/non approval of the request, based on inspection findings and ARNG-AVS review comments and recommendations.
 - (5) Conduct annual range safety or facility inspections to ensure continued safe use by ARNG personnel.

2-13. Other Army Components/Military Services/Agencies

- a. 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.
- b. 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-828C (as appropriate), and NGR 5-1.
- c. 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 RM process.
- d. Intraservice/Intragovernmental Support Agreements, prescribes specific ARNG criteria for establishing agreements between the ARNG and non-DoD agencies.
- e. Storage and/or disposal of Non-DOD Hazardous Materials (Ammunition & Explosives) requires ARNG-AVS review and DARNG approval.

2-14. Risk Management

- a. The RM process described in DA Pam 385-30, ATP 5-19, FM 3-0, and AR 385-10, will be used to manage risks during all ARNG live-fire-training activities. Risk assessments, with the exception of deviations from AE or chemical agent safety standards, will be documented using DD Form 2977, Deliberate Risk Assessment Worksheet, (DRAW). DA Form 7632, Deviation Approval and Risk Acceptance Document (DARAD) is mandatory for deviations from AE or chemical agent safety standards.
- b. Additionally, RM will be used to identify range hazards and implement appropriate controls in the development of installation and unit range regulations and SOPs.
- c. When the application of the RM 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 3-6 of this regulation and AR 385-63 and DA Pam 385-63 are met.
- d. Personnel and units using ARNG ranges or training areas will employ RM procedures to identify operational hazards and implement appropriate controls in order to minimize mission risk.
- e. ARNG units will document the formal RM 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.
- f. 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.
- g. The recreational use of training land and ranges is subject to AR 385-63 as well as all applicable Federal, State, local laws and regulations and installation SOPs.
- h. TAG may approve recreational activities on ARNG ranges or training areas at locations other than temporary or permanently (dud-producing) contaminated impact areas. A risk assessment will be completed and appropriately accepted IAW this regulation, ATP 5-19, DA Pam 385-30, and AR385-10.

Chapter 3

Deviation Authority and Processes

3-1. Deviations from Range Standards and Procedures

- a. A deviation, as discussed in this regulation/order, is the temporary departure from established range standards and procedures. Each departure activity from standard procedures requires an approved deviation. Deviations will be documented by number and nomenclature indication the command, approval year, State, location, and deviation number (i.e. ARNG-2019-CT-EHRR-SDZ-003). Deviations from range standards or procedures contained in this regulation, AR 385-63 and DA Pam 385-63 may be granted based on critical mission requirements. The ARNG objectives are not to deviate from standards published in AR 385-63 and DA Pam 385-63 unless reasons for doing so are strategic and compelling. 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.

b. Risk management will be integrated into the deviation process. Deviations are limited to:

(1) Reducing surface danger zone (SDZ), laser surface danger zone (LSDZ), and weapon danger zone (WDZ) dimensions when terrain, artificial barriers, or other compensating factors make smaller danger zones safe.

(a) Deviations applied to danger zones extending beyond authorized range impact area(s)/installation boundaries must be based on the ability to sufficiently contain projectiles, hazardous fragments, laser beams, and both vertical and horizontal ricochets within the authorized range impact area(s)/installation boundaries and areas under military control (for example, leased land or training areas acquired through memorandum of agreement or memorandum of understanding).

(b) A safety analysis approved by the United States Army Armament Research, Development and Engineering Center must be submitted with non-standard deviation requests. The analysis must ensure 99.9999% containment of munitions and hazardous fragments with a probability of escapement from the danger zone not to exceed a probability of 1:1,000,000 (one in a million).

(2) Modifying prescribed procedures for a munitions' use appropriate for a state of training of participating personnel to increase training realism.

(3) Allowing personnel not authorized by chapter 3-6 of this pamphlet within the danger zone, unless prohibited.

c. 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 when:

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

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

d. 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 nonparticipating 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.

e. 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).

f. 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.

g. Range deviations are effective for one year or less, 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 the range facility since approval of the active deviation, the specific changes must be submitted to ARNG-AVS for review. The deviation memorandum will accompany these submissions. All initial deviations and deviation renewals will be reported to ARNG-AVS for inclusion in the Central Register of range deviations.

h. 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.

i. Any physical or administrative changes to a deviated range will immediately revoke the approved deviation and suspend all range operations until a new deviation is submitted and approved or a determination can be made that a deviation is no longer required to continue range standard operations.

j. ARNG deviations are considered valid –

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

- (2) When they establish effective alternative hazard controls to the applicable safety criteria.
- (3) When proper reviews by the SOHM, and ARNG-AVS have been performed.
- (4) When they are applied only to ARNG personnel, ranges and training areas.
- (5) When they are reviewed annually by the SOHM for applicability, and renewed as necessary, and entered in the Central Registry at ARNG-AVS
- (6) When the original conditions requiring deviation have not changed.

3-2. Range Safety Deviation Authority

- a. The Adjutant General of the respective State/Territory is the approval authority for all deviations within their State/Territory. This authority shall not be further sub-delegated. The Adjutant General does not have authority to grant exceptions to the prohibitions in paragraph 2-11 of this regulation.
- b. ARNG-AVS is final concurring authority for all ARNG deviations. ARNG-AVS concurrence review actions are required prior to submittal for TAG deviation approval.
- c. ARNG deviations are considered valid:
 - (1) When all criteria mandated in AR 385-63 and DA Pam 385-63 have been met that allow deviations for SDZs.
 - (2) When they establish effective alternative hazard controls to the applicable safety criteria.
 - (3) If the proper reviews by the SOHM, and ARNG-AVS have been performed.
 - (4) When they are applied only to ARNG personnel, ranges and training areas.
 - (5) When they are reviewed annually by the SOHM for applicability, and renewed as necessary.
 - (6) 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 approach of the ARNG to eliminate all deviations from ARNG ranges. Commanders at all levels should strive to eliminate deviated ranges within the frame work of the five year installation plan.
- b. When a deviation is required, the State will complete the range safety deviation packet constructed IAW paragraph 3-4 of this regulation and DA Pam 385-63.

3-4. Preparation of the Range Deviation

- a. Requests for deviation shall originate from the unit or activity conducting the event or the installation Range Management Authority (RMA). The installation RMA makes the initial judgment regarding the suitability of a proposed deviation prior to submission to the concurring and approving authorities. Requests will be coordinated through the State Safety Manager and appropriate local chain of command. (i.e. mission commander, legal, environmental, and public affairs offices, as appropriate).
- b. 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.
- c. At a minimum, all deviation requests will contain the following, as appropriate:
 - (1) Memorandum Statement citing chapter, paragraph, and subparagraph of the specific condition requiring deviation, and the name and number of the operational range, training facility, or maneuver area involved.
 - (2) Description of the existing condition and anticipated hazards, subsequent hazard analysis, and risk analysis.
 - (3) Name, type, and DODIC of ammunition and/or explosives, or laser proposed to be used on the range.
 - (4) Statement as to why a deviation is necessary and impact on training if not granted.
 - (5) Control measures taken to mitigate hazards and/or minimize risk and residual risk level.
 - (6) Installation and unit standard operating procedures (SOPs) governing the specific operational range, training facility, or maneuver area for which the deviation applies.
 - (7) Scaled topographical map depicting SDZ and requested deviation.
 - (8) Map coordinates of the firing position(s), target location, and quadrant or elevation of fire, if required. The firing position(s), direction of fire, and danger zones will be plotted on the scaled map with distances shown in meters (m).

(9) 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.

(10) Computer-generated danger zones and terrain profiles depicting the gun target line (GTL), the left and right limits of fire, the relative elevation of the weapon system being fired, the target, and the natural terrain backstop or artificial barrier, as appropriate.

(11) DD Form 2977 Deliberate Risk Assessment Worksheet (DRAW) signed by the appropriate level of command, based on the residual risk assessment. This form will address:

(a) Description of the existing condition(s) and the attendant hazard. 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 DD Form 2977 as described above.

(b) 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.

(c) Control measures taken to eliminate hazards and/or minimize. 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.

(d) Residual risk levels are decided by the control(s) put in place to reduce the initial hazards. 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.

(e) The supervision of controls 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.

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

d. The completed packet will be coordinated through local approval channels, to include the State Safety Office, prior to submittal to ARNG-AVS for review and final concurrence. Packets may be submitted to ARNG-AVS at either the ARNG-AVS GKO Portal Central Registry, Organizational email, or through the U.S. Postal mail at;

(1) Central Registry at <https://gko.portal.ng.mil/arnng/G3/D01/B04/S01/PE26-Range-Safety-Program/Forms/AllItems.aspx?RootFolder=%2farnng%2fG3%2fD01%2fB04%2fS01%2fPE26%2dRange%2dSafety%2dProgram%2fNGB%20Range%20Deviation%20Central%20Registry&FolderCTID=0x012000CD5CFE64D04EE74A86C4391A0CFE1985>

(2) ARNG-AVS Organizational email at ng.ncr.ngb-arnng.mbx.arnng-safety-and-standardization@mail.mil.

(3) Herbert R. Temple, Jr., Army National Guard Readiness, Attn: ARNG-AVS, 111 South George Mason Drive, Arlington, VA 22204-1373.

3-5. Deviation Renewal

a. Deviations may be renewed by the respective approval authority provided:

- (1) Deviation expiration does not exceed 6 months
- (2) Conditions cited in the original deviation analysis, coordination, and approval have not changed.
- (3) Signature approving authority for the deviation has not changed.
- (4) A new memorandum is submitted as per chapter 3-4, c(4) and c(5).

b. Include a statement indicating the ability to sufficiently contain projectiles, hazardous fragments, laser beams and both vertical and horizontal ricochets sufficiently within the installation boundaries and areas under military control (as applicable). Installations must indicate the ability to provide unlikely escapement probability (1:1,000,000) for SDZs that extend beyond installation boundaries.

3-6. Deviation Limitations

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

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

- (2) Modifying prescribed firing procedures for the purpose of increasing training realism:
 - (a) When modifications do not sacrifice or violate safety criteria.
 - (b) When modified procedures continue to meet doctrinal training requirements.
 - (c) When the increased risks are identified, documented, and incorporated into the SDZ as appropriate.
- b. Allowing non-participating personnel into the SDZ, when hazard controls adequately reduce and/or eliminate personnel exposure.
 - c. An effective life of one year from the date of the authorizing official's signature IAW AR 385-63 and DA Pam 385-63. Deviations may be renewed by the approval authority provided the conditions cited in the original deviation have not changed, per paragraph 3-5 above.
 - d. 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, and AR 200-3.

3-7. Range Safety Deviation Central Register

- a. The ARNG Central registry is a Guard Knowledge Online database used to submit, store, access, view, and update ARNG Range and Explosives safety actions. Development and updating of range safety surface danger zones, deviations, explosives safety site plans, exceptions, and explosives safety surveys. The ARNG Central Register is available through Guard Knowledge Online and may be accessed using the Common Access Card.
- b. ARNG-AVS and each State Safety Office will maintain central registers of range safety deviations from the standards of DA Pam 385-63 IAW AR 385-63.
- c. Each State will identify ranges with approved deviations in the ARNG Central Registry and the ARNG official database of record for all Real Property.

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. Safety requirements for indoor firing ranges and shoothouses

- a. Army National Guard indoor firing ranges and shoothouses shall be maintained IAW DA Pam 385-63.
- b. ARNG indoor firing ranges attached to readiness centers or other habitable locations are prohibited.
- c. ARNG indoor firing ranges and shoothouses shall comply with applicable Occupational Safety and Health Administration and Environmental Protection Agency standards. The safe operation and maintenance of indoor firing ranges and shoothouses shall include:
 - (1) Lead intoxication.
 - (a) Commanders will ensure that Soldiers and maintenance personnel who operate in urban combat live-fire facilities understand the potential hazards of lead poisoning and the controls, based upon an individual's level of exposure, required to mitigate this hazard. Therefore, facility SOPs will address the Industrial Hygiene survey controls developed for the facility and facility personnel, and unit SOPs will address lead poison awareness to include safety precautions, hygienic standards, "do's and don'ts" on the range, methods to limit exposure, etc.

- (i) Do not collect spent brass casings in personal headgear.
- (ii) Do not use dry sweeping to clean lead-contaminated areas – use HEPA vacuums to limit exposure.
- (iii) Change clothing and footwear before returning to the unit area or going home (children are more susceptible to lead poisoning).

(iv) Take steps to remove residual lead dust from hands and clothing to avoid cross-contamination of other personnel.

(b) Indoor firing ranges and shoothouses must comply with Occupational Safety and Health Administration standards (29 CFR 1910.1025) including medical surveillance requirements. Personnel exposures, which are intermittent, will be controlled per the criteria provided in DA Pam 385-63, Table 2-1.

(c) The criteria in DA Pam 385-63, Table 2-1 were developed to control intermittent lead exposure and establish maximum hours of exposure based on the airborne lead concentration and the number of days firing per year. These criteria are to be used as interim control measures only. Maximum effort will be made to reduce the airborne lead levels to 0.03 milligrams per cubic meter (mg/m³) or less.

(d) Lead exposures for personnel are determined by a sampling strategy that employs general-area and breathing-zone samples. Paragraph 2-7b contains guidance for air sampling. The Industrial Hygiene Department of the U.S. Army Public Health Center will conduct the airborne lead sampling and provide the analysis and recommend the maximum allowable hours of exposure to be used as indicated table 2-1. Once an airborne lead concentration is determined, table 2-1 is used to set maximum allowable hours of exposure for each category of range user. Other potential lead exposures, including off-duty firing, may contribute to an individual's overall exposure and should be considered in establishing maximum allowable exposure time.

(2) Air sampling.

(a) Collect all lead samples on cellulose ester filters meeting the following specifications: pore size of 0.8 microns, 37 millimeters (mm) in diameter, three-piece preloaded cassette, and closed face. Sampling rate should be 1 to 4 liters per minute for a minimum volume of 500 liters.

(b) In indoor firing ranges, sample on the firing line, 3m behind the firing line, and in adjacent areas (such as range office, supply room, or hallways). In small ranges (fewer than six firing positions), samples should be taken at each firing position on and off line. In larger ranges (six or more firing positions), breathing-zone and general-area samples should be taken in every other firing position and off line. In shoothouses, sample at each doorway and other locations where personnel may pause. Permanently assigned range personnel may be evaluated using data obtained from general-area and breathing-zone samples, if applicable. Take at least one air sample for lead in an area adjacent to the facility defined above during each monitoring period. The sample should indicate whether or not lead contamination is confined to the facility.

(c) The following actions are critical to proper evaluation:

- (i) Sample during periods of maximum use.
- (ii) If firing is over an extended period of time, allow time for possible buildup of airborne concentrations before sampling.
- (iii) Sample during the use of higher-caliber ammunition if more than one type of ammunition is used.
- (iv) Calibrate all pumps before and after use by a method traceable to a primary standard (for example, bubble and burette).

(3) Ventilation.

(a) Contaminations occur as byproducts of firing (that is, lead, carbon monoxide, and aldehydes) and must be removed from the facility through an adequate ventilation system. The maximum concentration of lead acceptable for an 8-hour daily exposure (time-weighted average) is 0.05 mg/m. A ventilation system designed to provide this protection is sufficient to remove other byproducts of firing.

(b) Optimum ventilation systems should intake make-up air behind the firing line and expel exhausted air at the target line or bullet trap.

(c) Downrange air velocity can be measured or approximated by using a 30-second smoke candle and stop watch. Ignite the smoke candle behind the firing line and time the smoke from the moment the first plume crosses the firing line until it reaches the bullet trap. Calculate the air velocity in meters per second (m/s) by dividing the range distance or length (from firing line to bullet trap) (D) by time (T), or $D/T = m/s$. A minimum of 0.18m/s is required. This is equal to 0.017 cubic meters per second per square meter of cross-sectional area. During the smoke evaluation, observe the range for any "dead spots" (swirling of smoke up-range) or other turbulent airflow motions that may allow for increased exposure at or behind the firing line.

(d) Ensure proper disposal of contaminated waste (for example, filters).

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-828C, Laser Range Safety and Joint Pub 93-09.1, Joint Laser Designation Procedures, are definitive guidance for laser operations, characteristics, and general procedures.

(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) DA Pam 385-24, 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.

b. 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, DA Pam 385-40, and TB MED 524.

(1) 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.

(2) 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.

(3) Night vision devices will not be used for laser eye protection. These devices are not "cover-all" goggles.

c. 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.

d. 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.

e. 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.

f. 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:

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

(1) 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.

(2) 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.

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

h. Laser Range Approvals.

(1) Approval for Laser Ranges is granted by the SOHM after review and concurrence by ARNG-AVS and U.S. Army Public Health Center (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 ARNG-AVS to the U.S. Army Public Health Center for analysis. ARNG-AVS will provide the SOHM with the recommendation as well as precautions that shall be followed during laser operations on the range in question.

(3) Submissions 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.

i. 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-828C. Warning signs are posted for laser activity.

(2) 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.

(3) 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.

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

(5) 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.

(6) Computer bombing systems often use target designation laser range finder capability to perform computer-controlled auto-release of weapons. This area short of the target must be included in the laser hazard area and cleared of specular reflectors.

(7) 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.

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-828C apply. Tactical exercises involving force-on-force components using laser devices other than MILES may be approved by TAG.

4-4. Range Clearance and UXO Operations

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

b. A hazard assessment using DD Form 2799 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 Operations Management Authority or Training Center Commander should contact their supporting EOD organization for assistance in developing the CRM worksheet and developing range-clearing procedures.

4-5. 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

Additional Range Requirements

5-1. Training

There are currently no mandatory Army Military Occupational Specialty specific or Additional Skill Identifier training requirements for Range Operations 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 Operations 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 Operations 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 Operations personnel:

- a. 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 TRADOC Capability Manager-Ranges (TCM Ranges) and ARNG.
- 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 Operations Course, administered by ARNG.

5-2. 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 Regulation 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 Regulation 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.
- c. 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 Regulation 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 Regulation 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.

5-3. Communications

Effective communications are required to control firing, coordinate requests for medical assistance, and announce unsafe conditions. 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 operations 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 operations 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 operations.

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 operations organization will be maintained as prescribed above.

5-4. 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 Management Control evaluations/inspections of ARNG ranges and training areas to ensure that ranges remain safe. A Management Control Evaluation Checklist (appendix C) may be used for this purpose. The site commander's periodic inspection is separate from the SOHM's annual inspection.

d. These facilities require periodic inspections to ensure compliance with current health and safety standards. The types of periodic inspections are initial, detailed, and annual.

(1) Initial inspections are one-time inspections made by qualified and competent safety or engineer personnel. The purpose of the initial inspection is to classify the authorized level of use of the facility. Based on the findings of the initial inspection, the facility will be classified as safe, limited, or unsafe. DA Form 5687 (Initial Inspection Checklist for Indoor Ranges) will be used to record the initial indoor firing range inspection. Criteria for initial inspection of shoothouses will be developed by the RMA, appropriate safety office, industrial hygiene office, and appropriate medical authority based on local conditions. A copy of the initial inspection will be maintained at the range and available for review.

(a) A facility classified as safe permits authorized firing for military and civilian use.

(b) A facility classified as limited permits only limited use under controlled conditions. The personnel exposure limits for intermittent atmospheric lead exposure will be used for limited operation of the facility.

(c) A facility classified as unsafe is not authorized for use under any conditions.

(2) Detailed inspections will be made by the support installation team composed of safety, facility engineer, and medical department activity representatives. Detailed inspections are in addition to the initial inspection. DA Form 5688 (Detailed Inspection Checklist for Indoor Ranges) will be used as a minimum for conducting the indoor firing range inspection. Criteria for detailed inspection of shoothouses will be developed locally as in paragraph (1), above. Findings from the detailed inspection will determine complete facility retrofit requirements. For new facilities, a detailed inspection will be made within 120 days of the initial inspection. It is important that appropriate safety, industrial hygienist and range authority representatives participate in the planning, preparation and execution stages of design and construction of all ranges.

(3) Annual inspections will be made by safety specialist (0018 series) or safety engineer (0803 series) personnel to ensure safety standards and procedures are maintained in the operation of the facility. The annual inspection will be made within 45 days of the anniversary date of the last annual inspection.

e. Inspection and evaluation results will be provided to the next higher headquarters for action as appropriate. Supporting installation safety managers will maintain an information copy.

f. The supporting facility coordinator will maintain a record of each inspection. Subsequent inspections will be made as a follow-up check against previous inspection results to assure required corrective action(s) noted has/have been accomplished and that there are not adverse changes to the building envelope, environmental conditions, and/or safe operating procedures.

Appendix A

Management Control Evaluation Checklist

A-1. Function

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

A-2. Purpose

The purpose of this checklist is to assist commanders, managers, and supervisors in evaluating the key management controls processes outlined below. It is not intended to cover all controls.

A-3. Instruction

Answers must be based on actual assessments of key range safety management control processes (e.g., document analysis, direct observation, sampling, simulation, etc.). Answers which indicate deficiencies must be explained and corrective action indicated in supporting documentation.

1. Program management

Are management control processes in place to ensure that range safety responsibilities, programs, and procedures are implemented in accordance with AR 385-63?

2. Education, Training & Promotion

a. Are management control processes in place to ensure proper use of both SUA and airspace outside SUA used for live-fire training?

b. Are management control processes in place to ensure Range safety certification programs will be used to train and qualify personnel in the duties of officer-in-charge (OIC) and range safety officer (RSO) for firing exercises and maneuver operations?

c. Are management control processes in place to ensure Range safety certification programs will be integrated into organizational training?

d. Are management control processes in place to ensure the Operations Officer provides personnel designated as OIC's and RSO's a range safety briefing on the use of the training complex as part of certification?

3. Inspections, Surveys, Assessments & Technical Consultation

a. Are management control processes in place to ensure final acceptance surveys are conducted of all firing ranges, weapons training facilities, and related structures following new construction or modification or renovation?

b. Are management control processes in place to ensure accomplishment of maintenance of a central register of deviations from the standards of AR 385-63 and DA Pam 385-63 within the command?

c. Are management control processes in place to ensure appropriate actions, including closure, to control hazards on ranges determined to be unsafe?

4. Risk Assessment / Hazard Analysis

a. Are management control processes in place to ensure accomplishment of review of design plans to ensure that safety requirements are adequately addressed prior to new construction or modification/or renovation of firing ranges and/or weapons training facilities?

b. Are management control processes in place to ensure review and approval procedures for conducting Risk Management (RM) in accordance with established doctrine?

c. Are management control processes in place to ensure unauthorized persons are prohibited from entering impact areas or areas known/suspected to contain unexploded ordnance (UXO) by use of positive controls (i.e. fencing and/or posting of UXO hazard warning signs)?

Appendix B

References

Required Publications

AR 385-10

Army Safety Program (Cited in Chapters 1-5, 1-7b, 1-8a, 1-10e, 1-11a, 1-11d, 1-11dd, 2-14a, 2-14g)

AR 385-63

Range Safety (Cited in Chapters 1-5, 1-7b, 1-8a, 1-10e, 1-11, 1-11c, 1-11dd, 2-14a, 2-14g)

ATP 5-19

Risk Management (Cited in Chapter 2-14,a)

DA Pam 385-10

Army Safety Program (Cited in Chapter 1-11a)

DA Pam 385-24

The Army Radiation Safety Program (Cited in Chapters 1-10b, 1-10e, 1-12l, 4-3a(4))

DA Pam 385-30

Risk Management (Cited in Chapters 2-14a, 2-14g)

DA Pam 385-40

Army Accidents Investigations and Reporting (Cited in paras 1-11k, 4-3b)

DA Pam 385-63

Range Safety (Cited in Chapters 1-5, 1-6a, 1-7a, 1-7c(2), 1-8d, 1-8i, 1-8o, 1-10b, 1-10i, 1-11g, 1-11o, 1-11y, 1-11z, 1-11dd, 1-12b, 1-12e, 1-12lk, 1-12l, 1-12m(1), 1-12m(3a), 2-1d, 2-1e, 2-1c, 2-3a(3), 2-5f, 2-7d, 2-8a, 2-11a(2), 2-11c(8), 2-12e, 2-12g, 2-13b, 2-14b(1), 2-14b(2), 3-1a, 3-1c, 3-1j(1), 3-2c(1), 3-3b, 3-6c, 3-7b, 4-1a, 4-1b(1), 4-1b(2), 4-2a, 4-2c, 4-2d, 4-4a, 5-1, 5-1e, 5-4a)

DA Pam 385-64

Ammunition and Explosives Safety Standards (Cited in Chapters 1-8i, 1-10e, 1-11y, 2-3a, 2-3a(1), 2-3a(2), 4-4a)
Related Publications

29 CFR 1910

Occupational Safety and Health Standards

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 200-3

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 405-10

Acquisition of Real Property and Interests Therein

AR 405-80

Management of Title & Granting Use of Real Property

DA Pam 40-501

Hearing Conservation Program

DA Pam 385-24

The Army Radiation Safety Program

DA Pam 385-40

Accident Reporting and Records

DoD Manual 4160.21M

Defense Materiel Disposition Manual

FM 3-0

Operations

ATP 5-19

Risk Management

Joint Pub 93-09.1

Joint Laser Designation Procedures

MEDCOM Reg 40-12

Medical/Dental Site Support Plan to Annual Training

MIL-HDBK-828C

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 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

Referenced Forms

Unless otherwise indicated, DA forms are available on the Army Publishing Directorate's Web site at <http://www.apd.army.mil>. Unless otherwise indicated, NG forms are available on the National Guard Bureau Publications & Forms Library Web site at <https://www.ngbpdc.ngb.army.mil/>

DD Form 1390

FY Military Construction Program

DD Form 1391

FY Military Construction Project Data

DD Form 2977

Deliberate Risk Assessment Worksheet (DRAW)

DA Form 2028

Recommended Changes to Publications and Blank Forms

DA Form 5687

Initial Inspection Checklist for Indoor Ranges

DA Form 7632

Deviation Approval and Risk Acceptance Document (DARAD)

Appendix C

Glossary

Section I

Abbreviations

AE

Ammunition and Explosive

AR

Army Regulation

ARNG

Army National Guard

ASP

Ammunition Supply Point

ATP

Army Techniques Publication

CALFEX

Combined Arms Live-Fire Exercise

CFR

Code of Federal Regulations

DA

Department of the Army

DARAD

Deviation Approval and Risk Acceptance Document (DA Form 7632)

DA Pam

Department of the Army Pamphlet

DDESB

Department of Defense Explosives Safety Board

DoD

Department of Defense

DODD

Department of Defense Directive

DODI

Department of Defense Instruction

DODIC

Department of Defense Identification Code

DRAW

Deliberate Risk Assessment Worksheet (DD Form 2977)

EOD

Explosive Ordnance Disposal

EPR

Enhanced Performance Round

FM

Field Manual

GTL

Gun Target Line

HQDA

Headquarters, Department of the Army

IAW

In Accordance With

ICMs

Improved Conventional Munitions

MEDCOM

Medical Command

MILES

Multiple Integrated Laser Engagement System

MIL–HDBK

Department of Defense Handbook

MOU

Military Operations in Urban Terrain

NCO

Noncommissioned Officer

NGB

National Guard Bureau

NSD

Non-Self-Destructing

OIC

Officer in Charge

Pam

Pamphlet

PPE

Personal Protective Equipment

PRIDE

Planning Resource for Infrastructure Development and Evaluation

QASAS

Quality Assurance Specialist – Ammunition Surveillance

RDA

Ricochet Danger Area

RM

Risk Management

RMA

Range Management Authority

RMTK

Range Managers Toolkit

RSO

Range Safety Officer

SARSA

Small Arms Range Safety Area

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

TRADOC

U.S. Army Training and Doctrine Command

UAS

Unmanned Aircraft System

USACE

U.S. Army Corps of Engineers

USASOC

U.S. Army Special Operations Command

USATCES

U.S. Army Technical Center for Explosives Safety

UXO

Unexploded Ordnance

VI

Vertical Interval

WDZ

Weapon Danger Zone

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 of Deflection

The angle of travel of bullet fragments relative to the plane of the target surface towards the shooter.

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 G

The danger area between the CAMDV area and Area C which exists during the firing of artillery rounds equipped with a PGK. This area accounts for the possibility of a locked PGK canard resulting in a short round.

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 of Critical Concern

Any item deemed necessary to protect during range operations

Area R

The portion of the SDZ behind the firer where personnel, equipment and facilities may be endangered by ricochets to the rear of the firing line.

Area S

The radius of S value around a laser target from which all peculiarly 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 lazied. 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 operations. 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 operations office. Also referred to as a dry firing status.

Combined arms live-fire exercises (Army)

A combat exercise in which Army 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.

Command responsibility

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

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, 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 AR 385-63 and DA Pam 385-63.

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 operations 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 Management Authority

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.

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.

Non-Participating Personnel

Personnel that are not under the direct OIC/RSO control/responsibility and are not involved in the overall exercise/training event in any way.

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.

Participating Personnel

Personnel that are under direct OIC/RSO control/responsibility participating in or part of an overall exercise/training event and directly involved in some or all of the tasks or events associated with the overall exercise/training.

Primary danger area

An area within the SDZ where hazards are known to exist and in which no unprotected soldier 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.

Probability

An approximation of the likelihood of a hazard scenario occurring. Probability has no dimension but must be attached to an interval of exposure (for example, one operating year, a million vehicle miles, 1,000 landings).

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 Management Authority.

Range personnel

Persons designated to assist the Range Management Authority 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 risk associated with a hazard that remains after implementing all planned countermeasures or controls to eliminate, reduce or control the impact of the hazard. The residual risk can also be the initial risk. This situation happens when the initial risk was so low that the hazard did not warrant expenditure of funds to mitigate.

Ricochet Danger 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

Risk is defined as the measure of the expected loss from a given hazard or group of hazards, usually estimated as the combination of the likelihood (probability) and consequences (severity) of the loss.

- 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 management process

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.

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 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.

Severity

An approximation of the amount of potential harm, damage, or injury associated with a given hazard scenario or mishap.

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 element whose structure is prescribed by competent authority, such as a table of organization and equipment.

Uprange

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 Danger Zone

WDZ encompasses the ground and airspace for lateral and vertical of impact and post impact effects (ie. Projectiles, fragment, debris and, components) resulting from the firing, launching, and/ or detonation of aviation delivered ordnance. This three-dimensional zone accounts for weapon accuracy, failures, ricochets, and broaches/porpoising of a specific weapon/munition type delivered by a specific aircraft type. Weapon danger zones represent the minimum safety requirements designed for aviation weapons training on DOD ranges.

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.