

# DDESB

## Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern-Related Activities



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**Department of Defense Explosives Safety Board**

**Alexandria, Virginia**

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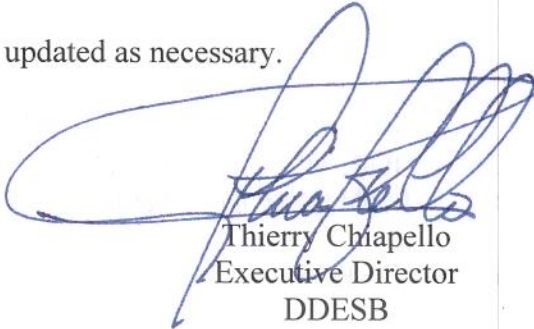
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## FORWARD

Effective 1 October 2015, Technical Paper (TP) 18, "Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern-Related Activities," supersedes TP 18, "Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel" dated December 2004. Existing contracts will continue to apply the provisions of TP 18 dated December 2004 until completion of the current contract; with exception of options which are effective after 1 October 2015.

Department of Defense Explosives Safety Board (DDESB) Technical Paper (TP) 18 provides the minimum qualification standards for personnel conducting munitions and explosives of concern (MEC)-related activities in support of the Department of Defense.

This document will be updated as necessary.



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## CHAPTER 1

### INTRODUCTION

#### 1.1. GENERAL

a. This technical paper (TP) provides minimum qualification standards, established by the DoD Explosives Safety Board (DDESB), for personnel who:

(1) Support munitions and explosives of concern (MEC)-related activities:

(a) Support workers (SW).

(b) Sweep personnel (SP).

(2) Conduct or supervise MEC-related activities:

(a) Unexploded ordnance technicians (UXOTs).

(b) UXO qualified personnel (UXOQP).

b. MEC-related activities include, but may not be limited to:

(1) Munitions responses to MEC.

(2) Operational range clearance-related activities.

(3) Similar operations that involve the intentional physical contact with MEC including:

(a) Chemical military munitions and chemical agents (CAs) in other than a munitions configuration (collectively referred to as “chemical warfare materiel (CWM)”).

(b) Ground-disturbing or other intrusive activities in areas known or suspected to contain MEC.

c. During MEC-related activities, personnel may be exposed to explosive or CA hazards (collectively referred to as “explosive hazards”) posed by MEC (e.g., UXO, discarded military munitions (DMM)) and associated material potentially presenting an explosive hazard (MPPEH). Collectively, these activities and operations are referred as “MEC-related activities.”

d. Personnel must, commensurate with their duties, meet the minimum qualification standards of this TP when:

(1) Performing or supervising operations when intentional physical contact with MEC is planned or will occur.

(2) Conducting ground-disturbing or other intrusive activities in areas known or suspected to contain MEC.

e. Personnel who support, conduct, or supervise MEC-related activities who do not meet the minimum qualification standards of Tables 4.1, 4.2, or 4.3 must not have direct contact with MEC or MPPEH encountered during MEC-related activities until the material has been evaluated and determined not to pose an explosive hazard. SWs (e.g., geophysicists, vehicle operators, guards):

(1) Must be provided explosives safety education (e.g., DoD recognize, retreat, report (3Rs) explosives safety education training) before being allowed in areas known or suspected to contain MEC.

(2) May require escort by a UXOT (see Paragraph 2.2.b.(1)(k)) or UXOQP.

## 1.2. APPLICABILITY

a. These requirements apply to:

(1) DoD personnel that perform MEC-related activities.

(2) Contractors performing MEC-related activities under:

(a) DoD contracts.

(b) State and other federal contracts, when the application of these requirements were stipulated or agreed on in property transfer documents (e.g., Finding of Suitability for Early Transfer) and/or agreements (e.g., Environmental Services Cooperative Agreements) between DoD and a State or other federal agency.

(3) DoD personnel or contractors conduct ground-disturbing or other intrusive activities funded by the DoD in areas known or suspected to contain MEC, and activities involving the intentional physical contact with MEC, except as specified in Paragraph 1.2.b.

b. These requirements do not apply to:

(1) DoD explosive ordnance disposal (EOD) operations.

(2) Personnel performing duties directly related to quality assurance (QA) surveillance testing or research, development, test and evaluation (RDT&E).

(3) Explosives workers such as personnel involved in the decontamination or demolition of explosives-contaminated buildings or infrastructure.



(4) Operational and former ranges for which it is confirmed based on physical or historical evidence that the only munitions-related activities that occurred on the range were ones that involved live-fire training or testing with small arms ammunition. However, personnel working on such ranges will at a minimum be provided explosives safety education (e.g., DoD recognize, retreat, report (3Rs) explosives safety education training), which must include recognition of military munitions.

(5) Other entities (e.g., commercial developers, contractors) performing MEC-related activities under contract with a State or other federal entities. However, the DDESB recommends the State or federal entity require their application.

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## CHAPTER 2

### MEC-RELATED ACTIVITIES PERSONNEL – POSITION TITLES, DUTIES AND RESPONSIBILITIES

#### 2.1. GENERAL

a. Training levels and work experience of the following personnel must be documented and verifiable:

**(1) MEC-Related Activities Support Personnel**

(a) SW

(b) SP (see 294951 in the appendix to this chapter)

**(2) UXOT**

(a) UXO-Technician I (UXO-TI) (see 29491 in the appendix to this chapter)

(b) UXO-Technician II (UXO-TII) (by definition are also UXOQP) (see 29492 in the appendix to this chapter)

(c) UXO-Technician III (UXO-TIII) (by definition are also UXOQP) (see 29493 in the appendix to this chapter)

**(3) UXOQP**

(a) UXO Quality Control Specialist (UXOQCS)

(b) UXO Safety Officer (UXOSO)

(c) Senior UXO Supervisor (SUXOS)

**(4) Dive Qualified Personnel**

b. DoD activities and DoD contractors performing MEC-related activities are responsible for ensuring personnel employed meet the qualifications specified in this TP.

c. Personnel assigned to support MEC-related activities that are only responsible for supervising (e.g., dive master) or supporting (e.g., dive tender) dive operations from the surface are not required to be a UXOT or meet the criteria of UXOQP. When performing MEC-related activities, such personnel must also meet the qualification criteria for the task performed.

d. Under certain circumstances, the duties of a UXOSO and UXOQCS may be filled by a single individual who meets the training and experience requirements for both positions. If not explicitly specified in the contracting documents or applicable Service guidance, site-specific decisions allowing performance of the duties by a single individual will be provided in writing by the government contracting officer's representative on advice of government explosives safety personnel and in coordination with the contractor.

e. UXOTs and UXOQP must meet the applicable requirements of 18 United States Code (U.S.C.) 842 as amended by the Bureau of Alcohol, Tobacco, Firearms and Explosives in 27 Code of Federal Regulations (CFR) 555.26 and State requirements. Personnel who do not meet these requirements will not be provided access to explosives.

f. Personnel supporting or conducting MEC-related activities may be required to possess specific or specialized licenses (e.g., a commercial or specialized vehicle driver's license, state blasters license), hazardous material endorsements, or be included in a medical monitoring program. (See 29 CFR 1910.120.)

g. Personnel who are working at a hazardous waste site may require successful completion of 40 hours of hazardous waste operations and emergency response (HAZWOPER) training per 29 CFR 1910.120.

**2.2. DUTIES AND RESPONSIBILITIES.** This chapter identifies and describes positions by title and outlines the duties and responsibilities of each position. Although this chapter addresses some qualifications, Chapters 3 and 4 present detailed qualifications and training requirements.

**a. MEC-Related Activities Support.** Personnel who are not UXOTs or UXOQP, but support MEC-related activities, perform a variety of tasks (e.g., brush-cutting, operating heavy equipment, surveying, site security, dive tenders) required to support the safe conduct of MEC-related activities.

**(1) SW**

(a). Must be provided general and site-specific training. At a minimum, this must include:

1. General and site-specific safety. Such training includes, but may not be limited to the proper use of equipment and personal protective equipment (PPE); physical, biological, and chemical hazards; and the potential hazards associated with the tasks they are to perform.

2. Explosives safety training. Recognition of munitions; raw, possibly weathered explosives (e.g., trinitrotoluene (TNT), propellants); and chemical agent identification sets (CAIS) and the actions that should be taken should a suspect munition be encountered (e.g., 3Rs).

(b) SW will:

1. Not conduct activities (e.g., ground disturbing) that could result in physical contact with MEC, including CWM, CAIS, or MPPEH unless protected or escorted.

2. When determined necessary by a risk assessment, be shielded from the potential explosive hazards associated with MEC known or suspected to be present within the site (e.g., heavy equipment operators).

3. Be escorted by a UXOT (see Paragraph 2.2.b.(1)(k)) or UXOQP within areas known or suspected to contain MEC, when determined necessary by a risk assessment that considers the support or tasks they are to perform. Escorts will help ensure MEC on the surface, and subsurface anomalies are avoided. Support activities performed by SW who may require escort include:

a. Conducting geophysical surveys and similar activities.

b. Clearing vegetation from areas where surface MEC is known or suspected to be present.

c. Operating heavy equipment.

d. Performing site or area security functions requiring access to areas where surface MEC is known or suspected to be present or MEC-related operations are being conducted.

**(2) SP.** The SP must:

(a) Assist UXOT and UXOQP in the performance of MEC-related activities but are not involved in explosive operations.

(b) Provide general and site-specific training. At a minimum, this must include:

1. General and site-specific safety. Such training includes, but may not be limited to the proper use of equipment and PPE; physical, biological, and chemical hazards; and the potential hazards associated with the tasks they are to perform.

2. Explosives safety training. Recognition of military munitions; raw, potentially weathered explosives (e.g., TNT, propellants); and CAIS and actions that should be taken should a munition or suspect munition be encountered (e.g., 3Rs).

(c) Not be allowed to conduct activities that could result in physical contact with MEC, including CWM or CAIS; material documented as an explosive hazard (MDEH); and MPPEH, unless the MPPEH has received an initial inspection by UXOQP who determined the risk of movement is acceptable.

(d) Be supervised or, if required, escorted by a UXOT (see Paragraph 2.2.b.(1)(k)) or UXOQP within areas known or suspected to contain MEC. The need for an escort is determined by a risk assessment that considers the support or tasks to be performed. Escorts will help ensure MEC and MPPEH on the surface, and subsurface anomalies are avoided.

(e) Be supervised by a UXO-TIII or above when performing activities in areas where there is a medium to high probability that MEC will be encountered, as determined by a risk assessment. Activities that may be performed by SP include:

1. Conducting visual or technology-aided sweeps for surface MEC.
2. Conducting geophysical surveys for subsurface anomalies.
3. Performing, when necessary, field maintenance and/or function checks on geophysical instruments and related equipment within an area known or suspected to contain MEC.
4. Moving MPPEH (e.g., munitions debris and range-related debris) that has received an initial inspection by UXOQP who determined the risk of movement is acceptable for further inspection or processing per approved DDESB procedures.

**b. UXOT.** These personnel perform a variety of MEC-related activities.

**(1) UXO-TI.** When directed or supervised by a UXOQP, must be able to:

- (a) Investigate for and classify MEC and MPPEH, including identifying explosive residues in media (soil, oil, etc.), buildings and installed equipment.
- (b) Identify different types of military munitions, including identifying whether a military munition's fuze is armed or unarmed.
- (c) Excavate subsurface anomalies for identification.
- (d) Move (e.g., consolidate) MEC, specifically UXO or DMM, within a munitions response site (MRS) or on an operational range after the UXOSO and SUXOS have jointly evaluated and determined the risk of movement to be acceptable.
- (e) Operate vehicles transporting explosives, MPPEH or MDEH on site. (Individuals must be appropriately licensed for the class of vehicle being operated.)
- (f) Transport military munitions, commercial explosives, and/or MDEH that meets the above criteria that has been determined safe for transport over public traffic routes (PTR). Such munitions and explosives must be packaged in a manner that allows their safe transport and complies with Department of Transportation (DOT) and other applicable federal and State laws, and DoD policies. (Note: Only UXO determined to be safe for transport by EOD personnel may be transported over a PTR.)

(g) Prepare electric and non-electric firing systems.

(h) Set up decontamination stations and decontaminate CA-contaminated personnel, military munitions and other material of interest (e.g., munitions debris, glass vials) per approved plans. The performance of these functions may require additional training.

(i) Assist UXOQP in documenting the explosives safety status of MPPEH.

(j) Construct engineering controls (protective works).

(k) Escort personnel who are not directly involved in MEC-related activities (e.g., SW, SP, visitors to cultural sites) on property known or suspected to contain MEC, but have an operational requirement and authorization to access such property. Although escort by a UXO-TI is typically performed under the supervision of a UXOQP, the responsible commander or authority may approve UXO-TI personnel to perform escort duties without supervision. Such approval must be, based on an approved risk assessment and implementation of methods to mitigate potential exposures.

**(2) UXO-TII.** Must be able to:

(a) Perform the functions of a UXO-TI.

(b) Store explosive materials per applicable guidance, including preparing on-site holding areas to temporarily store and secure MEC or MPPEH, and other explosives (e.g., donor charges).

(c) Determine, using a variety of techniques (e.g., global positioning equipment, land navigation techniques), and record the location of subsurface anomalies, surface MEC and other material of interest in a field environment.

(d) Perform field-collection and -testing procedures to identify explosives-contaminated media or material (e.g., equipment used for the load-assemble-pack of military munitions).

(e) Inspect and document the explosives safety status of MPPEH.

(f) Supervise, as required, SW, SP, and UXO-TI.

**(3) UXO-TIII.** Must be able to:

(a) Perform the functions of a UXO-TI and UXO-TII.

(b) Ensure compliance with a DoD Military Service- and/or DDESB-approved required explosives safety submissions (RESS).

(c) Supervise and perform on-site destruction or demilitarization of MEC in place or at a consolidated detonation site. This includes determining where and when it is safe to initiate destruction and when engineering controls are required to mitigate the effects of a detonation.

(d) Implement an explosives storage plan per applicable guidance.

(e) Prepare administrative reports required for munitions responses (e.g., daily UXO team report), operational range clearance activities and similar operations.

(f) Develop and implement standard operating procedures and work plans for munitions responses and operational range clearance activities.

(g) Assist in the preparation of risk and hazard analyses.

(h) Conduct daily site safety briefings.

(i) Supervise the conduct of the different types of MEC-related activities performed at a site.

(j) Determine if MDEH, which is not known or suspected to be UXO, is safe to ship and properly documented for transport over PTR per Technical Bulletin 700-2, Naval Sea Systems Command Instruction 8020.8C, Technical Order 11A-1-47.

(k) Package military munitions, commercial explosives, and MDEH that has been determined safe for transport over PTR.

(l) Serve as UXO team leader.

**c. UXOQP.** These personnel conduct, manage or oversee MEC-related activities (e.g., reacquire and investigate anomalies, document explosives safety status of materials) required during munitions responses and operational range clearance activities and/or verify the completion of such responses and activities safely and per applicable requirements and approved plans. By definition, UXO-TII and UXO-TIII are considered both UXOTs and UXOQP.

**(1) UXOQCS.** Must be able to:

(a) Perform the functions of a UXOT.

(b) Develop and, upon approval, implement the project's quality control (QC) plan for MEC-related activities per applicable requirements.

(c) Conduct and document QC audits of MEC-related activities for compliance with applicable requirements.

(d) Identify, document, report and ensure completion of corrective actions to ensure MEC-related activities comply with applicable requirements.



(e) Ensure compliance with a DoD Military Service – and/or DDESB-approved RESS.

(f) Prepare QC reports.

**(2) UXOSO.** Must be able to:

(a) Perform the functions of UXOT.

(b) Develop and, upon approval, implement explosives and health and safety plans and programs per applicable DoD, federal, State, and local requirements.

(c) Ensure compliance with a DoD Military Service- and/or DDESB-approved RESS.

(d) Analyze the potential risks (e.g., operational, explosives safety, general safety) associated with MEC-related activities and develop and implement required, mitigating measures.

(e) Establish and ensure compliance with site-specific explosives safety requirements, including, but not limited to:

1. Enforcing personnel limits and explosives safety quantity distance (ESQD) arcs for explosive-related operations.

2. Conducting, documenting, and reporting the results of safety inspections and ensuring implementation of corrective actions.

3. Ensuring protective works and safety equipment within an exclusion zone are used, when required; and operated per manufacturer's specifications, applicable DDESB approvals, DoD policy, and federal, State, or local statutes, regulations, and codes.

(f) Ensure that air-monitoring equipment is operated and maintained properly at sites with known or potential airborne contaminants (e.g., CWM sites).

(g) Evaluate the risk of movement (e.g., consolidation) of MEC within an MRS or on an operational range with the SUXOS, and provide approval for movement by UXOT when the risk of movement is determined to be acceptable.

**(3) SUXOS.** Must be able to:

(a) Perform the functions of a UXOT, UXOQCS, and UXOSO.

(b) Ensure compliance with a DoD Military Service- and/or DDESB-approved RESS.

(c) Plan, coordinate, and supervise all on-site munitions response and operational range clearance activities.

(d) Supervise up to ten UXO teams.

(e) Assist in development of required plans (e.g., health and safety plans).

(f) Review all field reports (e.g., daily reports, audits) and approve UXO team reports.

(g) Evaluate the risk of movement of UXO or DMM within an MRS or operational range with the UXOSO, and provide approval for movement by UXOT when the risk of movement is determined to be acceptable.

**d. Dive-Qualified Personnel.** Some MEC-related activities require personnel also be dive-qualified. Divers who are performing the duties of a UXOT or UXOQP must meet this TP's criteria for the duties performed and possess the dive-related certifications required for the tasks they are to perform or supervise. An SUXOS, UXOSO, or UXO-TIII providing supervision of MEC-related activities from the surface do not need to possess diver certification.

(1) Dive-qualified personnel will meet the requirements of 29 CFR 1910, Subpart T, and possess either:

(a) Dive-related certifications (e.g., dive master, surface-supplied air diver, surface supplied mixed-gas diver), as required for the tasks they are to perform or supervise, from an Association of Commercial Diving Educators (ACDE)-accredited school whose curriculum meets the America National Standards Institute (ANSI) Standard ANSI/ACDE-01; or

(b) A training certificate with a valid Association of Diving Contractors (ADC) Commercial Diver Certification Card for the appropriate training level.

(2) Divers who are performing MEC-related activities underwater must at a minimum meet the qualifications for a UXO-T1. Such divers may be provided guidance from an SUXOS, UXOSO, or UXO-TIII on the surface. This requires that the individual providing the guidance have real-time voice communication with the diver and real-time visual or imaging for confirmation of the material (e.g., military munitions, munitions debris) the diver is encountering. An SUXOS, UXOSO, or UXO-TIII providing supervision of MEC-related activities from the surface do not need to possess diver certification.

## APPENDIX

### DEPARTMENT OF LABOR, SERVICE CONTRACT ACT DIRECTORY OF OCCUPATIONS - UXO POSITION DESCRIPTIONS<sup>1</sup>

#### A.1. 29491 UXO-TI

a. Assists in:

(1) Performing reconnaissance and classification of UXO.

(2) Identifying U.S. and foreign guided missiles, bombs and bomb fuzes, projectiles and projectile fuzes, grenades and grenade fuzes, rockets and rocket fuzes, land mines and associated components, pyrotechnic items, military explosives, and demolition materials.

b. Performs location of subsurface UXO using military and/or civilian magnetometers.

(1) Assists in performing excavation procedures on buried UXO.

(2) Performs operator maintenance of military and/or civilian magnetometers.

(3) Locates surface UXO using visual means.

(4) Assists in transporting and storing UXO and demolition materials.

c. Assists in:

(1) Preparing non-electric firing system for a UXO disposal operation.

(2) Preparing electric firing system for a UXO disposal operation disposing of ammunition/ explosives by burning; disposing of ammunition/explosives by detonation.

(3) Operating a personnel decontamination station. Dons and doffs appropriate personal protective equipment in contaminated areas. Assists in the inspection of salvage UXO-related material and erection of UXO-related protective works.

#### A.2. 29492 UXO-TII

a. Performs reconnaissance and classification of UXO. Identifies U.S. and foreign guided missiles, bombs and bomb fuzes, projectiles and projectile fuzes, grenades and grenades fuzes rockets and rocket fuzes, land mines and associated components, pyrotechnics, military explosives, and demolition materials.

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<sup>1</sup> Refer to <http://www.dol.gov/whd/regs/compliance/wage/> for the current versions of these descriptions.

b. Locates subsurface UXO using military and/or civilian magnetometers.

(1) Performs excavation procedures on buried UXO by manual means; mechanical means.

(2) Performs operator maintenance of military and/or civilian magnetometers.

(3) Locates surface UXO using visual means. Operates motor vehicle transporting UXO.

(4) Prepares an on-site safe holding area for UXO.

(5) Performs storage of UXO and demolition materials.

(6) Prepares a UXO disposal site.

(7) Prepares non-electric firing system for a UXO disposal operation, electric firing system for a UXO disposal operation, and a detonating cord firing system.

(8) Disposes of UXO/explosives by burning or detonation.

(9) Operates a personnel decontamination station.

(10) Dons and doffs appropriate personal protective equipment in contaminated areas.

c. Inspects salvage UXO-related material.

(1) Erects UXO-related protective works.

(2) Determines a magnetic azimuth using a lensatic compass.

(3) Performs field expedient identification procedures to ID explosive-contaminated soil.

(4) Performs emergency leak seal and packaging of chemical warfare material.

(5) Uses radiographic (x-ray) equipment.

### **A.3. 29493 UXO-TIII**

a. Performs reconnaissance and classification of UXO. Identifies U.S. and foreign guided missiles, bombs and bomb fuzes, projectiles and projectile fuzes, grenades and grenade fuzes, rockets and rocket fuzes, land mines and associated components, pyrotechnic items, military explosives, and demolition materials.

b. Supervises the location of subsurface UXO using military and/or civilian magnetometers.

- (1) Supervises the:
    - (a) Excavation and recovery of subsurface UXO.
    - (b) Construction of UXO-related protective works.
    - (c) Location of surface UXO by visual means.
    - (d) Transporting and storing UXO assuring compliance with federal, State, and local laws.
    - (e) Disposal of UXO by burning/detonation.
    - (f) Preparation of a UXO disposal site.
    - (g) Preparation of an on-site safe holding area for UXO.
  - (2) Determines UXO-related storage compatibility.
  - (3) Prepares an explosives storage plan.
  - (4) Supervises donning and doffing of personal protective equipment, operation of a personnel decontamination station, and maintenance and operator checks on all team equipment.
  - (5) Prepares UXO-related administrative reports and standard operating procedures.
  - (6) Conducts daily team safety briefing.
- c. Supervises segregation of UXO-related scrap from non-UXO-related scrap, safe-handling procedures, team preventive medicine, and field sanitation procedures.
- (1) Performs risk hazard analysis; interpret x-ray of UXO.
  - (2) Supervises field expedient identification procedures to ID explosives contaminated soil, the determining of a magnetic azimuth using a lensatic compass, emergency leak sealing, and packaging of chemical warfare materiel.

#### **A.4. 29494 UXO SAFETY ESCORT**

a. Responsible for the safe escort of non-UXOQP who are not directly involved in specific UXO clearance site work, but have activities to perform within restricted/exclusion areas. Such personnel may include, but are not limited to, contractor personnel involved in the UXO cleanup, cultural visitors, surveying personnel, equipment operators, archaeologists, conservationists, geologists, news media, visiting government personnel, and other personnel as directed.

- b. Ensures safety during the transit of persons being escorted by scanning visually in the immediate path of the escorted party, and redirecting the party as necessary to avoid unexploded ordnance and other hazards.
- c. Is involved with hazard recognition and avoidance only, not the execution of UXO search or clearance actions.
- d. Must have UXO training qualifications.

**A.5. 29495 SP**

- a. Assist UXO personnel in the clearance of UXO, operating only under the direct working supervision of qualified UXO specialist and/or UXO supervisory personnel.
- b. Conduct visual and/or instrumented UXO search activities in the field and operate ordnance detection instruments and similar equipment.
- c. Remove UXO fuze remnants, fragments and related debris only after such items have been positively identified, inspected and verified as safe to handle by a qualified UXO specialist.
- d. Are not involved in the execution of explosives operations.
- e. Must have site and job specific contractor training, but does not require UXO qualifications.

## CHAPTER 3

### UXO-TI TRAINING STANDARDS

#### 3.1. MINIMUM TRAINING STANDARDS FOR UXO-TI

a. This chapter outlines the minimum training standards for a UXO-TI. Personnel who are trained as a UXO-TI must demonstrate the requisite knowledge and ability to perform required tasks in compliance with applicable operational and explosives safety requirements. Candidates for a UXO-TI position must successfully complete:

(1) 200 hours of explosives safety training as described in Paragraph 3.2. or a comprehensive assessment of the individual's ability to successfully perform as a UXO-TI. The course content must convey the information and skills needed to conduct MEC-related activities per applicable requirements. Both the course and comprehensive assessment must include practical exercises evaluating the skills required.

(2) 40 hours of HAZWOPER training per 29 CFR 1910.120.

b. An institution of higher education must provide this training or conduct this assessment and:

(1) Certify successful completion of the course requirements or a comprehensive assessment through written exams and practical exercises.

(2) Have programmatic accreditation by a U.S. Secretary of Education nationally recognized college or university educational accrediting agency, be a component member of a nationally recognized university's system, or be designated by statute as an agency of higher education and have a demonstrated history of providing quality training programs.

c. Before being employed as a UXO-TI, an applicant must provide the perspective employer documentation of successful course completion or successful completion of a comprehensive assessment from an institution of higher education that meets the above criteria. The employer must verify that the individual was trained by the training institution and the institution meets the above requirements.

#### 3.2. CURRICULUM AND TRAINING OBJECTIVES FOR UXO-TI

##### a. Munitions Responses to MEC

(1) **Description.** Understand the purpose, requirements, and procedures for a munitions response to MEC. This training includes explosives safety and environmental requirements applicable to the conduct of munitions responses to MEC.

(2) **Objectives**

- (a) Define terms and identify abbreviations.
- (b) Describe the purpose for munitions responses.
- (c) Describe planning, safety, and environmental requirements for conducting munitions responses.
- (d) Identify the documents (e.g., work plan, accident prevention plan) that should be available for review by field team members.
- (e) Describe the typical field tasks of a munitions response and their purpose.
- (f) Describe the required process to inspect and document the explosives safety status of MPPEH as either material documented as safe (MDAS) or as MDEH.
- (g) Discuss how to and the importance of maintaining a chain of custody for MDAS and MDEH.
- (h) Describe the consequences of losing the chain of custody for MDAS and MDEH.
- (i) Discuss potential liability concerns associated with evaluating MPPEH and documenting its explosives safety status as MDAS or MDEH.
- (j) Describe the proper assembly of protective works.
- (k) Describe the general operation of soil sifting, magnetic, and eddy current equipment as a method to separate MEC and munitions debris from soil.
- (l) Describe documentation required from a field team conducting MEC activities.

**b. Operational Range Clearance Activities and Similar Operations**

(1) **Description.** Understand the purpose, requirements, and procedures for the conduct of operational range clearance activities and similar operations. This training includes explosives safety and environmental requirements applicable to the conduct of operational range clearance activities and similar operations.

(2) **Objectives**

- (a) Describe the purpose of operational range clearance activities and similar operations and how they differ from munitions responses to MEC.
- (b) Describe how operational ranges are designed (e.g., impact areas, safety buffer zones) and used.



(c) Describe planning, safety, and environmental requirements for conducting operational range clearance activities.

(d) Describe the typical field tasks for the conduct of operational range clearance activities and how they differ from munitions responses to MEC.

(e) Describe the potential hazards associated with operational range clearance activities.

(f) Describe documentation required from a field team conducting operational range clearance activities.

(g) Describe the required process to inspect and document the explosives safety status of MPPEH as either MDAS or as MDEH.

(h) Discuss the importance of properly processing and managing MPPEH, MDAS, and MDEH, including the importance of maintaining the chain of custody.

(i) Describe the consequences of losing the chain of custody.

(j) Discuss potential liability concerns associated with evaluating MPPEH and documenting its explosives safety status as MDAS or MDEH.

### **c. Measurements and Mathematical Computations**

**(1) Description.** Understand the methods for conversion between the U.S. customary and metric systems of measurements and basic mathematical computations.

#### **(2) Objectives**

(a) Identify metric prefixes.

(b) Describe mathematical conversions within the metric system.

(c) Convert units from U.S. customary to metric and metric to U.S. customary.

### **d. Electricity**

**(1) Description.** Understand the basics of electricity and circuitry as applied to MEC-related activities.

#### **(2) Objectives**

(a) Define terms and identify abbreviations and symbols.

- (b) Describe electrical conductivity and its characteristics in different materials.
- (c) Describe types of cells and batteries, their construction features, and process used to generate electro-motive force.
- (d) Describe current flow, factors that affect current flow (including switches) and units of measurement of current flow.
- (e) Describe electrical resistance and the factors that affect resistance.
- (f) Describe the operation of a series direct current (DC) circuit with respect to Ohm's Law.
- (g) Describe the operation of basic parallel DC circuits with respect to the determination of equivalent resistance.
- (h) Describe capacitance in terms of charging and discharging a capacitor.
- (i) Diagram a basic circuit such as may be used in electric firing system.

**e. Physics**

**(1) Description.** Understand the basic physics as applied to MEC-related activities.

**(2) Objectives**

- (a) Define terms and identify abbreviations and symbols.
- (b) Describe forces and how they are graphically represented.
- (c) Describe Newton's first and third laws of motion.
- (d) Describe the difference between weight and mass.
- (e) Describe hydrostatics with respect to fluid pressure.
- (f) Describe properties of matter.
- (g) Define motion, work, and energy.
- (h) Describe measures of and forces affecting motion.
- (i) Identify the physical laws affecting gases.
- (j) Define magnetism.

**f. Military Munitions - Explosives and Explosive Effects**

**(1) Description.** Understand the basics of explosives and explosive effects.

**(2) Objectives**

- (a) Define terms and identify abbreviations and symbols.
- (b) Summarize the history of explosives.
- (c) Define propellants, explosives, and pyrotechnics.
- (d) Describe characteristics of military munitions (i.e., explosives, propellants, and pyrotechnics).
- (e) Identify the types of high explosives groups (primary, secondary, main charge).
- (f) Identify forms and classes of propellants and black powder, pyrotechnic, and tracer compositions.
- (g) Describe the functioning of an explosive train.
- (h) Define explosion and describe types of explosions (detonations, low order detonations, deflagrations).
- (i) Describe forms of energy produced by explosions.
- (j) Describe effects of an explosion (pressure wave, fragments, debris, thermal, ground shock).

**g. Military Munitions - Fuze Functioning**

**(1) Description.** Understand how fuzes function.

**(2) Objectives**

- (a) Define terms and identify abbreviations.
- (b) Describe fuze forces.
- (c) Describe fundamental principles of fuzes, fuze arming, and firing principles.
- (d) Describe fuze components.
- (e) Describe methods of employment and uses of fuzes.

- (f) Describe typical arming/functioning of fuzes.
- (g) Describe fuze types.

#### **h. Explosives Safety Precautions**

**(1) Description.** Understand explosives safety precautions as they apply to the conduct of MEC-related activities, including:

- (a) The different categories of MEC (i.e., UXO, DMM, or munitions constituents (MC) that are explosives and in concentration high enough to pose an explosive hazard), and MPPEH and MDEH.
- (b) The use of hazards of electromagnetic radiation to ordnance (HERO) safe equipment.

#### **(2) Objectives**

- (a) Define terms and identify abbreviations and symbols.
- (b) Describe the purpose of explosives safety precautions.
- (c) Describe safety considerations that apply by categories of MEC and MPPEH and MDEH.
- (d) Describe basic safety precautions for:
  1. Explosive-loaded munitions.
  2. Submunitions.
  3. Toxic chemical-loaded munitions.
  4. Pyrotechnic and incendiary munitions.
  5. Smoke-loaded munitions.
  6. Fuzing systems.
  7. Small arms ammunition.
  8. Training military munitions.
  9. Practice military munitions.
  10. Underwater munitions.

**i. Military Munitions Identification**

**(1) Description.** Provide a detailed description (e.g., family, group, type) and identify military munition, and applicable specific safety precautions based on type. (See Ammunition Terms.)

(a) Surface-fired, launched, or placed munitions:

1. Projectiles (gun, mortar, howitzer).
2. Small arms ammunition.
3. Land mines and associated components.
4. Infantry rockets and rocket fuzes.
5. Grenade and grenade fuzes.

(b) Air launched or fired munitions:

1. Bombs and bomb fuzes.
2. Guided missiles and missile fuzes.
3. Large rockets and rocket fuzes.
4. Submunitions.

(c) CWM (i.e., chemical munitions and CA in other than munitions configurations).

(d) CAIS.

(e) Smokes and pyrotechnics.

**(2) Objectives**

(a) Define terms and identify abbreviations and symbols.

(b) Provide a detailed description and identify military munition, and applicable specific safety precautions based on type..

(c) Demonstrate comprehension and detailed knowledge of live, training, and practice munitions.

- (d) Recognize munitions' color codes and markings.
- (e) Describe the basic safety precautions for explosive-initiating components.
- (f) Describe the safety precautions for munitions by category or group.

**j. Underwater Munitions Identification**

**(1) Description.** Understand underwater munitions.

**(2) Objectives**

- (a) Define terms and identify abbreviations and symbols.
- (b) Provide a detailed description and identify military munition, and applicable specific safety precautions based on type. .
- (c) Demonstrate comprehension and detailed knowledge of live training and practice underwater munitions by category and specific safety precautions based on type.
- (d) Recognize munitions' color codes and markings.
- (e) Describe the basic safety precautions for explosive-initiating components.
- (f) Describe the safety precautions for underwater munitions.

**k. Detection Equipment**

**(1) Description.** Understand general, physical, functional, operational, and maintenance of detection equipment for:

- (a) Location of subsurface anomalies using various technologies during the conduct of geophysical surveys.
- (b) Detection of subsurface anomalies.
- (c) Basic geophysical investigation (e.g., anomaly identification, mapping, target discrimination, QC processes).

**(2) Objectives**

- (a) Describe the purpose of geophysical survey equipment; operational characteristics, and capabilities.
- (b) Describe the theory of geophysical surveys.

- (c) Describe data analysis including the advanced geophysical classification process.
- (d) Describe all major and associated components including displays, controls, and indicators.
- (e) Describe the purpose of a geophysical system verification and the various tasks involved.
- (f) Describe operational tasks and preventive maintenance procedures.
- (g) Understand how to inventory and maintain equipment.
- (h) Understand typical instrument outputs and their use in munitions responses.

## **l. PPE**

**(1) Description.** Understand all relevant PPE.

### **(2) Objectives**

- (a) Identify where PPE requirements for MEC-related activities are specified and who is responsible for determining whether PPE is required and changing PPE requirements at a site.
- (b) Understand the capabilities and limitations of PPE, given the hazards that may be present.
- (c) Understand the requirements for employing PPE safely.
- (d) Describe the requirements and process for performing decontamination.

## **m. Demolition Materials**

**(1) Description.** Understand demolition materials and their use including:

- (a) Military and commercial explosives (U.S. and foreign).
- (b) Initiating components and systems.

### **(2) Objectives**

- (a) Define terms and identify abbreviations and symbols.
- (b) Describe military explosives, commercial explosives, and demolition materials and when each might be used.

- (c) Describe the purpose of demolition materials and specialized explosive techniques.
- (d) Describe tools and equipment used during demolition operations.
- (e) Describe demolition accessories.
- (f) Describe electric power sources and test sets used with demolition firing circuits.
- (g) Describe demolition charge initiators.
- (h) Describe demolition charges, charge kits, and assemblies.
- (i) Describe safety precautions for preparation and firing of demolition materials.

**n. Firing Systems**

**(1) Description.** Understand firing systems and their use.

**(2) Objectives**

- (a) Describe detonating cord demolition procedures.
- (b) Describe electric and non-electric firing systems.
- (c) Describe safety precautions for preparation and firing of demolition materials, including HERO and static discharge precautions for electric initiators.
- (d) Prepare firing systems (both electric and non-electric) for detonation operations.
- (e) Describe misfire safety precautions.
- (f) Describe hang fire safety precautions.

**o. Destruction and Demilitarization**

**(1) Description.** Understand the relationship between destruction (i.e., detonation, burning) and demilitarization requirements, and procedures for the destruction of conventional military munitions.

**(2) Objectives**

- (a) Define terms and identify abbreviations and symbols.
- (b) Describe the requirements for and purpose for destruction of conventional munitions.



(c) Describe destruction procedures, including the technologies available for the conduct of contained or controlled destruction.

(d) Describe the authorized destruction methods for different types of military munitions.

(e) Describe requirements and safety precautions for destruction operations.

(f) Describe destruction of conventional explosives and related hazardous materials.

(g) Describe the requirements for demilitarization of military materiel before disposal or recycling.

**p. Storage, Handling, and Transportation of Explosives (Military and Commercial)**

**(1) Description.** Understand storage, handling, and transportation of explosives.

**(2) Objectives**

(a) Describe the purpose for proper storage, handling, and transportation of explosives.

(b) Identify relevant regulations governing storage, handling, and transportation of explosives.

(c) Describe the hazard classification system.

(d) Discuss storage compatibility groups.

(e) Discuss safety requirements.

(f) Discuss ESQD and minimum separation distance requirements.

(g) Discuss transportation requirements for munitions and commercial explosives.

**q. Skills Requirements**

**(1) Description.** Demonstrate knowledge of policies, requirements, and procedures in the safe performance of MEC- and MPPEH-related duties.

**(2) Objectives.** Demonstrate, during a practical exercise, knowledge and comprehension of policies and procedures in safely:

(a) Planning and establishing a standard (100' x 100') UXO search grid.

- (b) Operating detection equipment used during geophysical surveys within areas known or suspected to contain MEC.
- (c) Detecting and determining the coordinates of anomalies.
- (d) Reacquiring and investigating (e.g., excavating) an anomaly.
- (e) Providing a detailed description of military munitions and identifying specific safety and applicable storage, handling and transportation precautions.
- (f) Designing and constructing various types of firing systems (single, dual prime series, dual prime parallel), both electric and non-electric.
- (g) Designing, constructing, and detonating a firing system to initiate a complete explosive charge using a line main and/or a ring main.

## CHAPTER 4

### MINIMUM QUALIFICATION STANDARDS

4.1. Minimum qualification standards for UXOQP, UXOT, and SP and SW are shown in Tables 4.1, 4.2, and 4.3, respectively.

4.2. UXOTs and UXOQP must meet the requirements of 18 USC 842 as amended by the in 27 CFR 555.26. Other personnel supporting MEC-related activities must be prohibited from access to explosives.

4.3. Individuals preparing materials for transport or transporting hazardous materials must complete a DOT-compliant (49 CFR 172.704) hazardous materials course.

4.4. Personnel working as UXOTs and UXOQP may have significant breaks between jobs. Generally, only the time such personnel have spent working under a contract that is performing MEC-related activities should count towards advancement, with 1880 to 1920 hours considered a 1-year full-time equivalent. UXOTs and UXOQP are responsible for maintaining a logbook of their hours, and should be able to provide reasonable documentation that supports the hours logged.

4.5. UXO-TIs with a 36-month continuous break in the performances of MEC-related activities requires requalification as a UXO-TI based on a comprehensive assessment or supervised on-the-job training. Requalification must be accomplished by attending a UXO-TI requalification training course or completion of a comprehensive assessment provided by a training organization as outlined in Paragraph 3.1.2.; or by supervised on-the-job training that the employer documents. For other personnel with a 36-month continuous break in the performances of MEC-related activities, when appropriate, provide supervised on-the-job training that is documented by the employer.

4.6. Personnel whose EOD status was terminated for gross negligence in the performance of assigned EOD duties, a flagrant violation of EOD safety procedures or regulation or who self-terminated the performance of EOD duties before the completion of 18 consecutive months of such duties will not be considered EOD qualified and will not be considered a military EOD School graduate. To obtain employment, such personnel must complete the training required for a UXO-TI.

**Table 4.1. Minimum Qualifications for UXOQP<sup>1, 2, 3, 4</sup>**

Position Description	Training Required	Minimum MEC-related Experience	Minimum MEC-Supervisory Experience	Minimum Total EOD/MEC Experience
SUXOS	Notes 5, 7, 8, 9, 10, and 11	2 years	1 year	10 years
	Notes 6, 7, 8, 9, 10, and 11	10 years	5 years	13 years
UXOSO	Notes 5, 7, 8, and 9	1 year	0.5 year	8 years
	Notes 6, 7, 8, and 9	8 years	2 years	10 years
UXOQCS	Notes 5, 7, 8, 10, and 11	1 year	0.5 year	8 years
	Notes 6, 7, 8, 10, and 11	8 years	2 years	10 years
Dive Qualified	Note 12	As indicated above for the position description.		

Notes:

- By definition, UXO-TII and UXO-TIII are UXOQP (minimum qualifications for UXO-T are provided on Table 4.2).
- Graduate of an Occupational Safety and Health Administration (OSHA)-compliant (29 CFR 1910.120) 40-hour HAZWOPER course.
- Limited to performance of MEC-related activities as a UXOT or UXOQP or similar civilian government service (e.g., Ordnance and Explosives Safety Specialist (OESS)). Conduct of activities performed as an SP or SW are not considered MEC-related experience and are not counted toward the experiential requirements for UXOQP.
- Limited to experience in UXO supervisory positions (i.e., UXO-TIII, UXOQCS, UXOSO, OESS).
- Graduate of a military EOD School of the United States, Canada, Great Britain, Germany, or Australia. (See Paragraph 4.6. for EOD personnel who were terminated for gross negligence in the performance of assigned duties, a flagrant violation of EOD safety procedures or regulation, or who self-terminated the performance of EOD duties before reaching 18 consecutive months.)
- Graduate of a UXO-TI Course (see Chapter 3), the EOD assistant’s course or pass a comprehensive assessment.
- Graduate of an OSHA-compliant (29 CFR 1910.120(e)(4)) 8-hour Management and Supervisor Training course, if supervising other personnel.
- Possesses an understanding of applicable explosives safety criteria and experience in the various phases of a munitions response to MEC or the conduct of range clearance activities, as appropriate for the operations to be performed.
- Must have completed a 10-hour OSHA Construction Safety and Health Training and earned a Department of Labor Construction Safety Course Completion Card.
- UXOQCS must have either:
  - Successfully completed training as a quality professional (i.e., International Standards Organization 9001 internal auditor, American Society of Quality Certified quality auditor);
  - Possess a quality-professional certification by a recognized organization (e.g., U.S. Army the Corps of Engineers Naval Facility Engineering Command Training Course Construction Quality Management for Contractors; or
  - Receive company- and project-specific QC training and work under the supervision of a certified quality professional.
- UXOQCS must demonstrate an understanding of QC and QA practices associated with MEC-related activities and managing and processing MPPEH, including documentation of its explosives safety status.
- Divers who are independently performing the duties of a UXOT or UXOQP must:
  - Meet this TP’s criteria for the duties performed and the requirements of 29 CFR 1910, Subpart T.
  - Possess the dive-related certifications required for the tasks they are to perform or supervise. (Note: Certifications (dive or training) must be from an accredited school and meet the requirements contained in ANSI/ACDE Standard-01; be documented as valid by an ADC Commercial Diver Certification Card for the appropriate training level; and/or have documentation of successful completion of an appropriate level of training from an ACDE accredited school.)

**Table 4.2. Minimum Qualifications for UXOT<sup>1, 2, 3</sup>**

Position Description	Training Required	Minimum MEC-related Experience	Minimum Total EOD/MEC Experience
UXO-TIII	Notes 4, 6, and 7	0 years	8 years
	Notes 5, 6, and 7	8 years	8 years
UXO-TII	Notes 4 and 7	0 years	3 years
	Notes 5 and 7	3 years	3 years
UXO-TI	Notes 4 and 7	0 years	0 years
	Notes 5 and 7	0 years	0 years
Dive Qualified	Note 8	As indicated above for the position description.	

Notes:

1. By definition, UXO-TII and UXO-TIII are also UXOQP.
2. Graduate of an OSHA-compliant (29 CFR 1910.120) 40-hour HAZWOPER course.
3. Limited to performance of MEC-related activities as a UXOT or UXOQP or similar civilian government service (e.g., OESS). Conduct of activities performed as an SP or SW are not considered MEC-related experience and are not counted toward the experiential requirements for UXOQP.
4. Graduate of a military EOD School of the United States, Canada, Great Britain, Germany, or Australia. (See Paragraph 4.6. for EOD personnel who were terminated for gross negligence in the performance of assigned duties, a flagrant violation of EOD safety procedures or regulation, or who self-terminated the performance of EOD duties before reaching 18 consecutive months.)
5. Graduate of a UXO-TI Course (see Chapter 3), the EOD assistant’s course or pass a comprehensive assessment.
6. Graduate of an OSHA-compliant (29 CFR 1910.120(e)(4)) 8-hour Management and Supervisor Training course.
7. On-the-job training including, but not limited to familiarity with the process, procedures, and equipment (e.g., geophysical) used for conducting MEC-related activities.
8. Divers who are independently performing the duties of a UXOT or UXOQP must:
  - a. Meet this TP’s criteria for the duties performed and the requirements of 29 CFR 1910, Subpart T.
  - b. Possess the dive-related certifications required for the tasks they are to perform or supervise. (Note: Certifications (dive or training) must be from an accredited school and meet the requirements contained in ANSI/ACDE-01; be documented as valid by an ADC Commercial Diver Certification Card for the appropriate training level; and/or have documentation of successful completion of an appropriate level of training from an ACDE accredited school.)

**Table 4.3. Minimum Qualifications for SP and SW<sup>1</sup>**

Position Description	Training Required	Minimum MEC-related Experience <sup>3, 4</sup>
SP	Note 2	0 years
SW	Note 2	0 years
<p>Notes:</p> <ol style="list-style-type: none"> <li>1. Job- and site-specific training including, but not limited to, general and site specific safety (e.g., proper use of equipment and PPE, physical, biological, and chemical hazards); explosives safety training (e.g., recognition of military munitions, 3Rs); and proper use of equipment to be used.</li> <li>2. Personnel who are working at a hazardous waste site may require successful completion of an OSHA-compliant (29 CFR 1910.120) 40-hour HAZWOPER course.</li> <li>3. Experience as an SP or SW is not required for UXO-TI certification.</li> <li>4. Activities performed as an SP or SW are not counted toward the experiential requirements for a UXOT or UXOQP.</li> </ol>		

## GLOSSARY

### G.1. ACRONYMS

3Rs	recognize, retreat, report
ACDE	Association of Commercial Diving Educators
ADC	Association of Diving Contractors
ANSI	America National Standards Institute
CA	chemical agent
CAIS	chemical agent identification sets
CFR	Code of Federal Regulations
CWM	chemical warfare materiel
DC	direct current
DDESB	Department of Defense Explosives Safety Board
DMM	discarded military munitions
DOT	Department of Transportation
EOD	explosive ordnance disposal
ESQD	explosive safety quantity distance
HAZWOPER	hazardous waste operations and emergency response
HERO	hazards of electromagnetic radiation to ordnance
MC	munitions constituents
MDAS	material documented as safe
MDEH	material documented as an explosive hazard
MEC	munitions and explosives of concern
MPPEH	material potentially presenting an explosive hazard
MRS	munitions response site
OESS	Ordnance and Explosives Safety Specialist
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
PTR	public traffic route
QA	quality assurance
QC	quality control
RDT&E	research, development, test and evaluation
RESS	required explosives safety submissions

RSP	render-safe procedures
SP	sweep personnel
SUXOS	Senior UXO Supervisor
SW	support worker
TNT	trinitrotoluene
TP	technical paper
U.S.C.	United States Code
UXO	unexploded ordnance
UXOQCS	UXO Quality Control Specialist
UXOQP	UXO Qualified Personnel
UXOSO	UXO Safety Officer
UXOT	UXO Technician
UXO-TI	UXO Technician I
UXO-TII	UXO Technician II
UXO-TIII	UXO Technician III

## G.2. DEFINITIONS

**Ammunition Terms.** The below provide general meanings for the terms listed. Based on use, certain terms may have a different meanings.

- Family - weapon system munitions which provide a similar capability (e.g., tank, artillery, bombs)
- Group - family broken into more specific category usually by weapon system (e.g., M1 Abrams 120mm, 105mm)
- Type - denotes payload or capability delivery (e.g., high explosive, armor piercing)
- Category:
  - Operational, combat, training, or testing
  - Storage category
  - MEC category (i.e., UXO, DMM or MC (explosive))
- Group - sensitivity of storage compatibility, munitions with similar explosive characteristics relating to means of detonation, blast considerations, and special containment requirements (e.g., sensitivity to heat, friction, percussion)

**DMM.** Defined in 10 U.S.C. 2710(e)(2).

**explosive.** Defined in DoD 6055.09-M, Volume 8.

**explosive hazard.** Defined in DoD 6055.09-M, Volume 8.



**EOD.** Defined in DoD 6055.09-M, Volume 8.

**EOD personnel.** Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; 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 certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform render safe procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices.

**explosives or munitions emergency response.** Defined in 40 CFR 260.10.

**MC.** Defined in 10 U.S.C. 2710 (e)(3).

**MDAS.** Defined in DoD Instruction 4140.62.

**MDEH.** Defined in DoD Instruction 4140.62.

**MEC.** Specific categories of military munitions that may pose unique explosives safety risks when present in high enough concentrations to pose an explosive hazard:

Unexploded Ordnance (UXO), as defined in 10 U.S.C. 101(e)(5)

Discarded military munitions (DMM), as defined in 10 U.S.C. 2710(e)(2)

MC (e.g., TNT, cyclotrimethylenetrinitramine) as defined in 10 U.S.C. 2710(e)(3),

**military munitions.** All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard.

Includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof.

Does not include wholly inert items, improvised explosives devices and nuclear weapons, nuclear devices, and nuclear components, but does include non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 *et seq.*) have been completed. (See 10 U.S.C. 101(e) (4).)

**MPPEH.** 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:

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.

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.

Other items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions. (See DoDI 4140.62.)

**MRS.** Defined in DoD 6055.09-M, Volume 8.

**munitions debris.** Defined in DoD 6055.09-M, Volume 8.

**munitions response.** Defined in DoD 6055.09-M, Volume 8.

**munitions response area.** Defined in DoD 6055.09-M, Volume 8.

**range clearance.** Defined in DoD 6055.09-M, Volume 8.

**range-related debris.** Defined in DoD 6055.09-M, Volume 8.

**UXO.** Defined in 10 U.S.C. 101(e)(5)(A) through (C).

**UXOQP.** Defined in DoD 6055.09-M, Volume 8.

**UXOT.** Defined in DoD 6055.09-M, Volume 8.

## REFERENCES

- American National Standards Institute, Association of Commercial Diving Educators-01, "National Standard for Divers – Commercial Diver Training – Minimum Standard," current edition
- Code of Federal Regulations, Title 27, Section 555.26
- Code of Federal Regulations, Title 29
- Code of Federal Regulations, Title 40, Section 260.10
- Code of Federal Regulations, Title 49, Section 172.704
- DoD 6055.09-M, Volume 8, "DoD Ammunition and Explosives Safety Standards: Glossary," February 29, 2008, as amended
- DoD Instruction 4140.62 "Material Potentially Presenting an Explosive Hazard," November 24, 2008, as amended
- International Standards Organization 9001, "Quality management systems – Requirements," current edition
- Technical Bulletin 700-2, Naval Sea Systems Command Instruction 8020.8C, Technical Order 11A-1-47, "Department of Defense Ammunition and Explosives Hazard Classification Procedures," July 30, 2012
- United States Code, Title 10
- United States Code, Title 18, Section 842
- United States Code, Title 42, Section 2011 *et seq.*