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RANGE PLANNING AND OPERATIONS

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This manual and Air Force Instruction (AFI) 13-201, *Airspace Management*, implement Air Force Policy Directive (AFPD) 13-2, *Air Traffic, Airfield, Airspace, and Range Management*. This manual also implements Department of Defense Instruction (DoDI) 1322.27, *DoD Urban Training Facilities,* and DoDI 3200.21, *Sustaining Access to the Live Training Domain*. It applies to all Regular Air Force, Air National Guard (ANG), and Air Force Reserve range operating authorities. It provides guidance for the planning, operations, management, safety, equipment, facilities, and security of Air Force ranges covered by this manual (see Attachment 2). Refer recommended changes and questions about this publication to the Office of Primary Responsibility using the Air Force Form 847, *Recommendation for Change of Publication*; route Air Force Forms 847 from the field through the appropriate functional chain of command. See paragraph 1.4 for guidance on supplementing this manual. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance

statement. See AFI 33-360, *Publications and Forms Management*, Table 1.1, for a description of the authorities associated with the Tier numbers. Waivers to this manual are authorized and are processed IAW AFI 33-360. For compliance items not identified with a Tier number, waiver authority is delegated to the Headquarters Air Force Operational Training Infrastructure Division (AF/A3TI). Waivers for non-Tiered and T-0 compliance items must be coordinated through the MAJCOM before they are submitted to AF/A3TI for action. T-0 compliance items are those imposed by law, DoD policy, or an external organization (e.g., FAA). While AF/A3TI will take T-0 waiver requests for action, it is possible the waiver may not be granted. T-1, T-2, and T-3 waivers automatically expire 30 days after a change of command unless the new commander renews the waiver. At the unit level, the range operating authority should monitor implementation of this manual and review approved waivers anytime the circumstances that prompted the waiver or the impacts of the excepted activity change substantially. Submit waiver requests on the Air Force Form 679, *Air Force Publication Compliance Item Waiver Request/Approval*, through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication Office of Primary Responsibility for non-tiered compliance items (see paragraph 1.3 for additional information). Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Disposition Schedule in the Air Force Records Information Management System.

(AETC) This supplement implements and extends the guidance of Air Force Manual (AFMAN) 13-212V1, *Range Planning and Operations*. It applies to all AETC ranges. This supplement does not apply to the Air National Guard or Air Force Reserves. This supplement contains guidance unique to the training mission and guidance of AETC on items not covered by the basic AFI. AETC units will publish their supplements according to AFI 33-360, *Publications and Forms Management*, and its AETC supplement. Units will coordinate supplements through the Range and Airspace Branch (19 AF/DOO) for approval before publishing. They will forward one copy of their finalized publication to 19 AF/DOO. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through appropriate functional chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this supplement are maintained according to AFI33-322, *Records Management and Information Governance Program*.

SUMMARY OF CHANGES

This document has been substantially revised and requires a complete review. Tiering and compliance statements have been updated IAW Administrative Assistant to the Secretary of the Air Force (SAF/AA) recommendations. Implementing language from DoDI 3200.21 has been incorporated. Additionally, responsibilities for the Air Force Installation and Mission Support Center and the Air Force Civil Engineer Center (AFCEC) have been added, and the requirement for individual comprehensive range plans has been eliminated.

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Chapter 1

INTRODUCTION

1.1. Purpose. This manual provides guidance for commanders to operate assigned ranges safely, effectively, and efficiently to meet training and test requirements while minimizing potential effects on the environment and the surrounding communities.

1.1. (AETC) Purpose. This supplement further defines Air Education and Training Command specific requirements and responsibilities to manage AETC ranges in addition to guidance in AFMAN 13- 212 V1.

1.2. Scope.

1.2.1. This manual applies to all Air Force-operated air and ground ranges listed in Attachment 2. These ranges are part of the Air Force's Operational Training Infrastructure. Space-launch activities are not covered by this manual. Small arms training ranges are addressed in AFI 36-2654, *Combat Arms Program*, and are not covered by this manual. Air Force-operated air and ground ranges outside of the United States will comply with the provisions of all applicable international agreements, this manual, Department of Defense Directive (DoDD) 4715.12, *Environmental and Explosives Safety Management on Operational Ranges Outside the United States*, DoDI 4715.22, *Environmental Management Policy for Contingency Locations*, and AFI 32-7091, *Environmental Management Outside the United States*. **(T-0).**

1.2.2. Attachment 2 is intended to be the definitive list of ranges covered by this manual. Air Force organizations conducting range activities, as defined in Title 10 of United States Code (U.S.C.) Section (§) 101(e)(2), at locations other than those listed in Attachment 2 must contact the Publication Office of Primary Responsibility (through the parent Major Command [MAJCOM]) for a coverage review unless one or more of the criteria listed in the following subparagraphs are met: **(T-1).**

1.2.2.1. The activity is specifically excluded in paragraph 1.2.1.

1.2.2.2. The activity is conducted at an operational range operated by another military service, federal agency, or a host nation, IAW the rules and procedures established by the organization operating the range. **Note:** while this AFI only applies to Air Force-operated ranges, ranges operated by non-Air Force entities that are located on Air Force real property (e.g., test sites located on an Air Force installation) shall comply with applicable portions of this manual via a host-tenant agreement to ensure safety and stewardship of Air Force property. IAW AFI 32-9003, *Granting Temporary Use of Air Force Real Property*, when the Air Force grants the right of exclusive or non-exclusive use of Air Force real property to a non-Federal agency a license is required; when granted to another Federal agency a permit is required.

1.2.2.3. The activity requires airspace only (no land or water surface component), and is conducted IAW Air Force, Department of Defense (DoD), and Federal Aviation Administration (FAA) or applicable host nation airspace regulations.

1.2.2.4. The activity consists of training involving drop zones and/or landing zones, and is conducted IAW AFI 13-217, *Drop Zone and Landing Zone Operations*.

1.2.2.5. The activity consists of training conducted off federal real property. Refer to DoDI 1322.28, *Realistic Military Training (RMT) Off Federal Real Property*, for requirements and procedures for this type of activity.

1.2.3. If the coverage review determines the activity is within the scope and intent of this manual, the AFI will apply and Attachment 2 will be updated accordingly.

1.3. Waiver request. Waiver requests will be submitted using the Air Force Form 679 and will include the information specified in paragraph 1.9.4.2. of AFI 33-360. Additional requirements are at the discretion of the waiver authority.

1.3.1. Non-Tiered and T-0 waiver requests must also include the following:

1.3.1.1. Range name, location, range operating authority and a point of contact.

1.3.1.2. Description of the conditions at issue to include:

1.3.1.2.1. Potential alternatives and their impact on test and training operations, maintenance, cost, and other factors deemed appropriate by the requesting agency.

1.3.1.2.2. Risk management assessment. See paragraph 4.18.

1.3.1.2.3. Supporting maps, charts, graphics, or other illustrations as appropriate.

1.3.1.3. A detailed plan to alleviate the condition.

1.3.1.4. Previously granted waiver.

1.3.2. AF/A3TI will coordinate non-Tiered, T-0 and T-1 waiver requests with AF/A4CX for Explosive Ordnance Disposal (EOD), unexploded ordnance (UXO), and range clearance matters and with AF/TE for test and evaluation range matters when appropriate.

1.3.3. AF/A3TI will coordinate all waiver requests with Air Combat Command (ACC), Airspace, Ranges and Airfield Operations Division (ACC/A3A) so they can maintain appropriate situational awareness as the lead MAJCOM.

1.3.4. **(Added-AETC)** AETC/CC is the MAJCOM POC for Tier 1 and Tier 2 waivers.

1.4. Supplements. This publication may be supplemented at any level. All supplements are routed as indicated in 1.4.1. for coordination prior to certification and approval. Supplements may change, or add procedures, as applicable, to this manual, but changes can be no less restrictive than this manual. All supplements are published IAW AFI 33-360 on the Air Force electronics publications website.

1.4.1. For MAJCOM supplements, MAJCOMs must submit a copy to AF/A3TI for review and coordination prior to publication.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. The Director of Global Power Programs (SAF/AQP) will:

2.1.1. Act as the focal point for development and procurement of subscale and full-scale aerial target systems and Combat Training Range Systems, aircraft tracking equipment, threat simulators and engagement scoring systems.

2.1.2. Perform all Program Element Monitor (PEM) responsibilities for Aerial Targets and Combat Training Range development and procurement (program elements [PE] 64735, 27429, and 35116).

2.1.3. Coordinate range-related acquisition programs and PE changes with AF/A3TI.

2.2. The Deputy Under Secretary of the Air Force, International Affairs (SAF/IA) will:

2.2.1. Manage (in conjunction with Air Force Security Assistance and Cooperation Directorate) Foreign Military Sales cases, and other security assistance cases, involving major systems or requiring special management consideration of range-related issues.

2.2.2. Serve as the focal point for negotiations with foreign nations on issues related to the use of Air Force-owned or operated ranges and range equipment.

2.3. The Assistant Secretary of the Air Force for Installations, Environment, and Energy (SAF/IE) will:

2.3.1. Provide policy and oversight of all operational range environmental support such as operational range assessments and responses, natural and cultural resource management, hazardous material and hazardous waste management, and compliance with applicable environmental requirements.

2.3.2. Represent the Air Force in meetings with the Office of the Secretary of Defense and environmental regulatory agencies involving discussion of Air Force range environmental compliance activities and environmental policy.

2.3.3. Oversee the acquisition, creation, modification, transfer, or withdrawal of range land IAW AFI 32-9001, *Acquisition of Real Property*, the Federal Land Policy and Management Act and Title 43, U.S.C., Sections 155-158.

2.4. The Deputy Chief of Staff for Operations (AF/A3). IAW Headquarters Air Force Mission Directive 1-54, *Deputy Chief of Staff, Operations, Plans & Requirements*, AF/A3 is responsible for matters concerning ranges. AF/A3, through the Director of Training and Readiness (AF/A3T), establishes range policy, programming, and requirements.

2.4.1. Training and Readiness (AF/A3T) will:

2.4.1.1. Designate AF/A3TI as the Office of Primary Responsibility for Air Force range policy and management.

2.4.1.1.1. Operational Training Infrastructure Division (AF/A3TI) will:

2.4.1.1.1.1. Develop range policy, programming, and requirements IAW AFPD 13-2.

2.4.1.1.1.2. Review and coordinate on ACC's Enterprise Range Plan.

2.4.1.1.1.3. Review and coordinate Test/Training Space Needs Statements (T/TSNS) for ranges.

2.4.1.1.1.4. Advocate for Air Force range development and procurement funding in coordination with the Director for Global Power Programs (SAF/AQP) PEM.

2.4.1.1.1.5. Advocate for Air Force range sustainment funding.

2.4.1.1.1.6. Sponsor Air Force PEM for Readiness Training Ranges, Operations and Maintenance (O&M) (PE 27604F).

2.4.1.1.1.7. Sponsor Air Force PEM for the Nevada Test and Training Range and the Utah Test and Training Range (PE 27428F).

2.4.1.1.1.8. Designate the proponent responsible for execution of the Environmental Impact Analysis Process (EIAP) for range-related actions. Support range proponents in meeting their EIAP responsibilities per Title 32 Code of Federal Regulations (CFR) §989.3(d) as documented in the T/TSNS, ensure headquarters review prior to public announcement and preparation of the description of proposed action and alternatives (32 CFR §989.28), and participate early in the scoping and review of all EIAP issues and documents concerning Air Force-operated ranges. All EIAP work associated with ANG ranges will be overseen by the National Guard Bureau (NGB).

2.4.1.1.1.9. Coordinate with the DoD Urban Training Facilities Review Group to ensure Air Force urban training facility proposals are properly evaluated and/or certified IAW DoDI 1322.27.

2.4.1.1.1.10. Coordinate with other public, private, and tribal interests and agencies as required in support of Air Force range actions. The NGB will coordinate with the states on behalf of the ANG.

2.4.1.1.1.11. Provide range-related information to the Strategic Basing-Executive Steering Group as requested.

2.5. The Director of Civil Engineers (AF/A4C) will:

2.5.1. Oversee implementation of policy and provide program oversight for the Operational Range Assessment Program IAW DoDI 4715.14, *Operational Range Assessments*.

2.5.2. Provide environmental policy consultation and support to SAF/IE for Office of the Secretary of Defense meetings related to Air Force ranges that require environmental representation.

2.5.3. Oversee implementation of policy and execution for applicable EIAP issues and documents concerning Air Force-operated ranges IAW 32 CFR Part 989. The NGB oversees the EIAP for ANG range actions.

2.5.4. Provide environmental consultation in support of Military Munitions Rule compliance under Title 42 U.S.C. Sections 6901-6992, *Resource Conservation and Recovery Act*.

2.5.5. Implement range-related environmental policy to ensure compliance with DoD policy and regulatory requirements.

2.6. Test Policy and Programs Division (AF/TEP) will:

2.6.1. Perform all PEM responsibilities for the following test and evaluation infrastructure and support areas: Air Force Operational Test and Evaluation Center O&M; Combat Development; Threat Simulator Development; Major Test and Evaluation Investment; Initial Operational Test and Evaluation; Test and Evaluation Support; Facility Sustainment – Test and Evaluation Support; and Facility Restoration and Modernization – Test and Evaluation Support.

2.7. NGB. The NGB is the channel of communication between the Air Force and states for all matters pertaining to ranges held for the purpose of the ANG. The NGB will assume the role of the Headquarters Air Force under the oversight of the Secretary of the Air Force as described in DoDD 5105.77, *National Guard Bureau (NGB).*

2.8. MAJCOM Commanders. Unless a MAJCOM is specified in parentheses at the beginning of the sub-paragraph, all references to MAJCOMs in this manual include the ANG and Commander, Air Force Forces in Combatant Commands. MAJCOM Commanders, through appropriate level staff (including the Air Force Installation and Mission Support Center), will:

2.8.1. **(ACC)** Develop and publish the Enterprise Range Plan.

2.8.2. Review and forward requests for non-Tiered and T-0 waivers to this manual to AF/A3TI. Serve as the T-1 waiver authority or delegate this authority to the appropriate MAJCOM Director.

2.8.3. Review urban training facility proposals from ranges, and submit these proposals to AF/A3TI for coordination with the Urban Training Facilities Review Group.

2.8.4. Develop policy, advocate for resources, define requirements, and manage the oversight of MAJCOM ranges.

2.8.5. Contract for services to support execution of range missions IAW AFI 63-138, *Acquisition of Services*, and AFI 63-101/20-101, *Integrated Life Cycle Management.* When practical, partner with other MAJCOMs to achieve economies of scale.

2.8.6. **(ACC)** Serve as the lead MAJCOM for the overall program management of Center Scheduling Enterprise (CSE) to include development of utilization guidance, system implementation, and sustainment.

2.8.6.1. Ensure range scheduling and utilization data is standardized across the Air Force, recorded, reported, and archived in CSE.

2.8.7. **(ACC)** Serve as the lead MAJCOM for Weapon Danger Zones (WDZ).

2.8.8. Ensure ranges use the most current training Surface Danger Zones (SDZ)/WDZs concurrent with the introduction of new aircraft, weapons, and tactics or training requirements.

2.8.8. **(AETC)** ROAs will ensure the most current training Surface Danger Zones (SDZ)/Weapons Danger Zones (WDZ) are used for weapons employment. If no training SDZ/WDZ footprint exists for planned weapons employment, seek a waiver through 19 AF/DOO to HAF **(T-1)**.

2.8.9. Establish procedures and training requirements for electronic warfare operations personnel performing duties associated with paragraph 4.13.

2.8.10. Support efforts of ranges to conserve and restore the natural and man-made infrastructure at their ranges.

2.8.11. Coordinate with other public and private interests and agencies as required to support MAJCOM range requirements.

2.8.12. Fund laser and directed energy weapon range certifications.

2.8.13. **(Air Force Materiel Command [AFMC])** Through the 711th Human Performance Wing, maintain the institutional capability to conduct range certifications for lasers and directed energy weapons.

2.8.14. **(ACC, Air Force Global Strike Command (AFGSC) , Pacific Air Forces [PACAF], Air Education and Training Command [AETC], Air Force Special Operations Command [AFSOC], United States Air Forces in Europe-Air Forces AFRICA [USAFE-AFAFRICA])** Provide O&M inputs for Readiness Training Ranges (PE 27604F). ACC will serve as lead MAJCOM for representing PE 27604F to the Air Superiority Core Function Team, who is responsible for representing programmatic details within PE 27604F as part of the corporate process.

2.8.15. **(ACC)** Sponsor PEM for Nevada Test and Training Range and Utah Test and Training Range (PE 27428F). ACC will serve as lead MAJCOM for representing PE 27428F to the Air Superiority Core Function Team, who is responsible for representing programmatic details within PE 27428F as part of the corporate process.

2.8.16. **(ACC, PACAF, AETC, AFSOC, USAFE-AFAFRICA, ANG, AFRC, AFGSC, Air Mobility Command)** Provide input for training range investment and equipment, including threat system modernization (PEs 27429F/64735F). ACC will serve as lead MAJCOM for representing PEs 27429F/64735F to the Air Superiority Core Function Team, who is responsible for representing programmatic details within these two PEs as part of the corporate process. ACC will develop and publish a process for soliciting MAJCOM input.

2.8.17. **(ANG)** Sponsor the PEM for ANG Ranges, O&M, and personnel (PE 52634F). ANG will represent PE 52634F to the Air Superiority Core Function Team, who is responsible for representing programmatic details within PE 52634F as part of the corporate process.

2.8.18. **(AFMC)** Sponsor the PEM for AFMC Ranges, Operations and Sustainment, and Personnel (PE 65807F) IAW the Air Force and MAJCOM Corporate process.

2.8.19. **(AFMC)** Sponsor the PEM for the Test and Evaluation investment PEs.

2.8.20. **(ACC)** Host a biennial Air Force Airspace and Range Conference.

2.8.21. Provide oversight and funding to ensure that range systems meet cybersecurity risk management framework requirements IAW AFI 16-101, *Risk Management Framework (RMF) for Air Force Information Technology (IT).*

2.8.22. **(AFMC)** Through, the Air Force Installation and Mission Support Center:

2.8.22.1. Perform all PEM responsibilities for the following range support areas: Military Construction; Range Facility Sustainment, Restoration, Modernization; Facilities Operation for Range Utilities; and operational range environmental support such as operational range assessments and responses, and natural and cultural resources program execution.

2.8.22.2. Identify environmental requirements eligible for funding in environmental PEs. Ensure AFCEC programs projects IAW AFI 32-7001, *Environmental Management*, AFI 32-7020, *The Environmental Restoration Program*, or AFI 32-7091, as appropriate in Automated Civil Engineers System, or successor system.

2.8.22.3. AFCEC Technical Support Division, AFCEC/CZT, will:

2.8.22.3.1. Serve as Office of Primary Responsibility for execution of the Operational Range Assessment Program.

2.8.22.3.1.1. Maintain permanent records, documenting the technical data gathered and the analysis to determine if there is a release or substantial threat of a release of munitions constituents of concern from an operational range to an off-range area that creates an unacceptable risk to human health or the environment.

2.8.22.3.1.2. Maintain an inventory of Air Force operational ranges.

2.8.22.4. AFCEC National Environmental Policy Act Division, AFCEC/CZN, will:

2.8.22.4.1. Initiate planning for the EIAP when requested by a range proponent.

2.8.22.4.2. Support range proponents in land acquisition efforts IAW AFI 32-9001 and DoDI 4165.71, *Real Property Acquisition*. Ensure all National Environmental Policy Act compliance requirements in support of land acquisition are met.

2.8.23. **(Added-AETC)** HQ 19AF/DOO is the AETC focal point for range operations and unless otherwise noted is responsible for coordinating and staffing for range, Air Combat Training Systems (ACTS) and airspace issues.

2.9. Range Operating Authority. The wing or Combat Readiness Training Center commander responsible for operating the range will serve as the range operating authority, however range operating authority responsibilities may be delegated, in writing, to a unit commander or designated representative, however, contractors cannot serve as range operating authorities. For ANG-operated ranges and Nevada Test and Training Range, the range commander is designated as the range operating authority. ANG range operating authorities will be confirmed by the United States Property and Fiscal Officer prior to assumption of duties. Range operating authorities will:

2.9. (AETC) Range Operating Authority. The Director of the 56th Range Management Office (RMO) is the Range Operating Authority for the Barry M. Goldwater Range (BMGR) at Luke AFB.

2.9.1. Ensure compliance with this manual and other directives applicable to range programs. **(T-1)**. Range operating authorities may delegate the daily scheduling, operation, maintenance, and management of the range to a subordinate unit.

2.9.2. Appoint a range operations officer, in writing, to supervise range operations, management, planning, and maintenance. **(T-1)**. The range operations officer will be a military officer or DoD civilian employee. **(T-1)**. **Note:** range operating authorities must ensure requests for waivers forwarded to the MAJCOM are reviewed by the Staff Judge Advocate and Manpower offices for compliance with applicable law and DoDI 1100.22, *Policy and Procedures for Determining Workforce Mix*. **(T-1).**

2.9.2.1. The range operating authority will designate the responsibilities of the range operations officer. Normally the range operations officer has authority over all range

activities that support mission readiness training and serves as the range operating authority's primary point of contact for range issues.

2.9.2.2. The range operations officer develops range procedures, interfaces with support agencies and flying units related to range operations, maintenance, planning, and compliance.

2.9.3. Appoint a range safety officer. **(T-1)**. The range safety officer will be a military officer or DoD civilian employee. **(T-1). Note:** range operating authorities must ensure requests for waivers forwarded to the MAJCOM are reviewed by the Staff Judge Advocate and Manpower offices for compliance with applicable law and DoDI 1100.22. **(T-1).**

2.9.4. Appoint or obtain the support of a military officer or civilian as a Flight Safety Officer IAW AFI 91-202, *The US Air Force Mishap Prevention Program,* if the range accommodates flight test or training. **(T-3)**.

2.9.5. Appoint a Laser Safety Officer IAW AFI 48-139, *Laser and Optical Radiation Protection Program*, if the range accommodates laser operations. **(T-3)**.

2.9.6. Appoint a Directed Energy Weapon Safety Officer IAW AFI 91-401, *Directed Energy Weapons Safety*, or obtain Directed Energy Weapon Safety Officer support from a parent or associated unit if the range has been certified to conduct directed energy weapon operations. **(T-1)**.

2.9.7. Certify range control officers and Test Area Control Officers in writing. **(T-2)**. The range operating authority will establish the education, training, experience, and affiliation (contract or government) requirements for these positions. **(T-1)**.

2.9.7. **(AETC)** AETC range control officers (RCO) must maintain currency in order to perform RCO duties. The ROA or Group Commander may waive RCO currency for unusual circumstances. Waivers will be in writing and for a period not to exceed 24 hours. RCO certification requirements are listed in **Attachment 7**. RCO records are the property of the US government and will: reflect the training, currency and certification of all RCOs; be retained to assure safe and successful accomplishment of duties as an RCO; be available for review.

2.9.7.1. For ranges providing Class A service, the range control officer at a minimum will have experience as a rated aircrew member, an Air Traffic Controller, an Air Battle Manager, a Terminal Attack Controller, a Weapons Director, a previous range control officer or equivalent test experience. **(T-1).**

2.9.7.2. For test sites, identify actions, requirements, and responsibilities of the designated range control officers and test area control officers. **(T-1)**.

2.9.7.3. For air-to-air and air-to-surface training, range control officer qualification requirements, duties and responsibilities will be IAW AFI 11-214, *Air Operations Rules and Procedures*. **(T-2)**.

2.9.7.4. **(Added-AETC)** The RCO Duty Period (RDP) begins when the RCO reports for duty and ends after the last control or range event.

2.9.7.5. **(Added-AETC)** The RDP shall not exceed 12 hours. RCOs will not exceed 60 RDP hours in any consecutive 7-day period **(T-3)**.

2.9.7.6. **(Added-AETC)** RCOs will not perform any duties involving aircraft operations:

2.9.7.6.1. **(Added-AETC)** Anytime the RCO has not obtained crew rest IAW paragraph 2.9.7.7 **(T-3)**.

2.9.7.6.2. **(Added-AETC)** If impaired by alcohol or any other intoxicating substance, to include the effects or after-effects.

2.9.7.6.3. **(Added-AETC)** Anytime a physical or psychological condition is suspected or known to be detrimental to the safe performance of RCO duties.

2.9.7.7. **(Added-AETC)** Crew rest is compulsory for RCOs prior to performing any duties involving aircraft operations and is a minimum of 8 non-duty hours before the RDP begins. Crew rest is free time and includes time for meals, transportation, and rest. This time must include an opportunity for at least 8 hours of uninterrupted sleep. The RCO crew rest period cannot begin until after the completion of official duties **(T-3)**.

2.9.8. Certify Range Training Officers in writing. **(T-2)**. For air-to-air training on ranges and other airspace providing Class D service, the primary Range Training Officer responsibilities in addition to flight safety are to facilitate training, provide real-time kill removal, and assist flight leads in mission reconstruction during debriefs. During autonomous air-to-air training (conducted without Ground-Control Interception or Airborne Warning and Control System), the Range Training Officer may assist aircrews in maintaining aircraft inside airspace boundaries and expedite rejoins upon request. The Range Training Officer may be military or contractor furnished, but as a minimum, Range Training Officers must possess "rated mission expertise" in the activity being performed or have Air Battle Manager/Weapons Director experience. **(T-2).**

2.9.9. Appoint a data steward to create, maintain, and manage the range functional geospatial data and/or mission datasets. **(T-3)**. The range data steward coordinates with the Installation Geospatial Integration Office on all mapping and geospatial integration requirements IAW paragraph 3.2.2 and AFI 32-10112, *Installation Geospatial Information and Services (Installation GI&S).*

2.9.10. Ensure all personnel appointed or assigned to the range are qualified and trained for their positions IAW Attachment 5, Range Personnel Training, and MAJCOM supplements before assuming duties. **(T-1)**. All training must be documented. **(T-2).** The method of documentation is up to the supervisor, if not otherwise prescribed by the applicable MAJCOM or related chain of authority.

2.9.11. Ensure that authorized visitors and personnel who infrequently visit the range are appropriately briefed on range safety. **(T-1)**.

2.9.12. Participate in AFI 99-103, *Capabilities Based Test and Evaluation*, safety review process by assessing test project safety plans, ensuring that they identify and mitigate all health and safety risks. **(T-1)**.

2.9.13. As requested, provide information and assistance to test planners regarding range costs, availability, and how the range establishes priorities for training and testing requirements.

2.9.14. Prior to authorizing test events on a primary training range (PTR), obtain MAJCOM approval of test footprints or WDZ surrogate footprints and risk assessments IAW paragraph 4.11.3.1.2 and 4.11.3.1.3.

2.9.15. Enter into written agreements in coordination with the MAJCOM and IAW paragraph 4.2. and AFI 25-201, *Intra-Service, Intra-Agency, and Inter-Agency Support Agreements Procedures*. **(T-1)**.

2.9.16. Develop and maintain a range supplement to this manual, which is approved and published at wing level. **(T-1)**. **Exception:** supplements for ANG ranges and Nevada Test and Training Range may be approved and published by the range operating authority.

2.9.16.1. Ranges may use the most suitable format for the supplement (i.e., integrated or standalone) IAW AFI 33-360.

2.9.16.2. Range operating authorities must submit the range supplement to the parent MAJCOM for review and coordination prior to publication. **(T-1).** When supplements require update due to a significant change in range operations, submit an updated supplement to the MAJCOM within 120 days.

2.9.16.3. At a minimum the supplement must include: general range description; services available; hours of operation; range diagrams; range scheduling procedures; operations; joint operating procedures; laser and attack restrictions, target and weapons authorizations and restrictions (to include composition of target and authorized ordnance); electronic warfare operating procedures; safety; emergency and jettison procedures; authorized frequency clearances; range control officer procedures; chaff and flare operations; night lighting diagrams; night operations; range control officer night vision device (NVD) operations; ground laser procedures; support agency procedures and agreements; range clearance operations; pyrotechnic employment procedures and restrictions; and fire suppression responsibilities. **(T-2).**

2.9.17. Ensure proposals to construct or upgrade urban training facilities are properly evaluated and/or certified IAW DoDI 1322.27 and this manual. **(T-0)**.

2.9.18. Maintain scheduling control over all range space and equipment using CSE and document scheduling procedures in a letter of agreement or the range supplement. **(T-1)**.

2.9.19. Post on CSE applicable range information, points of contact, updated procedures, access to the local supplement to this manual, scheduling information, and links to other large reference sources, such as target and range imagery, stored outside of CSE. **(T-1)**.

2.9.19. **(AETC)** Range Scheduling. Publish range scheduling procedures in the local range supplement and post them on the individual Range SharePoint page. The Scheduling Authority (SA) will establish, as a minimum, scheduling procedures for: normal and additional operating hours, schedule changes, and dissemination of range safety information to off-station/non-local users.

2.9.20. Although Civil Engineering (CE) manages the EOD program and provides personnel for range clearance mission, the range operating authority funds all aspects of range clearance support. **(T-1).**

2.9.21. Work with the supporting EOD unit and environmental office to develop the annual range clearance plan 6 months in advance and ensure the clearance schedule is readily available. **(T-3).**

2.9.22. Maintain a record of clearance activities that accurately captures the geographic scope of the clearance activity. **(T-1)**. Copies of EOD range clearance reports suffice provided the reports include this required information.

2.9.23. Develop and implement training, inspection, and maintenance procedures for range NVDs utilized by range control officers and other range personnel. **(T-2)**.

2.9.24. Establish procedures for range, occupational and explosive safety. **(T-1).** Range operating authorities must ensure safety of landing zones and drop zones are IAW AFI 13-217 and that emergency procedures are readily available to the range control officer and other ground personnel. Range operating authorities should contact the supporting installation Weapons Safety Manager to assist in licensing or siting munitions storage locations.

2.9.25. Implement a risk management process for the range IAW AFI 90-802, *Risk Management*. **(T-1)**.

2.9.25.1. For changes to range operations or procedures where the risk increases to high (or above), the range operating authority will notify the parent MAJCOM prior to implementation IAW AFI 91-202. **(T-2)**.

2.9.25.2. For planned or implemented changes, the range operating authority will perform and maintain records of a WDZ analysis for all targets, manned facilities/sites, and equipment on the range. **(T-1)**.

2.9.26. Make reasonable effort to make information concerning hazard areas associated with ranges under the range operating authority's control available to the public. **(T-1)**.

2.9.27. Ensure range boundary signs are posted IAW paragraph 4.5.1. **(T-1)**. On ranges that fall within the boundaries and direct control of another agency responsible for the safety and security of the range, such as a shared-use Army range, the range operating authority shall coordinate with the owning agency to determine appropriate signage consistent with the intent of paragraph 4.5.1. **(T-1)**.

2.9.28. Establish an outreach program to educate installation personnel and the public about the dangers of trespassing and UXO hazards. **(T-1)**. Using appropriate forums, address range issues that have the potential to influence the surrounding community. **(T-3)**.

2.9.29. Establish procedures for basic first aid and medical evacuation of any personnel injured during range operations. **(T-1)**. Ensure EOD range clearance activities receive medical support IAW AFMAN 91-201, *Explosive Safety Standards*, and AFI 32-3001, *Explosive Ordnance Disposal (EOD) Program*.

2.9.30. Establish range security procedures to include physical safeguards for all range equipment and facilities. **(T-1)**.

2.9.31. Control access to hazardous areas, as described in Chapter 4, using physical safeguards or procedures to protect all personnel and property. **(T-1)**.

2.9.32. Conduct a risk assessment to establish published procedures and restrictions for the expenditure of all munitions (weapons, flares, threat simulators, etc.). **(T-1)**. Review the risk assessment annually. **(T-2)**.

2.9.33. Restrict the use of depleted uranium (DU) to sole use impact areas that have been permitted by Air Force Medical Support Agency's Radioisotope Committee. **(T-0)**.

2.9.34. Prepare requests for disposal or recycling of DU penetrators and fragments IAW AFI 40-201, *Radioactive Material Management*, and coordinate with the supporting Installation Radiation Safety Officer. **(T-0)**.

2.9.35. Prohibit training that employs improved conventional munitions or munitions that contain submunitions (e.g., cluster bombs) unless specifically authorized by AF/A3TI. **(T-0).**

2.9.35.1. When authorized, establish sole-use target or impact areas where feasible for training activities involving improved conventional munitions or submunitions. **(T-0).**

2.9.35.2. Make all reasonable attempts to employ inert and live improved conventional munitions on different targets. **(T-0).**

2.9.36. For research, development, test and evaluation activities that involve improved conventional munitions or submunitions, establish sole-use target or impact areas. **(T-0).**

2.9.37. To the maximum extent practicable, designate separate impact areas for live and inert ordnance training. **(T-1).**

2.9.38. Ensure no target or target material is placed on a range until all hazardous material, including potential hazardous waste regulated by the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992, has been removed from the target or target material, except to the extent that the presence of such hazardous material is essential to the operation or effectiveness of the target or target material. **(T-0)**.

2.9.39. Implement a preventive and corrective maintenance program to renovate, remove, and overhaul range targets, systems and debris. **(T-1)**.

2.9.40. Whenever possible, design, locate, and maintain targets to minimize future debris clearance costs to include use of innovative range clearance technologies and best management practices (target material substitution, recycling, etc.).

2.9.41. Immediately report if a release of ordnance results in off-range impacts IAW AFI 91-202.

2.9.42. Immediately report off-range releases in the United States or the substantial threat of an off-range release of munitions constituents of concern in the United States, when such release or threat of release poses an imminent and substantial threat to human health or the environment IAW DoD Response authorities under 10 U.S.C. § 2701, *Environmental Restoration Program*, and 42 U.S.C. § 9604, *Response Authorities*. **(T-0).** Support EOD and environmental offices that are responsible for response actions under the Air Force environmental restoration program.

2.9.43. Implement, where appropriate or recommended as a result of an operational range assessment, proactive management practices to prevent or mitigate actual or potential migration of munitions constituents beyond the range boundary. **(T-0).**

2.9.44. Lead efforts to sustain, restore, and modernize the natural and man-made infrastructure on the range. **(T-3)**. This includes identifying the range natural infrastructure requirements and regularly evaluating the health of the natural infrastructure.

2.9.45. Review, coordinate or approve all plans, proposals, and documents that potentially could affect range operations to ensure compatibility. **(T-1).**

2.9.45.1. Within 90 days of taking over such duties and at least annually thereafter, the range operating authority will coordinate with the supporting installation CE environmental office and ensure that range operations are in compliance with applicable environmental requirements and within the scope of all relevant environmental analyses, including any required management actions or mitigation. **(T-1)**.

2.9.45.2. As required, identify and resolve in consultation with the officials responsible for the existing agreements (to include renegotiation of existing agreements if necessary) any management or mitigation actions that are having or could have a significant adverse impact on range operations.

2.9.46. Participate in the T/TSNS process and coordination IAW AFI 13-201 and this manual.

2.9.47. Be the approval authority for coordination with the delegated lease execution authority on any enhanced use leases, outgrants, leases, or easements on Air Force range property. **(T-1)**. See also paragraph 4.4.2.3.

2.9.48. Identify, as early as possible, future range activities/actions which may require environmental analysis under EIAP, and provide this information to the servicing CE environmental office for inclusion in the appropriate activity management plan which allows for documentation of any required funding needed to perform the analysis. **(T-2)**.

2.9.49. Implement climate change mitigation and adaptation strategies documented in the Integrated Natural Resources Management Plan and/or Enterprise Range Plan as necessary and appropriate. **(T-0).**

2.9.50. Review, as early as possible, proposed activities (e.g., exercises) which may involve foreign nations employing weapons at the range. **(T-2).** Collect data for validation of WDZ footprints and identify range limitations which may restrict or prevent foreign participation. **(T-2).** Communicate findings and recommendations to the responsible MAJCOM office. **(T-2)**.

2.9.51. Locations where air-to-air gunnery training is performed using towed targets and drones, ensure that the aircraft performance capabilities and the appropriate munitions ballistics tables are used to determine the airspace and surface area required for safe operation. **(T-1).**

2.9.52. When PTRs and non-Major Range and Test Facility Base (MRTFB) ranges, have been declared in excess to the range requirements by the range operating authority, the MAJCOM and AF/A3TI, notify the supporting CE unit with real property responsibility of the excess status. **(T-1)**. Obtain MAJCOM approval for any government-owned range equipment or facilities to be deactivated, transferred, or decommissioned. **(T-2).**

2.9.53. Submit requests to modify existing range Combat Training Systems (CTS) to ACC/A3A using Air Force Form 1067, *Modification Proposal*. **(T-1).**

2.9.54. Ensure all range radio frequency spectrum and communication requirements are met IAW Chapter 4.

2.9.55. Designate in writing, instructor personnel to conduct electronic warfare range/electronic warfare site training for government personnel.

2.9.56. Authorize laser/directed energy weapon operations on the range only after the laser/directed energy weapon and the range have been certified for use by 711 HPW/RHD. Ensure the range laser/directed energy weapon certification is re-accomplished before it expires. Coordinate the use of lasers/directed energy weapons by any non-Air Force unit on Air Force ranges with 711 HPW/RHD. **Note:** Research and Test and Evaluation activities involving laser devices/directed energy weapon do not require range certification if conducted IAW AFI 99-103 and applicable research and test management instructions.

2.9.57. **(Added-AETC)** Range Users Meeting. All ROAs will hold an annual Range Users Meeting to ensure assigned user's requirements are identified and are being adequately addressed. The Range Users Meeting should focus on current range capabilities and future requirements. Attendees should include at a minimum: the ROA, OSS, Intelligence, Wing Weapons and Tactics representative or equivalent, and representation by each range user. Examples of topics to address are: range safety, operating procedures, scheduling, targets and target sets, threats, range clean-up, weapons danger zones, scoring, etc. The minutes will be signed by the ROA and an electronic copy sent to 19AF/DOO **(T-3)**.

2.10. Installation/Center/Wing Chief of Safety will:

2.10.1. In coordination with the range operating authority, develop and implement required programs, practices, and procedures to reduce risk to the public, personnel and resources, and maximize mission accomplishment. **(T-1)**.

2.10.2. Advise commanders on range safety requirements for all operations. **(T-1)**.

2.10.3. Provide trained and certified experts for range safety oversight and guidance on operational and test and evaluation issues. **(T-1)**.

2.10.4. Provide mission safety requirements for operational and test and evaluation procedures. **(T-1).**

2.10.5. Develop standardized range safety requirements. **(T-1)**.

2.10.6. Manage the safety mishap reporting program. **(T-1)**.

2.10.7. Investigate, report, and identify corrective actions for range safety deficiencies, high accident potentials, and mishaps. **(T-1)**.

2.10.8. Conduct analysis and advise commanders of in-flight impact, explosive, toxic, laser, directed energy, radiological, and acoustic hazards. **(T-1)**.

2.10.9. Review and coordinate all range operations and training documentation. **(T-3)**.

2.10.10. Assist in the development of a Wildland Fire Management Plan. **(T-3)**.

2.10.11. Before exposing people, equipment, or the environment to hazards during test and evaluation, obtain and use safety releases from program offices. **(T-1)**.

2.11. Range Safety Personnel will:

2.11.1. **(All range safety officers and Flight Safety Officers)** Advise the range operating authority on the safe conduct of range operations.

2.11.2. Test safety personnel have additional safety responsibilities, and reflect those of the person conducting on-site or direct, real-time monitoring of range operations. Duties may vary

by the type of operation: For Class T services, the range safety officer duties are typically performed by the range control officer/test area control officer. For tests requiring the monitoring of a system or operation from a mission control facility (e.g., a weapon flight test with a Flight Termination System installed) the safety function is usually performed by a range safety officer on a console. For small test operations (e.g., a munitions/explosives test) the on-site safety function may be performed by the Test Director/Manager. Regardless of the personnel or event, the range safety officer will:

2.11.2.1. Be on-site at the operation or in a position to have real-time situational awareness of events, personnel and assets. **(T-1)**.

2.11.2.2. Receive a briefing from (coordinate with) range control/safety on hazards and mitigating measures associated with the test activity. **(T-1)**. This may vary from the range safety standard operating procedures with respect to the restrictions and mitigating measures established by the AFI 99-103 mandated safety review.

2.11.2.3. Ensure an applicable footprint/hazard area has been applied to the activity. **(T-1)**.

2.11.2.4. Obtain status of the range and authorization to conduct activity/fire from range control. **(T-1)**.

2.11.2.5. Ensure the hazard area is clear. **(T-1)**.

2.11.2.6. Ensure proper Personal Protective Equipment is worn and applicable safety measures (e.g., as required by the AFI 99-103 mandated safety review) are in place. **(T-1)**.

2.11.2.7. Monitor flight path and status of weapon/asset, range boundaries and areas of concern; execute Flight Termination System as required. **(T-1)**.

2.11.2.8. Suspend activity in event of mishap or significant unforeseen hazard. **(T-1).** Range safety personnel will contact Wing/Center Safety as resumption of activity may require Test Execution Authority authorization and a mishap investigation. **(T-1)**.

2.11.3. Obtain training and certification as required by the range operating authority. **(T-3)**.

2.12. Installation Civil Engineer will:

2.12.1. Provide, sustain, restore, and modernize the range infrastructure, facilities, and environment necessary to support range operations. **(T-1).** The supporting CE unit augments these functions if organic or contracted CE teams assigned to the range are not sufficient.

2.12.2. Maintain an accurate inventory of Air Force-controlled range real property in the Automated Civil Engineers System or successor system. **(T-1)**.

2.12.3. Establish standards for the comprehensive planning, design, construction, operation, revitalization, and maintenance of range real property facilities to sustain their value to the Air Force, consistent with Air Force policies. **(T-1)**.

2.12.4. Assist in the development and submission of funding requests for range infrastructure and facility requirements. **(T-1).** For environmental requirements, assist in the development of and coordination of funding requests with AFCEC who will enter environmental funding requests into the Automated Civil Engineers System or successor system. **(T-1)**.

2.12.5. Deliver services and products normally associated with facility management and operations to include real property transactions; construction, maintenance, and revitalization; utilities; and support of real property installed equipment. **(T-1)**.

2.12.6. Provide EOD support for range clearance operations IAW AFI 32-3001. **(T-1).**

2.12.7. Review, coordinate, or approve all range-related capability documents to ensure compatibility with community planning, EOD, UXO, environmental regulatory requirements, and range clearance operations. **(T-1)**.

2.12.8. Coordinate range-related environmental programs, plans or actions with the range operating authority or designated representative (e.g., range operations officer) prior to final signature or implementation. **(T-1)**.

2.12.9. Act as the liaison office or delegate this responsibility, for compliance issues with environmental regulatory agencies. **(T-1)**.

2.12.10. Establish local procedures and provide subject matter expertise with regard to environmental compliance and environmental program requirements. **(T-1)**. To facilitate this, the supporting CE unit will:

2.12.10.1. Provide education and training, to include shop-level training, to meet environmental compliance requirements, as needed. **(T-1).**

2.12.10.2. Review all environmental permits and permitting requirements to ensure that ranges are in compliance. **(T-1).**

2.12.10.3. Prepare and implement required environmental plans (e.g., Integrated Natural Resources Management Plan, Wildland Fire Management Plans, and Integrated Cultural Resources Management Plans) IAW associated AFIs and applicable guidance. **(T-0).**

2.12.10.4. Develop procedures to address conflicts between military mission objectives and environmental and cultural resource constraints. **(T-1).**

2.12.10.5. Serve as the installation-level environmental planning function for applicable EIAP issues and documents concerning Air Force-operated ranges IAW 32 CFR Part 989. **(T-0).**

2.12.10.6. Provide environmental consultation and support for compliance with the Military Munitions Rule under Resource Conservation and Recovery Act. **(T-1).**

2.12.10.7. Track and report toxic and hazardous material information IAW Title 42 U.S.C. Sections 11001-11050, *Emergency Planning and Community Right-to-Know*, including annual Toxic Release Inventory reporting.

2.12.11. Implement, manage, and provide support for the range-related portion of Installation Geospatial Information and Services Program IAW AFI 32-10112. **(T-3)**. Maintain consistent range geospatial data visualization, analysis, and integration capabilities IAW Air Force data strategies and associated standards.

2.12.11.1. Support range data stewards to assure quality and protection of range geospatial data, to include recommendations for safeguarding Geographic Information System data stored within the range organization.

2.12.11.2. Facilitate the identification of (and access to) those geospatial data that are maintained through the GeoBase Service.

Chapter 3

COMPREHENSIVE RANGE PLANNING

3.1. Comprehensive Range Planning. Comprehensive range planning is accomplished to ensure training and testing requirements are met. This process evaluates range requirements against current and projected capabilities to identify shortfalls and to guide sustainable range development to mitigate shortfalls. This manual and a hierarchy of plans provide the policy and guidance that documents the current sustainment and future range development.

3.1.1. Operational Training Infrastructure Flight Plan. AF/A3TI drafts and publishes the Operational Training Infrastructure Flight Plan. Since ranges are part of the Air Force's operational training infrastructure, the Operational Training Infrastructure Flight Plan provides the long-term strategic vision and direction for Air Force ranges. The plan establishes a vision of a realistic, integrated training environment that allows forces to train in mission relevant employment schemes to achieve and sustain full-spectrum readiness. It also describes the long-term operational training infrastructure requirements to achieve the vision set forth in the 2015 Strategic Master Plan and Air Force Future Operating Concept.

3.1.2. Enterprise Range Plan. ACC, as the lead MAJCOM, will produce an Enterprise Range Plan and coordinate it with AF/A3TI prior to publication. The plan should have a 10-year planning horizon and support achievement of the vision established in the Operational Training Infrastructure Flight Plan.

3.1.2.1. ACC will ensure the Enterprise Range Plan identifies the current mission of each range and the range requirements. This includes detailing necessary test and training capabilities as well as specifying training requirements for assigned users. It should compare current and known future requirements against the current range capabilities to identify shortfalls and describe investment actions.

3.1.2.2. Enterprise Range Plan development provides an opportunity for all MAJCOM organizations and staff to provide input, coordinate actions within the command and across MAJCOMs. ACC will coordinate the plan with all other MAJCOMs to ensure their needs and concerns are addressed.

3.1.2.3. The Enterprise Range Plan shall take into consideration climate change-related risks and opportunities (e.g., sea level rise, shifts in precipitation, increases in droughts or floods, increases in severe weather events and temperature). Authoritative climate data will be obtained from the 14th Weather Squadron (**https://climate.af.mil**).

3.1.3. Air Force Training Requirements. Range training support requirements are based on the Major Weapon System, Designed Operational Capability statement missions and training events of the assigned units. The Ready Aircrew Program (RAP), Major Weapon System Volume 1, training publications and syllabi normally provide the specific events that require range support. Attachments 3 and 4, Range Supported Major Weapon System Training Events and Assigned Range Users, are a compilation of the applicable events, required range capability and infrastructure for each specific training event and are based on current practices. As Major Weapon System, mission types or training events, and/or tactics, techniques, and procedures change to meet emerging threats and technologies, the MAJCOM Realistic

Training Review Boards are instituted to maximize the quality of unit training and convene (usually annually) to update training events, frequency and standards.

3.1.3.1. At a minimum, MAJCOMs shall biennially review applicable portions of the Combat Air Forces, Mobility Air Forces, and Special Operations Forces Realistic Training Review Board recommendations; range user assignments; the range-supported Major Weapon System events; and other applicable training requirements documents. Following the review, the MAJCOMs, through ACC as the lead MAJCOM, will provide AF/A3TI with inputs on recommended changes to Attachments 3 and 4.

3.1.3.1.1. The biennial review should ensure a specific range has been tasked to support each specific training event and that it has the required capability to do so. MAJCOMs must support shortfalls necessitating a change to assigned users, or capability and infrastructure investments based on the published data.

3.1.3.1.2. User-event assignments should consider geographic proximity as well as the scope and attributes required for the assigned event. Units will not be assigned to more than one range for the same training event.

3.1.3.1.3. When a MAJCOM does not have an adequate or close-proximity range to support one of its units, the MAJCOM will engage other range-owning MAJCOMs and services for support and assignment of their units. If the shortfall cannot be serviced, the proponent MAJCOM will submit a T/TSNS to AF/A3TI for resolution.

3.1.3.1.4. During the biennial review, MAJCOMs should review test and training requirements to determine the live and synthetic mix and if changes to range requirements are needed. This drives a continuous modernization process that meets test objectives, increases combat realism, aids tactics development, enhances day-to-day training, and moves toward a balanced and appropriate live and synthetic mix.

3.1.3.2. Non-Air Force Training Requirements at PTRs. Support of non-Air Force unit training events on Air Force ranges is often based on historical agreements and/or related to basing decisions. This support may establish additional range financial obligations and requirements and range operating authorities must document this with a written agreement as outlined in paragraph 4.2. **(T-1).**

3.1.3.2.1. The range operating authority, in coordination with the MAJCOM, will identify the specific events, training priority, and related range capabilities and infrastructure needed to support the training **(T-2)**; and will determine if the range has the capacity to support the event(s) while continuing to meet its obligations to the assigned Air Force users. **(T-2)**.

3.1.3.2.2. If additional operating hours, capabilities, equipment or infrastructure are necessary to support the training, the range operating authority will document those costs in the written agreement and coordinate for reimbursement as authorized IAW paragraph 4.2. **(T-1)**. Ranges will not assume training that incurs additional costs to support users that have not been assigned to them in this manual, unless documented in a written agreement which has been approved by the range-operating MAJCOM and AF/A3TI. **(T-1)**.

3.1.3.3. Training Priority at PTRs. Priority is normally determined by the range-operating Wing. The range-operating Wing and individual ranges should schedule effectively to adequately support each assigned user in the assigned event as well as non-Air Force users who have entered into a written agreement for support. Ranges are authorized to provide range access and training support on a space-available basis to non-assigned units but those units should not normally have priority above assigned users.

3.1.3.4. Training-Support Requirements at MRTFB Ranges. IAW DoDD 3200.11, *Major Range and Test Facility Base (MRTFB),* the MRTFB may be used by DoD users and by users outside the Department such as United States Government Agencies, State and local governments, allied foreign governments, and commercial entities for training events. Users must clearly articulate training requirements to determine the level of support needed and the priority of the activity.

3.1.3.5. Training Priority at MRTFB Ranges. IAW DoDD 3200.11, scheduling of the MRTFB is based upon a priority system that gives equitable consideration to all DoD Components and accommodates DoD acquisition program priorities. The Test Resource Management Center implements the composition, sizing and usage for the MRTFB. Priority for training operations on MRTFB ranges is coordinated at the local level through a robust scheduling and prioritization process that takes into account both test and training requirements needed to support all users.

3.1.3.6. Range Test-Support Requirements. Test requirements are based on the characteristics and attributes of the specific test and are governed by departmental and service-level directives and instructions. MAJCOMs, acquisition programs, SAF/AQ, and AF/TE collaboratively define the test requirements and the resources necessary to support them.

3.1.4. Test and Training Resource Programs. Test and training requirements are funded through a combination of institutional funds and reimbursements and/or customer fees at MRTFB ranges. Test and training resource funding is managed through Air Force and other DoD unique PEs. Execution is accomplished by various Air Force field activities. Headquarters Air Force Test and Evaluation Infrastructure and Resource Division (AF/TEP) provides test and evaluation resource oversight and guidance to the MRTFB ranges through the parent MAJCOM. AF/A3TI provides training resource oversight and guidance to MRTFB ranges and together with the ANG, Air Space and Ranges Division (NGB A2/3/6/10YR) to PTRs.

3.1.4.1. Aligning and Deconflicting Test and Training Requirements. Within the Air Force, the investments needed for test requirements may also be needed for training, and vice versa. Infrastructure investments at MRTFB ranges are planned and allocated through different processes, PEs and special access programs. It is imperative to avoid redundancy and gain synergy by closely aligning and deconflicting test and training requirements.

3.1.4.1.1. Training O&M. PE 27604 and PE 52634 fund PTR O&M, and are programmed by ACC and NGB A2/3/6/10YR (respectively) through the Air Superiority Core Function Team. Individual MAJCOMs execute funding in these PEs for their assigned ranges. The program funds range contracts, certain range personnel and O&M of range capabilities. It also funds technical and service contracts to maintain operating hours and the basic infrastructure for scoring activities, threat and debrief

systems, data link capabilities and other range services such as road maintenance and range clean up.

3.1.4.1.2. Test O&M. AF/TE determines the PEs and execution agents for Air Force test requirements.

3.1.4.1.3. Nevada Test and Training Range and Utah Test and Training Range O&M. PE 27428 funds Nevada Test and Training Range and Utah Test and Training Range O&M, and is programmed by ACC through the Air Superiority Core Function Team. ACC is also the executing agent for this program. The program funds range contracts, certain range personnel, and O&M of range capabilities. It also funds technical and service contracts to maintain operating hours and the basic infrastructure for scoring activities, telemetry, threat and debrief systems, data link capabilities and other range services such as road maintenance and range clean up.

3.1.4.2. Improvements/Investments.

3.1.4.2.1. Test and Training Space. Test and training space attributes accommodate missions based on tactics, techniques, and procedures and event requirements. When range operating authorities/MAJCOMs project a unit readiness decline due to a deficiency or gap in range capabilities, MAJCOMs should first attempt to shift the unit assignment to a range with the required capability, or submit a T/TSNS to meet the shortfall.

3.1.4.2.1.1. Actions involving the fielding of new capabilities, changes in land use or the acquisition of new land or airspace typically generate long-term sustainment costs, environmental impacts and public interest. Therefore, any action to establish, modify, or delete test/training space except those purely administrative in nature (i.e. changes that do not impact the capabilities or capacity of the range), must be reviewed by units, MAJCOMs, and Headquarters Air Force via the T/TSNS process detailed in AFI 13-201. **(T-1)**. Examples of actions requiring a T/TSNS include: acquiring new land or airspace; lowering the minimum altitude of a Military Operations Area; fielding a new capability with a recurring sustainment cost; moving or establishing a live munitions area. Equipment replacement governed by a program office does not require a T/TSNS. Actions that only impact ANG equipment purchased with National Guard and Reserve Equipment Account funds do not require a T/TSNS.

3.1.4.2.1.1.1. Requests from non-Air Force entities to move onto an Air Force range must be vetted through the Strategic Basing Process as defined in AFI 10-503, *Strategic Basing*. Additionally, approved non-Air Force tenants desiring to increase their manpower by 35 or more positions must also receive approval from the Air Force Strategic Basing Process.

3.1.4.2.1.1.2. Range operating authorities and MAJCOMs must follow the guidelines and approval process established in DoDI 3200.18, *Management and Operation of the Major Range and Test Facility Base*, for any changes/closures to MRTFB ranges that affect the MRTFB capabilities or capacity. **(T-0)**.

3.1.4.2.1.1.3. For proposals involving expansion of range boundaries, whether permanent or otherwise, range operating authorities and MAJCOMs must also

coordinate the T/TSNS with the AFCEC Military Munitions Response Program office to identify conflicts and impacts related to current or projected Air Force Military Munitions Response Program projects. **(T-1).**

3.1.4.2.1.2. Airspace and Land Actions.

3.1.4.2.1.2.1. Airspace. When establishing a need for new airspace, proponents must ensure they comply with AFI 13-201 and applicable FAA Orders and Directives. **(T-0).**

3.1.4.2.1.2.2. Land Acquisition. Land acquisitions require lead times as long as 7 years. There are a variety of mechanisms for acquiring land. Examples include traditional buy/lease transactions, or withdrawal under the Federal Land Policy and Management Act (see also "Land Withdrawal" in terms section of Attachment 1). Once the T/TSNS is approved, AF/A3TI will work with the proponent and SAF/IEI to pursue the correct mechanism.

3.1.4.2.1.2.3. Closing or Transferring Ranges. MRTFB ranges must follow Office of the Secretary of Defense processes before reducing or eliminating capability IAW DoDI 3200.18. **(T-0).** For PTRs and non-MRTFB ranges, when declared in excess to the range requirements by the range operating authority, the MAJCOM and AF/A3TI, the land will be surface cleared IAW Air Force standards. **(T-1).** The range operating authority will notify the supporting CE unit with real property responsibility of the excess status for subsequent action to determine a new use and accomplish required clearance for the new use. **(T-1)**. It is Air Force policy to clear to a level deemed safe for the proposed future land use and issue Certificates of Clearance for excess ranges or ranges converted to other uses but remaining on the installation property inventory. The supporting CE unit will ensure clearance IAW DoDI 3200.16 *Operational Range Clearance*, excess declaration IAW AFI 32-9004, *Disposal of Real Property*, and National Environmental Policy Act actions IAW 32 CFR Part 989. **(T-0).** Return, or partial return, of overseas ranges operated or maintained by United States personnel or forces to host nation control is conducted IAW DoDI 4165.69, *Realignment of DoD Sites Overseas*. **(T-0).** Airspace transfer is IAW AFI 13-201, and range operating authorities must ensure disposition of government-owned range equipment and facilities is IAW MAJCOM guidance. **(T-2).**

3.1.4.2.2. Range Equipment and Infrastructure. Range equipment and infrastructure provide instrumentation for numerous functions, including test and evaluation, readiness training, tactics development and evaluation, command and control, safety, and real-time flight monitoring. Ideally, these systems provide precise monitoring and reconstruction, and facilitate post-mission debriefing of range users for various mission sets (i.e., single or multiple aircraft, ground training, and test missions), to include reactions to air defense threats, live or simulated ordnance exchanges, and realistic simulations of the projected threat environment. The requirement for continuous modernization of these systems drives investments in this area.

3.1.4.2.2.1. Test Equipment and Infrastructure. The Test Investment Planning and Programming Process provides the venue for investing in test infrastructure.

Headquarters AFMC/A3 manages the Air Force Test Investment Planning and Programming Process to identify test resource investments needed to support military systems testing. Those investments that have possible multi-service applicability may be referred to the Central Test and Evaluation Investment Program for funding.

3.1.4.2.2.2. Training Equipment and Infrastructure. When a range projects that equipment or infrastructure deficiencies will prohibit them from supporting an assigned training event or an emerging requirement, the range operating authority should coordinate with the MAJCOM to have the mission reassigned, arrange for O&M funding, or coordinate acquisition of the required equipment or infrastructure with the lead MAJCOM (ACC). AFSOC may seek funding that supports Special Operations Forces-unique training and has Special Operations Forces sustainment. In these cases, AFSOC will coordinate with the lead MAJCOM if it affects other Air Force range users. **(T-1)**. All equipment or materials purchased for ANG range operations with state or National Guard and Reserve Equipment Account funds will remain with the State when and if the range real property is reassigned. **(T-0).**

3.1.4.2.2.2.1. AFLCMC/HBZ and ACC/A3AR shall address improvement of existing CTS using feedback from equipment users, jointly establishing priorities for future efforts, developing solutions to reliability and maintainability problems, and providing updates concerning on-going efforts.

3.1.4.2.2.2.2. Headquarters ACC is the lead agency for procurement and life-cycle fleet management of instrumentation, threat systems, and test/training range engineering development supporting Combat Air Forces requirements.

3.1.4.2.2.2.3. The Air Force Operational Test and Evaluation Center will coordinate on Combat Air Forces requirements that need operational test and evaluation input or may affect Operational Test and Evaluation as well as Developmental Test and Evaluation, Joint Test and Evaluation, and Expeditionary Force Experiments. **(T-1).**

3.1.4.2.2.2.4. Headquarters ACC/A3A will develop and maintain an equipment inventory and configuration control system, as part of the Enterprise Range Plan. It should accurately inventory, track equipment, and document the configuration and threat lay-down plan of threat emitters and simulators used for training.

3.1.4.2.2.2.5. The reallocation of threat systems will be coordinated by Headquarters ACC/A3A with the affected MAJCOM(s) and AF/A3TI, with AF/A3 arbitrating any disputes. **Note:** this paragraph is not intended to apply to maintenance-related movements, such as transfers to/from depot.

3.1.4.2.2.3. Requests for Disposition of Equipment. Range operating authorities must obtain MAJCOM approval to deactivate, transfer or decommission any range Combat Training System. **(T-2).** All CTS deactivation/decommission and final disposition requests will be approved by the parent MAJCOM and Headquarters ACC with AF/A3TI arbitrating any disputes. This does not apply to Test and Evaluation equipment on MRTFB ranges which is managed IAW DoDI 3200.18.

3.1.4.2.2.4. Urban Training Facilities. Constructing or upgrading semi-permanent and permanent urban training facilities, as defined and covered in DoDI 1322.27, requires advance coordination. The parent MAJCOM will evaluate proposals. Proposals which are funded via MILCON also require certification by the Under Secretary of Defense for Personnel and Readiness (USD (P&R)). Range operating authorities shall submit proposal information (to include the items listed in Enclosure 3 of DoDI 1322.27) through the parent MAJCOM and ACC to AF/A3TI prior to initiating development or procurement of these capabilities. **(T-0)**. AFSOC may submit proposals directly to AF/A3TI for projects that support Special Operations Forces-unique training and have Special Operations Forces sustainment. AF/A3TI will consult with Office of the Secretary of Defense, as appropriate, to identify evaluation and certification requirements for the proposal.

Chapter 4

RANGE OPERATIONS AND SAFETY

4.1. Range Operations. Range operating authorities will ensure that range operations are conducted IAW this manual, DoDD 4715.11, *Environmental and Explosives Safety Management on Operational Ranges Within the United States*, AFI 13-201, AFI 11-214, AFMAN 91-201, Technical Order (TO) 1-1M-34, *Aircrew Weapons Delivery Manual,* TO 1-1M-34-1, *Aircrew Weapons Delivery Manual (classified),* aircraft specific weapons delivery TOs, aircraft specific AFI 11-2 Mission Design Series, and United States Air Force Weapons School instructional texts. For ranges outside of the United States, range operating authorities must also ensure operations are conducted IAW DoDD 4715.12, DoDI 4715.22, and AFI 32-7091, whichever apply. For operations involving ground weapons, range operators should consult AFI 36-2654 (as applicable); weapons system TOs; test-specific procedures, and/or specific SDZ profiles for the types of operations and weapons used.

4.2. Written Agreements. AFI 25-201 details the required procedures for entering into written agreements. Range operating authorities should closely coordinate with the MAJCOM any time the range is agreeing to provide support to an unassigned range user and a written agreement is required. DoDD 3200.11 and AFI 99-103 address the written agreements and documentation for test support. Range operating authorities will ensure that all written agreements are maintained IAW AFMAN 33-363. **(T-1)**. All agreements pertinent to their range should be readily available to range personnel and users.

4.2.1. Types of Written Agreements.

4.2.1.1. Support Agreement (DD Form 1144). IAW AFI 25-201, range operating authorities must use the DD Form 1144 to document recurring reimbursable support when the Air Force is the supplier. **(T-0)**. The range operating authority, in coordination with the MAJCOM, shall complete an Inter-Service Support Agreement when providing training support to any other DoD component. Specifically, an Inter-Service Support Agreement is required when a non-Air Force user from another DoD Component requests more than 12 days of range use per calendar year. **(T-1)**.

4.2.1.1.1. Ranges may entertain requests and discuss user requirements with any non-Air Force user, but the range operating authority will coordinate and receive approval from the MAJCOM prior to entering into any agreement for support of non-Air Force training events that require commitment of additional resources. **(T-2)**.

4.2.1.1.2. Written support agreements are not required for occasional/limited use or during Air Force-sponsored exercises, deployments, evaluations, or inspections.

4.2.1.2. Memorandum of Understanding. A memorandum of understanding defines general areas of understanding between two or more parties, when reimbursement is not required. It neither includes commitment of resources nor binds a party to a specific action. Individual units normally author memorandums of understanding and coordinate them with the parent MAJCOM. Ensure memorandums of understanding involving other nations are reviewed by the MAJCOM Judge Advocate and the State Department Mission in the host country for legal implications. See DoDI 4000.19, *Support Agreements*, Enclosure 3, for memorandum of understanding content and format requirements.

4.2.1.3. Memorandum of Agreement. Memorandums of agreement document the specific terms and responsibilities that two or more parties agree to in writing, especially those that involve reimbursement or financial obligations (but without the recurring requirement which drives a DD Form 1144). It includes either a commitment of resources or binds a party to a specific action. Individual units normally author memorandums of agreement and coordinate them with the parent MAJCOM. Ensure memorandums of agreement involving other nations are reviewed by the MAJCOM Judge Advocate and Financial Management, and the State Department Mission in the host country for legal and financial implications. See DoDI 4000.19, Enclosure 3, for memorandum of agreement content and format requirements.

4.2.2. Written Agreements for Test and Evaluation Activities. AFI 99-103 details the extensive documentation processes required for test and evaluation activities. MRTFB ranges may enter into written agreements via formal documentation and coordination at the range operating authority level.

4.2.3. Foreign User Training Support Agreements. Foreign users will submit written requests for range support through appropriate country offices within SAF/IA to AF/A3TI. AF/A3TI will coordinate with the appropriate MAJCOM to determine the level of support and to integrate the support requirement into the range mission. The MAJCOM will then task the range operating authority to develop the agreement resulting in a memorandum of understanding or memorandum of agreement between the range and appropriate foreign authority. These agreements may also include specific letters of agreement, a Host-Tenant Support Agreements, other support agreements detailed on a DD Form 1144 and/or Foreign Military Sales Letter of Offer and Acceptance. Each signatory ensures that these agreements meet the needs of the organization without compromising the mission and obligating the organization beyond its intent or authority and are consistent with any applicable international agreements with the host nation. Range operating authorities will coordinate the draft agreement with the MAJCOM Office of the Staff Judge Advocate. **(T-1)**. If a conflict arises regarding one of these agreements, the range operating authority should resolve the issue at the appropriate level.

4.3. Joint Use of Ranges. Joint use of ranges will be established by the appropriate written agreement(s), license, contract or other written test documentation between the range operating authority or test authority (in coordination with the MAJCOM) and the joint user IAW AFI 25-201 or test instructions. **(T-1).** All written agreements should ensure the range operating authority can terminate user activities detrimental to the range's natural, cultural, or physical infrastructure and obtain compensation or redress.

4.3.1. Use of Air Force Ranges for Non-Air Force Contract Air Support. PTRs can only be used by contract air support providers when it is in support of a DoD contract. MRTFB ranges may be used by contract air support providers when supporting a non-DoD contract (e.g. contracts supporting other United States Government Agencies, State or local governments, allied foreign governments, or commercial entities). When use of an Air Force range by a contract air support provider in support of another service's contract is requested, the other service's Technical Airworthiness Authority must provide confirmation that an airworthiness assessment has been conducted and a flight release has been issued.

4.3.1.1. When another service requests use of an Air Force range for their contracted air support, ACC/A3A must verify the aircraft status (civil aircraft operations or public aircraft operations) with the other service's Technical Airworthiness Authority prior to allowing the contractor to operate on an Air Force range. **Note:** an aircraft must be in public aircraft operations status in order to drop ordnance on a range and have an approved WDZ footprint, WDZ surrogate footprint or waiver.

4.3.1.2. If a Combatant Command has contracted air support for another service's training (e.g., if USSOCOM contracts air support for Navy Seal training) and requests use of an Air Force range, ACC/A3A must verify the aircraft status (civil aircraft operations/public aircraft operations) with the supported service's (the service that is receiving the training) Technical Airworthiness Authority prior to allowing the contractor to operate on an Air Force range. Combatant Commands do not have a Technical Airworthiness Authority; therefore the service receiving the support must act as the Technical Airworthiness Authority. **Note:** for assistance with verifying airworthiness, contact the Air Force Technical Airworthiness Authority, AFLCMC/EZSA.

4.4. Shared Use of Ranges.

4.4.1. Shared Use for Test and Training Activities. Range operating authorities will address user requirements and scheduling to develop a priority policy. **(T-3)**. In many instances, a written agreement between the range scheduling office and assigned range users may be appropriate.

4.4.1.1. 10 U.S.C. § 2681 authorizes the DoD to contract for the use of MRTFB resources by commercial entities. DoDD 3200.11 and DoDI 3200.18 provide guidance for these activities. Commercial activities on any range cannot compromise public safety, detract from mission accomplishment, nor impair range operations or scheduling in any way. Prioritization of MRTFB assets for commercial use is generally made available only on a non-interference basis.

4.4.1.2. PTRs are not designed or structured to accommodate test and evaluation activities as defined in AFI 99-103. Should use of a PTR be necessary for test and evaluation activities, that cannot be accommodated by an MRTFB range, all applicable test and evaluation governing directives, instructions, safety and risk management procedures, necessary range enhancements, training, environmental impact analysis, additional personnel or upgrades required for the activity will be accomplished and complied with at the cost to the proponent. **(T-1).** Proponents must obtain approval from the range's parent MAJCOM. **(T-1).**

4.4.1.2.1. Requests for performing test and evaluation activities on PTRs must be submitted to the parent MAJCOM and verify the following information:

4.4.1.2.1.1. That there are no scheduling impacts to the training mission of the range.

4.4.1.2.1.2. That there are no costs incurred by the range or the range O&M contractor, to include overtime.

4.4.1.2.1.3. That the test team(s) planned to use dedicated test facilities per AFI 99-103 but were deferred by the MRTFB due to capacity or other reasons.

4.4.1.2.1.4. That there are no planned permanent impacts to the range, i.e., the range will be returned to the same state as prior to the test.

4.4.1.2.1.5. That test activities are IAW the approved National Environmental Policy Act process developed for the range.

4.4.1.2.1.6. That the test team(s) is aware of the PTR's capabilities (or lack of) and potential issues such as limited instrumentation, and that any associated impacts will not adversely affect the test.

4.4.1.2.1.7. That risk management is accomplished prior to conducting any portion of the test on the PTR. The tester must provide test-specific assessment to the range operating authority for consideration, and the range operating authority must determine whether the test activity can be safely conducted on their range.

4.4.1.3. IAW DoDD 3200.11, the MRTFB may be used by other DoD users, including DoD training users.

4.4.2. Shared Use for Activities other than Test and Training. Shared use of range land with non-DoD users is encouraged when it does not compromise public safety, detract from mission accomplishment, or impair range operations. IAW AFMAN 91-201, public access is prohibited in areas known or suspected to contain UXO or other munitions that have experienced abnormal environments. **(T-0)**. Shared use is characterized as either concurrent or non-concurrent.

4.4.2.1. Concurrent Shared Use. Civil activities may occur concurrently with range operations provided human access is prohibited in the hazard area during operations. Agriculture, grazing and timber management are examples of activities that are conducive to concurrent shared use.

4.4.2.1.1. Grazing programs can be a complementary activity on Air Force ranges. Grazing programs are conducted IAW AFI 32-7064, *Integrated Natural Resource Management*. Grazing programs on Department of the Interior lands withdrawn for Air Force use are generally the responsibility of the Bureau of Land Management. IAW AFI 32-7064, the supporting CE unit must prepare an Integrated Natural Resources Management Plan that addresses all issues related to natural resources for all ranges.

4.4.2.1.2. Other Commercial Activities. Air Force ranges may also offer other commercial uses such as timber management, agricultural out-leasing, and mining. Again, many of these programs are generally the responsibility of the Bureau of Land Management. The Bureau of Ocean Energy Management of the Department of Interior manages the oil and gas exploration on the outer continental shelf applicable to Air Force over-water ranges. For ranges located outside the United States, Combatant Command and in-theater Headquarters Air Force Component Command (e.g., USAFE-AFAFRICA, PACAF, Air Forces Central Command), issuances may prohibit or restrict commercial uses.

4.4.2.2. Non-Concurrent Shared Use. Civil use of range land may be allowed within the hazard area (exclusive of areas known or suspected to contain UXO) IAW paragraph 4.5.2. Recreation and education programs are often compatible because many ranges encompass large airspace, land, or water areas and may contain significant natural resources, wild

areas, historical sites, or archaeological sites. As custodian of this public property, the Air Force has the responsibility to maintain it in the best manner possible consistent with the military mission. IAW AFI 32-7064, the supporting CE unit will ensure that range Integrated Natural Resources Management Plans address public access to natural resources. This plan is prepared in cooperation with the United States Fish and Wildlife Service and the state fish and game agency. Additionally, the supporting CE unit will ensure that Integrated Cultural Resources Management Plans, IAW AFI 32-7065, *Cultural Resources Management*, address public restrictions to range areas containing, archaeological and cultural resources, including sacred sites. The range operating authority is the approval authority for all non-concurrent shared use of range land. **(T-2).**

4.4.2.3. Enhanced Use Leases, outgrants, leases, and easements. Normally Air Force ranges are not used for enhanced use leases, outgrants, leases, or easements, as they can encroach on or otherwise adversely impacts range activities and capabilities. However, if one of the real estate actions is deemed beneficial to the Air Force, the appropriate authority, as delegated by Mission Directive 1-18, *Assistant Secretary of the Air Force (Installations, Environment and Energy)*, may enter into an agreement only after the installation commander, the range operating authority, the MAJCOM, and AF/A3TI coordinate on approval of the transaction. The range operating authority may deem an enhanced use lease compatible with range activity on a case-by-case basis, provided it does not adversely impact range capability (to include MRTFB capabilities). Approval of enhanced use lease consideration should run from the range operating authority to the installation commander to the MAJCOM to AF/A3TI to SAF/IEI, in coordination with AFCEC/CI. Range sustainment, repair, modernization and other range facility investments shall be the primary objective for application of enhanced use lease proceeds derived from ranges. **(T-1)**.

4.5. Range Access. MAJCOMs and range operating authorities will develop procedures for permitting and deconflicting ground party and non-military activities on the range. **(T-1)**. **Note:** Where the terms Essential Personnel, and Mission Essential Personnel are used below, reference the "Terms" section in Attachment 1 of this manual.

4.5.1. Warning Signs. In addition to the installation warning signs required by AFI 31-101, *Integrated Defense (FOUO)*, range operating authorities will post safety warning signs (multi-lingual where appropriate) on the range boundaries. **(T-1)**. Refer to AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, for sizing and general design criteria. Where practical, signs should include both text and pictograms/symbols describing the hazard. The type of sign (i.e., "Danger," "Warning," etc.) is selected based on the degree of hazard associated with range activities. Ranges conducting laser operations shall also post laser warning signs utilizing the signage guidance in Military Handbook 828C, *Range Laser Safety*. **(T-1)**. For ranges located on another service's/host nation's property, and where another agency is responsible for range access, security and signage, the range operating authority may apply that service/nation's rules, specified text, graphics, or procedures. Range operating authorities will ensure signs required by this section are placed along the boundaries: **(T-1).**

4.5.1.1. Where crossed by roads, paths, trails, streams, streambeds or railways.

4.5.1.2. At 200 meter intervals where roads, paths, trails or railways parallel the range boundary within 500 meters.

4.5.1.3. At 1000 meter intervals in other readily accessible areas not included above. **Note:** Signs are not required in areas that are not readily accessible on foot or with wheeled vehicles (e.g., mountainous terrain, swamps, lakes).

4.5.2. Hazard Areas. The hazard area is a composite of all WDZs, SDZs, Laser SDZs, and Directed Energy WDZs for all authorized weapon delivery events, and represents operational hazards as well as residual hazards following munitions deliveries. hazard areas may be segmented based upon the targets, weapons, tactics, maintenance or clearance being utilized or conducted at a given time. If hazard areas are segmented, range operating authorities will ensure segment borders are readily identifiable by ground personnel. **(T-3).** Access during operations into the hazard area is limited to Mission Essential Personnel, unless specifically authorized by the range operating authority. During intentional detonations, personnel shall be afforded protection standards per AFMAN 91-201. The range operating authority shall ensure that personnel accessing a Laser SDZ or Directed Energy WDZ have received applicable laser/directed energy weapon safety training and wear the appropriate Personal Protective Equipment. **(T-2)**. Routine access to hazard areas not in use should be limited to Essential Personnel. Public access to hazard areas is prohibited until all ordnance employed in the applicable portion of the hazard area is accounted for and appropriate remediation actions (i.e., decontamination and risk management assessment) have been conducted. Access to hazard areas is determined locally based on a risk management assessment IAW paragraph 4.18. On ranges where another agency controls hazard area access, the range operating authority will establish procedures to verify access control and inform that agency of potential hazards. **(T-2)**.

4.5.2.1. Impact areas. The impact area is that area on a range immediately surrounding the target(s) or desired point(s) of impact approved for actual ordnance delivery. Public access to impact areas is prohibited at all times. Range operating authorities will ensure when range impact area(s) or specific desired points of impact are not in use that access is limited to Essential Personnel. **(T-1). EXCEPTION:** impact area access restrictions may not apply when range land use is governed the provisions of a real property permit (e.g. joint-land use permit). The impact area demarcation is determined locally using risk management assessment IAW paragraph 4.18, but should normally be no less than either a) 500 feet from the center of a target or desired point of impact approved for live ordnance, or b) 300 feet from the center of a target or desired point of impact used solely for inert or practice ordnance.

4.5.2.2. WDZ. The WDZ encompasses the ground and airspace for lateral and vertical containment of a user-determined percentage of projectiles, fragments, 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 (resurfacing) of a specific weapon or munitions type delivered by a specific aircraft type under planned specific delivery release parameters.

4.5.2.3. SDZ. The SDZ encompasses the ground and airspace designated for vertical and lateral containment of a percentage of projectiles, fragments, debris, and components resulting from the firing, launching, or detonation of weapon systems to include explosives and demolitions. See the United States Army's Range Manager's Toolkit Software for specific SDZ information.

4.5.2.4. Laser SDZ and Directed Energy WDZ. Laser SDZs and Directed Energy WDZs encompass the ground area where laser radiation or directed energy levels may exceed Maximum Permissible Exposure levels thereby requiring controls. In addition, a Directed Energy WDZ may include proximity restrictions to the testing or employment of directed energy weapons with or in vicinity of conventional munitions to prevent inadvertent functioning or damage. Active Laser SDZs or Directed Energy WDZs become part of the hazard area while such equipment is in use.

4.5.3. Observation Posts. Notwithstanding paragraphs 4.5.2 and 4.11.5, observation posts within a hazard area may be used by Tactical Air Control Parties, Joint Terminal Attack Controllers (JTAC), or other briefed personnel involved in Close Air Support (CAS)/air-to-ground training, consistent with the following criteria:

4.5.3.1. Range operating authorities will conduct a risk assessment of the proposed observation post or maneuver area prior to approving their use. **(T-1)**.

4.5.3.2. Mission Essential Personnel operating inside an active hazard area must remain outside the minimum safe distance for Ground Parties (Training Use Only: Live Fire) published in Air Force Tactics, Techniques, and Procedure 3-2.6(I), *JFIRE Multi-Service Tactics, Techniques and Procedures for the Application of Firepower*. **(T-1).** IAW AFI 11-214, if the planned operations or deliveries are inconsistent with the assumptions used to derive the minimum safe distance values, personnel must remain outside the WDZ.

4.5.3.3. If there is no published minimum safe distance for the weapon or aircraft, submit requests to the ACC Weapons and Tactics office (ACC/A3TW) for review and approval. Personnel shall not be allowed inside the WDZ unless such approval is granted. **(T-1)**.

4.5.3.4. While inside the hazard area, all personnel will wear protective gear IAW AFI 11-214 and AFI 13-112V1, *Joint Terminal Attack Controller (JTAC) Training Program.*

4.6. Radio Frequency Spectrum Issues. Range operating authorities will identify the radio frequency spectrum required for range operation and coordinate requirements with the appropriate Installation Spectrum Manager. **(T-1)**. The range operating authority will ensure that a frequency assignment has been obtained by the user (or appropriate Spectrum Management Office supporting the user's radio frequency requirements) prior to using any radio frequency emitting equipment. **(T-1)**.

4.6.1. The range operating authority will ensure AFI 91-208, *Hazards of Electromagnetic Radiation to Ordnance (HERO) Certification and Management*, requirements are met. Seek assistance with Hazards of Electromagnetic Radiation to Ordnance requirements from the supporting installation Weapons Safety Manager prior to the use or presence of ordnance containing electrically initiated devices during range operations.

4.7. Communications Requirements. The range operating authority will submit all normal communication capability requirements to the supporting wing communications function. **(T-2)**. Test-specific systems used on MRTFB ranges may be obtained by local acquisition methods.

4.7.1. Ranges providing Class A, B and C services will have reliable point-to-point communication with the parent or using base and manned sites on the range. **(T-2).** During Class A service, the range control tower will have redundant communication capability with the flank tower(s) and operations building(s). **(T-2).** All parties or individuals must maintain

two-way voice contact with the main tower, range office, and/or parent base while in the hazard area. **(T-1).** Portable or mobile radios may be used for backup communication and to maintain contact with personnel in the hazard area.

4.7.2. Ranges providing Class A, B and C services will have ground-to-air radios to communicate with aircraft on the range. **(T-2).** Primary systems are normally ultra-high frequency radios, but very-high frequency, or frequency modulation radios are authorized at ranges where users are similarly equipped. Provision of dual, multi- band radios should be considered to maximize mission flexibility and safety monitoring capability.

4.7.2.1. When a range provides Class A service, the range control officer is responsible for all range operations and air/occupational safety, except in cases where weapons release clearance is delegated. The range control officer must maintain continuous radio communication with all aircraft and ground personnel on the range and have a backup, independent radio. **(T-2)**. The range control officer must remain in either the main or flank tower (or another MAJCOM approved location) while providing Class A service. **(T-2)**.

4.7.2.2. During Class B service, ranges must have the capability to communicate with the aircraft to provide scores. **(T-2)**.

4.7.2.3. During Class A and B service, ranges will ensure all ultra-high frequency, very-high frequency, frequency modulation and Land Mobile Radio voice frequencies being used on range are recorded at all times. **(T-2)**.

4.7.2.4. The range control officer will ensure that all recorders are working properly. **(T-3).** The range control officer will ensure each recording contains the range name, date, and time. **(T-3).** The range operating authority or range operations officer will establish procedures to ensure recordings are maintained for a minimum of 7 days. **(T-3).** In addition, the range control officer will keep and secure recordings containing records of any range incident until released by the investigating agency. **(T-3)**.

4.7.2.5. All aircraft utilizing the range will monitor Guard frequency. **(T-0)**.

4.7.2.6. Aircraft using ultra-high frequency, very-high frequency, or frequency modulation radios on the range will utilize range assigned ultra-high frequency, very-high frequency, or frequency modulation frequencies. **(T-1)**.

4.7.3. Ranges providing Class D service where operations are monitored by a Range Training Officer should have ground-to-air radios to communicate with aircraft on the range and network connectivity to ground instrumentation receivers when live-monitoring of the mission is mandatory.

4.7.4. Communication Operations. Range personnel normally operate all communication equipment used on range. Communications personnel will be assigned as radio operators only when special conditions warrant (e.g., when sufficient range personnel are unavailable due to unplanned or unforeseen deployments).

4.8. Armament Safety Procedures. For ranges capable of aircraft ordnance delivery, prior to first release when carrying expendable ordnance (live, inert, or practice), final switch configuration for weapon release is not accomplished until the aircraft is in such a position that any accidental release will be contained within the range. **(T-1)**. MAJCOMs will develop specific guidance for armament system configurations for multiple passes. After completing final weapons delivery,

each flight member will perform a weapons system safety check. **(T-1)**. Refer to AFI 11-214, aircraft specific AFI 11-2MDS series operating procedures, and individual range supplements for additional guidance.

4.8. (AETC) Armament Safety Procedures. AETC Ranges will publish specific guidance in their range supplement to address Master Arm procedures based on their range users and range configuration. **(T-2)**

4.9. Weapons Release Authority. Acceptance of weapons release authority incurs sole responsibility for the safe release of ordnance.

4.9.1. Terminology Conventions. To prevent miscommunication, when authorizing weapons release personnel will only use the term "cleared." **(T-1)**. Personnel will use the term "continue" in the manner described in Joint Publication 3-09.3, *Close Air Support*, to acknowledge requests or indicate approval to proceed with an attack profile or action without providing clearance to release any ordnance yet. **(T-1)**.

4.9.2. On ranges providing Class A service, weapons release authority resides inherently with the range control officer. For each pass, the range control officer will authorize weapons release with a “cleared hot” radio call unless release authority has been delegated. **(T-1)**. The range control officer may delegate weapons release authority to a qualified flight lead, individual pilot, Forward Air Controller (Airborne), JTAC or other briefed person by issuing an “Authorized (flight lead, individual pilot, Forward Air Controlled (Airborne), JTAC, etc.) Control” radio call. The range control officer will remain in either the main or flank tower (or another MAJCOM approved location), will retain overall range authority at all times and can withdraw release clearance or abort a release at any time. **(T-2)**.

4.9.3. On ranges providing Class B and C service, weapons release authority follows a hierarchy from the JTAC, to the Forward Air Controller (Airborne), to the flight lead, to an individual pilot or other briefed person who may then delegate the authority as desired.

4.10. Simulated Weapons Release Authority. Except during flight-lead or individual control, to emulate the clearance procedures contained in Joint Publication 3-09.3, the weapons release authority should issue a “continue dry” radio call to signify authority to simulate weapons release.

4.11. Weapons Employment and Airdrop Operations.

4.11.1. Personnel will not employ weapons outside approved DoD Special Use Airspace. **(T-0)**. **Note:** Research and Test and Evaluation activities do not require Special Use Airspace if conducted IAW AFI 99-103, provided appropriate coordination and approvals are obtained from FAA/spectrum authorities as required.

4.11.2. Range operating authorities must ensure the land or sea underlying the hazard area or failure footprint used for actual weapon employment are protected by purchase, lease, or other means to ensure the safety of personnel, structures, and the public from expended weapons, laser and electromagnetic emissions, and target debris. **(T-0)**.

4.11.2.1. For events where the weapons footprint falls outside the lateral confines of the established range boundaries, the range operating authority will notify the public and conduct a risk assessment and take actions to minimize the hazard to the public and non-DoD property. **(T-1)**.

4.11.2.2. Range operating authorities at test ranges will ensure a Flight Termination System or other containment measures are applied to aerial test items (weapons, missiles, unmanned aerial systems, etc.) having the potential to exceed range boundaries and endanger public or DoD assets and personnel. **(T-1).** Range operating authorities will establish a method of determining the position of the item in relation to its footprint and the range boundary and assess the need for redundancy of position information, telemetry, and Flight Termination System signal transmission based on the potential hazard. **(T-1)**.

4.11.3. WDZ Tool Methodology. The WDZ tool application methodology allows the range operating authority to identify possible target locations, modify allowable delivery ground tracks to eliminate or reduce hazards, identify the best location for range improvements, and design a new impact area or range. The methodology is based on WDZ footprints developed from a combination of actual weapon impact data and simulation results. A WDZ defines the minimum land required to employ a given munition safely, using a certain aircraft and delivery tactic, over a specific soil density and target type. Each WDZ footprint incorporates a probability distribution function, which provides the information necessary to perform a quantitative risk assessment and evaluate the relative risk of an identified hazard.

4.11.3.1. Except as noted below, range operating authorities will prohibit weapons employment unless an applicable SDZ/WDZ footprint, WDZ surrogate footprint or test footprint has been applied to the target for the specific delivery platform, weapon and employment parameters. **(T-1)**. Range operating authorities may expedite analysis by grouping targets together or combining aircraft type, weapon type, and tactics, as appropriate. Test footprints are not authorized for training missions, nor are applicable training footprints, by themselves, sufficient for test missions, but training footprints may be used as part of the range operating authority's overall risk assessment.

4.11.3.1.1. Where containment is software selectable, range operating authorities will apply WDZs and SDZs that provide the following containment of projectiles, fragments, debris and components as a minimum: **(T-1).**

4.11.3.1.1.1. Surface fires: 99.9999% (Expressed as 1:1,000,000 escapement for SDZs).

4.11.3.1.1.2. Aviation-delivered gun ammunition: 99.999%.

4.11.3.1.1.3. All other aviation-delivered ordnance: 99.99%.

4.11.3.1.2. WDZ surrogate footprints may be used and do not require AF/A3TI approval when:

4.11.3.1.2.1. Test events are conducted on MRTFB ranges or test sites.

4.11.3.1.2.2. AFMC-sponsored test events are conducted on a PTR and a test footprint or WDZ surrogate footprint has been approved by AFMC/SE, the range operating authority, and the range-owning MAJCOM.

4.11.3.1.3. WDZ surrogate footprints must be used and require AF/A3TI approval when:

4.11.3.1.3.1. Training operations involve specific delivery platforms, weapon and employment parameter combinations, including foreign aircraft and weapons, that do not exist in the WDZ tool.

4.11.3.1.3.2. Test events are conducted on a PTR except as noted in 4.11.3.1.2.2.

4.11.3.1.3.3. Training operations involve specific delivery platforms, weapon and employment parameter combinations that are classified and cannot be generated in the WDZ tool (it is an unclassified system).

4.11.3.1.4. The use of WDZ surrogate footprints may be approved by completing the following actions:

4.11.3.1.4.1. The event-sponsoring MAJCOM requests a permanent WDZ footprint from ACC/A3A as the lead Air Force agent for procuring and modifying WDZ footprints as necessary.

4.11.3.1.4.2. Range operating authority performs a risk assessment using a WDZ surrogate footprint and 100% containment of projectiles, fragments, debris and components and submits it to the range-owning MAJCOM.

4.11.3.1.4.3. The range-owning MAJCOM reviews and provides concurrence with the range operating authority's WDZ surrogate footprint and risk assessment to the event-sponsoring MAJCOM.

4.11.3.1.4.3.1. When use of a WDZ surrogate footprint is requested for contracted air support for another service or MAJCOM:

4.11.3.1.4.3.1.1. The service or MAJCOM requesting use of the surrogate footprint is responsible for performing a risk assessment and generating surrogate footprint(s) using 100% containment of projectiles, fragments, debris and components and submitting them to the range-owning MAJCOM.

4.11.3.1.4.3.1.2. The range-owning MAJCOM must verify that the contractor meets airworthiness requirements IAW that Service's Technical Airworthiness Authority and that the aircraft will be in public aircraft operations status (i.e., has an Interim Flight Clearance for the Navy or an Airworthiness Release for the Army).

4.11.3.1.4.3.1.3. Contact the Air Force Technical Airworthiness Authority, AFLCMC/EZSA, for assistance with verifying airworthiness.

4.11.3.1.4.3.1.4. The range-owning MAJCOM must include verification of airworthiness with the WDZ surrogate footprint request that is submitted to AF/A3TI.

4.11.3.1.4.4. The event-sponsoring MAJCOM submits WDZ surrogate footprint and risk assessment to AF/A3TI for approval.

4.11.3.1.5. For foreign countries using same type United States aircraft and United States weapons, range operating authorities may use a United States aircraft WDZ in their risk management assessment. Notify the MAJCOM and AF/A3TI of the use of this applicable WDZ prior to actual employment. Range operating authorities may also apply a larger buffer, for risk mitigation purposes, if the foreign country is not a routine participant and unfamiliar with the range and exercise/training scenario.

4.11.3.1.6. MRTFB and test range range operating authorities are responsible for ensuring test footprints are developed and applied for test missions. If the application

of test footprints would preclude the accomplishment of test objectives, the range operating authority, in conjunction with the AFI 99-103 mandated safety review, may authorize the use of a risk management policy. The range operating authority will perform a risk assessment, which is validated by the safety review, to identify and minimize hazards consistent with test objectives (see AFI 99-103). **(T-1)**.

4.11.3.2. Procuring WDZ Footprints. Headquarters ACC/A3A is the lead Air Force agent for procuring and modifying WDZ footprints for Combat Air Forces requirements. MAJCOMs requiring unique or fast-track WDZ footprints will fund their respective requirements and coordinate with ACC/A3A at least 6 months prior to the need date. Foreign countries will coordinate WDZ acquisition through the Foreign Military Sales Case and submit a letter of request to the United States Navy International Program Office through their respective embassy at least 9 months prior to the need date. Embassies must email the letter of requests in Portable Document Format to **navyipolors@navy.mil.**Foreign participants in exercises conducted on Air Force ranges must provide WDZ procurement information to the appropriate exercise coordination function during the exercise planning process.

4.11.4. Precautions with Expendable Munitions. Aircraft with free-falling and/or forward-firing ordnance will not over fly or point their guns at manned sites with intent to expend or employ weapons. **(T-1).** Aircraft with moveable guns, such as helicopters and AC-130 Gunships, will not point their guns at any manned site. **(T-1).** Range operating authorities must ensure that facilities where the risk of damage is deemed unacceptable are not within any footprint. **(T-1).**

4.11.5. Weapons Employment near Manned Equipment, Facilities and Sites.

4.11.5.1. Training Operations. In general, manned equipment, facilities and sites, such as range towers, simulated threat emitter systems, and observation posts, may be located within the hazard area during range operations, provided the associated personnel are designated Mission Essential, inert ordnance is used, and a risk assessment is conducted and approved by the range operating authority IAW paragraph 4.18. See also paragraph 4.5.3. for additional criteria associated with observation posts.

4.11.5.2. Test Operations. Range operating authorities must ensure the presence of manned equipment, facilities and sites are addressed in the risk assessment process described in paragraph 4.11.3.1.4. **(T-1).** Authorized test activities employing live munitions may locate personnel or equipment (e.g., telemetry or recording devices) within the hazard area only if essential for mission accomplishment, and only with documented risk management application and approval. Permanently locating or constructing non-essential manned facilities within a hazard area with continuous exposure requires the application of AFMAN 91-201 processes and approval authorities following range operating authority coordination.

4.11.6. Improved Container Delivery System and Joint Precision Airdrop System Deliveries.

4.11.6.1. Range operating authorities will approve Improved Container Delivery System and Joint Precision Airdrop System deliveries only if the Precision Airdrop System-Mission Planner derived footprints for success and chute failure overlay only government-owned, leased or otherwise controlled land with no non-mission essential personnel present

and an Airdrop Damage Estimation acceptable to the range operating authority has been accomplished. **(T-1)**. Additional Joint Precision Airdrop System/ Improved Container Delivery System information and restrictions are published in AFI 13-217.

4.11.6.2. If the load is projected to, or may transit non-restricted airspace during its fall (e.g., footprints are not wholly contained within restricted airspace), range operating authorities will also ensure the user complies with applicable rules contained in Title 14 CFR Subpart B, Section 105.25, *Information required, and notice of cancellation or postponement of jump* (Federal Aviation Regulation 105.25). **(T-0)**.

4.11.6.3. Equipment, facilities and Mission Essential Personnel are permitted within the success, chute failure and the guidance failure footprints if the range operating authority has conducted and approved a risk assessment IAW paragraph 4.18.

4.11.6.4. Because weather observations and dropsonde (an expendable, aircraft-launched weather measurement device) wind updates are used to revise footprint analyses up until the time of delivery, range operating authorities should ensure the user is aware of the range operating authority's exclusion requirements and be provided with the location of airspace/range boundaries and any personnel or equipment the range operating authority cannot or chooses not to allow in the footprint as part of his/her risk analysis.

4.11.7. **(Added-AETC)** Ground Weapons. ROAs will perform a risk assessment and establish appropriate procedures prior to firing ground weapons (small arms, artillery, surface-to- surface missiles, etc.). When ranges support ground weapons on a regular basis the ROA will use the SDZ Tool to support their risk assessment, otherwise the requestor must provide the ROA detailed information to support a risk assessment and the ROA must validate the information provided. The SDZ Tool is part of the Range Manager's Tool Kit (RMTK) available on the USMC Range and Training Area Management website, **https://rtam.tecom.usmc.mil/rm/Safety.asp?SEID=RS_SAF**.

4.12. Jettison Areas. Range operating authorities will ensure that all ranges with aerial delivery capability have an area within the hazard area designated for jettison of ordnance and stores. **(T-1).** The location of jettison areas and jettison procedures are designed to minimize the hazard to the public, ground personnel and range structures as well as aircraft and aircrew.

4.13. Electronic Warfare Training Operations. Electronic warfare training facilities provide a realistic electronic threat environment through the use of surface-to-air missile and anti-aircraft artillery threat emitter simulators. These facilities provide electronic warfare support for composite force training, unit exercises, unit gunnery competitions, normal training missions, and higher Headquarters exercises or inspections.

4.13.1. Electronic Warfare Personnel Training. To provide a realistic threat environment, electronic warfare threat operators require a working knowledge of electronic warfare doctrine and employment concepts.

4.13.1. **(AETC)** All personnel who operate or maintain EW threat simulators and visual cueing systems will be trained in a unit training program. Training records will be maintained by hard copy or electronic means **(T-2)**.

4.13.1.1. Training Programs. Management criteria, administrative practices, and training policies required to conduct a comprehensive electronic warfare training program include

academics and practical application in live and simulated environments. Electronic warfare threat operators should be familiar with applicable MAJCOM training events and requirements defined in AFI 11-2MDSv1s and RAP Tasking Memos.

4.13.1.1.1. **(Added-AETC)** Familiarization. Conduct a one-time orientation covering the mission, organization, equipment/system familiarization, safety and security at the operating location. All newly assigned threat operator personnel will receive familiarization training no later than 30 working days after arrival on site. Personnel will not operate any threat simulator or UHF/VHF radio for aircrew training unsupervised until they have completed this training **(T-2)**.

4.13.1.1.2. **(Added-AETC)** Threat Operator Training. Hands-on Operator training for the specific threat simulator will be documented and personnel evaluated to demonstrate proficiency before they are considered qualified **(T-2)**.

4.13.1.1.3. **(Added-AETC)** Recurring Training. The ROA will determine the need for recurring training, e.g. to keep current on the latest operations tactics and techniques or when threat equipment operations procedures change. New or recurring training will be documented in individual's training record.

4.13.1.2. Responsibilities. Range operating authorities will select and designate in writing instructor personnel responsible for conducting site training for government personnel. The unit training officer/site manager will develop the unit training programs, training schedules, quarterly and annual unit training plans, and lesson plans, and is the unit approving authority for all unit-developed training courses or programs. For contractor run operations, the range operating authority must ensure the contract contains the minimum training requirements listed in Attachment 5. **(T-1).**

4.13.2. Range operating authorities should make every effort to provide scores and feedback for requested electronic warfare activity. These are documented and delivered in a mutually agreed upon format.

4.13.3. **(Added-AETC)** Publish local guidance in the range supplement to AFMAN 13-212V1.

4.13.3.1. **(Added-AETC)** In coordination with local MDS Weapons and Tactics Officers identify local procedures and scenarios based on the unique range capabilities taking into account types of range equipment and types of aircraft conducting training.

4.14. Flare and Chaff Employment. Unless further restricted by MAJCOM or local supplements, flares will be employed IAW AFI 11-214, while chaff will be employed IAW the latest version of Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3212.02D, *Performing Electronic Attack in the United States and Canada for Tests, Training and Exercises*, and AFI 11-2MDS series instructions. This guidance assumes use of current inventory flares and chaff, a frequency authorization for chaff, and an adequate environmental analysis of the use of flare and chaff. The use of flare or chaff cartridges having significantly different characteristics (pyrophoric flares or double squibbed chaff) is restricted to authorized test and evaluation activities until their use is authorized by the appropriate MAJCOM.

4.15. Global Positioning System (GPS) Electronic Attack. GPS electronic attack in DoD tests, training, and exercises are employed IAW the latest version of CJCSM 3212.03A, *Performing*

Tests, Training, and Exercises Impacting the Global Positioning System, and classified supplement. These activities require approval from the Commander, United States Strategic Command.

4.15.1. GPS Electronic Attack Requests and Approvals. Units requesting GPS electronic attack must have official sanction from a DoD organization or authorized contractor (under contract with a DoD organization) and be conducted to ensure forces can operate in an intense electronic warfare environment. **(T-0)**. Units must develop and submit requests IAW the procedures established in CJCSM 3212.03A. **(T-0)**.

4.15.2. GPS Electronic Attack Employment. Teams conducting these operations will maintain positive control of GPS jammers. **(T-0)**. For range safety, the range operating authority will provide the teams operating GPS jamming equipment with a primary and alternate means of communication. **(T-1)**.

4.15.2.1. Ranges must provide dedicated Cease Buzzer telephone numbers for the duration of the GPS electronic attack employment. **(T-0)**. The range or proponent must provide these telephone numbers with the initial request package. **(T-1).** Any change to Cease Buzzer numbers must be provided to the Air Force Spectrum Management Office by either the range or the proponent in an updated request to be forwarded to United States Strategic Command and received by FAA Headquarters not later than than 7 days prior to event execution. **(T-0)**.

4.15.2.2. Ranges must provide the GPS jamming teams with the capability to monitor Guard and range operations channels. **(T-0)**.

4.15.2.3. Ranges must make notifications prior to and post GPS electronic attack operations IAW the GPS electronic attack approval message from the Commander, United States Strategic Command (and FAA or the United States Coast Guard concurrence messages, if applicable). **(T-0)**.

4.15.2.4. Ranges must make Cease Buzzer notifications IAW GPS electronic attack approval message from the Commander, United States Strategic Command and the procedures defined in CJCSM 3212.03A. **(T-0)**.

4.16. Laser and Directed Energy Weapon Operations.

4.16.1. Laser Range Operations. The range operating authority will not authorize laser operations unless the range is certified and the laser either complies with the Federal Performance Standard for Laser Products issued by the Food and Drug Administration, Center for Devices and Radiological Health, in Title 21, CFR, Subchapter J, Parts 1040.10 and 1040.11 or has a current and valid exemption issued by the Air Force Laser System Safety Review Board. **(T-1)**. Examples of lasers include designators, rangefinders, and illuminators/pointers.

4.16.1.1. Laser operators shall be trained on safe use procedures by their Unit Laser Safety Officer. Unit Laser Safety Officers may contact the supporting Bioenvironmental Engineering Flight for laser safety training information.

4.16.1.2. Military-Specific Laser Operations. Prior to commencement of laser operations on Air Force ranges:

4.16.1.2.1. All Air Force military-specific lasers shall have an exemption from the Air Force Laser System Safety Review Board and be certified for use on Air Force ranges by 711HPW/RHD.

4.16.1.2.2. Other DoD components using non-Air Force military-specific lasers on Air Force ranges shall provide the range operating authority with their service's safety evaluation. Additionally, the non-Air Force military specific laser must be certified for use on Air Force ranges by 711 HPW/RHD. As long as these requirements have been met, non-Air Force personnel may be authorized to operate non-Air Force military-specific lasers on an Air Force range, but Air Force personnel will not be authorized to participate in these operations.

4.16.1.2.3. Foreign nations using non-Air Force military-specific lasers on Air Force ranges shall provide the range operating authority with an independent (i.e., not conducted by the manufacturer) laser safety evaluation if available. The range operating authority will coordinate laser use with 711HPW/RHD. The foreign nation must comply with *North Atlantic Treaty Organization (NATO) Allied Range Safety Publication (ARSP)-4, Edition B, Version 1, Laser Safety for Military Use*, or, for non-North Atlantic Treaty Organization nations, an equivalent standard to be approved by the range operating authority on a case-by-case basis.

4.16.2. Directed Energy Weapon Range Operations. The range operating authority will not authorize directed energy weapon operations (to include, but not limited to, high-energy lasers, weaponized microwave and millimeter wave beams, explosive-driven electromagnetic pulse devices, acoustic weapons, laser induced plasma channel systems, non-lethal directed energy devices, and atomic-scale and subatomic particle beam weapons) unless the weapon has been certified (or approved for testing) IAW AFI 91-401, and the range has been certified for the weapon. **(T-1)**.

4.16.3. Research and Test and Evaluation Activities.

4.16.3.1. Research and Test and Evaluation activities involving lasers or directed energy weapons do not require range certification if conducted IAW AFI 99-103 and applicable research and test management instructions. However, lasers used for research, development, test and evaluation events or demonstrations on a range must comply with the Federal Laser Product Performance Standard (21 CFR 1040.10 and 1040.11) or been approved by the Laser System Safety Review Board. The range operating authority will include the Installation Laser Safety Officer and Bioenvironmental Engineering Office, as applicable, on the AFI 99-103 safety review team. **(T-1)**. The safety review must show control of the hazards from the beginning of operations until termination. **(T-1)**.

4.16.3.2. The safety review assessment team must show that hazards extending beyond restricted airspace or controlled government land have the appropriate levels of federal and local coordination in place. **(T-1)**. The Installation Commander or range operating authority is the final approval authority in lieu of formal range certification. Additional expertise regarding Test and Evaluation can be obtained by contacting the 711th Human Performance Wing (711 HPW) or other Air Force Research Laboratory unit with applicable expertise.

4.16.4. Range Certification. The range operating authority will request laser and/or directed energy weapon range certification through the MAJCOM to the 711 HPW/RHD. **(T-2).** 711 HPW/RHD will report certification results to the range operating authority, the base Bioenvironmental Engineering office, and the parent MAJCOM. **(T-2)**.

4.16.4.1. Laser range evaluations are conducted by 711 HPW/RHD in collaboration with other agencies as needed to enable safe mission accomplishment. 711 HPW/RHD will include in the evaluation an on-site survey, a review of proposed activities (weapons, targets, and tactics) and provide range-specific laser safety footprints, safety recommendations, flight profiles, and systems approved for use on that range. **(T-1)**.

4.16.4.2. Directed energy weapon evaluations will be a collaborative effort between 711 HPW/RHD, AFRL/RD, and any other agency needed to ensure foreseeable health and material safety concerns are considered. **(T-1)**.

4.16.5. Certification Annual Reviews. The Laser Safety Officer and/or Directed Energy Weapon Safety Officer will review applicable operations with the range operations officer or range operating authority annually (within 45 days of the certification report's anniversary) to ensure activities are within the scope of the current range certification. **(T-2)**. If any activities or physical changes to the range are found to be outside the scope, the range operations officer/range operating authorities will terminate the affected operations until they have been evaluated and incorporated into the range certification. **(T-1)**. Contact the 711 HPW/RHD for assistance. **Note:** the previous two sentences do not apply to research or Test and Evaluation activities, provided the conditions in paragraph 4.16.3.1 have been met. Range operating authorities will report findings from the annual review to the parent MAJCOM and 711 HPW/RHD. **(T-2)**.

4.16.6. Certification Validity. Certifications expire at the end of the third fiscal year following issuance (e.g., a certification dated 3 December 2017 expires on 30 September 2021). Range operating authorities must ensure the certification is re-accomplished IAW paragraph 4.16.4 before covered activities may resume. **(T-2)**. Prior to expiration, the certification is valid for the equipment, aircraft, targets, tactics and weapons evaluated as long as the report's recommendations are complied with, land and airspace boundaries remain unchanged, annual reviews are submitted to the MAJCOM and 711 HPW/RHD within 45 days of the initial report's anniversary, and laser specular hazards are periodically removed (as specified in paragraph 4.16.8.4). The reinstatement or extension of a certification is at the discretion of 711 HPW/RHD based on the scope of any reported changes.

4.16.7. Commander, United States Strategic Command Coordination. Use of Category II or III lasers or laser systems that have the potential to propagate above the horizon requires range operating authority notification to United States Strategic Command Commander IAW DoDI 3100.11, *Management of Laser Illumination of Objects in Space*, and Chairman of the Joints Chiefs of Staff Instruction 3225.01, *Illumination of Objects in Space by Lasers*. **(T-0).**

4.16.8. General Requirements for Lasers and Laser Directed Energy Weapons.

4.16.8.1. Lasers will not be operated without the approval of the Laser Safety Officer and the range operations officer (range control officer during Class A service). **(T-2)**.

4.16.8.1. **(AETC)** The ROA must specify the lasers and settings approved for use on the range (IAW the Laser Survey), e.g. "COMBAT MODE" versus "TRAINING MODE" settings, etc.

4.16.8.2. The user will notify the range operations officer or range control officer upon termination of laser activity. **(T-3)**. The range operations officer or range control officer will acknowledge termination and record the start and stop time of range periods when laser operations take place. **(T-3)**.

4.16.8.3. Range users will not direct ground lasers at targets or hazard areas where the laser beam will terminate with an ocular hazard beyond the range boundary unless the hazardous laser energy exclusively transits restricted airspace (or equivalent) up to an altitude of 60,000 feet (Flight Level 600), and terminate in space without affecting non-participating satellites. **(T-0)**.

4.16.8.4. Range personnel must ensure specular hazards are periodically removed from the Laser SDZ surrounding the targets; reference guidance in Military Handbook 828C as necessary. **(T-2)**.

4.16.8.5. IAW AFI 48-139, the supporting Aerospace Medicine function will accomplish medical surveillance examination requirements for range personnel (as determined by the Installation Occupational and Environmental Health Working Group) before working in a laser hazard environment. **(T-2)**.

4.16.8.6. IAW AFI 48-139, all range personnel within the Laser SDZ during laser operations will wear laser eye protection of appropriate optical density. **(T-2)**.

4.16.9. General Requirements for Non-Laser Directed Energy Weapons.

4.16.9.1. Range operating authorities will ensure non-laser directed energy weapon systems are operated only with approval from the Directed Energy Weapon Safety Officer and the range operations officer (range control officer during Class A Service). **(T-2)**.

4.16.9.2. The user will notify the range operations officer or range control officer upon termination of directed energy weapon activity. **(T-3).** The range operations officer or range control officer will acknowledge termination and record the start and stop time of range periods when directed energy weapon operations take place. **(T-3)**.

4.16.10. Accident/Incident Injury Reporting. Report all actual or suspected laser accidents, incidents, and injuries that impact DoD personnel and coordinate immediate expert medical advice by calling the Tri-Service Laser Injury Hotline (1-800-473-3549) and the Unit Laser Safety Officer. **(T-0).**

4.16.11. Laser and Directed Energy Weapon Certification on Foreign and Other United States Service Ranges. When Air Force aircraft operate on another nation's/service's range, MAJCOMs will ensure safe use procedures have been developed and are promulgated by the host nation/service prior to employing lasers and/or directed energy weapons. In the event procedures have not been developed, range users will comply with this manual and North Atlantic Treaty Organization Allied Range Safety Publication-4, *Edition B, Version 1*. All military-specific lasers used by Air Force personnel, in any location, shall have a safety approval from the Air Force Laser System Safety Review Board. **(T-1)**.

4.17. Range Safety.

4.17.1. Visual Identification of Manned Equipment, Facilities and Sites. To the maximum extent possible, equipment and facilities, manned or unmanned, that are not targets should include visual identification systems, such as high contrast paint (white or orange), infrared radiation strobes, etc. Range personnel will not use white or orange paint on any "bombable" targets with the exception of strafe "rags" or specific test targets where white supports test objectives. **(T-1)**.

4.17.2. Range Visitor Procedures. Each range operating authority must publish or reference procedures in their local range supplement to ensure positive control of all spectators. **(T-3)**. Range operating authorities must analyze visitor locations using the appropriate weapons footprint(s)/hazard area(s) to ensure that spectators are not within these areas during operations. **(T-2)**. The range operating authority will have control in those limited cases where DoD personnel or contractors are within the hazard area during operations to accomplish a specific mission-related task. **(T-2)**.

4.17.2. **(AETC)** Each range will maintain a log documenting non-mission essential visitor's name, grade, organization, date, and purpose of visit. Maintain the log at the range for a minimum of one year **(T-2)**.

4.17.3. Flight Safety.

4.17.3.1. Airspace Activation. The range operating authority will ensure range airspace is activated with the local air traffic control facility or air traffic representative IAW local agreements between the range operating authority and the controlling agency. **(T-0).** The request for activation should be timed (before a scheduled mission) to allow shared or joint users to clear the area and for the controlling agency to make internal adjustments.

4.17.3.2. Weather Observation. The range control officer will monitor weather conditions to include altimeter setting, temperature, ceiling, visibility and winds. **(T-2)**. Observations may be obtained from the local base weather station, command post, Automated Weather Observing System, or air traffic control agency at least hourly, if the capability is not available at the range. The supporting weather detachment or command post should advise the range control officer of any sudden adverse weather changes that might affect range operations or safety.

4.17.3.3. Avian Hazard Advisory System. Where internet connectivity permits, range control officers will utilize Avian Hazard Advisory System (**http://www.usahas.com**) to monitor bird movement and bird strike risk levels for the airspace associated with the range. **(T-2)**.

4.17.3.4. Aircraft Accident Procedures. In case of an aircraft crash during Class A service, the range control officer will initiate all necessary emergency actions. **(T-1)**. These include appropriate notifications, closing of the range, and assuming responsibility as the interim on-scene commander until the crash response team can be organized. During Class B, Class C, and Class D service, the flight lead, individual pilot, Forward Air Controller (Airborne), JTAC or other briefed person will start the emergency actions, and if feasible, act as the interim on scene-commander. **(T-2).** Investigations are conducted IAW AFI 91-204, *Safety Investigations and Reports.*

4.17.3.4. **(AETC)** Each ROA will inform 19 AF/DOO at the earliest opportunity following major accidents/incidents such as crashes, off-range munitions impacts, major

fires, and major equipment damages and personnel injuries. ROAs may provide initial notification telephonically, as soon as practical, of incidents that will require 19 AF/DOO involvement or assistance, and will follow up via electronic mail. Notify 19 AF/DOO when a formal investigation is convened concerning range incidents. Send information copies of correspondence concerning range incidents to 19AF/DOO **(T-2)**.

4.17.4. Occupational and Explosive Safety.

4.17.4.1. Fire Prevention. Identify range activities likely to cause range fires, and develop and implement procedures to mitigate them. Identify a single agency or office responsible for determining the fire danger hazard level, typically in cooperation with the land management agency. Develop a decision matrix and checklist to standardize fire prevention actions and ensure appropriate responses as fire conditions change. Range operating authorities will ensure fire prevention is included in the Wildland Fire Management Plan and range supplement. **(T-3)**.

4.17.4.2. Fire Suppression Equipment. On ranges providing Class A or manned Class B or T service, appropriate fire suppression equipment and personnel must be available to deal with local fire hazards. **(T-2).** This capability may be provided through Air Force, host military organization for tenant units, landowner, in-service civilian, independent contractor assets, or through agreement with another government agency such as the Bureau of Land Management or United States Forest Service. The range operating authority, in coordination with the agency or organization providing fire support, shall identify the fire suppression equipment requirements and will ensure that fire suppression equipment sufficient to protect the lives of personnel on the range. **(T-2)**.

4.17.4.3. Emergency Procedures. Range operating authorities must ensure emergency procedures are readily available to the range control officer and other ground personnel, such as JTACs, for use during range operations. **(T-2).**

4.17.4.3. **(AETC)** RCO checklists, AFMAN 13-212V1, higher headquarters supplement and the local supplement, will be available in the main RCO tower of a Class A Range. Review checklists annually to ensure currency **(T-2)**.

4.17.4.4. Safety Briefing Requirements. The range operating authority or contractor will provide and document initial and yearly occupational and explosive safety briefings IAW AFMAN 91-201, to personnel assigned to operate and maintain Air Force ranges. **(T-2)**. The range operating authority will ensure all personnel participating in range clearance operations receive additional training IAW paragraph 6.4.2 before assisting in range clearance. **(T-2)**. The range operating authority must also ensure that authorized visitors and personnel who infrequently visit the range are appropriately briefed on range safety. **(T-1)**.

4.17.4.4. **(AETC)** Personnel will not enter any Hazard Area until they have received the range safety briefing. Tailor the safety briefing, as-needed, to include the items listed in paragraph **A5.1** **(T-2)**.

4.17.4.5. Hazard Condition Watch. The range control officer and all range personnel must continually watch for hazardous conditions such as trespassers, fires, bird activity, etc. **(T-3).** Range users will be notified immediately of any hazardous conditions on the range. **(T-**

3). If safety is in question, the range control officer or other appropriate authority will stop range operations until the situation is remedied. **(T-3)**.

4.17.4.6. Performance during Critical Tasks. During the performance of critical situational tasks such as controlling or monitoring the movement of aircraft or ground parties using the range, personnel must not conduct unrelated activities which divert their attention, degrade situational awareness or prevent timely communication. **(T-3)**. Such distracting prohibitions include composing and sending emails and text messages unrelated to the mission at hand, browsing web pages unrelated to the mission and making and receiving unofficial phone calls.

4.18. Risk Management. Range operations are complex and the risk management process requires a dedicated team representing multiple functional areas such as operations, CE (to include EOD), legal, public affairs, and safety. Utilize the risk management process prior to any change to range operations, boundaries, or procedures with the potential to increase flight, occupational or explosive safety risks. The risk management assessment examines type of ordnance authorized, employment tactics, weapons footprints, type of proposed joint or shared use, geographic features, frequency of EOD sweeps, etc. Coordinate assessments through the wing (or equivalent) POC for risk management matters. ACC Form 167, *ACC Risk Management Worksheet*, is one tool that may be used to assist with documenting risk management assessments.

4.19. Night Operations.

4.19.1. Covert or blacked-out lighting operations will not be conducted during Class A service unless the range control officer is equipped with binocular, generation-III NVDs. **(T-2)**. NVDs will be tested, adjusted and focused by the range control officer before use with (in order of preference) the Hoffman ANV-20/20 Tester, a unit eye lane or equivalent tester. **(T-2).** Range control officers will perform NVD testing, adjustment and focusing procedures IAW appropriate TOs, manufacturer instructions or MAJCOM guidance. **(T-2)**.

4.19.1. **(AETC)** The ROA shall determine the need for a night RCO. Each range will establish procedures to support aircraft utilizing Night Vision Devices (NVD)/Infrared Targeting Devices (ITD) compatible lighting or lights-out operations, to include mixed NVD/lights-out and NVD/lights-on missions **(T-3)**.

4.19.2. Range Lighting.

4.19.2. **(AETC)** Include lighting upgrade plans in range plans. Coordinate closely with local users to determine the best settings for range lighting.

4.19.2.1. Class A Service Identification Lighting. Ranges providing Class A services that support night operations must have available a distinctive pattern of lights visible by aircrews, with and without NVDs, to ensure positive orientation and identification of the range and target area. **(T-2)**. These lights should be readily identifiable but not so as to distract aircrews during weapons delivery or wash out target locations. Range operating authorities will ensure that no similar pattern of lights exists near the range that could be misidentified as targets or the impact area, but cultural lighting inside or outside the range boundary may serve as a portion of the distinctive pattern of lights. **(T-2)**.

4.19.2.2. Class B Service Identification Lighting. Ranges providing Class B services that support night operations will have lighting as described above unless the range operating

authority has determined that the lighting is not required based on a documented, risk management assessment (based on range size, remoteness, etc.) **(T-2)**.

4.19.2.3. Target Lighting. Lighting for the specific purpose of illuminating the target is only required on ranges that support users accomplishing unaided visual deliveries. If required (or desired by other users), target lighting may be accomplished using incandescent lights, lanterns, or flares. Lights and lanterns should be NVD compatible or reduced in intensity to produce the minimum halo around each light when viewed through NVDs. Every effort should be made to prevent the target from appearing as a light with a halo to allow for positive target identification.

4.19.2.3. **(AETC)** Each scheduled user will specify to the RCO what type of lighting/marking scheme is required for their mission. The RCO will ensure lighting/marking scheme is set as requested and inform aircraft of issues that prohibit planned use of specific targets at night.

4.19.2.4. Range Facility Identification.

4.19.2.4.1. Range Tower and Routinely-Manned Facility Lighting. Lighting is required on all routinely-manned range facilities and range towers to facilitate positive identification by aircrew. **(T-2)**. Proper management of tower lighting is important to maximize performance of NVDs used by range personnel. Tower lighting (interior and exterior) should be minimized to those necessary to conduct operations and all unnecessary lights should be extinguished or taped over. NVD compatible lighting is highly recommended. Consider moving tower, routinely-manned facilities and obstruction strobe lights to locations that can best support night operations.

4.19.2.4.2. Other Manned Locations. Other manned locations (such as observation posts, visitor locations, vehicles, etc.) will, as a minimum, mark their location by any means described in Joint Publication 3-09.3 for "friendly marking" that facilitates positive identification by aircrew. **(T-0)**.

4.19.3. Infrared Radiation Pointers and/or Lasers. Range users will not use a single, steady infrared radiation point as the sole means of target identification. **(T-1)**. If using an infrared radiation pointer to mark targets, range users must ensure either the target or friendly terminus of the pointer is positively verified by another means (snaking, friendly location marking, etc.). **(T-1)**. When ground based lasers/designators are used to designate targets, range users must ensure attack headings within ±10° of the laser designator to target line (safety zone) are prohibited and run-in headings are restricted to a 50° cone on either side of the safety zone. **(T-1)**. Per AFI 48-139, personnel will not be exposed to laser radiation in excess of the Maximum Permissible Exposure levels as defined in American National Standards Institute Z136.1, *Safe Use of Lasers*, and avoid unnecessary exposures to laser radiation below the Maximum Permissible Exposure. **(T-2)**.

4.20. Unmanned Aerial Systems/Remotely Piloted Aircraft. Range operating authorities shall conduct a risk management assessment of Unmanned Aerial System/Remotely Piloted Aircraft operations and apply appropriate mitigation measures prior to employment on the range. **(T-0).** At a minimum consider:

4.20.1. Kinetic energy potential for lethality and property damage.

4.20.2. Flight paths to avoid endangering concentrations of DoD and civil assets/personnel.

4.20.3. System maturity and employment methodology.

4.20.4. Mid-air collision avoidance through see, sense and avoid, spotter, or chase aircraft.

4.20.5. Airspace and Air Traffic Control coordination. See FAA publications for flight requirements in the National Airspace System.

4.20.6. Robustness and redundancy of vehicle control or telemetry.

4.20.7. Containment measures such as a Flight Termination System, lost link software, or parachute.

4.21. (Added-AETC) Requirements. User input received at the annual Range Users Meeting or through other means should be incorporated in target planning.

4.21.1. **(Added-AETC)** Acquisition. Select the type of target, target material or construction method based on target suitability and projected life cycle cost. Factors to consider may include, but are not limited to: target fidelity, durability/ordnance to be used, and accessibility on the range, repair/maintenance, recycling opportunity, environmental impact and disposal costs. Note: The final target determination should be based on which target satisfies the training or test requirement and is the most cost effective. The ROA should work closely with OSS Intelligence and Weapons and Tactics shops to develop realistic target sets to meet unit training requirements.

4.21.2. **(Added-AETC)** Preparation. Proper target preparation will greatly reduce safety hazards and cleanup costs. Identify and remove all hazardous materials IAW paragraph **2.9.38** and the following steps.

4.21.2.1. **(Added-AETC)** Drain all fluids except for a small amount of transmission fluid to permit the target to be dragged, as needed.

4.21.2.2. **(Added-AETC)** Remove dense metal portions (engines, transmissions, etc.) from potential strafe targets unless essential to the operation or effectiveness of the target.

4.21.2.3. **(Added-AETC)** Despecularize potential laser targets by removing reflective components; limit painting or masking to components which cannot be removed.

4.22. (Added-AETC) Smokey SAM/Smokey Gun Operations. AETC ranges conducting launch operations of the GTR-18A Rocket (Smokey SAM) or PJU-7A/E Projectile Simulator (Smokey Gun) will follow the guidance in T.O. 11L1-2-23-1, *Operational, Organizational and Intermediate Maintenance Instruction--Smokey SAM Simulator/Antiaircraft Artillery Visual Cueing System,* and this supplement. Develop an operating instruction (OI) IAW AFMAN 91-201, *Explosives Safety Standards,* to include procedures not covered in technical orders, operators manuals, or this instruction **(T-2)**.

4.22.1. **(Added-AETC)** Responsibilities. The ROA will ensure compliance with this instruction.

4.22.2. **(Added-AETC)** Remote Controlled Launchers. Use of remote control launchers is authorized only with safety certification for operational use IAW AFI 91-205, *Non-Nuclear Munitions Safety Board*. ROAs will develop local operating procedures to ensure personnel

safety and prevent foreign object damage (FOD) hazard to aircraft. Remote controlled launchers must incorporate a means to remotely disable launcher functioning (Safe) **(T-2)**.

Chapter 5

RANGE MAINTENANCE AND CLEARANCE OPERATIONS

5.1. Range Clearance Guidelines. Each MAJCOM/range operating authority is responsible for the clearance of operational ranges under its control IAW DoDI 3200.16, DoDI 4140.62, *Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH),* and Title 40 CFR, Parts 260-270. Furthermore, each MAJCOM/range operating authority must dispose of radioactive wastes IAW the Air Force Radioactive Recycling and Disposal Office and AFI 40-201. **(T-0).**

5.1.1. Funding and Scheduling Range Clearance. The range operating authority is responsible for funding and scheduling all Material Potentially Presenting an Explosive Hazard (MPPEH)/range clearance. The range operating authority should publish a readily accessible clearance schedule. The range operating authority or range operations officer may temporarily postpone range clearance on a case-by-case basis for severe weather or other unforeseen circumstances that warrant delays.

5.1.2. EOD Support for Range Clearance. Development of the annual range clearance plan will be a collaborative effort between the range operating authority and the supporting EOD unit (or MAJCOM) and be finalized at least 6 months prior to the first clearance activity. If there is no organic EOD capability, range operating authorities will establish a written agreement for range clearance support with the nearest Air Force EOD unit, if practicable; or if not with the nearest non-Air Force EOD unit via a memorandum of agreement and/or Inter-Service Support Agreement. **(T-2).** Range operating authorities will attempt to synchronize clearances with EOD deployment cycles or periods of high EOD operations tempo.

5.1.2.1. When the requirement for range clearance support exceeds the capability of the associated EOD unit, shortfalls are managed within the EOD Information Management System Range Support Tasking Program. The supporting EOD unit (or MAJCOM) will enter Range Support Tasking requests into EOD Information Management System as required to meet clearance requirements. **(T-2).**

5.1.2.2. Range operating authorities will prepare a plan for range clearance operations that at a minimum considers the number of personnel involved, types of ordnance anticipated to be encountered and/or recovered, expected levels of contamination, and support requirements. **(T-2)**.

5.1.2.2.1. The range operating authority will ensure the plan provides sufficient time to complete the planned and anticipated range clearance operations safely. **(T-2)**.

5.1.2.2.2. Consider requesting an advanced echelon element from the supporting EOD unit to conduct a GPS mapping survey of UXO-contaminated areas and debris-densities/distances around the targets at least 2 weeks prior to arrival of the main body for workload estimates and to finalize clearance planning.

5.1.2.3. Range operating authorities must finalize all range scheduling and EOD RST support at least 45 days before the start of the clearance operation. **(T-3)**.

5.1.3. To identify, safeguard, and dispose of UXO, range operating authorities will ensure the following are accomplished:

5.1.3.1. Safely clear UXO from ranges consistent with the stated mission of the range and for the continuing viability of the range. **(T-1).** Resolve all conflicts between explosive safety and other requirements with the objective of minimizing explosive hazards. Ensure controlled burning is not used to accomplish UXO clearance, but may be used to support UXO clearance if environmental and safety requirements are met. **(T-1)**.

5.1.3.2. Promptly report any UXO or aircraft incident that falls outside of range or installation boundaries to proper authorities to protect personnel and property IAW AFI 32-3001. **(T-0)**.

5.1.3.3. Notify installation personnel and the public, as appropriate, if any range operation presents a potential explosive hazard off the range. **(T-2).** This includes informing the public of any mishap that could impact the local community and may require additional precautions and/or restrictions. For range operations that occur outside the United States, comply with DoDI 4715.12 and relevant Combatant Command and in-theater Headquarters Air Force Component Command issuances, if any.

5.1.3.4. On operational ranges, the procedures for evaluating and responding to explosives safety, human health, and environmental risks are IAW AFMAN 91-201 and Title 40 CFR Parts 260-270.

5.1.3.5. Maintain permanent records of: **(T-0).**

5.1.3.5.1. All expenditures (types, quantities, locations, using organization, and estimated dud rates) per target of ammunition and explosives IAW DoDD 4715.11 and DoDI 4715.12.

5.1.3.5.2. All mishaps attributed to UXO that occur on or off the range/installation IAW DoDI 6055.07, *Mishap Notification, Investigation, Reporting, and Record Keeping*.

5.1.3.5.3. All EOD incidents and range clearance operations conducted on ranges.

5.1.3.5.4. All areas known or suspected to contain UXO using a geographic information system, range maps and/or installation master planning maps in compliance with the Spatial Data Standards for Facilities, Infrastructure, and Environment. Conduct historical research as necessary.

5.1.3.6. Remove all munitions debris from targets awaiting disposal. **(T-0)**.

5.2. Range Clearance Operations. Range clearance includes the removal or disposal of all ordnance, inert ordnance debris, training projectile ammunition, and other range debris reasonably possible to detect (normally down to 4 inches in size).

5.2.1. **WARNING:** Ranges will not conduct maintenance and clearance operations when snow covers the ground. **(T-1).** However, if specifically authorized in the MAJCOM supplement, activities such as clearance, target removal, or target replacement may be performed during these periods.

5.2.2. Ordnance Removal and Disposal. EOD Personnel or UXO-Qualified Personnel, as defined in the current version of the DoD Explosives Safety Board Technical Paper 18, *Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern-Related Activities,* will inspect munitions, munitions components, and targets for the presence

of explosive hazards and mark inspected items that are "safe to move". Only EOD Personnel will perform explosive operations to detonate/destroy UXO and energetic material. **(T-1)**. With an approved waiver, UXO-Qualified Personnel may perform limited explosives operations to support specific range clearance objectives, limited to venting practice bombs or destroying spotting charges. UXO-Qualified Personnel contracted to perform target maintenance or manage the installations MPPEH Program on operational ranges, will mark all UXO or munitions that contain explosives and report the item and location to the appropriate agency to coordinate with the supporting EOD unit to schedule a disposal/render safe procedures. Special attention should be provided during target inspection to ensure UXO are not embedded or contained within voids. "Safe to move" may be indicated by any readily distinguishable means that is mutually agreeable to EOD and the range operating authority.

5.2.3. Personnel assisting in range clearances will only handle items that have been inspected and marked "safe to move" by EOD Personnel or UXO-Qualified Personnel. **(T-1)**. Personnel assisting will be supervised by either EOD Personnel or UXO-Qualified Personnel to ensure hazardous items are not inadvertently moved or removed. **(T-1)**.

5.2.4. MPPEH Management. All munitions, munitions debris, and target debris removed from a range are considered MPPEH and are managed IAW explosive safety standards. Processing of MPPEH results in a classification of the material as either Material Documented as an Explosive Hazard or Material Documented as Safe. Ranges must institutionalize chain of custody processes for MPPEH from collection to final disposition of the hazardous and safe material. **(T-0)**. This is particularly necessary when two or more agencies (e.g., military and contracted) are involved in the MPPEH process. Refer to AFI 21-201, *Munitions Management*, for additional guidance on MPPEH management and disposition.

5.2.4.1. MPPEH processing (also known as "Range Residue Removal") is normally accomplished by UXO-Qualified Contractors where demilitarization complements the inspection process to enable a more thorough examination.

5.2.4.1. **(AETC)** Maintain a log of all MPPEH removed from the impact areas of the range and placed in the range holding area. Include target weights from the target management program and munitions counts from EOD range clearance reports. Use the log as the basis for R3 cost estimates.

5.2.4.2. Range operating authorities will ensure that MPPEH awaiting processing and inspection is in a properly sited residue holding area. **(T-0)**. When non-EOD personnel handle and transport material marked "safe to move," EOD Personnel or UXO-Qualified Personnel will supervise handling and loading for consolidation at the residue holding area. **(T-1)**. Only EOD Personnel or UXO-Qualified Personnel will handle material after placement in the residue holding area. **(T-1)**. Ranges may accumulate MPPEH until a cost-effective processing quantity is reached, but shall not delay processing in order to maximize the value of recyclable materials. **(T-0)**.

5.2.4.3. EOD Personnel or UXO-Qualified Personnel must double-inspect MPPEH IAW DoDI 4140.62 to identify and remove Material Documented as an Explosive Hazard before it can be declared Material Documented as Safe. **(T-0)**. To prevent co-mingling, once Material Documented as an Explosive Hazard and Material Documented as Safe are identified and documented as such, EOD Personnel or UXO-Qualified Personnel must segregate them from one another and from MPPEH awaiting inspection. **(T-0)**.

Segregation may be accomplished by any means that ensures physical separation and controlled access (e.g., bins, buildings, or fenced compounds under lock and key).

5.2.4.4. Disposal of Material Documented as Safe may be accomplished by any means consistent with DoDI 4140.62 and may be accomplished by the Defense Reutilization and Marketing Service under a memorandum of agreement or through direct commercial sales or contracts. Range operating authorities must ensure only properly inspected and documented Material Documented as Safe are released to the public. **(T-0)**. For Material Documented as Safe at ranges located outside the United States, ensure compliance with DoDI 4715.12 and relevant Combatant Command and in-theater Headquarters Air Force Component Command issuances, if any.

5.2.4.5. MPPEH disposal should not be viewed as a funds generating activity. Management and disposal of MPPEH should consider safety first, and ensure compliance with the Resource Conservation and Recovery Act Military Munitions Rule and (where applicable) hazardous waste management requirements. Additionally, IAW DoDI 4715.23, *Integrated Recycling and Solid Waste Management*, the following categories are excluded from being sold through a qualified recycling program: items that require demilitarization; ships, planes or weapons that require demilitarization or mutilation prior to sale; Munitions List items or Strategic List items. Range operating authorities must ensure the proceeds from their sale are NOT returned to a qualified recycling program. **(T-0)**.

5.2.4.6. **(Added-AETC)** MPPEH shall be processed to ensure explosive safety, demilitarization and environmental requirements are met before this material is released from DoD control. This process shall leave munitions and munitions residue in a condition where they will not be recognizable as munitions, allows for full inspection of the interior to ensure no explosive hazard remains, and typically prepares the material into an industry standard form. Use DoDM 4160.21, Defense Material Disposition (4 Volumes) and with DoDM 4160.28, Defense Demilitarization (3 volumes), to ensure proper demilitarization is accomplished. All processed material will be accompanied by a Range Residue Disposition Document, DD Form 1348-1A, Issue Release/Receipt Document, or locally generated documentation **(T-2)**.

5.2.4.6.1. **(Added-AETC)** Sub-scale practice bombs (e.g., bomb dummy unit) and other sub-scale practice munitions, expended rockets and warheads, inert projectiles; guided missile parts and guided bomb components will be run through a process that reduces 85% of these items into 4-inch pieces or smaller and unrecognizable as munitions items **(T-2)**.

5.2.4.6.2. **(Added-AETC)** Demilitarize full scale inert bombs to the point where they do not resemble a bomb. Filler materials will be removed **(T-2.)**

5.2.4.6.3. **(Added-AETC)** MPPEH Certification. All processed material will be accompanied by a LLRW statement, MDAS Certificate (DD Form 1348-1A, *Issue Release/Receipt Document*), and demilitarization certificate or locally generated documentation using the certification statements below. Certification statements will only be signed by qualified personnel. The Senior UXO Supervisor is responsible for all contractor on-site range residue certification activities. Certification Statements: LLRW: "I certify that the material listed hereon has no radiation levels greater than background;" MDAS Certification: "The material listed on this form has been

inspected or processed by DDESB-approved means as required by DoD policy, and to the best of my knowledge and belief does not pose an explosive hazard;" Demilitarization Certificate: "I certify that the items listed hereon have been demilitarized in accordance with DoD Manual 4160.28 Volume 3, Defense Demilitarization: Procedural Guidance, Category D, Appendix to Enclosure (3), Sub paragraph (a), PG 24" **(T-2)**.

5.2.4.6.4. **(Added-AETC)** MPPEH and Material Documented As Safe (MDAS) will be inspected IAW DODI 4140.62 **(T-2)**.

5.2.5. **(Added-AETC)** Any use of explosives by UXO-Qualified Contractor Personnel will only be permitted after a Site Specific Safety Plan (SSSP) is approved by installation safety office. The plan will address all aspects of the explosive operations, to include those listed in **Table 5.1**, Site Specific Safety Plan. The SSSP is valid for the duration of the contract or until operational procedures change **(T-2)**.

Table 5.1. (Added-AETC) Site Specific Safety Plan (SSSP) Items.

Item	Topic
A	Organization, Qualifications, and Responsibilities of Personnel Project Manager, UXO Site Safety and Health Officer, UXO COR. **NOTE:** Safety deficiencies noted by the EOD supervisor will be immediately identified to the Project Site Manager and/or the UXO Site Safety and Health Officer.
B	Site Description and Contamination Characterization
C	Hazard Analysis and Risk Assessment
D	Training (i.e., medical monitoring, HAZWOPR, site-specific training, Hazard Communication)
E	Personal Protective Equipment
F	Medical Surveillance
G	Environmental and Personal Monitoring
H	Site Control (i.e., Access, Communication, Security)
I	Personnel and Equipment Decontamination
J	Hazardous Waste Management
K	Emergency Response and Contingency Procedures
L	Spill Containment
M	Heat/Cold Stress Monitoring
N	Logs, Reports, and Record Keeping

5.3. Range Clearance Types and Requirements. On active ranges programmed for continued use, clear the surface of all UXO, MPPEH, and inert debris as described below. Ranges located outside the United States will comply with paragraphs 5.3.1 - 5.3.4.4 to the extent allowed by applicable international agreements.

5.3.1. The following general rules apply to all clearance activities:

5.3.1.1. Mechanized gathering procedures coordinated with the supporting EOD unit and approved by the Air Force Safety Center may be used to clear sub-scale practice munitions (e.g., BDU-33) as long as un-probed munitions are only handled by EOD Personnel or UXO-Qualified Personnel.

5.3.1.2. EOD Personnel or UXO-Qualified Personnel will only perform subsurface UXO and subsurface MPPEH removal as required in current or former hazard areas as required for construction, cable burial, etc. **(T-1).** EOD Personnel or UXO-Qualified Personnel will report subsurface MPPEH removal and range clearance separately. **(T-1)**.

5.3.1.3. Range operating authorities will ensure that hazard areas used specifically for live munitions containing extremely hazardous fuzing (e.g., influence, random-delay) are identified as "Extremely Hazardous Contaminated hazard areas." **(T-1).** Range clearance requirements of “Extremely Hazardous Contaminated hazard areas” are based on an Environmental, Safety, and Occupational Health risk assessment, and if warranted, range operating authorities must accomplish a waiver request IAW paragraph 1.3. and staff it through the appropriate Air Force Environmental, Safety, and Occupational Health agencies (i.e., CE Environmental, Safety, and/or Bioenvironmental Engineering). **(T-1).**

5.3.1.4. Ranges adjacent to the land of another service that prohibits clearance activities are exempt from clearance requirements on those portions when the other service provides written acknowledgement of the ramifications. These areas will be considered “Extremely Hazardous Contaminated impact areas” and managed accordingly by the range operating authority. **(T-1).**

5.3.1.5. Range operating authorities will receive authorization from adjacent facilities prior to decontaminating/clearing adjacent impact areas. **(T-1)**. Range operating authorities will document all access denials for clearance activities and report occurrences to the parent MAJCOM and AF/A3TI. **(T-2)**.

5.3.2. Low-Angle Strafe Targets. If used for low-angle strafe by aircraft that fly past or over the target within 500 feet of the target (slant range), range operating authorities will ensure that the target is hand-policed daily when used and cleared after 15,000 scored rounds (or 12 use days for non-scored targets). **(T-2)**.

5.3.3. Improved conventional munition targets (e.g., Cluster Bomb Unit grids) are normally cleared after accumulating a specific number of weapons. Range operating authorities will specify the maximum accumulation amount for improved conventional munition targets in the range supplement for approval by the MAJCOM with the concurrence of AF/A4C. **(T-1).** After the maximum accumulation amount is achieved, EOD Personnel will clear improved conventional munition targets to the radius where the debris density factor is less than five items per acre and at least 500 feet from the target. **(T-1)**.

5.3.4. Range Clearance Requirements. EOD Personnel will clear active ranges used for munitions expenditures IAW the minimum requirements defined in the following sub-paragraphs. **(T-1).** Conduct clearance more frequently or to a greater distance as required to maintain targets or realistic appearance, or where an uneven distribution of weapons results from restricted run-in headings. EOD Personnel will:

5.3.4. **(AETC)** ROAs will submit waivers IAW paragraph **1.3** for cancellation of the clearance or modification of range clearance criteria. A cancellation occurs when a clearance cannot be performed before the next scheduled clearance of the same type, e.g. a semi-annual clearance, regardless of any intervening, less restrictive clearance. A postponement occurs if the clearance can be performed before the next required clearance of the same type. Clear the entire prepared (graded) target area if it exceeds the minimum clearance distance to provide a safe working environment for range maintenance activities.

5.3.4.1. Clear target access roads and the area 50 feet on either side during clearance operations or target maintenance activities (only those roads noted on range maps and those used for sole access to targets/arrays). **(T-1).** Consider clearing to a greater side distance to accommodate anticipated vehicle traffic (e.g., towed load), vehicle characteristics (e.g., turn radius), and potential obstacles (e.g., road damage, UXO).

5.3.4.2. Semiannually or after 150 use days (whichever comes later), clear the area around each desired point of impact associated with a high-use target to a radius of 150 feet. **Note:** This criterion applies to individual desired points of impact (not multi-desired points of impact target arrays) that receive a high volume of munitions, where deferring clearance to the biennial interval would create a significant ricochet hazard or significantly increase the range clearance work effort due to the accumulation and/or density of UXO. **(T-1).** Range operating authorities may determine these high-use targets based on range-specific conditions, in consultation with the MAJCOM.

5.3.4.3. Biennially, no later than 2 years since last accomplished, clear the area around a target used for weapons expenditure as follows: **(T-1).**

5.3.4.3.1. Clear targets used for practice, inert, pyrotechnic, illumination or smoke munitions to either a) a radius of 300 feet, or b) the shorter radius where the debris density factor is less than five items per acre.

5.3.4.3.2. Clear targets used for high explosive munitions (including White Phosphorous) to either a) a radius of 500 feet, or b) the shorter radius where the debris density factor is less than five items per acre.

5.3.4.4. Decennially, no later than 10 years since last accomplished, clear the area around a target used for weapons expenditure to either a) a radius of 1,000 feet, or b) the shorter radius where the density of debris items is less than five per acre. **(T-1).** Range operating authorities may elect to clear all areas within 1,000 feet of targets every 10 years and may do so incrementally (e.g., 20% of the required area biennially for 10 years).

5.4. Range Maintenance and Clearance Safety.

5.4.1. **WARNING:** Non-EOD Personnel will not move or attempt to move munitions or targets unless they have been marked “safe to move” by EOD Personnel or UXO-Qualified Personnel. **(T-0)**. This includes any object that appears to have been delivered on-range or had

weapons fired against it. The sole exceptions are for training gun ammunition which has been expended on targets designated solely for that use, and expended Smokey Surface-to-Air Missile simulators.

5.4.2. Safety Training Requirements.

5.4.2.1. Range operating authorities will ensure all range personnel engaged in range maintenance and clearance operations receive occupational and explosive safety briefings IAW Attachment 5. **(T-1)**.

5.4.2.2. Range operating authorities will ensure EOD personnel receive orientation on ordnance expected to be encountered, range vehicle operation, and emergency procedures. **(T-1)**.

5.4.2.3. The supporting EOD unit will ensure non-EOD personnel who are assisting in range clearance operations are briefed on explosive safety hazards IAW AFMAN 91-201, the markings used for live, practice, and inert ordnance found in TO 11A-1-53, *General Instruction for Ammunitions Color Coding, Identification of Empty and Inert Loaded Ammunition Items and Components, and Assignment of Version Numbers to Training and Dummy Ammunition Items*, and the hazards they may encounter. **(T-1)**.

5.4.3. In addition to communication requirements specified in paragraph 4.7, each working EOD team must have a signaling device for use in the event an uninformed flight crew attempts to use the range. **(T-3)**.

5.4.4. Requiring activities shall incorporate Occupational Safety and Health Administration standards and/or Department of Defense Manual 4145.26, *DoD Contractors' Safety Manual for Ammunition and Explosives*, into range support contracts, as applicable. **(T-0)**. Requiring activities outside the United States may have additional, host nation requirements. Contact the servicing Safety Office for more information.

5.5. Range Operations during Range Maintenance and Clearance. Unless further restricted by MAJCOM or local range supplements, adhere to the following restrictions during range maintenance and clearance operations.

5.5.1. Only simulated weapons deliveries, IAW applicable directives, and training-mode laser operations are authorized for the duration of range maintenance and range clearance closures with the following exceptions. When the range is divided as described below all maintenance and clearance activities must be complete before air-to-ground activities can resume on that portion. (T-2). Range operating authorities will ensure that all restrictions are clearly identified in the range schedule and reinforced with range Notices to Airmen. (T-2).

5.5.1.1. Class A Service Operations. Range maintenance and clearance operations can be conducted on one side of a dual Class A service range (except behind strafe targets) while the range control officer is controlling aircrew training missions on the other side of the range.

5.5.1.2. Class B and C Service Operations. Ranges providing Class B and C service are normally closed during maintenance and clearance operations, but if the range is of sufficient size the range operating authority may authorize continued operations on portions of the range (and adjacent ranges) with the approval of the ground party team chief. If approved, the range operating authority will brief aircrews concerning the location

of ground personnel and emphasize the absolute need for positive target identification. (T-2).

5.5.2. Over Flight Procedures. Aircraft must obtain concurrence and approval from the ground party and range control officer/range operations officer for overflight over areas or portions of ranges during maintenance and clearance operations in conjunction with the following restrictions. **(T-1).** This ensures the protection of ground personnel and prevents aircraft damage by fragments from explosives operations. For the purpose of this manual, the overflight restrictions define a minimum distance in any direction, i.e., a "safety bubble." Strict adherence to the procedures outlined below is mandatory.

5.5.2.1. When range maintenance or clearance personnel are present on the range and explosives operations are not planned, aircraft will remain above 3,000 feet above ground level unless a lower altitude and distance is specifically approved by the ground party and range control officer/range operations officer. (T-1).

5.5.2.2. When explosives operations are planned, aircraft will remain at or above 10,000 feet above ground level (accounts for potential rogue fragments IAW AFMAN 91-201). (T-1).

5.5.2.3. Aircraft will not release chaff and flares over range maintenance and clearance operations. (T-1).

5.5.2.4. When no personnel are on the range aircraft operations may proceed with no additional altitude restrictions.

Chapter 6

TEST AND TRAINING USE OF DEPLETED URANIUM (DU)

6.1. Policy and Procedures for Use of DU. Test and training operations involving DU are IAW this manual, AFI 40-201, and the applicable Air Force Radioactive Material Permit issued under the authority of Air Force Master Materials License by the Radioisotope Committee (AFMSA/SG3PB).

6.2. Personnel Using or Handling DU will:

6.2.1. Comply with radiation safety procedures outlined in the license or permit authorizing the storage or use of DU, the referenced directives, local operating instructions or directives, and verbal instructions of their Radiation Safety Officer and supervisor. (T-0).

6.2.2. Halt any imminent danger situation immediately, place the operation in a safe configuration, and inform their Radiation Safety Officer or supervisor of unsafe or non-compliant radiological conditions and incidents or accidents involving DU. (T-0).

6.3. Authorized Locations. Range operating authorities must ensure the use of DU is restricted to sole use impact areas that have been permitted by the Radioisotope Committee. **(T-0)**. Range operating authorities will ensure, except for combat mix (i.e. a mixture of armor piercing and high explosive ammunition), all other munitions, live or inert, practice or full-scale, are prohibited from use in DU impact areas. **(T-0)**.

6.3.1. 30 millimeter Armor Piercing Incendiary DU Testing and Training. Testing of 30 millimeter armor piercing incendiary DU munitions and reliability certification flight tests are limited to the following locations:

6.3.1.1. Eglin Air Force Base, Florida, Area C-64. Used to conduct life cycle testing of 30 millimeter armor piercing incendiary (PGU-14/B) ammunition; rounds are fired into an enclosed gun butt. The range operating authority will ensure that only approved areas are used to handle, store, machine, and test research and development items within an enclosed test chamber. **(T-1)**.

6.3.1.2. Nevada Test and Training Range, Nevada, Target 63-10. Used to conduct Test and Evaluation to verify ballistics, Operational Flight Program software changes, Low Altitude Safety and Targeting Enhancement upgrades, and to conduct United States Air Force Weapons School instructor pilot training and tactical employment evaluation using Combat Mix.

6.3.2. Stockpile Surveillance Flight Tests (Air Force-National Nuclear Security Administration Joint Flight Tests). National Nuclear Security Administration constructs Joint Test Assemblies for Joint Flight Tests based on National Nuclear Security Administration and Air Force test requirements. These Joint Test Assemblies may contain DU.

6.3.2.1. As stated in the Air Force- National Nuclear Security Administration memorandum of agreement addressing joint test and assessment activities, it is the joint policy of National Nuclear Security Administration and the Air Force to recover lost Joint Test Assemblies whenever possible, consistent with United States policy and law.

6.3.2.2. Air Force- National Nuclear Security Administration Joint Flight Tests are normally conducted at Utah Test and Training Range, Eglin Range, National Nuclear Security Administration's test range located within Tonopah Test Range, and Army's Kwajalein Atoll (Reagan Test Site).

6.3.2.2.1. Units must obtain advance coordination for use of any other Air Force range for employment of Joint Flight Test weapons containing DU with the range's parent MAJCOM, AF/A3TI and AF/TE. **(T-1)**.

6.3.2.2.2. Joint Flight Test activities at Vandenberg Air Force Base, Nellis Air Force Base, Eglin Air Force Base, Whiteman Air Force Base, Barksdale Air Force Base, and Minot Air Force Base must limit operations to carrier/weapon interface and carrier launch only. **(T-1)**.

6.3.2.3. Air Force ranges supporting Joint Flight Tests will work with the Radioisotope Committee to determine whether the impact area requires a radioactive material permit/license, and obtain a permit/license when required. **(T-1)**.

6.3.2.4. Use of DU for stockpile surveillance flight tests is authorized under Air Force auspices by Section 91(b) of the Atomic Energy Act of 1954 (Public Law 83-703, 42 U.S.C. § 2121(b), *Material for Department of Defense use*) and falls under the jurisdiction of AFSEC/SEW.

6.4. Disposal/Decommission Procedures.

6.4.1. Disposal of Expended DU Penetrators. DU authorized personnel (see the Terms section in Attachment 1) will collect, package and dispose of expended DU penetrators and visible fragments in coordination with the Installation Radiation Safety Officer and the Radioisotope Committee. **(T-0).** Before commencing clearance actions, an EOD Team will sweep the impact area and eliminate any UXO or explosive hazards. **(T-1)**. Annually, DU authorized personnel will manually remove visible DU rounds and fragments, and package them for disposal. **(T-1).**

6.4.1.1. Disposal Packing Requirements. DU authorized personnel will package DU penetrators and fragments for disposal or recycling IAW instructions provided by Air Force Radioactive Recycling and Disposal Office. **(T-0).** The range operating authority will prepare requests for disposal or recycling IAW AFI 40-201 and coordinate with the Installation Radiation Safety Officer. **(T-0)**.

6.4.1.2. Contaminated Targets. Vehicles and tanks that are no longer intended to be used as targets or are so damaged from use that they are in need of replacement will be identified and decontaminated IAW AFI 40-201 by DU authorized personnel or have arrangements made for proper disposal or recycling. **(T-1)**.

6.4.2. Decommission Plan. IAW AFI 40-201, prior to expending DU at any authorized location, units will develop a decommissioning plan that identifies the cost to remediate DU contamination at the site based on current technology. The range operating authority will review and update the decommissioning plan biennially and provide a copy of the plan to the Radioisotope Committee. **(T-0)**.

Chapter 7

ENVIRONMENTAL MANAGEMENT

Note: For ANG ranges, AFCEC's environmental program responsibilities are performed by NGB. NGB will coordinate environmental program related actions with AFCEC as necessary.

7.1. Encroachment Prevention and Mitigation. Range encroachment must be identified and managed to ensure mission readiness, adequate natural infrastructure (air, land, and water) and frequency spectrum are available to test, train, and perform the Air Force's varied missions at its ranges. These resources can be degraded or denied in some locations due to environmental issues or encroachment. Encroachment (defined in AFI 90-2001, *Encroachment Management*) comes in many forms, but often results in diminished operations or significant workarounds, inconveniences, and additional costs.

7.1.1. The range operating authority will ensure the installation's encroachment study documents both internal and external encroachment issues for ranges and associated airspace describing impacts on the mission. **(T-3)**. Internal factors include, but are not limited to, wetlands, threatened and endangered species, hazardous waste sites, military frequency spectrum competition, and UXO. External factors include, but are not limited to, incompatible land use zoning, frequency spectrum restrictions, physical obstructions and renewable energy projects, and local and regional environmental constraints. The range operating authority will work with the installation encroachment management team (IEMT), to minimize external and internal encroachment impacts to the range. **(T-2)**.

7.2. Integrated Natural and Cultural Resources Programs. Air Force ranges will conserve natural and cultural resources pursuant to the Sikes Act (16 U.S.C. § 670 et seq), Endangered Species Act (16 U.S.C. § 1531 et seq), and the National Historic Preservation Act (54 U.S.C. § 300101 et seq).

7.2.1. The management of range natural resources is governed by an approved Integrated Natural Resources Management Plan IAW AFI 32-7064.

7.2.2. The management of cultural resources present on ranges is governed by an approved Integrated Cultural Resources Management Plan IAW AFI 32-7065.

7.2.3. Each Integrated Natural Resources Management Plan and Integrated Cultural Resources Management Plan is written to support the current and future known mission requirements identified in the Enterprise Range Plan and shall be amended as mission requirements change.

7.3. Environmental Compliance. Air Force ranges will conduct their activities according to national environmental policy and meet environmental compliance guidelines set forth in Air Force and DoDIs, including (but not limited to) AFI 32-7001, AFI 32-7047, *Environmental Compliance, Release, and Inspection Reporting,* and DoDI 4715.06, *Environmental Compliance in the United States*. The Air Force will comply with applicable Federal, State, and local environmental laws, standards, and reporting requirements. For ranges outside the United States, Air Force activities will comply with environmental criteria specified in applicable international agreements, the country-specific DoD final governing standard or, if no final governing standard exists, DoD Guide 4715.05-G, *Overseas Environmental Baseline Guidance Document*, and AFI 32-7091.

7.3.1. Military Munitions Rule. For ranges in the United States, the regulations governing cradle-to-grave management of hazardous waste are codified in Title 40 CFR Parts 260-270. The portion of those regulations that determines when military munitions become solid waste and provides standards for their management are codified in Title 40 CFR, Part 266, Subpart M, *Military Munitions* (40 CFR §§ 266.200 -- 266.206). MAJCOMs/range operating authorities will comply with DoDM 4715.26, *DoD Military Munitions Rule Implementation Procedures*, AFI 32-7042, *Waste Management*, AFI 21-201 to meet Environmental Protection Agency regulatory requirements on operational ranges (i.e., including both active and inactive ranges as defined by 40 CFR 266.201). **(T-0)**. Range operating authorities must ensure the supporting CE unit/environmental planning function is involved in the process. **(T-3)**.

7.3.2. MPPEH. MAJCOMs/range operating authorities will manage active and inactive ranges under their control to maintain long-term viability of DoD ranges while protecting human health and the environment and to minimize future clearance costs. **(T-1).** Ranges and munitions should be designed to minimize potential explosive hazards and harmful environmental impacts and to promote resource recovery and recycling. Each MAJCOM/range operating authority will comply with DoDI 4140.62, DoDD 4715.11, and DoDD 4715.12. **(T-0).**

7.3.3. Environmental Remediation outside the United States. To address environmental contamination on Air Force-operated ranges located in foreign countries, follow AFI 32-7091 to the extent that it does not conflict with the requirements of binding international agreements regarding use of ranges.

7.4. Pollution Prevention. Range operating authorities shall identify opportunities to optimize range processes or activities in terms of pollutant reduction, maximization of solid waste diversion, lower energy use, reduction in the use of natural resources, water conservation and improvements to health and safety IAW AFI 32-7001.

7.5. Operational Range Assessment Program. Ranges shall work with the supporting CE environmental office and AFCEC to conduct operational range assessments IAW DoDD 4715.11, DoDD 4715.12, DoDI 4715.14. **(T-0).**

7.6. Environmental Restoration Program. As necessary, range operating authorities will support environmental response actions (e.g., the identification and investigation of releases, removal actions or remedial actions) for a release or substantial threat of a release of hazardous substances, pollutants or contaminants on a range or migrating from a range to off-range areas IAW AFI 32-7020.

7.7. Programming Guidance. AFCEC will identify environmental requirements eligible for funding in environmental PEs. **(T-1).** The range operating authorities shall identify environmental requirements when requested by AFCEC in conjunction with their servicing environmental office. **(T-1).** AFCEC and the servicing environmental office can assist in identifying projects eligible for environmental funding versus environmentally related operational requirements that may be funded with range O&M funds. AFCEC will program projects IAW AFI 32-7001, AFI 32-7020 or AFI 32-7091, as appropriate in the Automated Civil Engineers System or successor system.

Chapter 8

TRACKING AND REPORTING REQUIREMENTS

8.1. Reporting Requirements. Ranges will utilize CSE to track range use such as scheduled and actual mission information, supporting range equipment, munitions used, etc. **(T-1)**. **Note:** this requirement may be waived for ranges that provide Class-T service and do not manage or use airspace. Range operating authorities must ensure classified information, if any, is maintained outside of CSE. **(T-1).**

8.2. Expended Munitions Tracking. IAW DoDD 4715.11, and DoDD 4715.12, range operating authorities will maintain records of all expenditures (types, quantities, locations, using organization, and estimated dud rates) of ammunition and explosives for each target. **(T-0)**. Range operating authorities and range personnel will record data in CSE when possible and by any other means when not. **(T-1)**. **Note:** in addition to munitions employed by range users, this requirement also applies to munitions employed by the range operator in support of test or training activities (e.g., Smokey Surface-to-Air Missiles).

8.3. Range Clearance Report. This report is a detailed report of clearance events and range operating authorities will ensure it precisely identifies the areas that have been cleared and includes the number of people and the amount of money and material used to accomplish the work. **(T-0)**. When closing or transferring ranges, range operating authorities will ensure the range clearance report is attached to the Certificate of Clearance which becomes an official document certifying that all dangerous and explosive materials that are reasonably possible to detect have been removed. **(T-0)**.

8.4. Defense Readiness Reporting System. IAW AFI 10-403, *Deployment Planning and Execution*, report range readiness in the Defense Readiness Reporting System.

8.5. Threat Systems and Equipment Inventory. Based on the threat systems and equipment required for each range as outlined in Attachment 3, each range-owning MAJCOM shall produce and maintain an inventory of threat systems and equipment (types and quantities) each range possesses and an inventory of threat systems and equipment each range requires, but does not possess.

8.5.1. Include Air CTS, threat, electronic attack, and feedback and scoring systems in the inventory.

8.5.2. Provide the inventory to ACC for inclusion in the Enterprise Range Plan.

8.6. (Added-AETC) Air Combat Training System (ACTS) Contract Reporting. Range Management Offices will report to 19 AF/DOO monthly expenditures of reimbursable Contract Line Item Numbers (CLIN) to include starting amount, monthly expenditure and balance for each reimbursable CLIN (Overtime, Equipment, Travel and General Services Administration (GSA) vehicle expenses). Send this report via electronic mail. See **Attachment 6** for format of report.

MARK C. NOWLAND, Lt Gen, United States Air Force

Deputy Chief of Staff for Operations

(AETC)

CRAIG D. WILLS, Major General, USAF
19th AF Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Legislative and Regulatory

10 U.S.C. § 101, *Definitions*

10 U.S.C. § 2701, *Environmental Restoration Program*

16 U.S.C. § 670 et seq., *Sikes Act*

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42 U.S.C. § 2121(b), *Material for Department of Defense use*

42 U.S.C. §§ 4321–4347, *National Environmental Policy Act of 1969*

42 U.S.C. §§ 6901-6992, *Resource Conservation and Recovery Act*

42 U.S.C. § 9604, *Response Authorities*

42 U.S.C. §§ 11001-11050, *Emergency Planning and Community Right-to-Know*

43 U.S.C. § 155 et seq., *Withdrawal, Reservation, or Restriction of Public Lands for Defense Purposes*

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14 CFR Subpart B, § 105.25, *Information required, and notice of cancellation or postponement of jump*

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Prescribed Forms

None

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Air Force Form 847, *Recommendation for Change of Publication*

Air Force Form 1067, *Modification Proposal*

DoD Form 1144, *Support Agreement*

Abbreviations and Acronyms

ACC—Air Combat Command

AETC—Air Education and Training Command

AFCEC—Air Force Civil Engineer Center

AFGSC—Air Force Global Strike Command

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFPD—Air Force Policy Directive

AFRC—Air Force Reserve Command

AFSOC—Air Force Special Operations Command

ANG—Air National Guard

CAS—Close Air Support

CE—Civil Engineering

CFR—Code of Federal Regulations

CJCSM—Chairman of the Joint Chiefs of Staff Manual

CSE—Center Scheduling Enterprise

CTS—Combat Training Systems

DoD—Department of Defense

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

DU—Depleted Uranium

EIAP—Environmental Impact Analysis Process

EOD—Explosive Ordnance Disposal

FAA—Federal Aviation Administration

GPS—Global Positioning System

IAW—In Accordance With

JTAC—Joint Terminal Attack Controller

MAJCOM—Major Command

MPPEH—Material Potentially Presenting an Explosive Hazard

MRTFB—Major Range and Test Facility Base

NGB—National Guard Bureau

NVD—Night Vision Device

O&M—Operations and Maintenance

PACAF—Pacific Air Forces

PE—Program Element

PEM—Program Element Monitor

PTR—Primary Training Range

RAP—Ready Aircrew Program

SDZ—Surface Danger Zone

TO—Technical Order

T/TSNS—Test/Training Space Needs Statement

USAFE-AFAFRICA—United States Air Forces in Europe-Air Forces AFRICA

U.S.C—United States Code

UXO—Unexploded Ordnance

WDZ—Weapon Danger Zone

Terms

Note: The purpose of this glossary is to help the reader understand the terms used in this publication. It does not encompass all pertinent terms—*DoD Dictionary of Military and Associated Terms*, and Air Force Doctrine Document 1-2, *Air Force Glossary*, contain standardized terms and definitions for DoD and Air Force use.

Air Combat Training Systems—A general term referring to aircraft instrumentation pods, ground receiving equipment, and interface/display equipment used for live monitoring, capture, and replay/debrief of training missions.

Tethered Flight Instrumentation Range Systems—These systems provide Time Space Position Information and model weapons impact or flyout for aircrew kill notification using ground-based computers, towers, and communications relays and aircraft pods or internal avionics. These systems also provide real-time live monitor capability for Range Training Officer oversight.

Rangeless/Untethered Flight Instrumentation Range Systems—These systems use autonomous pods, aircraft avionics or recording devices of participating aircraft to provide capabilities similar to a tethered system. Pod-to-pod or aircraft data links can relay kill predictions to participating aircraft for near-real time kill notification. Rangeless/untethered systems do not provide a real-time live monitor data feed to a Range Training Officer.

Air-to-Air Test and Training—Air-to-Air test and training covers a wide range of mission requirements, such as air-to-air operations involving simulated and actual employment of missiles, air-to-air gunnery, aeronautical system testing, unmanned vehicles, and electronic warfare, which require a substantial amount of range space and a sophisticated range infrastructure. This infrastructure may include high fidelity simulators, visual simulators, end-game scoring capabilities, command and control systems, communication networks, data display/processing capabilities, instrumentation systems, flight termination systems, and flight hazard analysis/strike prediction capability.

Air-to-Surface Test and Training—Air-to-Surface test and training may require a substantial amount of range space and a sophisticated infrastructure to support complex, multi-aircraft operations; air-to-surface munition, cruise missile, and directed energy weapon employment; aeronautical system testing; unmanned vehicles; airdrop; and battlefield operations. This infrastructure may include high and/or low fidelity threat simulators, visual threat simulators, scoring capabilities, realistic target arrays, command and control systems, communication networks, data display/processing capabilities, instrumentation/debrief systems, flight termination systems, and flight hazard analysis/strike prediction capability.

Alert Area—Airspace designated to inform pilots of a high level of training activity or any unusual activity where prior knowledge would significantly enhance air safety. There are no restrictions placed on non-participating instrument flight rules or visual flight rules aircraft.

Armor Piercing Incendiary—A 30 millimeter round consisting of a 0.66 pound extruded DU penetrator, alloyed with 0.75 weight percent titanium, encased in a 0.8 millimeter-thick aluminum shell and windscreen.

Byproduct Material—Radioactive material (except Source or Special Nuclear Material) yielded in or made radioactive by exposure to radiation, incident to the process of producing or using Source or Special Nuclear Material.

Certificate of Clearance—An official document that certifies removal of all dangerous and explosive materials reasonably possible to detect. The certificate is dated, and a range clearance report is attached. The cleared areas are identified in red crosshatch on a map, and annotated in the map legend.

Combat Training Systems—The family of systems that includes range threat systems, Air CTS, and associated live training capabilities that may include connectivity to virtual and/or constructive systems.

Comprehensive Range Planning—An iterative process that examines current and projected operational needs to identify the best use for limited range development resources and the largest threats to the military value of ranges and airspace.

Controlling Agency—Air Traffic Control facility responsible for providing airborne control services in and around a designated airspace. With respect to a restricted area, the using agency may authorize transit through or flight within the restricted area according to a joint-use agreement.

Department of Defense Explosives Safety Board—DoD organization charged with recommending new and updated explosives and chemical agent safety regulations and standards and performing explosives safety management functions IAW DoDD 6055.09E.

Depleted Uranium—DU is the resultant "waste" of the Uranium-235 enrichment process. The radioisotope ratio in DU is 0.4% Uranium-235 (maximum) and 99.6% Uranium-238. DU is a dense, heavy metal and has two properties that make it ideal for military applications: extremely high density and the tendency to ignite on impact (especially with steel).

Depleted Uranium Authorized Personnel—Personnel trained in DU hazards and wearing the appropriate personal protective equipment, as determined by a qualified health physicist and the Installation Radiation Safety Officer.

Directed Energy Weapon—A weapon system that uses directed energy primarily as a means to deny, disrupt, degrade (damage), or destroy enemy equipment, facilities, or personnel.

Electronic Warfare—Locations supporting electronic warfare training must be capable of providing a simulated electronic threat environment for aircrew combat training. Electronic warfare ranges are located on a range (usually a range capable of receiving surface fires and actual ordnance delivery). Electronic warfare sites typically provide electronic warfare simulation and feedback, but are not located on a range. An electronic warfare site can be established at any location with proper security. Typically, they are located under or near a military training route or Military Operations Area.

Electronic Warfare Range—This term has traditionally taken on a narrow definition of referring only to those ranges with an electronic warfare capability that is associated with and located on a range capable of receiving surface fires and actual ordnance delivery. However, with the proliferation of electronic warfare capabilities across all Air Force ranges, the term is now generally understood to refer to any range with an electronic warfare capability.

Electronic Warfare Site—An electronic warfare site is a specific type of electronic warfare training area which is not located within the boundaries of another range. Typically, the land required for an electronic warfare site is minimal and they do not support actual ordnance delivery. They can be located at any location with proper security and are usually located under or near a Military Training Route or Military Operations Area. In previous versions of this publication, this type of training area was referred to as an Electronic Scoring Site, despite the fact that many of these sites did not have scoring capability.

Emitter/Simulator—Generic terms used to describe threat equipment operated at electronic warfare ranges and electronic warfare sites. However, the terms could refer to a variety of equipment such as, but not limited to, emitter only systems, emitter-receiver-processors, and replica type systems.

Encroachment—Any deliberate action by any governmental or non-governmental entity or individual that does, or is likely to inhibit, curtail, or impede current or future military activities within the installation complex and/or mission footprint; or any deliberate military activity that is, or is likely to be incompatible with a community's use of its resources.

Environmental Impact Analysis Process—The formal Air Force process for implementing the National Environmental Policy Act and the Council on Environmental Quality's National Environmental Policy Act Regulations, used to support Air Force decision making and assess environmental impacts resulting from a proposed action and its reasonable alternatives.

Environmental Planning Function—At every level of command, the environmental planning function is a key participant responsible for the EIAP. At the request of the proponent, the environmental planning function manages the preparation of environmental documents and assists the proponent in obtaining review of environmental documents.

Essential Personnel—Those personnel on a range, not required for ordnance employment, that participate and provide essential support for the range test, training or evaluation mission. Examples include maneuver elements, opposition forces, instructors, evaluators, range personnel conducting maintenance, etc.

Explosive Ordnance Disposal—The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded explosive ordnance. It may also include explosive ordnance that has become hazardous by damage or deterioration.

Explosive Ordnance Disposal Personnel/Technician—Military personnel who have graduated from the Naval School, EOD; are assigned to a military unit with a service-defined EOD mission; and meet service and assigned unit requirements to perform EOD duties. EOD Personnel have received specialized training to address explosive and chemical agent hazards during both peacetime and wartime. EOD Personnel are trained and equipped to perform render safe procedures on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices.

Final Governing Standard—A comprehensive set of country-specific substantive environmental provisions. A Final Governing Standard requirement is typically a technical limitation on effluent or discharge, or a specific management practice. Examples include technical limits on air emissions and wastewater discharges, as well as recordkeeping and reporting requirements.

Hazard Area—The composite area of all WDZs, SDZs, Laser SDZs, and Directed Energy WDZs for all authorized weapon delivery events.

Impact Area—The area on a range immediately surrounding a target or designated mean point of impact that is approved for the actual delivery of ordnance. The impact area demarcation should normally be no less than a) 500 feet from the center of a target or desired point of impact approved for live ordnance, or b) 300 feet from the center of a target or desired point of impact used solely for inert or practice ordnance.

Joint Terminal Attack Controller—An individual qualified IAW Joint Publication 3-09.3 to provide terminal control for the delivery of weapons by aircraft.

Joint Use—With respect to ranges, Joint Use means other MAJCOMs or services may use, as long as they conduct operations IAW this manual, as supplemented. With respect to range airspace, it means the use by civil or other military aviation when it is not active.

Land Withdrawal—The process used as a means to transfer administrative jurisdiction from one federal agency to another. A withdrawal creates a title encumbrance on the land restricting an agency's ability to manage its lands under multiple use management principles. The restrictions generally segregate the lands from some or all the public land laws and some or all of the mining and mineral leasing laws for a specific period of time (generally 20 years for post Federal Land Policy and Management Act withdrawals). The Secretary of Interior is authorized to make, modify, extend, or revoke withdrawals.

Laser Surface Danger Zone—Designated region or ground area where laser radiation levels may exceed maximum permissible exposure levels, thereby, requiring control during laser operation.

Lead Major Command—As defined in AFI 38-101, *Air Force Organization*, a lead MAJCOM consolidates responsibilities for a particular function in a single MAJCOM, supporting the entire Air Force as applicable.

License—Nuclear Regulatory Commission written authorization delegating regulatory authority to receive, possess, use, or transfer Byproduct, Source, or Special Nuclear Material. The Nuclear Regulatory Commission has issued a master materials license to the Air Force Radioisotope Committee, which in turn issues radioactive material permits to Air Force units.

Low-Angle Strafe Target—A target specifically designed for aircraft strafe events where only training projectile ammunition is authorized, i.e., strafe pit.

Major Range and Test Facility Base—The designated core set of DoD Test and Evaluation infrastructure and associated workforce that must be preserved as a national asset to provide Test and Evaluation capabilities to support the DoD acquisition system. (DoDD 3200.11)

Material Potentially Presenting an Explosive Hazard—Material owned or controlled by the DoD that, before determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris) or potentially contains a high enough concentration of explosives that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization, or disposal operations). Excluded from MPPEH are: (1) Military munitions and military munitions-related materials, including wholly inert components (e.g., fins, launch tubes, containers, packaging material), that are to be used or reused for their intended purpose and are within a DoD Component-established munitions management system, (2) Non-munitions-related material (e.g., horseshoes, rebar, other solid objects) and munitions debris that are solid metal fragments that do not realistically present an explosive hazard, and (3) Other items (e.g., gasoline cans, compressed gas cylinders) that are not munitions or munitions-related material but may present an explosion hazard. (DoDI 4140.62)

Maximum Permissible Exposure—The level of laser radiation to which an unprotected person may be exposed without adverse biological changes in the eye or skin.

Military Operations Area—Special Use Airspace allocated to the military to separate/segregate certain military activities from Instrument Flight Rules traffic, and to identify the location of these military activities to Visual Flight Rules traffic. Visual Flight Rules aircraft are not restricted from transiting Military Operations Areas.

Military Training Route—A low-level, high-speed training route established IAW criteria in FAA Joint Order 7610.4T, *Special Operations*. Military Training Routes are used by DoD to conduct low altitude navigation and tactical training, in instrument and visual weather conditions, below an altitude of 10,000 feet Mean Sea Level and at airspeeds more than 250 Knots Indicated Airspeed. Routes are established as Instrument Flight Rules routes or Visual Flight Rules routes. The FAA has approval authority to implement Instrument Flight Rules routes and the appropriate MAJCOM approves Visual Flight Rules route implementation. Environmental documentation is required for implementation IAW 32 CFR Part 989. Visual Flight Rules routes are processed through the FAA via the Air Force Representative. Military Training Routes are published in the flight information publication AP/1B and charted on FAA Sectionals and DoD Low Instrument Flight Rules charts. Air Force Representatives assign all route numbers.

Mission Essential Personnel—Those personnel on a range directly required for the employment of ordnance (air/surface/electronic attack) in a test, training or evaluation mission. This may include JTACs, Tactical Air Control Parties, range control officers, scorers, and any other personnel identified as required by the range operating authority.

Ordnance—***Boosted Munitions (forward firing):*** Munitions such as the Air-to-Ground Missile-65 Maverick and the 2.75” folding fin rocket driven by propellant. These are also considered live munitions when they are equipped with an explosive or incendiary warhead.

Test—Research and development of developmental and production munitions, directed energy weapons, lasers, and explosives.

***Training*:**

Full-scale Inert: Concrete-filled or cast ductile iron bombs of the same size and weight of the live munition but containing no explosives, pyrotechnics, or chemical agents.

Practice Bombs: Practice bombs may be full-scale or sub-scale. Some practice bombs contain a small explosive charge or pyrotechnic that marks the point of impact with a small cloud of smoke or flash. For example, Bomb Dummy Unit-33 practice bombs contain a Mark 4 spotting charge, and Mark 82 practice bombs may contain 6.25 pounds of composition C-4 high explosive. British 1,000-pound class practice bombs may contain 50 pounds of Torpex. These bombs normally use a fuze to initiate the high explosive fillers.

Target Practice: Ball projectile gun ammunition that has no explosive in the projectile.

Live Munitions: Munitions containing a fuze and a high-explosive or incendiary warhead designed to detonate either prior to, upon, or shortly after impact. They can be bombs, missiles, rockets, bullets, etc.

Operational Range—A range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. (10 U.S.C. 101(e)(3)(A) and (B)). Also includes "military range," "active range," and "inactive range" as those terms are defined in 40 CFR § 266.201.

Overseas Environmental Baseline Guidance Document—A set of objective criteria and management practices designed to protect human health and the environment. It reflects generally accepted federal environmental standards that apply to DoD installations, facilities, and actions in the United States. It also incorporates requirements of United States law that have extraterritorial application (i.e., apply overseas). DoD developed and maintains the Overseas Environmental Baseline Guidance Document.

Penetrator—Dense projectile component of ammunition round designed to pierce armor.

Permit (Noun)—

***In General*:** an official document or certificate giving permission for something.

***Radioactive Material Permit*:** United States Air Force or United States Navy Radioactive Material Permit issued to a unit with the respective service, under the authority of that service's Master Materials License.

Primary Training Range— PTRs are established to accommodate training. They are not designed or structured to accommodate test and evaluation activities.

Prohibited Area—A specified area over the land of a state, or territorial waters adjacent thereto, within which the flight of aircraft is prohibited in the interest of national security and welfare.

Proponent—The office, unit, single manager or activity at any level that initiates, or is responsible for an Air Force action.

Radiation—The emissions, either electromagnetic or particulate, resulting from the transformation of an unstable atom or nucleus.

Radiation Safety Officer—An individual with specific education, military training, and professional experience in radiation protection practice appointed by a Permittee or the United States Air Force Radioisotope Committee to manage radiation safety programs. The term "Radiation Safety Officer" is a functional title and does not denote a commissioned status or specialty code. The Radiation Safety Officer must have the education, military training, and professional experience needed for the job.

Radioactive Material—Material with unstable nuclei that decay by emission of ionizing radiation. The radiation emitted may be alpha or beta particles, gamma or X-rays, or neutrons.

Range—

As set forth at 10 U.S.C. § 101(e)(1), the term "range", when used in a geographic sense, means a designated land or water area that is set aside, managed, and used for range activities of the DoD. Such term includes the following:

(A) Firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas.

(B) Airspace areas designated for military use IAW regulations and procedures prescribed by the Administrator of the FAA.

As set forth at 10 U.S.C § 101(e)(2), the term "range activities" means—

(A) research, development, testing, and evaluation of military munitions, other ordnance, and weapons systems; and

(B) the training of members of the armed forces in the use and handling of military munitions, other ordnance, and weapons systems.

Active Range—For the purposes of this manual, an active range is an operational range that is being used for range activities.

ANG Range—For the purposes of this manual, ANG ranges include all buildings and property that is established by the lease, license, permit or other written agreement, for either exclusive or joint use by the ANG for weapons delivery operations.

Inactive Range—For the purposes of this manual, an inactive range is an operational range that is still considered to be a range and has not been put to a new use that is incompatible with range activities.

Range Service Levels—Ranges provide different levels of service dependent upon several factors, such as hours of manned operation, scheduled test and training activities, utilization, etc. For example, a MRTFB range may provide both Class A and Class T service on different parts of the range or at different times; a PTR may provide Class A service during daylight hours and Class C service during nighttime hours.

Class A Service—Class A service provides a manned, ground-scoring and/or electronic warfare capable range with a range control officer present on range and controlling surface activities and air-to-ground operations.

Class B Service—Class B service provides a manned or unmanned, ground scoring and/or electronic warfare capable range where no range control officer is present on range for controlling surface activities and operations. **Note:** Class B service includes ranges where a

remotely-sited range operations center monitors air and ground operations and provides scoring feedback.

Class C Service—Class C service provides an unmanned range with no scoring, no electronic warfare services and no range control officer control of ground activities or operations.

Class D Service—Class D service provides an instrumented range supporting operations monitored by a Range Training Officer.

Class T Service—Class T service provides a manned or unmanned range or test site intended for test activities and explosives/weapons detonations, controlled by the range operating authority.

Range Clearance—Range clearance (previously known as "range residue clearance," "range decontamination," or "EOD clearance") is the surface-removal or disposal of MPPEH from the targets and surrounding areas. MPPEH includes UXO, classified ordnance, inert ordnance debris, and any other range material fired on, or upon a military range.

Range Clearance Report—A narrative statement about the removal and disposal of UXO and MPPEH on a specific range, and serves as a factual record of the debris clearance. Also known as a "Report of Clearance," it is not a "Certificate of Clearance" (defined above).

Range Control Officer—The person with primary responsibility for matters of range safety during aircraft operations, aircraft emergencies, and ground weapons fire activities during active events of this nature occurring on the range. Weapons release clearance authority resides with the range control officer (except where the range control officer has specifically delegated this authority to a qualified flight lead, individual pilot or Forward Air Controller, or other briefed person).

Range Operating Authority—The wing commander, or designated commander responsible for operating and maintaining the range. For ANG-operated ranges, the range commander is designated as the range operating authority. The range operating authority may delegate the daily scheduling, management, and maintenance of the range to any appropriate subordinate unit.

Range Operations Officer—The person who supervises range management, planning, maintenance, and day-to-day operations. Specific responsibilities are designated by the range operating authority.

Range Test and Training Activities—The land or sea encompassed within the hazard area or underlying an air-to-air range used for actual weapon employment must be protected by adequate physical safeguards, legally sufficient real property acquisition documentation (e.g., fee interest purchase, lease) or other means to ensure the safety of personnel, structures, and the public from expended weapons, laser and electromagnetic emissions, and target debris.

Range Training Officer—The person responsible for monitoring Air CTS, passing kill removal, and providing debriefs. The Range Training Officer will establish communication with aircraft entering the range.

Restricted Area—

An area (land, sea or air) in which there are special restrictive measures employed to prevent or minimize interference between friendly forces or an area under military jurisdiction in which

special security measures are employed to prevent unauthorized entry.

Airspace where the flight of aircraft, while not wholly prohibited, is subject to restriction. When not activated by the using agency, the controlling air traffic control facility may authorize Instrument Flight Rules or Visual Flight Rules operations in the area. If joint use is authorized, the name of the controlling air traffic control facility is annotated on the map.

An area that must contain all "Hazardous Activity" as defined by branch of service for specific type of aircraft using the range.

Shared Use—When the range operating authority authorizes non-DoD, private or government agencies or individuals to use range land or airspace concurrently or non-concurrently.

Special Use Airspace—Airspace of defined vertical and lateral dimensions wherein activities are confined. Certain limitations or restrictions may be imposed on non-participating aircraft. Except for Controlled Firing Areas, Special Use Airspace is depicted on aeronautical charts. Types of Special Use Airspace include: alert areas, controlled firing areas, military operations areas, national security areas, prohibited areas, restricted areas, and warning areas.

Surface Danger Zone—The ground and airspace designated 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.

Surface-to-Air Test and Training—Surface-to-Air test and training covers a wide range of mission requirements. Ranges that support, for example, endo-atmospheric and exo-atmospheric missile intercepts, aeronautical system testing, and ballistic missiles require a substantial amount of range space and a sophisticated range infrastructure. This infrastructure may include high fidelity simulators, visual simulators, end-game scoring capabilities, command and control systems, communication networks, data display/processing capabilities, instrumentation systems, flight termination systems, and flight hazard analysis/strike prediction capability.

Surface-to-Surface Test and Training—Surface-to-Surface test and training covers a wide range of mission requirements, including survivability test, horizontal and vertical live-fire events, surface and subsurface tests in international waters, research and development, directed energy weapon, explosives operations, heavy weapons qualification, and EOD thermal treatment and disposal. Ranges that support Special Operations Forces and other ground test and training requirements may require substantial ground infrastructure, including shoot houses, urban villages, laser scoring, in-band imaging, complex communication and instrumentation, range surveillance radars and other facilities.

Test Areas Control Officer—The person responsible for range operations and safety at a test site when no air-to-ground weapons release authority is needed.

Test Sites—These sites are developed and used for specific developmental test and evaluation and operational test and evaluation requirements. They are considered ranges under this manual due to the scope, nature and frequency of conducting many of the defined range activities.

Unexploded Ordnance—As set forth at 10 U.S.C. § 101(e)(5), the term “UXO” means military munitions that—

(A) have been primed, fused, armed, or otherwise prepared for action;

(B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and

(C) remain unexploded, whether by malfunction, design, or any other cause.

United States—The several States, District of Columbia, Commonwealths of Puerto Rico and Northern Mariana Islands, American Samoa, Guam, Midway and Wake Islands, United States Virgin Islands, any other territory or possession of the United States, and associated navigable waters, contiguous zones, and ocean waters of which the natural resources are under the exclusive management authority of the United States.

Urban Training Facility—Facilities constructed for the primary purpose of training in an urban environment. They include instrumentation, communications infrastructure, and the population needed to create a physical urban environment and capabilities to conduct training in that environment. Facilities can be composed of buildings, subterranean infrastructure, airfields, and representative building shells, bridges, tunnels, etc., that constitute target arrays for fixed and rotary wing aircraft. All urban training facilities will support live training, however, based on the training audience and their training objectives, may support virtual and constructive training as well. (DoDI 1322.27)

Unexploded Ordnance-Qualified Personnel—Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor. UXO-qualified personnel must also meet DoD Explosives Safety Board experience and training requirements. (DoD Explosives Safety Board Technical Paper 18)

Air Force Master Materials License—The Nuclear Regulatory Commission License issued to the United States Air Force Radioisotope Committee. The Master Materials License delegates to the Air Force regulatory authority over Byproduct, Source, and limited quantities of Special Nuclear Material.

Air Force Radioactive Material Permit—Written authorization from the United States Air Force Radioisotope Committee allowing Air Force organizations to receive, possess, distribute, use, transfer, or dispose of radioactive materials.

Air Force Radioisotope Committee—A committee established according to, and the named licensee on Air Force Master Materials License. The Radioisotope Committee coordinates the regulatory and administrative aspects of licensing, possessing, distributing, using, transferring, transporting, and disposing of all radioactive material in the Air Force.

Warning Area—A specified area above, below, or within which there may be potential danger. Airspace of defined dimensions over international waters that contain activity that may be hazardous to non-participating aircraft. An area that must contain all "Hazardous Activity" as defined by branch of service for specific type of aircraft using the range.

Weapon Danger Zone—The ground and airspace for lateral and vertical containment of a user-determined percentage of projectiles, fragments, debris, and components resulting from the firing, launching, and/or detonation of aviation delivered ordnance.

Attachment 2

UNITED STATES AIR FORCE OPERATED OR OWNED RANGES GOVERNED BY THIS MANUAL

Note: The "Owner" column in the tables contained in this attachment is intended to reflect the entity with real property accountability for the range land.

Table A2.1. PTRs.

PTR Name	Range Location	Operator	Owner
Adirondack	Fort Drum, New York	ANG	United States Army
Airburst	Fort Carson, Colorado	ANG	United States Army
Avon Park	Florida	ACC	ACC
Barry M. Goldwater Range East	Arizona	AETC	AETC
Belle Fourche Electronic Warfare Site	Wyoming	AFGSC	AFGSC
Bollen Range	Pennsylvania	ANG	United States Army
Cannon	Fort Leonard Wood, Missouri	ANG	United States Army
Claiborne Range	Louisiana	AFRC	AFRC
Dare County Ranges Air Force Dare County Range Navy Dare County Range	North Carolina	ACC United States Navy	ACC ACC
Draughon	Japan	PACAF	Japan
Falcon	Fort Sill, Oklahoma	AFRC	United States Army

PTR Name	Range Location	Operator	Owner
Grand Bay	Georgia	ACC	ACC
Grayling	Camp Grayling, Michigan	ANG	United States Army
Guam Electronic Warfare Site[1]	Joint Region Marianas-Andersen, Guam	AFGSC	United States Navy
Hardwood	Volk Field, Wisconsin	ANG	ANG
Holloman Ranges Centennial Oscura	New Mexico	ACC	United States Army
Indiana Air Range Complex Jefferson Atterbury	 Indiana Camp Atterbury, Indiana	ANG	United States Army
Joint Pacific Alaska Range Complex Blair Lakes Oklahoma Yukon	 Eielson Air Force Base, Alaska Fort Greely, Alaska Fort Wainwright, Alaska	PACAF	 PACAF United States Army United States Army
McMullen Range	Texas	ANG	United States Navy
Melrose Range	New Mexico	AFSOC	AFSOC

PTR Name	Range Location	Operator	Owner
Mountain Home Range Complex Juniper Butte Saylor Creek Grasmere Electronic Warfare Site	Idaho	ACC	ACC
Poinsett Range	South Carolina	ACC	ACC
Polygone Electronic Warfare Site	Germany/France	USAFE-AFAFRICA	United States/ Germany/ France
Razorback	Fort Chaffee, Arkansas	ANG	United States Army
Shelby	Mississippi	ANG	United States Army
Smoky Hill	Kansas	ANG	ANG
Snyder Electronic Warfare Site	Texas	AFGSC	AFGSC
Torishima	Japan	PACAF	Japan
Warren Grove	New Jersey	ANG	ANG

1. AFGSC/A3 will designate the range operating authority for the Guam Electronic Warfare Site.

Table A2.2. MRTFB Ranges.

MRTFB Range Name	Range Location	Operator	Owner
412th Test Wing[1]	Edwards Air Force Base, California	AFMC	AFMC
96th Test Wing[1]	Eglin Air Force Base, Florida & Holloman Air Force Base, New Mexico	AFMC	AFMC
Nevada Test & Training Range	Nevada	ACC	ACC

Utah Test & Training Range	Utah	ACC	AFMC

1. The MRTFB asset names differ slightly from DoDD 3200.11 due to AFMC organizational changes. The 412th Test Wing aligns with the Air Force Flight Test Center entry in DoDD 3200.11. The 96th Test Wing entry aligns with the 46th Test Wing/46th Test Group entry in DoDD 3200.11.

Table A2.3. Test Sites.

Test Site Name	Range Location	Operator	Owner
Air Force Research Laboratory Laser – 1Kilometer and 2 Kilometer Laser Targets	Kirtland Air Force Base, New Mexico	AFGSC	AFGSC
Air Force Research Laboratory Chestnut Test Site	Kirtland Air Force Base, New Mexico	AFGSC	AFGSC
Air Force Research Laboratory High Energy Research Test Facility Microwave	Kirtland Air Force Base, New Mexico	AFGSC	AFGSC
Starfire Optical Range	Kirtland Air Force Base, New Mexico	AFGSC	AFGSC
Aerospace Vehicle Survivability Facility	Wright-Patterson Air Force Base, Ohio	AFMC	AFMC

Attachment 3

RANGE SUPPORTED MAJOR WEAPON SYSTEM TRAINING EVENTS

Table A3.1. A-10 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
A-10	1	Mission Profiles (General)	RAP[1]	Range/airspace access-scheduling/operating hours
A-10	2	Airborne Laser Designation	RAP	Laser capable
A-10	3	Air Strike Control Actual Ordnance	RAP	Live or inert capable
A-10	4	CAS in Urban Terrain	RAP	Constructed urban village
A-10	5	Flare	RAP	Capable
A-10	6	Full Scale Weapons Delivery/Heavy Weight	RAP	Live or inert capable
A-10	7	Laser Spot Search/Track	RAP	Laser capable
A-10	8	Laser Guided Bomb	RAP	Live or inert capable, laser capable
A-10	9	Maverick Event	RAP	Live or inert capable
A-10	10	Night Strafe	RAP	Strafe pit open during nighttime
A-10	11	Suppression of Enemy Air Defenses-Contested	RAP	Live or inert capable, visual and/or electronic threat replication
A-10	12	Self-Mark Strafe (Night)	RAP	Strafe pit with scoring
A-10	13	Strafe	RAP	Strafe pit with scoring
A-10	14	Target Mark	RAP	Multiple targets and strafe pit, flare capable, laser capable, or live or inert capable
A-10	15	Targeting Pod Event	RAP	Multiple targets
A-10	16	Chaff	RAP	Capable
A-10	17	Electronic Warfare Event Air-to-Ground	RAP	Threat emitter
A-10	18	Moving Target Attack	RAP	Remote-controlled vehicle capable of 25 miles per hour
A-10	19	Degraded/Denied Communications	RAP	Communications jammer
A-10	20	Degraded/Denied Data Link	RAP	Data link jammer
A-10	21	Degraded/Denied GPS	RAP	GPS jammer

Major Weapon System	Event Number	Event	Event Source	Range Capability
A-10	22	Large Force/Flag Exercise	RAP	Scenario-based threat replication

1. A-10 RAP Tasking Memorandum, Aviation Schedule 2017 Change 1, (AS-17 Ch 1), (Effective 01 Apr 17)

Table A3.2. AC-130 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
AC-130	1	Live Fire	RAP	High explosive impact area
AC-130	2	Precision Guided Munition Employment	Theater Deployment	Capable of laser and GPS guided precision-guided munition
AC-130	3	Live Fire Radar Profile (AC-130U only)	RAP	High explosive impact area radar firing capable
AC-130	4	Air-to-Ground Gunnery	Theater Deployment	Live capable
AC-130	5	Chaff	RAP	Capable
AC-130	6	Flare	RAP	Capable
AC-130	7	Threat Event	RAP	Emitters
AC-130	8	Call-For-Fire	RAP	Live capable
AC-130	9	CAS	Theater Deployment	Live capable
AC-130	10	Airborne Laser Designation	RAP	Laser capable

Table A3.3. B-1 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
B-1	1	Actual Weapon Release (Inert)	RAP	Inert capable with separate cluster-bomb targets set
B-1	2	Wind Corrected Munitions Dispenser Release	RAP	Live or inert capable and separate cluster-bomb target set

Major Weapon System	Event Number	Event	Event Source	Range Capability
B-1	3	Actual Flare Event	RAP	Capable
B-1	4	Actual Chaff Event	RAP	Capable
B-1	5	Electronic Attack Threat Activity	RAP	Electronic threat emitter
B-1	6	Targeting Pod Operations	RAP	Tactical targets, laser capable
B-1	7	Contested/Degraded Operations	RAP	GPS and communications jammer
B-1	8	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.4. B-2 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
B-2	1	Air-to-Ground Missile-158 Bomb Run	RAP	Emitters
B-2	2	B61/83 Actual Release	RAP	Inert capable
B-2	3	Guided Bomb Unit-31/28 Actual Release	RAP	Live or inert capable
B-2	4	Guided Bomb Unit-38 Actual Release	RAP	Live or inert capable
B-2	5	Guided Bomb Unit-57 Bomb Run	RAP	Emitters
B-2	6	Conventional Unguided	RAP	Live or inert capable
B-2	7	Electronic Threat Activity	RAP	Electronic threat emitter
B-2	8	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.5. B-52 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
B-52	1	Actual Joint Direct Attack Munition/Wind Corrected Munitions Dispenser Release	RAP	Live or inert capable and separate cluster-bomb target set
B-52	2	Actual Weapon Release	RAP	Live or inert capable

Major Weapon System	Event Number	Event	Event Source	Range Capability
B-52	3	Joint Direct Attack Munition/Wind Corrected Munitions Dispenser Jettison	RAP	Live or inert capable
B-52	4	Laser Spot Search/Track	RAP	Laser capable
B-52	5	Laser Guided Bomb Actual Weapon Release	RAP	Live or inert capable and laser capable
B-52	6	Chaff/Flare Exercise	RAP	Chaff/flare capable
B-52	7	Targeting Pod employment with Inertially Aided Munitions	RAP	Live or inert capable
B-52	8	Electronic Attack Threat Activity	RAP	Threat emitter
B-52	9	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.6. C-17 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
C-17	1	Airdrop Container Delivery System Actual	Volume 1	Drop zone
C-17	2	Airdrop Equipment Actual	Volume 1	Drop zone
C-17	3	Airdrop Personnel Actual	Volume 1	Drop zone
C-17	4	Flare/Laser Infrared Countermeasures	Volume 1	Simulator capable
C-17	5	Precision Airdrop System Airdrop Event	Volume 1	Capable
C-17	6	Tactical Airdrop Night	Volume 1	Drop zone-night hours
C-17	7	Threat Event	Volume 1	Emitters
C-17	8	Electronic Warfare Event	Volume 1	Emitters
C-17	9	Contested/Degraded Operations	Volume 1	Emitters, GPS jammer, communications jammer, data link jammer

Major Weapon System	Event Number	Event	Event Source	Range Capability
C-17	10	Large Force/Flag Exercise	Volume 1	Scenario-based threat replication
C-17	11	Assault Landing (Day)	Volume 1	Assault strip
C-17	12	Assault Landing (Semi-Prepared Runway Operations)	Volume 1	Dirt assault strip
C-17	13	Assault Landing (Night Vision Goggle Operations)	Volume 1	Assault strip—night hours

Table A3.7. C-130 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
C-130	1	Airdrop Container Delivery System Actual	Volume 1	Drop zone
C-130	2	Air Drop Equip Actual	Volume 1	Drop zone
C-130	3	Airdrop Personnel Actual	Volume 1	Drop zone
C-130	4	Tactical Airdrop Night	Volume 1	Drop zone-night hours
C-130	5	Precision Airdrop System Airdrop Event	Volume 1	Capable
C-130	6	Flare	Volume 1	Capable
C-130	7	Chaff	Volume 1	Capable
C-130	8	Threat Event	Volume 1	Emitters
C-130	9	Contested/Degraded Operations	Volume 1	Emitters, GPS jammer, communications jammer, data link jammer
C-130	10	Large Force/Flag Exercise	Volume 1	Scenario-based threat replication
C-130	11	Assault Landing (Day)	Volume 1	Capable range and capable airspace (allow tactical arrival/departure)
C-130	12	Assault Landing (Semi-Prepared Runway	Volume 1	Capable range and capable airspace
C-130	13	Assault Landing (Night Vision Goggle Operations)	Volume 1	Capable range, capable airspace, and special tactics support

Table A3.8. C-145 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
C-145	1	Low Cost Low Altitude Airdrop	RAP	Drop zone day/night
C-145	2	Night Vision Goggle Airdrop	RAP	Drop zone day/night
C-145	3	Night Vision Goggle Insertion/Extraction	RAP	Blacked out landing zone
C-145	4	Semi-Prepared Surface Landing/Takeoff	RAP	Dirt landing zone
C-145	5	Military Free Fall	Theater Deploym	Drop zone day/night
C-145	6	Live Fire	Theater Deploym ent	Impact area day/night
C-145	7	Airland - Improved Surface	Theater Deploym ent	Hard surface landing zone
C-145	8	Airland - Unimproved Surface	Theater Deploym ent	Dirt/clay surface landing zone
C-145	9	Airdrop (Personnel/Container Delivery System/Equipment)	Theater Deploym ent	Day/night drop zone
C-145	10	Air-to-Ground Gunnery	Theater Deploym ent	Live capable

Table A3.9. C-146 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
C-146	1	Night Vision Goggle Insertion/Extraction		Blacked out landing zone
C-146	2	Semi-Prepared Surface Landing/Takeoff		Dirt landing zone

Table A3.10. CV-22 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
CV-22	1	Insertion/Extraction Training	RAP	Landing zone
CV-22	2	Alternate Insertion/Extraction	RAP	Landing zone/drop zone
CV-22	3	Chaff	RAP	Capable
CV-22	4	Flare	RAP	Capable
CV-22	5	Electronic Warfare Event/Degraded Operations	RAP	Emitters, GPS jammer, communications jammer, data link jammer
CV-22	6	Hoist Training	RAP	Landing zone, drop zone, helicopter landing zone
CV-22	7	Airland - Improved Surface	RAP	Hard surface helicopter landing zone
CV-22	8	Airland - Unimproved Surface	RAP	Dirt/clay surface helicopter landing zone
CV-22	9	Air-to-Ground gunnery	RAP	Live capable
CV-22	10	Military Free Fall	RAP	Drop zone

Table A3.11. E-3 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
E-3	1	Electronic Warfare Event	RAP	Emitters
E-3	2	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.12. E-8 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
E-8	1	Large Force/Flag Exercise	RAP	Scenario-based threat replication
E-8	2	Moving Target	RAP	Capable
E-8	3	Electronic Warfare Event	RAP	Emitters

Table A3.13. EC-130 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability

EC-130	1	Smokey Surface-to-Air Missile Event		Capable
EC-130	2	Large Force/Flag Exercise		Scenario-based threat replication

Table A3.14. F-15C Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-15C	1	Aerial Gunnery	RAP[1]/ Syllabus	Live capable, airborne target
F-15C	2	Chaff	RAP/ Syllabus	Capable
F-15C	3	Flare	RAP/ Syllabus	Capable
F-15C	4	Electronic Warfare Event	RAP/ Syllabus	Emitters
F-15C	5	Large Force/Flag Exercise	RAP	Scenario-based threat replication
F-15C	6	High Angle Strafe	RAP	Controlled overland range

1. F-15C RAP Tasking Memorandum, Aviation Schedule 2017 Change 1 (AS-17 Ch 1), (Effective 01 Apr 17)

Table A3.15. F-15E Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-15E	1	Aerial Gunnery	RAP[1]	Live capable and airborne target
F-15E	2	Chaff	RAP	Capable
F-15E	3	Flare	RAP	Capable
F-15E	4	Electronic Warfare Event	RAP	Emitters
F-15E	5	Inertially Aided Munition Actual	RAP	Live or inert capable
F-15E	6	Moving Target Laser Guided Bomb/Strafe	RAP	Laser capable and remote-controlled vehicle capable of 25 miles per hour
F-15E	7	Strafe	RAP	Strafe pit with scoring
F-15E	8	Precision Guided Munition Actual	RAP	Live or inert capable and laser capable

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-15E	9	Large Force/Flag Exercise	RAP	Scenario-based threat replication

1. F-15E RAP Tasking Memorandum, Aviation Schedule 2017 Change 1 (AS-17 Ch 1), (Effective 01 Apr 17)

Table A3.16. F-16 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-16	1	Aerial Gunnery	RAP[1,2]	Live capable and airborne target
F-16	2	Chaff	RAP/ Syllabus	Capable
F-16	3	CAS in Urban Terrain	RAP	Constructed urban village
F-16	4	Full-Scale Weapons Delivery/Heavy Weight	RAP/ Syllabus	Live or inert capable
F-16	5	Flare	RAP/ Syllabus	Capable
F-16	6	Inertially Aided Munition Actual	RAP/ Syllabus	Live or inert capable
F-16	7	Laser Guided Bomb Actual	RAP/ Syllabus	Live or inert capable and laser capable
F-16	8	Strafe	RAP/ Syllabus	Strafe pit with scoring
F-16	9	Night Strafe	RAP/ Syllabus	Strafe pit open during nighttime
F-16	10	Electronic Warfare Event	RAP	Emitters
F-16	11	Moving Target Laser Guided Bomb Attack	RAP	Laser capable and remote-controlled vehicle capable of 25 miles per hour
F-16	12	Moving Target Strafe	RAP/ Syllabus	Remote-controlled vehicle capable of 25 miles per hour
F-16	13	Large Force/Flag Exercise	RAP/ Syllabus	Scenario-based threat replication

1. F-16 Blk 25-42 RAP Tasking Memorandum, Aviation Schedule 2017 Change 1, (AS-17 Ch 1), (Effective 01 Apr 17)

2. F-16CM Blk 50/52 RAP Tasking Memorandum, Aviation Schedule 2017 Change 1 (AS-17 Ch 1), (Effective 01 Apr17)

Table A3.17. F-22 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-22	1	Aerial Gunnery	RAP[1]	Live capable and airborne target
F-22	2	Chaff	RAP	Capable
F-22	3	Electronic Warfare Event	RAP	Emitters
F-22	4	Flare	RAP	Capable
F-22	5	Large Force/Flag Exercise	RAP	Scenario-based threat replication

1. F-22A RAP Tasking Memorandum, Aviation Schedule 2017 Change 1 (AS-17 Ch 1), (Effective 01 Apr 17)

Table A3.18. F-35 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-35	1	Aerial Gunnery	RAP[1]	Live capable and airborne target
F-35	2	CAS in Urban Terrain	RAP/ Syllabus	Constructed urban village
F-35	3	Electronic Warfare Event	RAP/ Syllabus	Emitters
F-35	4	Full-Scale Weapons Delivery/Heavy Weight	RAP/ Syllabus	Live or inert capable
F-35	5	Inertially Aided Munition Actual	RAP/ Syllabus	Live or inert capable
F-35	6	Laser Guided Bomb Actual	RAP/ Syllabus	Live or inert capable and laser capable
F-35	7	Moving Target Laser Guided Bomb Attack	RAP/ Syllabus	Laser capable and remote-controlled vehicle capable of 25 miles per hour
F-35	8	Moving Target Strafe	RAP/ Syllabus	Remote-controlled vehicle capable of 25 miles per hour
F-35	9	Night Strafe	RAP/ Syllabus	Strafe pit open during nighttime
F-35	10	Target Mark	RAP	Multiple targets and strafe pit, flare capable, laser capable, or live or inert capable

Major Weapon System	Event Number	Event	Event Source	Range Capability
F-35	11	Large Force/Flag Exercise	RAP/ Syllabus	Scenario-based threat replication
F-35	12	Flare	RAP	Capable

1. F-35A RAP Tasking Memorandum, Aviation Schedule 2017 Change 1 (AS-17 Ch 1), (Effective 01 Apr 17)

Table A3.19. Ground Combat Trainer Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
Ground Combat Trainer	1	Ground Combat Training	Theater Deployment	

Table A3.20. HC-130 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
HC-130	1	Airdrop Container Delivery System Actual	RAP	Drop zone
HC-130	2	Heavy Equipment Airdrop	RAP	Drop zone
HC-130	3	Airdrop Personnel Actual	RAP	Drop zone
HC-130	4	Tactical Airdrop Night	RAP	Drop zone – night hours
HC-130	5	Precision Airdrop System Airdrop Event	RAP	Capable
HC-130	6	Flare	RAP	Capable
HC-130	7	Chaff	RAP	Capable
HC-130	8	Threat Event	RAP	Emitters
HC-130	9	Max Effort Landing	RAP	Capable range and capable airspace (allow tactical arrival/departure)
HC-130	10	Max Effort Night Landing	RAP	Capable range and capable airspace
HC-130	11	Contested/Degraded Operations	RAP	Emitters, GPS jammer, communications jammer, data link jammer

Table A3.21. HH-60 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
HH-60	1	Chaff	RAP	Capable
HH-60	2	Flare	RAP	Capable
HH-60	3	Electronic Warfare Event	RAP	Emitters
HH-60	4	Contested/Degraded Operations	RAP	Emitters, GPS jammer, communications jammer
HH-60	5	Helicopter Gunnery Event	RAP	Multiple targets and strafe pit

Table A3.22. JTAC Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
JTAC	1	Terminal Attack Controller mission-Day	13-112V1	Day range access for participating aircraft
JTAC	2	Terminal Attack Controller mission-Night	13-112V1	Night range access for participating aircraft
JTAC	3	Terminal Attack Controller Mission-Live Ordnance	13-112V1	Live or inert capable
JTAC	4	Control Type 1 Terminal Attack Controller Mission	13-112V1	Range access for participating aircraft
JTAC	5	Control Type 2 Terminal Attack Controller Mission	13-112V1	Range access for participating aircraft
JTAC	6	Laser Target Designation	13-112V1	Laser capable
JTAC	7	Control CAS Mission	13-112V1	Range access for participating aircraft
JTAC	8	Degraded Operations	13-112V1	Emitters, GPS jammer, communications jammer, data link jammer

Table A3.23. KC-10 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
KC-10	1	Contested/Degraded Operations	Volume 1	Emitters, GPS jammer, communications jammer, data link jammer
KC-10	2	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.24. KC-46 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
KC-46	1	Laser Infrared Countermeasures/Laser	Volume 1	Simulator capable
KC-46	2	Threat Event	Volume 1	Emitters
KC-46	3	Electronic Warfare Event	RAP	Emitters
KC-46	4	Contested/Degraded Operations	Volume 1	Emitters, GPS jammer, communications jammer, data link jammer
KC-46	5	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.25. KC-135 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
KC-135	1	Contested/Degraded Operations	Vol 1	Emitters, GPS jammer, communications jammer, data link jammer
KC-135	2	Large Force/Flag Exercise	RAP	Scenario-based threat replication

Table A3.26. MC-130 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
MC-130	1	Airdrop Heavy equipment	RAP	Drop zone day/night
MC-130	2	Airdrop High Speed	RAP	Drop zone day/night
MC-130	3	Airdrop High Altitude	RAP	Drop zone day/night
MC-130	4	Airdrop Visual	RAP	Drop zone day/night
MC-130	5	Airdrop Personnel	RAP	Drop zone day/night
MC-130	6	Airdrop Container Delivery System	RAP	Drop zone day/night
MC-130	7	Airdrop Low Cost Low Altitude Airdrop	RAP	Drop zone day/night
MC-130	8	Airdrop Joint Precision Airdrop System	RAP	Drop zone day/night

Major Weapon System	Event Number	Event	Event Source	Range Capability
MC-130	9	Forward Area Refueling Point	RAP	Landing zone day/night/blacked out
MC-130	10	Insertion/Extraction	RAP	Landing zone day/night/blacked out
MC-130	11	Max Effort Takeoff	RAP	Landing zone day/night/blacked out
MC-130	12	Assault Landing	RAP	Landing zone day/night/blacked out
MC-130	13	Self-Contained Approach Training	RAP	Landing zone day/night/blacked out
MC-130	14	Receiver Air-to-Air Refueling	RAP	Air-to-air refueling track day/night
MC-130	15	Tanker Air-to-Air Refueling	RAP	Helicopter air-to-air refueling/tanker air-to-air refueling tracks day/night
MC-130	16	Air Intercept Training	RAP	Large block altitude day/night
MC-130	17	Surface Radar	RAP	Emitters
MC-130	18	Night Vision Goggle Landing/Takeoff	RAP	Blacked out landing zone
MC-130	19	Airland - Improved surface	RAP	Hard surface landing zone
MC-130	20	Airland - Unimproved surface	RAP	Dirt/clay surface landing zone
MC-130	21	Chaff	RAP	Capable
MC-130	22	Flare	RAP	Capable
MC-130	23	Threat Event/Degraded Operations	RAP	Emitters, GPS jammer, communications jammer, data link jammer

Table A3.27. MQ-1 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
MQ-1	1	Buddy Lase	RAP	Laser capable
MQ-1	2	Hellfire	RAP	Live or inert capable and laser capable

Table A3.28. MQ-9 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
MQ-9	1	Buddy Lase	RAP	Laser capable
MQ-9	2	Hellfire	RAP	Live or inert capable and laser capable
MQ-9	3	Inertially Aided Munition	RAP	Live or inert capable
MQ-9	4	Laser Guided Bomb	RAP	Laser capable

Table A3.29. PC-12 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
PC-12	1	Shortfield Procedures	RAP	Landing zone day/night
PC-12	2	Night Vision Goggle Air/Land	RAP	Landing zone AMP3/4
PC-12	3	Semi-Prepared Surface Landing/Takeoff	RAP	Dirt landing zone
PC-12	4	Low Cost Low Altitude Airdrop	RAP	Drop zone day/night
PC-12	5	Night Vision Goggle Airdrop	RAP	Drop zone day/night
PC-12	6	Night Vision Goggle Insertion/Extraction	RAP	Blacked out landing zone

Table A3.30. RC-135 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
RC-135	1	Contingency		Scenario-based threat replication
RC-135	2	Sensitive Recon Operation		Scenario-based threat replication
RC-135	3	Suppression of Enemy Air Defenses Integration		Scenario-based threat replication

Major Weapon System	Event Number	Event	Event Source	Range Capability
RC-135	4	Contested/Degraded Operations		GPS and communications jammer
RC-135	5	Collection		Electronic emitter
RC-135	6	Annual Combat Search and Rescue Integration Scenario		Scenario-based threat replication
RC-135	7	Electronic Warfare Activity		Multiple emitters

Table A3.31. Small Unmanned Aerial Systems Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
Small Unmanned Aerial System	1	Unmanned Aerial System Training	Theater Deployment	Multiple large open areas within restricted airspace and supporting frequency allocations

Table A3.32. Special Tactics Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
Special Tactics	1	Parachute Insertion	Theater Deployment	Static line/high altitude low open personnel drop zone/day/night/water
Special Tactics	2	Parachute Insertion	Theater Deployment	Static line/ high altitude low open personnel drop zone/day/night
Special Tactics	3	Alternate Insertion/Extraction Operations	Theater Deployment	Rotary wing/tiltrotor drop/landing zone/day/night
Special Tactics	4	All Terrain/Tactical Vehicle Operations	Theater Deployment	All-terrain vehicle practice course
Special Tactics	5	Terminal Control Operations	Theater Deployment	Live or inert capable
Special Tactics	6	Demolition	Theater Deployment	Demolition capable
Special Tactics	7	Combat/Tactical Operations	Theater Deployment	Light/heavy weapons, military operation in urban terrain

Major Weapon System	Event Number	Event	Event Source	Range Capability
Special Tactics	8	Small Unmanned Aerial System Operations	Theater Deployment	Small Unmanned Aerial System capable and multiple large open areas within restricted airspace with supporting frequency
Special Tactics	9	Assault Zone Operations	Theater Deployment	Capable
Special Tactics	10	Medical/Combat Search and Rescue/Personnel Recovery	Theater Deployment	Capable
Special Tactics	11	Degraded Operations	Theater Deployment	Emitters, GPS jammer, communications jammer, data link jammer

Table A3.33. T-38C (Introduction to Fighter Fundamentals) Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
T-38C	1	Aerial Gunnery[1]	Syllabus	Restricted area airspace
T-38C	2	10-degree Low Angle High Drag Pop	Syllabus	Class A service
T-38C	3	10-degree Low Angle High Drag Pop	Syllabus	Class A service
T-38C	4	Strafe (high or low angle)	Syllabus	Strafe pit
T-38C	5	Visual Level Delivery	Syllabus	Class A service

1. Aerial Gunnery is simulated, but requires restricted airspace by AETC policy due to student pilots. While training events which only require airspace are generally outside the scope of this AFI, an exception is made for this unique case.

Table A3.34. Tactical Air Control Party Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
Tactical Air Control Party	1	Ground Training (All)	Theater Deployment	Bivouac, land navigation, ground maneuver, vehicle convoy, survival, evasion, resistance and escape, and close quarters battle capable

Table A3.35. U-28 Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
U-28	1	Shortfield Procedures		Landing zone day/night
U-28	2	Night Vision Goggle Air/Land	RAP	Landing zone blacked out
U-28	3	Semi-Prepared Surface Landing/Takeoff	RAP	Dirt landing zone
U-28	4	Low Cost Low Altitude Airdrop	RAP	
U-28	5	Night Vision Goggle Airdrop	RAP	Drop zone-night hours
U-28	6	Night Vision Goggle Insertion/Extraction	RAP	Blacked-out landing zone-night hours
U-28	7	Intelligence, Surveillance, and Reconnaissance Training	RAP	Airspace
U-28	8	Airland - Improved Surface	Theater Deploymen	Hard surface helicopter landing zone
U-28	9	Airland - Unimproved Surface	Theater Deploymen t	Dirt/clay surface helicopter landing zone
U-28	10	Buddy Lase	RAP	Laser capable
U-28	11	Flare	Theater Deploymen t	Capable
U-28	12	Threat Event/Degraded Operations	Theater Deploymen t	Emitters, GPS jammer, communications jammer, data link jammer
U-28	13	Intelligence, Surveillance, and Reconnaissance Event with Ground Element	Theater Deploymen t	Restricted access roadwork with obscuration areas

Table A3.36. UH-1N Events.

Major Weapon System	Event Number	Event	Event Source	Range Capability
UH-1N	1	Helicopter Gunnery	RAP	Day/Night live capable
UH-1N	2	Aerial Interdiction	RAP	Day/Night, multiple targets

UH-1N	3	CAS	RAP	Day/Night, multiple targets, live integrated air and ground fires, constructed urban village

Attachment 4

ASSIGNED RANGE USERS AND TRAINING EVENTS

A4.1. The range assignments in this attachment are intended to capture only the primary range used by the unit for each training event. The range assignments are not intended to limit units from using other, non-assigned ranges, as required or necessary to meet their training requirements.

Table A4.1. A-10 Range Assignments.

WG	Unit	Location	1 Mission Profiles	2 Airborne Laser Designation	3 Airstrike Control Actual Ordnance	4 Close Air Support in Urban Terrain	5 Flare	6 Full Scale Weapons Delivery/Heavy Weight	7 Laser Spot Search/Track	8 Laser Guided Bomb	9 Maverick Event	10 Night Strafe	11 Suppression of Enemy Air Defenses-Contested	12 Self-Mark Strafe (night)	13 Strafe	14 Target Mark	15 Targeting Pod Event	16 Chaff	17 EW Event Air-to-Ground	18 Moving Target Attack	19 Degraded/Denied Communications	Degraded/Denied
23 WG	75 FS	Georgia	Grand Bay								Avon Park		Grand Bay						Grand Bay			Ne
23 WG	74 FS	Georgia	Grand Bay								Avon Park		Grand Bay						Grand Bay			Ne
51 FW	25 FS	Korea	Joint Pacific Air Range Complex																			
53 WG	422 TES	Nevada	Nevada Test and Training Range																			
57 WG	548 CTS, Det 1	Louisiana	Claiborne					Claiborne			Claiborne				Claiborne							
96 TW	40 TS	Florida	96 TW (Eglin)																			
122 FW	163 FS	Indiana	Indiana Air Range Complex										Indiana Air Range Complex									
124 FW	190 FS	Idaho	Mountain Home - events listed as TBD																			
127 FW	107 FS	Michigan	Indiana Air Range Complex																			
175 WG	104 FS	Maryland	Bollen																Bollen			
355 FW	354 FS	Arizona	Barry M. Goldwater Range																			
355 FW	357 FS	Arizona	Barry M. Goldwater Range																			
442 FW	47 FS	Arizona	Barry M. Goldwater Range																			
442 FW	76 FS	Georgia	Grand Bay																			
442 FW	303 FS	Missouri	Cannon																			
USAFWS (57 WG)	66 WPS	Nevada	Nevada Test and Training Range																			

Table A4.2. AC-130 Range Assignments.

WG	Unit	Location	1 Live Fire	2 Precision Guided Munition Employment	3 Live Fire Radar Profile (AC-130U only)	4 Air-to-Ground Gunnery	5 Chaff	6 Flare	7 Threat Event	8 Call-For-Fire	9 Close Air Support	10 Airborne Laser Designation
1 SOW	4 SOS	Florida	96 TW (Eglin)		96 TW (Eglin)							
27 SOW	16 SOS	New Mexico	Melrose		Melrose							
AFSOAWC	19 SOS	Florida	96 TW (Eglin)		96 TW (Eglin)							
AFSOAWC	551 SOS	New Mexico	Melrose		Melrose							
USAFWS	14 WPS	Florida	96 TW (Eglin)		96 TW (Eglin)							

Table A4.3. B-1 Range Assignments.

Unit	Location	Actual Weapon Release (Inert)	Wind Corrected Munitions Dispenser Release	Actual Flare Event	Actual Chaff Event	Electronic Attack Threat Activity	Targeting Pod Operations	Contested/Degraded Operations
		1	2	3	4	5	6	7
9 BS	Texas	Melrose	Utah Test and Training Range	Melrose		Snyder		Utah Test and Training Range
28 BS	Texas	Smoky Hill	Utah Test and Training Range			Snyder		Utah Test and Training Range
34 BS	South Dakota	Utah Test and Training Range				Belle Fourche		Utah Test and Training Range
37 BS	South Dakota	Nevada Test and Training Range				Smoky Hill		Utah Test and Training Range
337 TES	Texas	Melrose	Utah Test and Training Range			Snyder		Nevada Test and
419 FLTS	California	412 TW (Edwards)						
77 WPS	Texas	Utah Test and Training Range		Nevada Test and Training Range		Snyder		Nevada Test and

Table A4.4. B-2 Range Assignments.

WG	Unit	Location	Air-to-Ground Missile 158 Bomb Run	B61/83 Actual Release	Guided Bomb Unit-31/28 Actual Release	Guided Bomb Unit-31/28 Actual Release	Guided Bomb Unit-5 Bomb Run	Conventional Unguided	
			1	2	3	4	5	6	
53 WG	72 TES	Missouri				Smoky Hill			Nevada
131 BW	110 BS	Missouri	Utah Test and Training Range		Smoky Hill		Utah Test and Training Range	Smoky Hill	Utah
509 BW	13 BS	Missouri	Utah Test and Training Range		Utah Test and Training Range				
509 BW	393 BS	Missouri	Utah Test and Training Range		Utah Test and Training Range				Utah
509 BW	394 CTS	Missouri		Smoky Hill					
USAFWS	325 WPS	Missouri	Nevada Test and Training Range		Nevada Test and Training Range				Nevada

Table A4.5. B-52 Range Assignments.

Unit	Location	Actual Joint Direct Attack Munition/Wind Corrected Munitions Dispenser Release	Actual Weapon Release	Joint Direct Attack Munition/Wind Corrected Munitions Dispenser Jettison	Laser Spot Search/Track	Laser Guided Bomb Actual Weapon Release	Chaff/Flare Exercise	Targeting Pod Employment
		1	2	3	4	5	6	
11 BS	Louisiana	Utah Test and Training Range	Melrose	Utah Test and Training Range	Razorback		Utah Test and Training Range	Smok
20 BS	Louisiana	Smoky Hill					Nevada Test and Training Range	
96 BS	Louisiana	Nevada Test and Training Range			Utah Test and Training Range			
23 BS	North Dakota				Mountain Home	Smoky Hill	Mountain Home	Smo
69 BS	North Dakota	Nevada Test and Training Range	Utah Test and Training Range		Belle Fourche	Grayling	Nevada Test and Training Range	Gra
49 TES	Louisiana		Smoky Hill		Smoky Hill			
93 BS	Louisiana	Smoky Hill	Utah Test and Training Range	Smoky Hill	Claiborne	Smoky Hill	Nevada Test and Training Range	Smo
343 BS	Louisiana	Utah Test and Training Range	Utah Test and Training Range	Utah Test and Training Range	Claiborne	Smoky Hill	Utah Test and Training Range	
419 FLTS	California	412 TW (Edwards)						
340 WPS	Louisiana		Utah Test and Training Range		Utah Test and Training Range			

Table A4.6. C-17 Range Assignments.

WG	Unit	Location	1 Airdrop Container Delivery System Actual	2 Airdrop Equipment Actual	3 Airdrop Personnel Actual	4 Flare/Laser Infrared Countermeasures	5 Precision Airdrop System Airdrop Event	6 Tactical Airdrop Night	7 Threat Event	8 Electronic Warfare Event	9 Contested/Degraded Operations	10 Large Force/Flag Exercise	11 Assault Landing (Day)
3 WG	517 AS	Alaska	Joint Pacific Air Range Complex										
15 WG	535 AS	Hawaii	No range assigned										
60 AW	21 ALS	California	No range assigned										
62 AW	4 AS	Washington	Joint Pacific Air Range Complex			Nevada Test and Training Range	Pacific Air Range Com		Nevada Test and Training				
62 AW	7 AS	Washington	Joint Pacific Air Range Complex			Nevada Test and Training Range	Pacific Air Range Com		Nevada Test and Training				
62 AW	8 AS	Washington	Joint Pacific Air Range Complex			Nevada Test and Training Range	Pacific Air Range Com		Nevada Test and Training				
97 AMW	58 AS	Oklahoma	Falcon										
105 AW	137 AS	New York	Adirondack					Adirondack					
145 AW	156 AS	North Carolina	No range assigned										
164 AW	155 AS	Tennessee	No range assigned										
167 AW	167 AS	West Virginia	Bollen			Bollen							
172 AW	183 AS	Mississippi	Shelby										
176 AW	249 AS	Alaska	Joint Pacific Air Range Complex									Joint Pacif	
305 AMW	6 AS	New Jersey	Bollen			Bollen				Nevada Test and Tra			
436 AW	3 AS	Delaware	Bollen			Bollen				Nevada Test and Tra			
437 AW	14 AS	South Carolina	Avon Park					Avon Park	Nevada Test and Training Range			Avon Park	Nevad
437 AW	15 AS	South Carolina	Avon Park					Avon Park	Nevada Test and Training Range			Avon Park	Nevad
437 AW	16 AS	South Carolina	Avon Park					Avon Park	Nevada Test and Training Range			Avon Park	Nevad
445 AW	89 AS	Ohio	No range assigned										
452 AMW	729 AS	California	No range assigned										
512 AW	326 AS	Delaware	Bollen			Bollen							
USAFWS	57 WPS	New Jersey	Nevada Test and Training Range			Bollen	da Test and Training R		Bollen	Nevada Test and Tra			

Table A4.7. C-130 Range Assignments.

WG	Unit	Location	1 Airdrop Container Delivery System Actual	2 Air Drop Equipment Actual	3 Air Drop Personnel Actual	4 Tactical Airdrop Night	5 Precision Airdrop System Airdrop Event	6 Flare	7 Chaff	8 Threat Event	9 Contested/Degraded Operations	10 Large Force/Flags Exercise	11 Assault Landing Day	12 Assault Landing (Semi Prepared Runway Operations)	13 Assault Landing (Night Vision Goggle Operations)
19 AW	34 CTS	Arkansas	Razorback									Claiborne			
19 AW	41 AS	Arkansas	Razorback												
19 AW	50 AS	Arkansas	Razorback												
19 AW	61 AS	Arkansas	Razorback												
86 AW	37 AS	Germany								Polvogne		Polvogne			
94 AW	700 AS	Georgia	No range assigned												
103 AW	118 AS	Connecticut	No range assigned												
109 AW	139 AS	New York	Bollen			Bollen				Bollen					
120 AW	186 AS	Montana	No range assigned												
123 AW	165 AS	Kentucky	Atterbury												
130 AW	130 AS	West Virginia	No range assigned												
133 AW	109 AS	Minnesota	Hardwood									Hardwood			
136 AW	181 AS	Texas	Falcon					Falcon		Snyder					
139 AW	180 AS	Missouri	Smoky Hill												
143 AW	143 AS	Rhode Island	No range assigned												
145 AW	156 AS	North Carolina	No range assigned												
146 AW	115 AS	California	No range assigned												
152 AW	192 AS	Nevada	No range assigned												
153 AW	187 AS	Wyoming	No range assigned												
156 AW	198 AS	Puerto Rico	No range assigned												
165 AW	158 AS	Georgia	Shelby											Shelby	
166 AW	142 AS	Delaware	Bollen			Bollen				Bollen					
176 WG	144 AS	Alaska	No range assigned												
179 AW	164 AS	Ohio	Bollen			Bollen				Bollen					
182 AW	169 AS	Illinois	No range assigned												
189 AW	154 TRS	Arkansas	Razorback												
193 SOW	193 SOS	Pennsylvania	Bollen			Bollen				Bollen					
302 AW	52 AS	Colorado	Airburst							Airburst					
302 AW	731 AS	Colorado	Airburst							Airburst					
314 AW	48 AS	Arkansas	Cannon					Cannon		Cannon					
317 AG		Texas	Claiborne					Claiborne		Nevada Test and Training Range					
317 AG	40 AS	Texas	Claiborne					Claiborne		Nevada Test and Training Range					
374 AW	36 AS	Japan	No range assigned												
403 AW	815 AS	Mississippi	Shelby							Townsend				Shelby	
440 AW	95 AS	North Carolina	Poinsett							Poinsett		Poinsett			
908 AW	357 AS	Alabama	No range assigned												
910 AW	757 AS	Ohio	No range assigned												
911 AW	758 AS	Pennsylvania	Bollen			Bollen				Bollen					
934 AW	96 AS	Minnesota	Hardwood									Hardwood			
USAFWS	29 WPS	Arkansas	Smoky Hill									Nevada Test and Training Range			

Table A4.8. C-145 Range Assignments.

WG	Unit	Location	1 Low Cost Low Altitude Airdrop	2 Night Vision Goggle Airdrop	3 Night Vision Goggle Insertion/Extraction	4 Semi-Prepared Surface Landing/Takeoff	5 Military Free Fall	6 Live Fire	7 Airland - Improved Surface	8 Airland - Unimproved Surface	9 Airdrop (Personnel/Container Delivery System/Equipment)	10 Air-to-Ground Gunnery
AFSOAWC	5 SOS	Florida	96 TW (Eglin)						96 TW (Eglin)			
AFSOAWC	6 SOS	Florida	96 TW (Eglin)						96 TW (Eglin)			
919 SOW	711 SOS	Florida	96 TW (Eglin)						96 TW (Eglin)			

Table A4.9. C-146 Range Assignments.

WG	Unit	Location	1 Night Vision Goggle Insertion/Extraction	2 Semi-Prepared Surface Landing/Takeoff
27 SOW	524 SOS	New Mexico	Melrose	
919 SOW	859 SOS	Florida	96 TW (Eglin)	

Table A4.10. CV-22 Range Assignments.

Unit	Location	1 Insertion/Extraction Training	2 Alternate Insertion/Extraction	3 Chaff	4 Flare	5 Electronic Warfare Event/Degraded Operations	6 Hoist Training	7 Airland - Improved Surface	8 Airland - Unimproved Surface	9 Air-to-Ground gunnery	10 Military Free Fall
8 SOS	Florida	96 TW (Eglin)									
20 SOS	New Mexico	Melrose									
71 SOS	New Mexico	Holloman									
67 SOS	England	No range assigned									
7 SOS	England	No range assigned									
1 SOS	Japan	No range assigned									

Table A4.11. E-3 Range Assignments.

WG	Unit	Location	1 Electronic Warfare Event	2 Large Force/Flag Exercise
3 WG	962 AACS	Alaska	Joint Pacific Air Range Complex	
18 WG	961 AACS	Japan	Joint Pacific Air Range Complex	
552 ACW	960 AACS	Oklahoma	Poinsett	Nevada Test and Training Range
552 ACW	963 AACS	Oklahoma	Poinsett	Nevada Test and Training Range
552 ACW	964 AACS	Oklahoma	Poinsett	Nevada Test and Training Range
552 ACW	965 AACS	Oklahoma	Poinsett	Nevada Test and Training Range
552 ACW	966 AACS	Oklahoma	Poinsett	

Table A4.12. E-8 Range Assignments.

WG	Unit	Location	Large Force/Flag Exercise	Moving Target	Electronic Warfare Event
			1	2	3
116 ACW	128 AC2S	Georgia	Nevada Test and Training Range		
461 ACW	12 AC2S	Georgia	Nevada Test and Training Range		
461 ACW	16 AC2S	Georgia	Nevada Test and Training Range		

Table A4.13. EC-130 Range Assignments.

WG	Unit	Location	Smokey Surface-to-Air Missile Event	Large Force/Flag Exercise
			1	2
55 WG	41 ECS	Arizona	Barry M. Goldwater Range	Nevada Test and Training Range
55 WG	43 ECS	Arizona	Barry M. Goldwater Range	Nevada Test and Training Range
193 SOW	193 SOS	Pennsylvania	Bollen	Nevada Test and Training Range

Table A4.14. F-15C/D Range Assignments.

WG	Unit	Location	Aerial Gunnery	Chaff	Flare	Electronic Warfare Event	Large Force/Flag Exercise	High Angle Strafe
			1	2	3	4	5	6
18 WG	44 FS	Japan	Joint Pacific Air Range Complex					
18 WG	67 FS	Japan	Joint Pacific Air Range Complex					
48 FW	493 FS	England	No range assigned					
53 WG	85 TES	Florida	No range assigned					
53 WG	422 TES	Nevada	No range assigned					
96 TW	40 TS	Florida	No range assigned					
104 FW	131 FS	Massachusetts		Adirondack				Adirondack
125 FW	159 FS	Florida	No range assigned					
142 FW	123 FS	Oregon	No range assigned					
144 FW	194 FS	California	No range assigned					
159 FW	122 FS	Lousiana		Claiborne				
173 FW	114 FS	Oregon	No range assigned					
USAFWS	433 WPS	Nevada	No range assigned					

Table A4.15. F-15E Range Assignments.

Unit	Location	1 Aerial Gunnery	2 Chaff	3 Flare	4 Electronic Warfare Event	5 Inertially Aided Munition Actual	6 Moving Target Laser Guided Bomb/Strafe	7 Strafe	8 Precision Guided Munition Actual	9 Large Force/Flag Exercise
333 FS	North Carolina			Dare County						
334 FS	North Carolina			Dare County						Nevada Test and Training Range
335 FS	North Carolina			Dare County						Nevada Test and Training Range
336 FS	North Carolina			Dare County						Nevada Test and Training Range
492 FS	England	No range assigned								
494 FS	England	No range assigned								
85 TES	Florida		96 TW (Eglin)					6 TW (Eglin		Nevada Test and Training Range
422 TES	Nevada	Nevada Test and Training Range								
40 TS	Florida	96 TW (Eglin)								
428 FS*	Idaho		Mountain Home							
389 FS	Idaho		Mountain Home							Nevada Test and Training Range
391 FS	Idaho		Mountain Home							Nevada Test and Training Range
307 FS	North Carolina			Dare County						
17 WPS	Nevada		Nevada Test and Training Range							

*F-15SG – Singapore

Table A4.16. F-16 Range Assignments.

WG	Unit	Location	1 Aerial Gunnery	2 Chaff	3 Close Air Support in Urban Terrain	4 Full-Scale Weapons Delivery/Heavy Weight	5 Flare	6 Inertially Aided Munition Actual	7 Laser Guided Bomb Actual	8 Strafe	9 Night Strafe	10 Electronic Warfare Event	11 Moving Target Laser Guided Bomb Attack
8 FW	35 FS	Korea		Joint Pacific Air Range Complex									
8 FW	80 FS	Korea		Joint Pacific Air Range Complex									
20 FW	55 FS	South Carolina			Poinsett								
20 FW	77 FS	South Carolina			Poinsett								
20 FW	79 FS	South Carolina			Poinsett								
31 FW	510 FS	Italy	No range assigned										
31 FW	555 FS	Italy	No range assigned										
35 FW	13 FS	Japan		Draughon								Draughon	
35 FW	14 FS	Japan		Draughon								Draughon	
51 FW	36 FS	Korea		Joint Pacific Air Range Complex									
52 FW	480 FS	Germany										Polygone	
53 WG	85 TES	Florida		96 TW (Eglin)		96 TW (Eglin)							
53 WG	422 TES	Nevada		Nevada Test and Training Range									
56 FW	21 FS	Arizona		Barry M. Goldwater Range									
56 FW	62 FS	Arizona		Barry M. Goldwater Range									
56 FW	309 FS	Arizona		Barry M. Goldwater Range									
56 FW	310 FS	Arizona		Barry M. Goldwater Range									
56 FW	311 FS	New Mexico		Holloman									
56 FW	314 FS	New Mexico		Holloman									
56 FW	425 FS	Arizona		Barry M. Goldwater Range									
57 WG	64 ACS	Nevada		Nevada Test and Training Range									
57 WG	548 CTS, Det 1	Louisiana								Claiborne		Claiborne	
96 TW	40 TS	Florida	96 TW (Eglin)										
113 FW	121 FS	Maryland			Warren Grove								
114 FW	175 FS	South Dakota		Smoky Hill									
115 FW	176 FS	Wisconsin		Hardwood									
122 FW	163 FS	Indiana	No range assigned										
138 FW	125 FS	Oklahoma	Smoky Hill										
140 FW	120 FS	Colorado	Airburst		Airburst								
148 FW	179 FS	Minnesota		Hardwood									
149 FW	182 FS	Texas		McMullen						McMullen			
158 FW	134 FS	Vermont		Adirondack									
162 WG	148 FS	Arizona		Barry M. Goldwater Range									
162 WG	152 FS	Arizona		Barry M. Goldwater Range									
162 WG	195 FS	Arizona		Barry M. Goldwater Range									
162 WG	AA TC	Arizona		Barry M. Goldwater Range									
169 FW	157 FS	South Carolina		Townsend									
177 FW	119 FS	New Jersey		Adirondack			Warren Grove						
180 FW	112 FS	Ohio		Indiana Air Range Complex									
187 FW	100 FS	Alabama			Shelby								
301 FW	457 FS	Texas		Falcon									
354 FW	18 ACS	Alaska		Joint Pacific Air Range Complex			Joint Pacific Air Range Complex					Joint Pacific Air Range Complex	
412 TW	416 FLTS	California		412 TW (Edwards)									
442 FW	303 FS	Missouri	No range assigned										
482 FW	93 FS	Florida		Avon Park									
USAFWS	16 WPS	Nevada		Nevada Test and Training Range									

Table A4.17. F-22 Range Assignments.

WG	Unit	Location	1 Aerial Gunnery	2 Chaff	3 Electronic Warfare Event	4 Flare	5 Large Force/Flag Exercise
1 FW	27 FS	Virgina					Nevada Test and Training Range
1FW	94 FS	Virgina					Nevada Test and Training Range
3 WG	90 FS	Alaska	Joint Pacific Air Range Complex				
3 WG	525 FS	Alaska	Joint Pacific Air Range Complex				
53 WG	422 TES	Nevada			Nevada Test and Training Range		
154 WG	199 FS	Hawaii	No range assigned				
325 FW	43 FS	Florida		96 TW (Eglin)			Nevada Test and Training Range
325 FW	95 FS	Florida		96 TW (Eglin)			Nevada Test and Training Range
412 TW	411 FTS	California	No range assigned				

Table A4.18. F-35 Range Assignments.

WG	Unit	Location	1 Aerial Gunnery	2 Close Air Support in Urban Terrain	3 Electronic Warfare Event	4 Full-Scale Weapons Delivery/Heavy Weight	5 Inertially Aided Munition Actual	6 Laser Guided Bomb Actual	7 Moving Target Laser Guided Bomb Attack	8 Moving Target Strafe	9 Night Strafe	10 Target Mark	11 Large Force/Flag Exercise
33 FW	58 FS	Florida		96 TW (Eglin)									96 TW (Eglin
53 WG	31 TES	California	412 TW (Edwards)										
53 WG	422 TES	Nevada	Nevada Test and Training Range										
56 FW	61 FS	Arizona		Barry M. Goldwater Range									
56 FW	62 FS	Arizona		Barry M. Goldwater Range									
388 FW	4 FS	Utah	Utah Test and Training Range										Nevada Test and Train
388 FW	34 FS	Utah	Utah Test and Training Range										Nevada Test and Train
388 FW	421 FS	Utah	Utah Test and Training Range										Nevada Test and Train

Table A4.19. Ground Combat Trainer Range Assignments.

WG	Unit	Location	1 Ground Combat Training
AFSOAWC	371 SOCTS	Florida	96 TW (Eglin)

Table A4.20. HC-130 Range Assignments.

WG	Unit	Location	1 Airdrop Container Delivery System Actual	2 Heavy Equipment Airdrop	3 Airdrop Personnel Actual	4 Tactical Airdrop Night	5 Precision Airdrop System Airdrop Event	6 Flare	7 Chaff	8 Threat Event	9 Max Effort Landing	10 Max Effort Night Landing	
23 WG	71 RQS	Georgia	Avon Park					Grand Bay	Avon Park	Grand Bay			Neva
23 WG	79 RQS	Arizona	Barry M. Goldwater Range										Neva
53 WG	53 TES	Arizona	Barry M. Goldwater Range										
58 SOW	550 SOS	New Mexico	Holloman										
106 RQW	102 RQS	New York	Bollen			Bollen				Bollen			
176 WG	210 RQS	Alaska	Joint Pacific Air Range Complex										
920 RW	39 RQS	Florida	No range assigned										

Table A4.21. HH-60 Range Assignments.

WG	Unit	Location	Chaff	Flare	Electronic Warfare Event	Contested/Degraded Operations	Helicopter Gunnery Event
			1	2	3	4	5
18 WG	33 RQS	Japan	No range assigned				
23 WG	41 RQS	Georgia	Avon Park	Grand Bay		Nevada Test and Training Range	
23 WG	55 RQS	Arizona	Barry M. Goldwater Range			Nevada Test and Training Range	
23 WG	66 RQS	Nevada	Nevada Test and Training Range				
48 FW	56 RQS	England	No range assigned				
53 WG	88 TES	Nevada	Nevada Test and Training Range				
57 Wg	548 CTS, Det 1	Lousiana					
58 SOW	512 RQS	New Mexic	Holloman				
106 RW	101 RQS	New York	Adirondack				
129 RW	129 RQS	California	No range assigned				
176 WG	210 RQS	Alaska	No range assigned				
920 RW	301 RQS	Florida	No range assigned				
920 RW	305 RQS	Arizona	Barry M. Goldwater Range				
USAFWS	34 WPS	Nevada	No range assigned				

Table A4.22. JTAC Range Assignments.

WG	Unit	Location	1 Terminal Attack Controller mission-Day	2 Terminal Attack Controller mission-Night	3 Terminal Attack Controller Mission Live Ordnance	4 Control Type 1 Terminal Attack Controller Mission	5 Control Type 2 Terminal Attack Controller Mission	6 Laser Target Designation	7 Control Close Air Support Mission	8 Degraded Operations
1 ASOG	5 ASOS	Washington	Shelby							
24 SOW	21 STS	North Carolina	Dare County							
24 SOW	22 STS	Washington	Mountain Home							
24 SOW	24 STS	North Carolina	Avon Park							
24 SOW	23 STS	Florida	Avon Park							
93 AGOW	7 ASOS	Texas	Holloman							
93 AGOW	9 ASOS	Texas	Claiborne				Claiborne			
93 AGOW	10 ASOS	Kansas	Smoky Hill							
93 AGOW	11 ASOS	Texas	Falcon							
93 AGOW	13 ASOS	Colorado	Airburst							
93 AGOW	14 ASOS	North Carolina	Dare County							
93 AGOW	15 ASOS	Georgia	Dare County							
93 AGOW	19 ASOS	Kentucky	Smoky Hill							
93 AGOW	20 ASOS	New York	Adirondack							
93 AGOW	21 ASOS	Texas	Claiborne				Claiborne			
93 AGOW	682 ASOS	South Carolina	Poinsett							
93 AGOW	712 ASOS	Texas	Claiborne				Claiborne			
124 FW	124 ASOS	Idaho	Mountain Home							
137 SOW	146 ASOS	Oklahoma	Falcon							
142 FW	125 STS	Oregon	Mountain Home							
145 AW	118 ASOS	North Carolina	Bollen							
159 FW	122 ASOS	Lousiana	Claiborne				Claiborne			
165 AW	165 ASOS	Georgia	Bollen							
174 ATKW	274 ASOS	New York	Adirondack							
177 FW	227 ASOS	New Jersey	Warren Grove							
184 IW	284 ASOS	Kansas	Smoky Hill							
186 ARW	238 ASOS	Mississippi	Shelby							
193 SOW	148 ASOS	Pennsylvania	Bollen							
354 FW	3 ASOS	Alaska	Joint Pacific Air Range Complex							
354 FW	25 ASOS	Hawaii	Bollen							
USAFWS	66 WPS	Nevada	Nevada Test and Training Range							

Table A4.23. KC-10 Range Assignments.

WG	Unit	Location	1 Contested/Degraded Operations	2 Large Force/Flag Exercise
60 AMW	6 ARS	California	No range assigned	
60 AMW	9 ARS	California	No range assigned	
305 AMW	2 ARS	New Jersey	No range assigned	
305 AMW	32 ARS	New Jersey	No range assigned	

Table A4.24. KC-46 Range Assignments.

WG	Unit	Location	Laser Infrared Countermeasures/ Laser	Threat Event	Electronic Warfare Event	Contested/Degraded Operations	Large Force/Flag Exercise
			1	2	3	4	5
22 ARW	350 ARS	Kansas	No range assigned				
22 ARW	384 ARS	Kansas	No range assigned				
97 AMW	54 ARS	Oklahoma	No range assigned				
157 ARW	133 ARS	New Hampshire	No range assigned				

Table A4.25. KC-135 Range Assignments.

WG	Unit	Location	Contested/Degraded Operations	Large Force/Flag Exercise
			1	2
6 AMW	91 ARS	Florida	No range assigned	
18 WG	909 ARS	Japan	No range assigned	
22 ARW	344 ARS	Kansas	No range assigned	
22 ARW	349 ARS	Kansas	No range assigned	
22 ARW	350 ARS	Kansas	No range assigned	
22 ARW	384 ARS	Kansas	No range assigned	
43 ARW	72 ARS	Indiana	No range assigned	
43 ARW	74 ARS	Indiana	No range assigned	
92 ARW	92 ARS	Washington	No range assigned	
92 ARW	93 ARS	Washington	No range assigned	
97 AMW	54 ARS	Oklahoma	No range assigned	
100 ARW	351 ARS	England	No range assigned	
101 ARW	132 ARS	Maine	No range assigned	
108 ARW	141 ARS	New Jersey	No range assigned	
117 ARW	106 ARS	Alabama	No range assigned	
121 ARW	145 ARS	Ohio	No range assigned	
121 ARW	166 ARS	Ohio	No range assigned	
126 ARW	108 ARS	Illinois	No range assigned	
127 ARW	171 ARS	Michigan	No range assigned	
128 ARW	126 ARS	Wisconsin	No range assigned	
134 ARW	151 ARS	Tennessee	No range assigned	
151 ARW	191 ARS	Utah	No range assigned	
154 ARW	203 ARS	Hawaii	No range assigned	
155 ARW	173 ARS	Nebraska	No range assigned	
157 ARW	133 ARS	New Hampshire	No range assigned	
161 ARW	197 ARS	Arizona	Barry M. Goldwater Range	
168 ARW	168 ARS	Alaska	Joint Pacific Air Range Complex	
171 ARW	146 ARS	Pennsylvania	No range assigned	
171 ARW	147 ARS	Pennsylvania	No range assigned	
185 ARW	174 ARS	Iowa	No range assigned	
186 ARW	153 ARS	Mississippi	No range assigned	
190 ARW	117 ARS	Kansas	No range assigned	
412 TW	418 FLTS	California	No range assigned	
452 AMW	336 ARS	California	No range assigned	
459 ARW	756 ARS	Maryland	No range assigned	
507 ARW	465 ARS	Oklahoma	No range assigned	
914 AW	328 AS	New York	No range assigned	
916 ARW	77 ARS	North Carolina	No range assigned	
940 ARW	314 ARS	California	No range assigned	
USAFWS	509 WPS	Washington	Nevada Test and Training Range	

Table A4.26. MC-130 Range Assignments.

Location	1 Airdrop Heavy equipment	2 Airdrop High Speed	3 Airdrop High Altitude	4 Airdrop Visual	5 Airdrop Personnel	6 Airdrop Container Delivery System	7 Airdrop Low Cost Low Altitude Airdrop	8 Airdrop Joint Precision Airdrop System	9 Forward Area Refueling Point	10 Insertion/Extraction	11 Max Effort Takeoff	12 Assault Landing	13 Self-Contained Approach Training	14 Receiver Air-to-Air Refueling	15 Tanker Air-to-Air Refueling	16 Air Intercept Training	17 Surface Radar	18 Night Vision Goggle Landing/Takeoff	1 Airland - Improved
Florida	96 TW (Eglin)																		
New Mexico	Melrose																		
New Mexico	Holloman								Melrose										
California	No range assigned																		
England	No range assigned																		
Japan	No range assigned																		
Japan	No range assigned																		
Florida	96 TW (Eglin)																		
Florida	96 TW (Eglin)																		

Table A4.27. MQ-1 Range Assignments.

WG	Unit	Location	1 Buddy Lase	2 Hellfire
49 WG	6 RS	New Mexico	Holloman	
53 WG	DET 4	Nevada	Nevada Test and Training Range	
147 RW	111 ATKS	Texas	No range assigned	
162 FW	214 ATKS	Arizona	No range assigned	
163 RW	196 ATKS	California	No range assigned	
178 ISRW	162 RS	Ohio	Indiana Air Range Complex	
	645 ATS	North Carolina	No range assigned	
432 WG	11 RS	Nevada	Nevada Test and Training Range	
432 WG	15 RS	Nevada	Nevada Test and Training Range	
432 WG	17 RS	Nevada	Nevada Test and Training Range	
432 WG	18 RS	Nevada	Nevada Test and Training Range	
USAFWS	26 WPS	Nevada	Nevada Test and Training Range	
703 AESG	DET 3	California	No range assigned	

Table A4.28. MQ-9 Range Assignments.

WG	Unit	Location	Buddy Lase	Hellfire	Inertially Aided Munition	Laser Guided Bomb
			1	2	3	4
27 SOW	3 SOS	New Mexico	Melrose	Holloman		
27 SOW	33 SOS	New Mexico	Melrose	Holloman		
27 SOW	Det 1	Florida	Melrose	Holloman		
49 WG	9 ATKS	New Mexico	Holloman			
49 WG	16 TRS	New Mexico	Holloman			
49 WG	29 ATKS	New Mexico	Holloman			
53 WG	DET 4	Nevada	No range assigned			
118 WG	105 ATKS	Tennessee	No range assigned			
119 WG	178 ATKS	North Dakota	No range assigned			
132 WG	124 ATKS	Iowa	No range assigned			
147 WG	111 ATKS	Texas	No range assigned			
162 WG	214 ATKS	Arizona	No range assigned			
163 WG	196 ATKS	California	No range assigned			
174 ATW	138 ATKS	New York	Adirondack		Adirondack	
174 ATW	174 ATKS	New York	Adirondack		Adirondack	
188 FW	184 ATKS	Arkansas	No range assigned			
432 WG	11 ATKS	Nevada	No range assigned			
432 WG	15 ATKS	Nevada	No range assigned			
432 WG	17 ATKS	Nevada	No range assigned			
432 WG	18 ATKS	Nevada	No range assigned			
432 WG	22 ATKS	Nevada	No range assigned			
432 WG	42 ATKS	Nevada	No range assigned			
432 WG	89 ATKS	South Dakota	No range assigned			
432 WG	867 ATKS	Nevada	No range assigned			
703 AESG	DET 3	California	No range assigned			
USAFWS	26 WPS	Nevada	Nevada Test and Training Range			

Table A4.29. PC-12 Range Assignments.

WG	Unit	Location	Shortfield Procedures	Night Vision Goggle Air/Land	Semi-Prepared Surface Landing/Takeoff	Low Cost Low Altitude Airdrop	Night Vision Goggle Airdrop	Night Vision Goggle Insertion/Extraction
			1	2	3	4	5	6
1 SOW	34 SOS	Florida	96 TW (Eglin)					
1 SOW	319 SOS	Florida	96 TW (Eglin)					
AFSOAWC	19 SOS	Florida	96 TW (Eglin)					

Table A4.30. RC-135 Range Assignments.

WG	Unit	Location	1 Contingency	2 Sensitive Recon Operation	3 Suppression of Enemy Air Defenses Integration	4 Contested/Degraded Operations	5 Collection	6 Annual Combat Search and Rescue Integration Scenario	7 Electronic Warfare Activity
55 WG	38 RS	Nebraska	Nevada Test and Training Range				Belle Fourche	Nevada Test and Training Range	Belle Fourc
55 WG	45 RS	Nebraska	Nevada Test and Training Range				Belle Fourche	Nevada Test and Training Range	Belle Fourc
55 WG	338 CTS	Nebraska	Nevada Test and Training Range				Belle Fourche	Nevada Test and Training Range	Belle Fourc
55 WG	343 RS	Nebraska	Nevada Test and Training Range				Belle Fourche	Nevada Test and Training Range	Belle Fourc

Table A4.31. Small Unmanned Aerial System Range Assignments.

WG	Unit	Location	1 Unmanned Aerial System Training
AFSOAWC	Det 1, 371 SOCTS	Florida	96 TW (Eglin)

Table A4.32. Special Tactics Range Assignments.

WG	Unit	Location	1 Parachute Insertion	2 Parachute Insertion	3 Alternate Insertion/Extraction Operations	4 All Terrain/Tactical Vehicle Operations	5 Terminal Control Operations	6 Demolition	7 Combat/Tactical Operations	8 Small Unmanned Aerial System Operations	9 Assault Zone Operations	10 Medical/Combat Search and Rescue/Personnel
23 WG	58 RQS	Nevada	Nevada Test and Training Range									
24 SOW	23 STS	Florida	96 TW (Eglin)									
24 SOW	26 STS	New Mexico	Melrose									
24 SOW	720 STG	Florida	96 TW (Eglin)									
24 SOW	STTS	Florida	96 TW (Eglin)									
24 SOW	21 STS	North Carolina	Airburst									
123 AW	123 STS	Kentucky	No range assigned									

Table A4.33. T-38C Range Assignments.

WG	Unit	Location	1 Aerial Gunnery	2 10-degree Low Angle High Drag	3 10-degree Low Angle High Drag Pop	4 Strafe (high or low angle)	5 Visual Level Delivery
12 FTW	435 FTS	Texas	McMullen				
12 FTW	560 FTS	Texas	No range assigned				
14 FTW	49 FTS	Mississippi	No range assigned				
14 FTW	50 FTS	Mississippi	No range assigned				
47 FTW	87 FTS	Texas	No range assigned				
71 FTW	25 FTS	Oklahoma	No range assigned				
80 FTW	88 FTS	Texas	Falcon				
80 FTW	90 FTS	Texas	No range assigned				
96 TW	586 FLTS	New Mexico	No range assigned				
412 TW	418 FLTS	California	No range assigned				

Table A4.34. Tactical Air Control Party Range Assignments.

WG	Unit	Location	1 Ground Training (All)
AETC	Det 3, 342 TRS	Florida	96 TW (Eglin)

Table A4.35. U-28 Range Assignments.

WG	Unit	Location	1 Shortfield procedures	2 Night Vision Goggle Air Land	3 Semi-Prepared Surface Landing/Takeoff	4 Low Cost Low Altitude Airdrop	5 Night Vision Goggle Airdrop	6 Night Vision Goggle Insertion/Extraction	7 Intelligence, Surveillance, and Reconnaissance Training	8 Airland - Improved Surface	9 Airland - Unimproved Surface	10 Buddy Lase	11 Flare	12 Threat Event/Degraded Operations	13 Intelligence, Surveillance, and Reconnaissance Event with Ground
1 SOW	34 SOS	Florida	96 TW (Eglin)												
1 SOW	319 SOS	Florida	96 TW (Eglin)												
27 SOW	318 SOS	New Mexico	Melrose												
AFSOAWC	5 SOS	Florida	96 TW (Eglin)												
AFSOAWC	19 SOS	Florida	96 TW (Eglin)												
USAFWS	14 WPS	Florida	96 TW (Eglin)												

Table A4.36. UH-1N Range Assignments.

WG	Unit	Location	Helicopter Gunnery	Aerial Interdiction	Close Air Support
			1	2	3
11 WG	1 HS	Maryland	No range assigned		
58 SOW	512 RQS	New Mexico	Holloman		
582 HG	37 HS	Wyoming	No range assigned		
582 HG	54 HS	North Dakota	No range assigned		
96 TW	413 FLTS	Florida	No range assigned		
582 HG	40 HS	Montana	No range assigned		
374 AW	459 AS	Japan	No range assigned		
SURVIVAL SCHOOL	36 RS	Washington	No range assigned		

Attachment 5

RANGE PERSONNEL TRAINING

A5.1. General Training. All personnel assigned to the range who perform some or all of their duties on the range will be trained in or demonstrate adequate knowledge of the following subjects: **(T-1).**

A5.1.1. Local range operating procedures.

A5.1.2. Maintenance procedures and issues.

A5.1.3. Range stewardship (environmental awareness and protection).

A5.1.4. Hazardous materials/hazardous waste and local environmental procedures.

A5.1.5. Poisonous or dangerous fauna and flora.

A5.1.6. Local weather hazards.

A5.1.7. Range fire protection/fire suppression procedures.

A5.1.8. Aircraft crash procedures.

A5.1.9. Local safety, emergency, and contingency procedures.

A5.1.10. Basic first aid procedures.

A5.1.11. Explosive and other ordnance hazards (EOD safety briefing).

A5.1.12. Range access control and security procedures.

A5.1.13. Laser safety (only for ranges that have been certified for laser operations).

A5.2. Range Operating Authority Training. As a minimum, the range operating authority will be trained in or demonstrate adequate knowledge of the following publications or subjects: **(T-1).**

A5.2.1. National Environmental Policy Act.

A5.2.2. Risk communication.

A5.2.3. Public affairs.

A5.2.4. WDZ and SDZ Program.

A5.2.5. EOD briefing on the proper handling of training munitions.

A5.2.6. Overall range safety.

A5.2.7. AFI 13-212, as supplemented.

A5.2.8. Intermediate command instructions and manuals applicable to range “operations”.

A5.2.9. AFI 11-202, Volume 3, *General Flight Rules*.

A5.2.10. AFI 11-214.

A5.3. Range Operations Officer Training. As a minimum, the range operations officer will be trained in or demonstrate adequate knowledge of the following publications or subjects (test sites not conducting air operations are exempt for the items indicated by *): **(T-1).**

A5.3.1. Wing scheduling.

A5.3.2. Defense Acquisition University's Contracting Officer's Representative Course 222 (not applicable for the ANG).

A5.3.3. Unit Level On-Scene Mishap Investigation Commander.

A5.3.4. National Environmental Policy Act.

A5.3.5. Risk communication.

A5.3.6. AFI 11-202, Volume 3.*

A5.3.7. AFI 11-214.*

A5.3.8. Aircraft specific AFI 11-2MDS series.*

A5.3.9. Unimproved landing zone and drop zone operations, as applicable.*

A5.3.10. Local airspace configuration.

A5.3.11. AFI 13-212, as supplemented.

A5.3.12. Approved range construction and maintenance methods.

A5.3.13. Intermediate command instructions and manuals applicable to range "operations".

A5.3.14. Range control officer authority and responsibilities.

A5.3.15. Range utilization report/range record keeping.

A5.3.16. EOD briefing on the proper handling of training munitions.

A5.3.17. Unit Safety Officer or designated Laser Safety Officer training.

A5.3.18. WDZ and SDZ Program.

A5.3.19. Proper use and handling of applicable ground launched visual threats.

A5.4. Range Control Officer / Test Area Control Officer Training. As a minimum, the range control officer/test area control officer will be trained in or demonstrate adequate knowledge of the following publications or subjects (test sites not conducting air operations are exempt for the items indicated by *): **(T-1).**

A5.4.1. Wing scheduling.

A5.4.2. Unit level on-scene mishap investigation commander.

A5.4.3. Public affairs.

A5.4.4. AFI 11-202, Volume 3.*

A5.4.5. AFI 11-214.*

A5.4.6. Aircraft specific AFI 11-2MDS series.*

A5.4.7. Unimproved landing zone and drop zone operations, as applicable.*

A5.4.8. Local airspace configuration.

A5.4.9. AFI 13-212, as supplemented.

A5.4.10. Intermediate command instructions and manuals applicable to range "operations".

A5.4.11. Range control officer/Test Area Control Officer authority and responsibilities.

A5.4.12. Day/night aircraft ordnance delivery patterns for all aircraft using the range.*

A5.4.13. Obtain and interpret weather observations.

A5.4.14. Required weather minimums for each event.

A5.4.15. Use of the Avian Hazard Advisory System (Avian Hazard Advisory System, **http://www.usahas.com**).*

A5.4.16. Foul criteria.

A5.4.17. Communications procedures.

A5.4.18. Capabilities and limitations of range facilities.

A5.4.19. Hazard areas, pattern safety, WDZ, SDZ, and overall range safety.

A5.4.20. Range utilization report/range record keeping.

A5.4.21. EOD briefing on the proper handling of training munitions.

A5.4.22. Night operations.

A5.4.23. NVD training (if applicable) to include: human visual system, physiological issues, NVD adjustment, care, use and limitations, disorientation, and aircrew limitations as a minimum.

A5.4.24. Proper use and handling of applicable ground launched visual threats.

A5.4.25. On-Range Training. A qualified range control officer/range operations officer will supervise on-range range control officer training. **(T-1).** A qualified Test Area Control Officer/range control officer/range operations officer will supervise test site Test Area Control Officer training. **(T-1).** The range operating authority will develop a checklist to ensure complete and professional training. **(T-1).** Emphasize the use of sound judgment and common sense while controlling both aircraft and personnel during range operations. The on-range training should include the following items as a minimum: **(T-1).**

A5.4.25.1. Range hazard areas.

A5.4.25.2. Inspection of strafe impact areaimpact areas.*

A5.4.25.3. Range fire protection/fire suppression procedures.

A5.4.25.4. Aircraft crash procedures.*

A5.4.25.5. First aid and evacuation of injured personnel.

A5.4.25.6. Traffic conflict with other ranges in the area.

A5.4.25.7. Range pattern spacing.*

A5.4.25.8. Minimum altitude measuring devices.*

A5.4.25.9. Cease fire distance estimation for low angle strafe.*

A5.4.25.10. Foul criteria and procedures.

A5.4.25.11. Bomb plotting and electronic strafe scoring equipment.*

A5.4.25.12. Radio, other communications, and tape recorder operation.

A5.4.25.13. Lost communications procedures.

A5.4.25.14. Overall range safety.

A5.4.25.15. Night, laser, and tactical range operations (if applicable).

A5.4.25.16. Training on WDZ and SDZ tool applications.

A5.4.25.17. Proper use and handling of applicable ground launched visual threats.

A5.5. Range Training Officer Training. As a minimum, the Range Training Officer will be trained in or demonstrate adequate knowledge of the following publications or subjects: **(T-1).**

A5.5.1. AFI 11-202, Volume 3.

A5.5.2. AFI 11-214.

A5.5.3. Aircraft specific AFI 11-2MDS series.

A5.5.4. AFI 13-212, as supplemented.

A5.5.5. Intermediate command instructions and manuals applicable to range "operations".

A5.5.6. Range Training Officer authority and responsibilities.

A5.5.7. Capabilities and limitations of Air CTS facilities and systems.

A5.6. Electronic Warfare Personnel Training. As a minimum, the electronic warfare personnel (government or contracted support) will be trained in or demonstrate adequate knowledge of the following publications or subjects: **(T-1).**

A5.6.1. AFI 11-202, Volume 3.

A5.6.2. AFI 11-214.

A5.6.3. Aircraft specific AFI 11-2MDS series.

A5.6.4. Aircraft specific RAP tasking messages or Volume 1 training requirements.

A5.6.5. AFI 13-212, as supplemented (applicable sections).

A5.6.6. Intermediate command instructions and manuals applicable to range "operations".

A5.6.7. Local electronic warfare equipment operating restrictions.

A5.6.8. Capabilities and limitations of Air CTS facilities.

A5.6.9. Range safety.

A5.6.10. Electronic warfare equipment operating procedures for the applicable range equipment.

A5.6.11. Current scenarios/equipment uses and aircrew-developed timelines as directed by the range operating authority.

Attachment 6 (Added-AETC)

AIR COMBAT TRAINING SYSTEM REIMBURSABLE EXPENDITURE REPORT FORMAT

Figure A6.1. (AETC) Air Combat Training System Reimbursable Expenditure Report Format.

OVERTIME	EXPENDITURE	BALANCE
Starting		$22,000.00
DECEMBER	$1,760.89	$20,239.11
JANUARY	$2,856.39	$17,382.72
FEBRUARY		$17,382.72
MARCH		$17,382.72
APRIL		$17,382.72
MAY		$17,382.72
JUNE		$17,382.72
JULY		$17,382.72
AUGUST		$17,382.72
SEPTEMBER		$17,382.72
OCTOBER		$17,382.72
NOVEMBER		$17,382.72

EQUIPMENT	EXPENDITURE	BALANCE
Starting		$50,000.00
DECEMBER	$2,485.69	$47,514.31
JANUARY	$769.96	$46,744.35
FEBRUARY		$46,744.35
MARCH		$46,744.35
APRIL		$46,744.35
MAY		$46,744.35
JUNE		$46,744.35
JULY		$46,744.35
AUGUST		$46,744.35
SEPTEMBER		$46,744.35
OCTOBER		$46,744.35
NOVEMBER		$46,744.35

TRAVEL	EXPENDITURE	BALANCE
Starting		$20,000.00
DECEMBER	$1,150.59	$18,849.41
JANUARY	$1,896.25	$16,953.16
FEBRUARY		$16,953.16
MARCH		$16,953.16
APRIL		$16,953.16
MAY		$16,953.16
JUNE		$16,953.16
JULY		$16,953.16
AUGUST		$16,953.16
SEPTEMBER		$16,953.16
OCTOBER		$16,953.16
NOVEMBER		$16,953.16

GSA VEHICLE	EXPENDITURE	BALANCE
Starting		$28,000.00
DECEMBER	$4,750.15	$23,249.85
JANUARY	$2,580.39	$20,669.46
FEBRUARY		$20,669.46
MARCH		$20,669.46
APRIL		$20,669.46
MAY		$20,669.46
JUNE		$20,669.46
JULY		$20,669.46
AUGUST		$20,669.46
SEPTEMBER		$20,669.46
OCTOBER		$20,669.46
NOVEMBER		$20,669.46

Base Sheet3

Attachment 7 (Added-AETC)

RCO QUALIFICATIONS, REQUIREMENTS AND TRAINING

A7.1. (AETC) Experience. RCOs must have experience in at least one of the following areas:

A7.1.1. **(AETC)** Military experience in the tactical air delivery of air-to-ground ordnance and munitions.

A7.1.2. **(AETC)** Military or civilian experience in the management, supervision, or control of air operations in the military environment of a conventional or tactical range.

A7.1.3. **(AETC)** Military or civilian experience in the management, supervision, or control of air operations in the military environment of an airfield, including fighter or conventional bomber operations.

A7.2. (AETC) Qualifications. RCOs must possess the following qualifications:

A7.2.1. **(AETC)** Dependent upon specific local range communications assets, the ability to operate ultra-high frequency (UHF), very high frequency (VHF), citizen‘s band (CB), frequency modulation (FM), and telephonic two-way communications equipment.

A7.2.2. **(AETC)** A working knowledge of range scoring systems, range target systems, and emergency response actions.

A7.2.3. **(AETC)** Familiarity with the general classes and types of aircraft and ordnance expected to be employed at the range and the general classes and types of pattern deliveries that may be employed.

A7.2.4. **(AETC)** The ability to assimilate a variety of information in a dynamic environment and react with sound decisions and judgment while adhering to established practices and procedures.

A7.3. (AETC) Physical Requirements. RCOs must have:

A7.3.1. **(AETC)** Vision correctable to 20/20 and the ability to distinguish primary colors.

A7.3.2. **(AETC)** Normal depth perception.

A7.3.3. **(AETC)** Full use of both hands and arms.

A7.3.4. **(AETC)** Normal hearing.

A7.3.5. **(AETC)** The ability to climb up steps to a height of 120 feet.

A7.3.6. **(AETC)** The ability to lift dead weights up to 60 pounds.

A7.3.7. **(AETC)** The ability to maintain civilian and government driver’s licenses.

A7.4. (AETC) RCO Records. RCO records will be kept with the contractor. These records will reflect the training and qualifications of all RCOs and will be available for review as required. As a minimum, each RCO’s records will include:

A7.4.1. **(AETC)** Section 1: Personnel Data.

A7.4.2. **(AETC)** Section 2: RCO Certification and Currency Documentation.

A7.4.3. **(AETC)** Section 3: Academic, On-Range, and Demonstration Training.

A7.4.4. **(AETC)** Section 4: Evaluations.

A7.4.5. **(AETC)** Section 5: Supplemental Data.

A7.4.6. **(AETC)** Section 6: Certification of Annual Physical Examination.

A7.5. (AETC) Academic Training. Academic training programs for RCOs will include the following items, as applicable: (**Note:** Range RCO checklists and training will also include potential traffic conflicts with other ranges in the complex or nearby airspace and combat laser and safety procedures, as applicable).

A7.5.1. **(AETC)** Safety.

A7.5.2. **(AETC)** Range security.

A7.5.3. **(AETC)** RCO authority and responsibility.

A7.5.4. **(AETC)** Range weather minimums.

A7.5.5. **(AETC)** Communications procedures.

A7.5.6. **(AETC)** Aircraft ordnance delivery patterns.

A7.5.7. **(AETC)** Foul criteria.

A7.5.8. **(AETC)** Range facilities.

A7.5.9. **(AETC)** Pattern safety.

A7.5.10. **(AETC)** Range records maintenance.

A7.5.11. **(AETC)** Handling of training munitions.

A7.5.12. **(AETC)** Radio operations.

A7.5.13. **(AETC)** In-flight emergency.

A7.5.14. **(AETC)** Tape recorder operations.

A7.5.15. **(AETC)** WISS/IRSSS operations.

A7.5.16. **(AETC)** Minimum altitude measuring devices.

A7.5.17. **(AETC)** Dive angle references.

A7.5.18. **(AETC)** Fire control and suppression.

A7.5.19. **(AETC)** Crash and rescue operations.

A7.5.20. **(AETC)** Tactical range operations.

A7.5.21. **(AETC)** Night operations.

A7.5.22. **(AETC)** Traffic conflicts with other ranges.

A7.5.23. **(AETC)** Pattern spacing.

A7.5.24. **(AETC)** Strafe impact area inspections, maintenance, berms, scoring devices.

A7.5.25. **(AETC)** Helicopter operations.

A7.5.26. **(AETC)** Divert procedures.

A7.5.27. **(AETC)** General Aviation corridor (If applicable).

A7.5.28. **(AETC)** Automated range scoring systems.

A7.5.29. **(AETC)** Combat laser operations and safety procedures.

A7.5.30. **(AETC)** Generator operations.

A7.6. (AETC) RCO Certification. RCO certification requires a written examination, an on-range demonstration, and a memorandum of certification.

A7.7. (AETC) RCO Written Examination.

A7.7.1. **(AETC)** An open-book, written examination, consisting of 35 randomly selected, multiple- choice questions, will be administered by an RCO supervisor. The examination will cover the topics and publications listed in paragraph **A7.5**.

A7.7.2. **(AETC)** A passing score is 85 percent, corrected to 100 percent.

A7.7.3. **(AETC)** The RCO will be immediately decertified if he or she fails the written examination. If the RCO fails a second time, he or she must re-accomplish the entire RCO training program. If the RCO fails a third time, he or she will be dismissed from performing RCO duties.

A7.8. (AETC) On-Range Demonstration. The on-range demonstration involves observing a qualified RCO display the proper methods and techniques for controlling aircraft during air-to-ground operations. After observing a qualified RCO control at least four flights on the range (two at night), the upgrading RCO will control four flights (two at night) under the supervision of a qualified RCO. Day qualification is a prerequisite for night qualification. If four-ship formations frequent the range, the upgrading RCO must also control at least one of these during the on- range demonstration.

A7.9. (AETC) RCO Currency. To maintain currency, each RCO must:

A7.9.1. **(AETC)** Complete initial qualification and certification training.

A7.9.2. **(AETC)** Perform RCO duty at least once every 90 days (once a year for fighter aircrew).

A7.9.3. **(AETC)** Successfully complete the RCO written examination once every 12 months.

A7.10. (AETC) RCO Recurrency. If an RCO becomes noncurrent, he or she must regain currency according to paragraph **A7.9**. Recurrency actions will be documented. The governing group commander or ROA may waive RCO currency, but only under unusual circumstances. Any waivers will be in writing and for a period not to exceed 24 hours.

A7.11. (AETC) RCO Evaluations. The governing group commander or designated representative will select qualified people to make periodic, no-notice visits to the range to evaluate the on duty RCO. Evaluations will be documented.

A7.12. (AETC) RCO Certification Training Period. The certification training period and requirements vary with each range, but upgrading RCOs will be certified within 30 workdays.

A7.13. (AETC) Air-to-Air (A/A) RCO Program (If applicable). The A/A RCO program applies to combat crew training (CCT) units involved in aerial gunnery. A/A RCOs must be CCT

instructors selected by their squadron commander and certified by the governing group commander or designated representative. The following requirements apply to the program:

A7.13.1. **(AETC)** Academic training, supervised by the squadron weapons officer, will include:

A7.13.1.1. **(AETC)** AQ, Range Planning and Operation.

A7.13.1.2. **(AETC)** Applicable mission design series (MDS)-specific Air Force tactics, techniques, and procedures (AFTTP) publications.

A7.13.1.3. **(AETC)** Applicable MDS-specific, AFI 11-2XX publications.

A7.13.1.4. **(AETC)** Applicable MAJCOM publications.

A7.13.1.5. **(AETC)** Limits and sources of RCO authority and responsibility.

A7.13.1.6. **(AETC)** Aerial gunnery weather minimums.

A7.13.1.7. **(AETC)** Communications procedures.

A7.13.1.8. **(AETC)** Foul criteria.

A7.13.1.9. **(AETC)** Hazards and towed target range safety.

A7.13.2. **(AETC)** Certification will include:

A7.13.2.1. **(AETC)** An open-book, written examination on the topics listed in paragraph **A7.5**.

A7.13.2.2. **(AETC)** A passing score of 85 percent, corrected to 100 percent.

A7.13.2.3. **(AETC)** Documentation in the Aviation Resource Management System (ARMS) if available. If ARMS is not available, this documentation will be placed in the aircrew's training folder.

A7.13.3. **(AETC)** The A/A RCO will brief all applicable training rules during the preflight DART briefing.