

DDESB

Explosives Safety Training



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Department of Defense Explosives Safety Board

Alexandria, Virginia

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FOREWORD

Technical Paper (TP) 27 provides Department of Defense Explosives Safety Board (DDESB) guidance for implementing and managing an Explosives Safety Training Program. Department of Defense (DoD) Directive 6055.9E, "Explosives Safety Management and the DoD Explosives Safety Board," requires that the DoD Components ensure Military Service career programs (CPs) develop personnel qualified to serve as explosives safety management (ESM) subject matter experts (SMEs).

TP 27 identifies policies and core stakeholders who have responsibility for development of explosives safety personnel and lists explosives safety training available to the DoD ammunition and explosives (AE) community. This TP is intended to facilitate continuous improvement of explosives safety training and education throughout DoD's AE community.

TP 27 identifies core stakeholders in the development process for explosives safety personnel and policy documents that address this process. It also describes current training within DoD's AE community. This TP is intended to facilitate continuous improvement of the training and education process for explosives safety personnel.

The DDESB Explosives Safety Training and Education Working Group developed this TP, which has been reviewed by the DDESB staff and coordinated with the DDESB voting members.

This TP will be kept current as new courses are developed and new information becomes available. The latest version of this document can be found on the DDESB Website at <http://www.ddesb.pentagon.mil>.



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CHAPTER 1

INTRODUCTION

1.1. Background

1.1.1. To better serve the warfighter, Department of Defense (DoD) civilians, and the public, the Department of Defense Explosives Safety Board (DDESB) continuously improves the DoD Explosives Safety Management Program (ESMP) by:

1.1.1.1. Developing new tools and approaches to help warfighters better execute their mission.

1.1.1.2. Conserving resources.

1.1.1.3. Maximizing operational effectiveness.

1.1.2. On April 23, 2009, the DDESB established an Explosives Safety Training and Education Working Group to:

1.1.2.1. Review training and education guidance, doctrine, and the Military Services' career development plans.

1.1.2.2. Identify gaps in training and opportunities for further education through formal degree and/or certification programs.

1.1.3. Providing additional training and education opportunities is an integral element of an overall strategic human capital management strategy for explosives safety. This training ensures that a qualified and competent corps of explosives safety personnel continues to be available to support the DoD ESMP, as well as joint warfighters.

1.2. Purpose. The purpose of this technical paper (TP) is to:

1.2.1. Define training requirements for explosives safety personnel and provide recommendations to ensure that explosives safety personnel can execute their responsibilities for explosives safety. The DDESB and DoD Components have identified minimum requirements for explosives safety personnel.

1.2.2. Provide commanders and munitions managers at all levels with a consolidated information package that outlines explosives safety training requirements and available courses. The overall goal is to develop explosives safety personnel who are trained to execute their responsibilities.

1.2.3. Be a source document for the development and oversight of effective Explosives Safety Training Programs.

CHAPTER 2

THE ROLE OF EXPLOSIVES SAFETY PERSONNEL

2.1. General

2.1.1. Explosives safety personnel are responsible for helping to ensure the DoD ESMP provides for the safety of personnel, mission, assets, and the environment from hazards associated with ammunition and explosives (AE) throughout its life cycle. The AE life cycle:

2.1.1.1. Begins during the initial phases of the AE acquisition process and ends upon demilitarization and/or disposal.

2.1.1.2. Includes, but is not limited to, manufacturing, testing, maintenance or renovation, transportation, storage, and use.

2.1.1.3. Includes, when required, the performance of environmental response actions required to address unexploded ordnance, discarded military munitions, and munitions constituents.

2.1.2. Training for explosives safety personnel must be comprehensive and, at times, highly specialized to meet unique operational requirements. Some DoD Components and organizations require safety professionals to develop a comprehensive knowledge of both occupational and explosives safety.

2.2. Specific Duties. The duties of explosives safety personnel are determined by the nature of their positions or jobs. Explosives safety personnel may be required to perform the duties and functions in Table 2.1.

Table 2.1. Explosives Safety Personnel Duties and Functions

Duties and Functions	Detailed Responsibilities
ESMP Manager	<ul style="list-style-type: none"> • Develop, implement, and manage an installation or activity ESMP to reduce risks and mitigate the potential consequences of an intentional or unintentional detonation of AE. • Ensure compliance with applicable explosives safety policies and regulations throughout those aspects of the AE life cycle addressed by the installation or activity ESMP to protect human health and the environment.
Combatant Commander (CCDR) and Service Component ESMP Manager	<ul style="list-style-type: none"> • Provide ESMP-related guidance for complex operational and wartime AE-related plans and programs. • Develop instructions and procedures for AE-related operations. • Establish technical and administrative requirements that may impact a wide range of interagency safety activities. • Integrate Explosives Safety and Munitions Risk Management (ESMRM) in the Joint Operation Planning Process. See Chairman of the Joint Chief of Staff instruction (CJCSI) 4360.01, “Explosives Safety and Munitions Risk Management for Joint Operations Planning, Training, and Execution.”
Subject Matter Expert (SME)	<ul style="list-style-type: none"> • Serve as a SME on ESMP-related issues. • Typically requires highly specialized, technically complex knowledge of explosives safety, risk management, and military operations.
ESMP Technical Support	<ul style="list-style-type: none"> • Serve as an ESMP technical representative to committees and working groups that develop ESMP policy and program management decisions. • If required, prepare detailed plans, budgets, and schedules for assigned AE-related operations. • Provide support and advice in the development of requirements for the acquisition of new weapons systems, including compliance with applicable DoD and Service explosives safety and related standards supporting operations, manufacturing, testing, transportation, storage, maintenance, and demilitarization of these AE systems.
ESMP Evaluations	<ul style="list-style-type: none"> • Conduct explosives safety assessments of munitions operating facilities (e.g., production, renovation, demilitarization, storage) and munitions-related operations (e.g., surveillance testing, loading and unloading, live-fire training and testing, combat rehearsals). • Recognize and evaluate a variety of complex AE operations. • When applicable, coordinate with appropriate staff to identify the risk associated with AE processes and conditions. • Determine and recommend applicable methods and procedures for managing risks. • Document inspection, evaluation, or assistance findings and, when required, prepare formal reports for dissemination. • Advise staff agencies on measures to eliminate or control the potential AE-related hazards associated with operational missions.

Table 2.1. Explosives Safety Personnel Duties and Functions, continued

Duties and Functions	Detailed Responsibilities
Investigator for AE Accidents, Incidents, and Mishaps	<ul style="list-style-type: none"> • Evaluate and coordinate formal investigations of reportable and non-reportable accidents, incidents, and mishaps involving a wide range of AE-related operations. • Review factual data to include, but not limited to, photographs of the site, contributing factors, the extent of injuries, estimated cost of property damage, and the root cause. • Provide coordination on formal report of findings, including recommendations made and dates established, if any, to correct unsafe acts or conditions. • Compile and analyze mishap data. • Conduct root cause analyses. • Identify trends. • Provide functional and installation- or unit-level managers and safety personnel with mishap and trend analysis data. • Assist in developing programs to help reduce mishaps. • Use statistical data to prepare charts, tables, and reports. • Based on observed trends, recommend, develop, and implement training aimed at prevention of AE accidents, incidents, and mishaps.
Prepare or Review Required Explosives Safety Submissions (RESS) and ESMP-related Issuances	<ul style="list-style-type: none"> • Review and, when appropriate, endorse highly complex RESS for new construction, major building alterations, changes in an installation or activity AE mission or equipment, and monitor AE-related projects through completion. • Recommend, when necessary, required design changes and provide technical recommendations to eliminate or control the explosives safety hazards associated with the repair and maintenance of installation munitions operating facilities or equipment. • Develop specialized operating practices and procedures that may involve diverse, but recognized hazards associated with AE operations. • Review and approve local safety instructions and guides that are relevant to AE-related operations.
Deviations	<ul style="list-style-type: none"> • Review requests for exceptions, exemptions, deviations, variances, and waivers to mandatory explosives safety standards, and measures to mitigate the risks associated with approval of such requests. • Analyze acceptability of risk involved and recommends approval or disapproval of such requests.
Local Explosives Safety Training	<ul style="list-style-type: none"> • Provide technical safety training or instruction to installation and field-level safety representatives on areas such as ESMP, DoD, and Military Service explosives safety criteria, proper handling and storage of AE, and transportation and emergency response procedures. • Develop criteria and training standards. • Review lesson plans and formal training materials. • Promote AE safety campaigns through safety committee meetings. • Prepare safety articles, website, and other media formats for installation- and unit-level AE personnel to use for local training programs.

Table 2.1. Explosives Safety Personnel Duties and Functions, continued

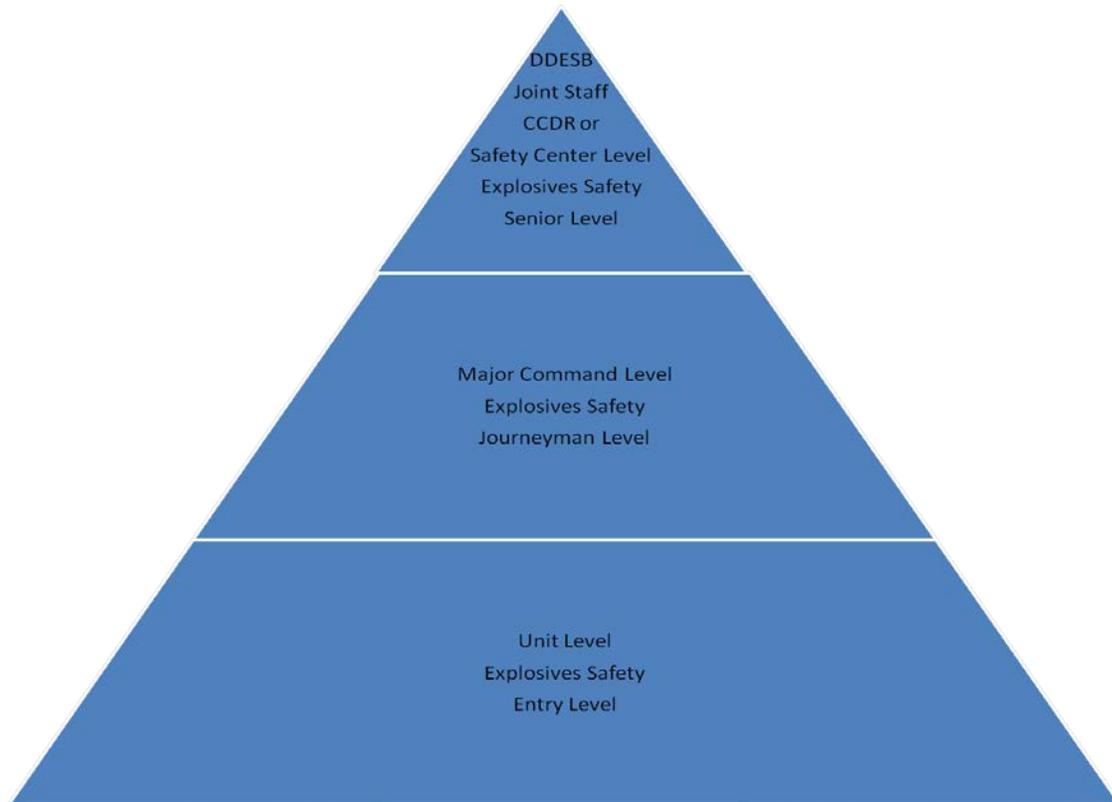
Duties and Functions	Detailed Responsibilities
Local Explosives Safety Training	<ul style="list-style-type: none"> • Evaluate instructor performance. • Provide subject matter expertise to AE safety courses taught by the Service and Command.
Communication	<ul style="list-style-type: none"> • Prepare and deliver oral presentations and briefings, training sessions, conferences, consultations, and strategy sessions with local staffs and other organizations to secure cooperation, resolve controversial issues, and convey information to proposed changes in assigned programs. • Develop and prepare a variety of correspondence and other documentation (e.g., formal memorandums, position papers, reports, staff studies, staff summary packages, briefings, charts, bullet background papers).
Military Munitions Response Program (MMRP)	<ul style="list-style-type: none"> • Provide on-site support for a Military Service MMRP. • Conduct reviews of RESS. • Make explosives safety determinations. • Provide RESS amendments and corrections. • Prepare RESS after-action reports. • Provide expert consultation on safety issues, policy, and standards analysis. • Collaborate with the Military Service explosives safety center or DDESB.
Provide Hazard Classifications	<ul style="list-style-type: none"> • Formulate and defend Service-level hazard classification and testing positions regarding joint Service weapons acquisition programs. • Serve as a Service-level representative for development of DoD hazard classification test and administrative policy and the US positions for North Atlantic Treaty Organization and United Nations deliberations regarding classification of munitions and explosives for international transportation as implemented by international conventions. • Serve as a Military Service hazard classification expert on DoD and joint panels, integrated product teams, and working groups for developing and harmonizing complex test procedures, data requirements, prescribed instrumentation, and criteria for interpreting results associated with insensitive munitions, hazard classification, and military qualification of new explosives and munitions. • Represent a Military Service in meetings with DOT regarding hazard classification policy and the Military Service criteria.
Perform Explosives Safety Tests	<ul style="list-style-type: none"> • Conceive, plan, and oversee a Military Service explosives safety test and analysis programs. • Identify and prioritize a Military Service explosives safety test requirements. • Develop highly technical detailed test plans to yield critical safety information for a Military Service AE operation.

CHAPTER 3

POTENTIAL CAREER PATHS FOR EXPLOSIVES SAFETY PERSONNEL

3.1. Career Levels for Explosives Safety Personnel. See Figure 3.1.

Figure 3.1. Career Levels



3.1.1. Entry Level (Interns). At this level, personnel:

3.1.1.1. Enter the explosives safety career field without prior experience.

3.1.1.2. Learn the fundamentals of explosives safety.

3.1.1.3. Gain the experience needed to advance in the explosives safety career field.

3.1.1.4. Are exposed to several different positions and a myriad of explosives safety management (ESM)-related duties.

3.1.2. Journeyman Level. When it is determined that entry-level explosives safety personnel have adequate ESM experience (e.g., successfully performed in various positions, successfully completed required training), they may advance to the journeyman level. Among other functions, journeyman-level explosives safety personnel:

3.1.2.1. May manage an organization's ESMP and serve as a SME within a large installation, a munitions operating or research, development, test and evaluation (RDT&E) facility, or at one of the Service's explosives safety centers.

3.1.2.2. Should expect to broaden their experience through a variety of diverse, challenging assignments and self-development.

3.1.2.3. Should both further their education and attend high-level training courses that broaden their knowledge of explosives safety operations and ESM.

3.1.3. Senior Level. Senior-level explosives safety personnel manage the ESMP at major headquarters, lead functional areas at Military Service safety centers, or serve as SMEs on the staff of the Organization of the Joint Chiefs of Staff or a Service staff, on a CCDR's staff, or at the DDESB. Among other functions, senior-level explosives safety personnel:

3.1.3.1. Develop DoD and Military Service policies and procedures,

3.1.3.2. Conduct reviews of their Military Service's ESMP,

3.1.3.3. Participate in accident, incident, and mishap investigations accident and incident

3.1.3.4. Should broaden their knowledge by attending institutional training and education programs, accepting challenging operational assignments, and through self-development. By doing so, senior-level explosives safety personnel will be able to provide and support strategic leadership in joint, interagency, intergovernmental, and multinational environments.

3.2. Career Development of Explosives Safety Personnel

3.2.1. Entry Level (Intern). Entry-level explosives safety personnel:

3.2.1.1. Have limited experience.

3.2.1.2. Have limited knowledge of the fundamentals of explosives safety.

3.2.1.3. Require comprehensive training about the fundamentals of an ESMP (e.g., AE, explosives safety, and AE-related operations).

3.2.1.4. As a critical aspect of their development, should be mentored by explosives safety personnel at the journeyman and senior levels.

3.2.1.5. Are required by some Military Services and organizations to develop a comprehensive understanding of the fundamentals of both occupational safety and health and ESM.

3.2.2. Journeyman Level. Journeyman-level explosives safety personnel are expected to attain and maintain an in-depth knowledge of explosives safety principles and practices, and be capable of serving as SMEs and mid-level managers for ESMP at various levels. Based on their education, training, and work experience, Journeyman explosives safety personnel should, among other functions:

- 3.2.2.1. Independently conduct hazard analyses and risk assessments,
- 3.2.2.2. Prepare RESSs (e.g., explosive site plans),
- 3.2.2.3. Provide explosives safety training,
- 3.2.2.4. Interpret explosives safety policies and criteria,
- 3.2.2.5. Chair explosives safety councils,
- 3.2.2.6. Conduct explosives safety compliance assessments,
- 3.2.2.7. Brief leadership on the potential hazards associated with DoD military munitions (AE) and other munitions (e.g., foreign, commercial),
- 3.2.2.8. Advise leadership on measures that should be implemented to mitigate risk,
- 3.2.2.9. Have the opportunity to become a SME in a variety of areas to include explosives hazard classification, site planning, risk assessment, electrical protection, hazard abatement and/or mitigation, and program management.

3.2.3. Senior Level. Senior-level explosives safety personnel are expected to possess in-depth knowledge of explosives safety principles, policies and criteria, and to be able to develop, manage and oversee an effective ESMP. Based on their education, training, and work experience, senior explosives safety personnel will, among other functions:

- 3.2.3.1. Be skilled at guiding and conducting ESMP assessments including:
 - 3.2.3.1.1. Root cause analyses.
 - 3.2.3.1.2. Accident, incident, or mishap investigations.
 - 3.2.3.1.3. Problem solving.
 - 3.2.3.1.4. Informed decision making.
 - 3.2.3.1.5. Program management.
 - 3.2.3.1.6. Policy development.

3.2.3.2. Brief at the most senior Service levels.

3.2.3.3. Advise senior-level commanders, including CCDRs and their staff, on applicable explosives safety criteria, risk assessments and mitigating measures.

3.2.3.4. Participate in joint Service or international work groups.

3.2.3.5. Provide explosives-safety input for strategic plans and policies.

3.2.3.6. Mentor entry- and journeyman-level explosives safety personnel.

CHAPTER 4

AE COMMUNITY STAKEHOLDERS AND POLICY DOCUMENTS

4.1. Explosives Safety Stakeholders

4.1.1. CCDRs. CCDRs have a vested interest in the safe accomplishment of their mission. The fundamental premise of explosives safety and AE risk management is the early and continuous identification and clear communication to appropriate levels of the chain of command of the potential risks and consequences of an inadvertent detonation of AE during all phases of military planning, training, and execution. See CJCSI 4360.01, “Explosives Safety and Munitions Risk Management for Joint Operations Planning, Training, and Execution.”

4.1.2. United States (US) Army Operations Center (AOC). Operational 24 hours a day, the AOC—also referred to as the Army Watch—is the DoD central point of contact for emergency responses to transportation incidents involving AE.

4.1.3. Defense Contract Management Agency (DCMA). DCMA’s contracting safety specialists:

4.1.3.1. Conduct post-award safety reviews, including reviews of contractor and subcontractor ESMPs,

4.1.3.2. Report AE accidents, incidents, and mishaps that occur within contractor facilities.

4.1.4. DDESB. DoDD 6055.9E, “Explosives Safety Management and the DoD Explosives Safety Board,” which implements section 172 of Title 10, United States Code (U.S.C.), “Ammunition Storage Board,” authorizes the DDESB as a standing joint board. The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) oversees the development and execution of the DoD ESMP. The DDESB advises the Secretary of Defense and DoD Components on ESM throughout the AE life cycle, including environmental responses required to address AE present as a result of DoD operations. Among other ESM-related policies, it is DoD policy to provide the maximum possible protection to people and property from the potential damaging effects of AE, both explosive and chemical.

4.1.5. DoD Components. In addition to other ESMP-related requirements, DoD Components are responsible for establishing, resourcing, implementing, and maintaining effective DoD Component-level ESMPs that provide for the safety of personnel, assets, and the public throughout the AE life cycle. This includes implementing DoD Component-level explosives safety standards consistent with DoD criteria in a manner that ensures effective ESM while meeting mission requirements. Critical aspects of an effective ESM are:

4.1.5.1. Explosives safety personnel and others involved in AE-related operations must be qualified to perform their assigned tasks.

4.1.5.2. AE accidents, incidents, and mishaps must be thoroughly investigated with a root cause determined.

4.1.5.3. Lessons learned are captured from DoD AE- and munitions-related operations and accidents, incidents, and mishaps.

4.2. Explosives Safety Policy Documents. See Table 4.1. for types of publications by category.

Table 4.1. Explosives Safety Policy Documents

Category	Publication	Sponsor
Public Laws	Title 42, U.S.C., “The Public Health and Welfare” “Section 172, Title 10, U.S.C., “Ammunition Storage Board”	Congress
Acquisition Regulations	DCMA Instruction DCMA Guidebook Federal Acquisition Regulation	DCMA
DoD Directives, Instructions, and Manuals	DoD Directive 6055.9E, “Explosives Safety Management and the DoD Explosives Safety Board”	USD(AT&L)
	DoD Instruction (DoDI) 5000.02, “Operation of the Defense Acquisition System”	USD (AT&L)
	DoDI 6055.07, “Mishap Notification, Investigation, Reporting, and Record Keeping”	USD(AT&L)
	DoDI 6055.16, “Explosives Safety Management Program”	USD(AT&L)
	DoD 4145.26-M, “DoD Contractor’s Safety Manual for Ammunition and Explosives”	USD(AT&L)
	DoD 4160.21-M, “Defense Materiel Disposition Manual”	USD(AT&L)
	DoD 6055.09-M, “DoD Ammunition and Explosives Safety Standards”	USD(AT&L)
CJCSIs	CJCSI 3170.01H, “Joint Capabilities Integration and Development System”	Director, Joint Staff
	CJCSI 4360.01, “Explosives Safety and Munitions Risk Management for Joint Operations Planning, Training, and Execution”	Director, Joint Staff
Military Services’ Publications	Air Force Instruction 91-202, “The US Air Force Mishap Prevention Program”	Headquarters, Air Force
	Air Force Instruction 91-204, “Safety Investigations and Reports”	Headquarters, Air Force
	Air Force Instruction 91-205, “Nonnuclear Munitions Safety Board”	Headquarters, Air Force
	Air Force Manual 91-201, “Explosives Safety Standards”	Headquarters, Air Force
	Air Force Manual 91-221, “Weapons Safety Investigations and Reports”	Headquarters, Air Force
	Air Force Policy Directive 91-2, “Safety Programs”	Headquarters, Air Force
	Army Materiel Command Regulation (AMC-R) 350-4, “Training and Certification Program for Personnel Working in Ammunition Operations”	US Army Materiel Command (USAMC)
	Army Regulation (AR) 75-1, “Malfunctions Involving Ammunitions and Explosives”	Headquarters, Department of the Army (HQDA)

Table 4.1. Explosives Safety Policy Documents, continued

Category	Publication	Sponsor
Military Services' Publications	AR 75-15, "Policy for Explosive Ordnance Disposal"	HQDA
	AR 385-10, "The Army Safety Program"	HQDA
	AR 385-63/Marine Corps Order (MCO) 3570.1C, "Range Safety"	HQDA and US Marine Corps (USMC)
	AR 702-12, "Quality Assurance Specialist (Ammunition Surveillance) Program"	HQDA
	Department of the Army (DA) Pamphlet 385-10, "Army Safety Program"	HQDA
	DA Pamphlet 385-30, "Mishap Risk Management"	HQDA
	DA Pamphlet 385-40, "Army Accident Investigations and Reporting"	HQDA
	DA Pamphlet 385-61, "Toxic Chemical Agent Safety"	HQDA
	DA Pamphlet 385-63, "Range Safety"	HQDA
	DA Pamphlet 385-64, "Ammunition and Explosives Safety Standards"	HQDA
	DA Pamphlet 385-65, "Explosive and Chemical Site Plan Development and Submission"	HQDA
	MCO P8020.10B, "Marine Corps Ammunition and Explosives Safety Policy Program"	Headquarters, USMC
	Naval Sea Systems Command (NAVSEA) Instruction 8020.18A, "Transportation Emergency Response Involving DoD Conventional Munitions and Explosives"	Commander, NAVSEA
	NAVSEA Ordnance Pamphlet (OP) 4, "Ammunition and Explosives Safety Afloat"	Commander, NAVSEA
	NAVSEA OP 5, Volume 1, "Ammunition and Explosives Safety Ashore"	Commander, NAVSEA
	NAVSEA OP 5, Volume 3, "Ammunition and Explosives Safety Ashore for Contingencies, Combat Operations, Military Operations Other Than War, and Associated Training"	Commander, NAVSEA
	Office of the Assistant Secretary of the Army for Installations and Environment Memorandum, "Interim Guidance for Chemical Warfare Material (CWM) Responses," 1 April 2009	HQDA

Table 4.1. Explosives Safety Policy Documents, continued

Category	Publication	Sponsor
Military Services' Publications	Naval Operations Instruction (OPNAVINST) 3500.39, "Operational Risk Management"	Chief of Naval Operations (CNO)
	OPNAVINST 8020.15/MCO 8020.13, "Explosives Safety Review, Oversight, and Verification of Response Actions Involving Military Munitions"	CNO
	OPNAVINST 8020.14/MCO 8020.11, "Department of Navy Explosives Safety Policy Manual"	CNO
	OPNAVINST 8023.24B, "Navy Personnel Ammunition and Explosives Handling Qualification and Certification Program"	CNO

CHAPTER 5

CAREER DEVELOPMENT PLANNING AND TRAINING

5.1. Career Development Planning

5.1.1. The explosives safety profession is a unique career. Explosives safety personnel have the ability to enhance operations, including combat capabilities, by identifying and offering solutions that mitigate considerable risks to DoD personnel, property and the environment. Explosives safety involves identifying potential hazards and developing and managing complex solutions to highly technical, often high-risk, problems. Competency in this career field requires advanced training, as prescribed in each Military Service's explosives safety policies and standards.

5.1.1.1. As US forces experience a transformation in a new age of warfare, developing competent, effective leaders is critical to anticipating and planning for the future. The DoD professional military education (PME) system:

5.1.1.1.1. Provides forums that encourage debate that serves to refine employment concepts for future operations.

5.1.1.1.2. Promote professional self-development, even during deployments, through outreach efforts, including new distance learning (DL) initiatives via the internet.

5.1.1.2. The Military Services' schools and colleges, and joint education programs offered by the National Defense University, are at the forefront of initiatives to develop competent, aggressive, and effective leaders in an effort to build the future joint force. It is important for explosives safety personnel to take advantage of available resources and commit to pursuing educational excellence. Doing so will help sustain a quality force of competent, well-trained explosives safety personnel. It is incumbent upon the DoD Components and Military Services, with DDESB support, to provide explosives safety personnel with information and opportunities that will provide them with the ability to make intelligent, well-informed decisions regarding their professional growth and development.

5.1.2. A key initial step in an individual career development plan is a self-assessment of skills and capabilities. By using Military Service-specific explosives safety competencies, explosives safety personnel can work with their supervisors and other senior employees to draft a career planning guide that can help determine the competencies needed for further development and the best method to obtain them.

5.1.3. Explosives safety personnel can be safety specialists/managers (0018) or safety engineers (0803) with general safety education, training, and experience augmented by specialized explosives safety education, training, and experience. It is critical that each DoD Component and Military Service define the competencies required for explosives safety

personnel and prescribe the specialized explosives safety education, training, and experience required to obtain these competencies (see Appendices A through F).

5.1.4. In February 2011, the Office of Personnel Management (OPM) established the official position series 0017 with the basic title explosives safety specialist (ESS), under Title 5, U.S.C., “Government Organization and Employees.” (See position classification flysheet at www.opm.gov/fedclass/gso017.pdf).

5.1.4.1. The 0017 series includes positions that manage, supervise, administer, lead, advise on, or perform explosives safety work including protecting personnel and property from the potentially hazardous consequences of unintentional detonations.

5.1.4.2. The 0017 series personnel are capable of reducing and mitigating the risks associated with AE, ensuring compliance with applicable explosives safety policy and regulations, and implementing and maintaining effective, comprehensive ESMP. As with other explosives safety personnel (e.g., 0018 and 0803 series) an ESS requires knowledge of:

5.1.4.2.1. Explosives safety laws, policies, regulations, rules, procedures and methods.

5.1.4.2.2. Munitions (military, commercial, foreign) and other energetic materials.

5.1.4.2.3. The effects of AE.

5.1.4.2.4. Methods of preventing or reducing the effects of explosive accidents, incidents, and mishaps.

5.1.4.2.5. The relationship between quantity-distance siting criteria and personnel safety.

5.1.4.2.6. Hazard classification.

5.1.4.2.7. The life cycle management of AE (e.g., inventory, storage, production, renovation, and disposition).

5.1.4.2.8. Environmental response actions that involve used AE and munitions constituents.

5.1.5. To provide optimal training for individuals serving as explosives safety personnel, the DoD Components and Military Services have identified the minimum training requirements to meet the core competencies (see Table 5.1). Many courses are available through the US Army Defense Ammunition Center (DAC); specialized courses are listed in Table 5.1. To see a current listing of DAC courses and descriptions or to register for these courses, go to <http://ammo.okstate.edu/>. Table 5.2 identifies relevant joint Service courses.

Table 5.1. Military Service/Agency Courses

Explosives Safety Professional Competency Courses		A/F Weapons Safety Specialist/ Manager	Army CP 20 QASAS	Army CP 12 (explosive safety)	Army CP 33 (ammunition manager)	Army USACE OESS	Navy ESO	Navy ESS	Marine Corps ESO	DCMA ESS
Course Name	Course Description	M = Mandatory R = Recommended P = Periodically Update								
AMMO 1	Conventional Ammunition Orientation									
AMMO 4	Ammunition Demilitarization		M		M					
AMMO 5	Ammunition Facilities		M		M					
AMMO 10	Ammunition Quality Assurance		M		M					
AMMO 12	Ammunition Storage		M		M					
AMMO 13	Ammunition Supply and Inventory				M					
AMMO 14	Ammunition Surveillance		M							
AMMO 18-DL	Basics of Naval Explosives Hazard Control								R	
AMMO 19	Chemical Accident/Incident Response and Assistance									
AMMO 20	Chemical Agent Safety					R				
AMMO 27-DL	Conventional Ammunition Radiation Hazards					R				
AMMO 28	Electrical Explosives Safety for Army Facilities		M		M					M
AMMO 31	Environmental Considerations		M	R	M					
AMMO 29	Electrical Explosives Safety for Naval Facilities						M	R	M	
AMMO 33	ES and Environmental Risk Management								R	
AMMO 36	Explosives Safety for Naval Facility Planning						M	R	M	

Table 5.1. Military Service/Agency Courses, continued

Explosives Safety Professional Competency Courses		A/F Weapons Safety Specialist/ Manager	Army CP 20 QASAS	Army CP 12 (explosive safety)	Army CP 33 (ammunition manager)	Army USACE OESS	Navy ESO	Navy ESS	Marine Corps ESO	DCMA ESS
Course Name	Course Description	M = Mandatory R = Recommended P = Periodically Update								
AMMO 37-DL	General Transportation of Hazardous Materials-Refresher					R				
AMMO 38	Introduction to Guided Missile Large Rocket		M		M					
AMMO 43	Intermodal Dry Container/ Container Safety Certificate Reinspection		M; P		M; P				M	
AMMO 45	Introduction to Ammunition			M		M			M	M
AMMO 47	Lightning Protection for Air Force Facilities	R								
AMMO 49	Naval ESMs/Supervisors Orientation						M	M	M	
AMMO 54	Risk Management and Standard Operating Procedure for AE Operations		M	R	M					M
AMMO 51-RC-DL	Naval Motor Vehicle and Railcar Inspection						M	R	M	
AMMO 55	Quality Assurance for Toxic Chemical Munitions		M		M					
AMMO 62	Technical Transportation of Hazardous Material		M		M	R			R	
AMMO 63	Explosives Safety Familiarization			M		M				M
AMMO 65	DoD Contractor's Explosives Safety Standards			R						M
AMMO 66-1	Basic Radiation Safety		M; P		M; P					
AMMO 67	Hazardous Material Familiarization and Safety in Transportation								M	

Table 5.1. Military Service/Agency Courses, continued

Explosives Safety Professional Competency Courses		A/F Weapons Safety Specialist/Manager	Army CP 20 QASAS	Army CP 12 (explosive safety)	Army CP 33 (ammunition manager)	Army USACE OESS	Navy ESO	Navy ESS	Marine Corps ESO	DCMA ESS
Course Name	Course Description	M = Mandatory R = Recommended P = Periodically Update								
AMMO 68	Military Munitions Rule		M	M; P	M	M; P				
AMMO 69-L-DL	Shipboard Explosives Safety - Amphibious								R	
AMMO 71	Ammunition Tools and Equipment		M		M					
AMMO 74	Explosives Safety Officer Orientation Course						M	R	M	
AMMO 75	Ammunition Physical Security		M		M					
AMMO 76	Identification of Ammunition		M		M				M	
AMMO 77-SAA	Small Arms Ammunition		M		M					
AMMO 77-DM	Demolition Materials		M		M					
AMMO 77-ART	Artillery Ammunition		M		M					
AMMO 77-B	Bombs		M		M					
AMMO 77-LM/PY	Land Mines/Pyrotechnics		M		M					
AMMO 77-CPE/P	Characteristics of Propellant & Explosives		M		M					
AMMO 78	Ammunition Publications		M	M	M	M				
AMMO 79	Ammunition Drawings		M		M					
AMMO 82	US Army Explosives Safety Quantity Distance (QD) and Site Planning		M	R	M					M
AMMO 86-DL	Transportation of Radioactive Material									

Table 5.1. Military Service/Agency Courses, continued

Explosives Safety Professional Competency Courses		A/F Weapons Safety Specialist/ Manager	Army CP 20 QASAS	Army CP 12 (explosive safety)	Army CP 33 (ammunition manager)	Army USACE OESS	Navy ESO	Navy ESS	Marine Corps ESO	DCMA ESS
Course Name	Course Description	M = Mandatory R = Recommended P = Periodically Update								
AMMO 87	MMRP									
AMMO 91	JMC SMCA Orientation and JOCG Integration									
AMMO 92	Transportation Physical Security				M					
AMMO 95	Traffic Management		M		M					
AMMO 97	Munitions History Program									
AMMO 99	Application of US Army QD Principles									
AMMO 100	Army Explosives Safety Site Planning Course									
AMMO 101	Tutorial for DDESB QD Calculator									
AMMO 103	Explosives Safety Siting and Army Site Submission Electronic Tool (ASSET)									
LTC-014 (AMMO 62)	Technical Transportation of Hazardous Material Offered at Camp Robinson, AR									
4E-91E/645-89D10/20 (Phase I)	Explosive Ordnance Disposal (EOD)					M				
4E-91E/645-89D10/20 (Phase II)	EOD					M				
AMMO 107	ESM for Safety Professionals			M		M				

Table 5.1. Military Service/Agency Courses, continued

Explosives Safety Professional Competency Courses		A/F Weapons Safety Specialist/ Manager	Army CP 20 QASAS	Army CP 12 (explosive safety)	Army CP 33 (ammunition manager)	Army USACE OESS	Navy ESO	Navy ESS	Marine Corps ESO	DCMA ESS
Course Name	Course Description	M = Mandatory R = Recommended P = Periodically Update								
HAZWOPER	Hazardous Waste Operations					M				
USACE Engineering Manual (EM) 385-1-97	Explosives Safety for OESSs					M				
Munitions Rule Training							M	R		
Ammunition Supply Administration							R	R		
USN/USMC Conventional Ammunition Sentencing Course							R	R		
Explosives Safety Stand-Down							R	R		
L3AZR2W071-OC2A	Weapons Safety Management Course	M								
Air Force AWST-100	Introduction to Weapons (Web-based)	R								
AWST-102	Licensed Explosives Storage (Web-based)	R								
AWST-104	Explosives Site Planning (Web-based)	R								
AWST-105	Explosives Safety Exceptions (Web-based)	R								

Table 5.1. Military Service/Agency Courses, continued

Explosives Safety Professional Competency Courses		A/F Weapons Safety Specialist/ Manager	Army CP 20 QASAS	Army CP 12 (explosive safety)	Army CP 33 (ammunition manager)	Army USACE OESS	Navy ESO	Navy ESS	Marine Corps ESO	DCMA ESS
Course Name	Course Description	M = Mandatory R = Recommended P = Periodically Update								
AWST-110	Glass Breakage Assessments Using WINGARD PE (Web-based)	R								
AWST-112	Fire Fighting and Prevention (Web-based)	R								
First Aid and CPR	Current First Aid and CPR					M				
USACE PROSPECT Course #215	Construction Safety					M				
USACE PROSPECT Course #175	Dive Safety Administer					M				
USACE PROSPECT Course #356	CERCLA/RCRA Process					R				
USACE PROSPECT Course #397	Dive Safety Administrator Refresher					M				
Bi-Annual Marine Corps ESO Training									M	
A/F = Air Force AWST = Advanced Weapons Safety Training CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act CP – career program CPR = cardiopulmonary resuscitation ESO = explosives safety officer		HAZWOPER = hazardous waste operations JMC = Joint Munitions Command JOCG = Joint Ordnance Commanders Group OESS = ordnance and explosives safety specialists QASAS = quality assurance specialist ammunition Surveillance RCRA = Resource Conservation and Recovery Act				SMCA = single manager for conventional ammunition USACE = US Army Corps of Engineers USMC = US Marine Corps USN = US Navy WINGARD = Window Glazing Analysis Response and Design				

5.2. Joint Career Development Training

Table 5.2. Joint Service Courses

Joint Service Course	AE Course Listing and Requirements Matrix	
	Description	School Location
C-4E-0010	Aviation Ordnance Officer Career Progression (Level 1)	Ordnance University, Detachment Milton, FL
C-4E-0011	Aviation Ordnance Officer Career Progression (Level 2)	Ordnance University, Detachment Milton, FL
C-4E-0012	Aviation Ordnance Officer Career Progression (Level 3)	Ordnance University, Detachment Milton, FL
4E-91E/645-89D10/20 (Phase I)	EOD (Army)	Ft Lee, VA
4E-91E/645-89D10/20 (Phase II)	EOD	Eglin Air Force Base (AFB), FL
CIN A-431-0011	Basic EOD Course, Naval School EOD, Eglin AFB, FL/Indian Head, MD	Eglin AFB, FL

APPENDIX A

USMC ROAD MAPS FOR ESSs

A.1. This section outlines:

A.1.1. The training and education requirements for USMC personnel in the AE-related military occupational specialty (MOS).

A.1.2. Provides guidance for career progression by identifying:

A.1.2.1. Initial skills.

A.1.2.2. Recommended billet assignments.

A.1.2.3. Required and recommended professional military training.

A.1.2.4. Professional reading list.

A.1.2.5. Recommended MOS-related and general DL courses (Marine-net and other Service courses).

A.1.2.6. Recommended college-level courses and degrees (including courses and degrees related to USMC MOS, if applicable), as well as an introduction to the qualification and certification program.

A.2. USMC's formal MOS-producing schools have been responsible for producing MOS road maps since April 2005. The MOS road maps:

A.2.1. Can be found at the Training and Education Command Website:
www.tecom.usmc.mil.

A.2.2. Are dynamic documents that will be updated with training and education recommendations and requirements as changes occur.

A.2.3. Are specifically tailored for each MOS. See Table A.1 for a listing of the relevant MOSs.

Table A.1. USMC MOSs

USMC Munitions Specialty Codes	
Position Description	Specialty Code (MOS)
Basic AE Ordnance Disposal Marine	2300
Explosive Ordnance Officer	2305
AMMO Technician	2311
EOD Technician	2336
Ammunition Officers	2340
Basic Aviation Ordnance Marine	6500
Aviation Ordnance Officer	6502
Aviation Ordnance Trainee	6511
Aircraft Ordnance Technician	6531
Aviation Ordnance Systems Technician	6541
Aviation Ordnance Chief	6591

A.3. To conduct an effective explosives safety program, USMC-civilian ESS Series 0017 must:

A.3.1. Fully understand not only explosives safety regulatory requirements, but also the interaction between those requirements and the requirements of AE life-cycle management. Formal training or experience in a variety of disciplines is necessary to achieve this understanding.

A.3.2. Have full knowledge of the distinctions among the explosives safety requirements/policies of the various Military Services to function effectively in the increasingly joint operational arena. To this end, the Commander, Marine Corps Systems Command is responsible for establishing training/qualification requirements for personnel involved in the conduct of the USMC Class V(W) and nonoperational aspects of the Class V(A) Explosives Safety Program.

A.4. USMC's Explosives Safety Officer Certification Program:

A.4.1. Provides USMC civilian personnel with a roadmap for career development throughout their total career.

A.4.2. Identifies a logical, visible framework for developing competencies required of personnel in the 0017 job series.

A.4.3. Blends formal training, on-the-job training (OJT), developmental assignments, and self-development activities.

A.4.4. Is continually reviewed and updated to ensure required training remains relevant.

APPENDIX B

US ARMY CPs AND EXPLOSIVES SAFETY TRAINING

B.1. AR 690-950, “Career Management,” governs the development, operation, and administration of DA civilian CPs. See Table B.1 for a listing of occupational series typically having responsibilities in explosives safety.

B.1.1. CP-12, the Safety and Occupational Health (SOH) CP, consists of 22 occupational series.

B.1.2. CP-33, the Ammunition Manager CP (AMCP), consists of 17 occupational series.

B.1.3. CP-20, the QASAS CP consists of occupational series 1910.

Table B.1. US Army Ammunition/Explosives Safety Civil Service Careers

US Army Explosives Safety Civil Service Careers			
Position Description	General Schedule (GS) Series	CP	Career Education & Training Plan
Occupational Safety and Health Manager	GS-0018	12	See Footnote 1
Occupational Safety and Health Technician	GS-0019	12	See Footnote 1
Safety Engineer	GS-0803	12	See Footnote 1
Quality Assurance Specialists (Ammunition Surveillance)	GS-1910	20	See Footnote 2
AMMO Management	GS-0301	33	See Footnote 2
Program Manager (AMMO)	GS-0340	33	See Footnote 2
Logistics Management Specialist	GS-0346	33	See Footnote 2
Engineering Technician	GS-0802	33	See Footnote 2
Industrial Engineering Technician	GS-0895	33	See Footnote 2
Production Manager	GS-1152	33	See Footnote 2
Industrial Specialist	GS-1150	33	See Footnote 2
Production Controller	GS-1152	33	See Footnote 2
Ammunition Production Controller	GS-1601	33	See Footnote 2
Equipment Specialist	GS-1670	33	See Footnote 2
General Supply Specialist	GS-2001	33	See Footnote 2
Supply Management Specialist	GS-2003	33	See Footnote 2
Inventory Management Specialist	GS-2010	33	See Footnote 2
Distribution Facilities Specialist	GS-2030	33	See Footnote 2
Supply Cataloger	GS-2050	33	See Footnote 2
Transportation Specialist	GS-2101	33	See Footnote 2
Traffic Management Specialist	GS-2130	33	See Footnote 2
1. https://safety.army.mil/cp12online/WelcomeOverview/tabid/1261/Default.aspx 2. http://interns.ammo.okstate.edu/Career.asp			

B.2. Per AR 385-10, “The Army Safety Program,” US Army safety professionals (primarily SOH specialists and managers (0018) and safety engineers (0803)) serve as the principal points of contact for explosives safety technical expertise and program management. They must be adequately trained and possess experience in explosives safety appropriate to their explosives safety roles and responsibilities. The Army Civilian Training, Education and Development System:

B.2.1. Provides DA civilian personnel with a roadmap for career development throughout their total career.

B.2.2. Identifies a logical, visible framework for developing competencies required of personnel in the SOH CP.

B.2.3. Blends formal training, OJT, developmental assignments, and self-development activities. Requirements are tailored to personnel in the CP and also include prescribed civilian leader development.

B.2.4. Career path components, life-cycle model, and other related documents are available at <https://safety.army.mil/cp12online/ACTEDS/tabid/1279/Default.aspx>.

B.3. The Joint CP-12 training program is a comprehensive 2- to 3-year program that prepares career interns for challenging assignments all over the world. This Joint Services SOH Training Program is 15 weeks of formal instruction taught at the US Army Combat Readiness/Safety Center. After the initial formal training, the internship consists of a combination of OJT and specific training unique to the intern’s installation/facility (to include additional required explosives safety training) over the remainder of the 2-year training period. Additional information on the CP-12 training program is available at <https://safety.army.mil/cp12>.

B.4. For explosives safety personnel to be effective, the US Army requires:

B.4.1. Competency in general SOH explosives safety and program management, typically obtained through the US Army’s CP-12 training program.

B.4.2. Competency in leadership, typically obtained through US Army leadership courses.

B.5. The US Army Explosives Safety Training Working Group and the Army CP-12 functional chief’s representative (FCR) have developed competency models for explosives safety functions at the core and advanced levels. US Army explosives safety and training SMEs, in turn, have developed and continue to develop coursework to provide the knowledge and skills to ensure the competency of safety personnel. Per US Army policy all safety professionals will possess a core knowledge of explosives safety. Accordingly, all US Army safety professionals will complete training in the courses in Table B.2.

Table B.2. US Army Safety Professionals Core Knowledge Training Courses

DAC Course	Mode	Duration
AMMO 45 - Introduction to Ammunition	DL (self-paced)	8 hours
AMMO 63 - US Army Explosives Safety Familiarization	DL	12 hours
AMMO 78 - Ammunition Publications	DL	6 hours
AMMO 107 - Introduction to ESM for Safety Professionals	DL or Classroom	18 hours 32 hours

B.5.1. The US Army's Explosives Safety Training Working Group is developing advanced competencies and explosives safety training for safety professionals with explosives safety responsibilities, including:

- B.5.1.1. Tactical/deployed assignments.
- B.5.1.2. Base operations.
- B.5.1.3. Industrial AE activities (including USAMC Depot and USACE functions).
- B.5.1.4. RDT&E.
- B.5.1.5. Munitions response.

B.5.2. The US Army CP-12 FCR is also developing an explosives safety certification program, the CP-12 Explosives Safety Professional Certificate. The Explosives Safety Professional Certificate – Level 1 is currently available to all personnel who meet the established requirements and apply. Additional information is available at <https://safety.army.mil/cp12>. This tiered certification program:

- B.5.2.1. Provides a formal structure for defining and assessing explosives safety.
- B.5.2.2. Ensures safety professionals meet the training and career standards necessary for managing and executing the US Army's explosives safety program.
- B.5.2.3. Supports professionalism of the SOH workforce and provides personnel with a clear path to career progression.
- B.5.2.4. Is executed by the US Army Combat Readiness/Safety Center with oversight by the US Army's Explosives Safety Training Working Group.

B.6. Per US Army policy and standards, US Army ammunition professionals are additionally tasked with explosives safety duties, dependent upon position requirements and duty location but most commonly (but not exclusively) with the 1910, 0301, and 0346 job series and MOS 890A, Ammunition Technician (a US Army Warrant Officer Program). Ammunition manager (CP-33)

and QASAS (CP-20) personnel and ammunition warrant officers are used to provide technical assistance to commanders and safety directors and must also be adequately trained and qualified in explosives safety. The path for US Army ammunition professionals to gain core explosives safety skills is included in these established CPs:

B.6.1. Both CP-33 and CP-20 careerists are provided with opportunities to advance in their respective job assignments, responsibilities, and pay grade. Initially, all interns share a strong learning experience within the GS-7 pay grade. Upon successful completion of Phase 1 classroom training, interns receive a non-competitive promotion to GS-09. For first year plans of study for interns, go to <http://interns.ammo.okstate.edu/Career.asp>.

B.6.2. Once CP-33 interns have completed Phase 1 and Phase 2 training, they are required to submit a resume to the AMCP office to officially register in the CP. The AMCP Office provides a memorandum to the careerist confirming registration, enters the careerist information in the AMCP database, and includes the careerist on distribution for AMCP professional development opportunities and other CP-33 information. CP-33 consists of 17 different job series; personnel registered in CP-33 can apply for any of these positions worldwide and are in control of their own career path. Careerists compete for jobs and move to other locations based on their application and selection for positions.

B.6.3. CP-20 QASAS perform ammunition surveillance duties relating to ammunition inspection and logistics management including:

B.6.3.1. The inspection, test, and evaluation of AE and related materiel to determine the current degree of serviceability and rate of deterioration.

B.6.3.2. Safety of AE during storage, handling, transportation, use, and disposal.

B.6.3.3. Transportation of AE, including propriety of stowage, blocking, bracing, and suitability of transport equipment.

B.6.3.4. Assurance that AE supply disciplines are properly exercised.

B.6.3.5. Assurance that AE maintenance programs are conducted in a safe and proper manner.

B.6.3.6. Advice and assistance to US troop units during combat and training operations, including range operations, malfunction investigations, field storage requirements, supply/resupply rate computations, and restrictions on AE use.

B.6.3.7. Chemical surety and performance of surety officer functions.

B.6.3.8. Technical advice and assistance in the development of AE support doctrine and in studies undertaken to resolve AE-related logistics problems.

B.6.3.9. Advice and assistance in developing AE facilities budget and manpower requirements.

APPENDIX C**US NAVY TRAINING REQUIREMENTS FOR
MILITARY, CIVILIANS, AND CONTRACTORS**

C.1. The US Navy Explosives Safety Training Program is managed by the Naval Ordnance Safety and Security Activity and mandatory requirements are documented in NAVSEA OP 5, Volume 1, “Ammunition and Explosives Safety Ashore.”

C.2. Civilians assigned to Navy shore station positions involving AE responsibilities are encouraged to complete desired education and training pertaining to explosives safety (see Table C.1).

C.3. All personnel (military, civilians, and contractors) assigned to US Navy shore station positions involving AE responsibilities must complete all mandatory explosives safety training (see Table C.2) for their positions within time constraints identified in Appendix D of NAVSEA OP 5, Volume 1, after reporting to explosives safety duty. Explosives safety officers must complete all required training within 24 months of reporting for duty.

C.4. Navy explosives safety training courses are provided via the DAC, Navy Knowledge Online, and other sources (see Table C.3).

Table C.1. Desired Civil Service Training and Education for ESSs and Managers

Level	Desired Education and Self Development	Desired Training/Education/Experience
Intern or Entry Level: Explosives Safety Officers and ESSs GS-09-11	Associate's Degree	ESS; Munitions Specialist – OJT, and job assignments to meet site-specific mission requirements plus progressive formal training including: <ul style="list-style-type: none"> • AMMO 29: Electrical Explosives Safety for Naval Facilities • AMMO 36: Explosives Safety for Naval Facility Planning • AMMO 43: Intermodal Dry Cargo Container Re-inspection • AMMO 49: Naval Explosives Safety for Supervisors/Managers • AMMO 51: Naval Motor Vehicle and Railcar Inspection • AMMO 62: Technical Transportation of Hazardous Material • AMMO 74: Naval Explosives Safety Officer Orientation • Operational Risk Management (ORM) Training • DoD Munitions Rule Implementation Policy Training • Material Potentially Presenting an Explosive Hazard Training • Ammunition Supply Administration • USN/USMC Conventional Ammunition Sentencing Course • Explosives Safety Stand Down
Journeyman Level: Explosives Safety Officers and ESSs GS-11-13 (Mid-Management)	Bachelor's Degree; continuing education in advanced studies; professional certifications, Navy veterans with munitions specialty codes	All of the entry-level desired training and education plus: <ul style="list-style-type: none"> • Navy Knowledge Online and OPM management training courses • Explosives Safety Seminars: <ul style="list-style-type: none"> • DDESB/ Naval Ordnance Safety and Security Activity • International Society of Explosives Engineers (ISEE) • American Institute of Chemical Engineers Progressive and focused studies in ORM concepts

Table C.1. Desired Civil Service Training and Education for ESSs and Managers, continued

Level	Desired Education and Self Development	Desired Training/Education/Experience
Senior Level: ESMs GS-14-15	Navy veterans with munitions specialty codes and supervisory experience, master's degree in Safety, Science, or Engineering; Master's degree in Safety, Science, or Engineering; continuing education in advanced studies; professional certifications	All of the entry-level and journeyman-level desired training and education plus focused executive and leadership management studies attained through the following: <ul style="list-style-type: none"> • Federal Executive Institute • Management Development Center • Industrial College of the Armed Forces • OPM • Universities/Colleges • Professional development seminars and workshops

Table C.2. NAVSEA OP 5, Volume 1, Explosives Safety Training Requirements

Positions*	Navy Explosives Safety Courses M = Mandatory; R = Recommended															
	Basic Explosives Safety AMMO-18/49	Electrical Explosives Safety for Naval Facilities AMMO-29	Explosives Safety and Environmental Risk Management AMMO-33	Explosives Safety for Naval Facility Planning AMMO-36	Intermodal Dry Container CSC Reinspection AMMO-43	Naval Motor Vehicle and Railroad Inspection AMMO-51	ESO Orientation Course AMMO-74	Material Handling Equipment (MHE) Operator Course	AE Driver 12-Hour Training Course	Munitions Rule Training	Apprentice Trainer Course	Crane Safety (Non-Cab Operated Cat 3)	Crane Rigger	Ammunition Supply Administration	USN/USMC Conventional Ammunition Sentencing Course	Explosives Safety Stand Down
Commanding Officer, Officer-in-Charge, Executive Officer, Senior Civilian Director			M													R
ESO (oversees operations at facilities, enforces all safety regulations)	M 49	M	R	M		M	M			M				R	R	R
Ordnance/Weapons Officer	M 49	R	R	R			R			R				R	R	R
ESS (monitors programs and on-site operations)	M 49	R		R		R	R			R				R	R	R
Naval Ordnance Safety and Security Activity Explosives Safety Inspectors	M 49	M	R	M	R	M	M			M				M	R	R
Personnel who conduct or inspect grounding, bonding, and/or lightning protection	R 18	M														R
Personnel who prepare, review, and approve site approvals requests	R 49	R		M												R
Personnel who are involved in the handling or management of Waste Military Munitions	M 49									M						R
Explosives Driver	M† 18					R†			M							R

Table C.2. NAVSEA OP 5, Volume 1, Explosives Safety Training Requirements, continued

Positions*	Navy Explosives Safety Courses M = Mandatory; R = Recommended															
	Basic Explosives Safety AMMO-18/49	Electrical Explosives Safety for Naval Facilities AMMO-29	Explosives Safety and Environmental Risk Management AMMO-33	Explosives Safety for Naval Facility Planning AMMO-36	Intermodal Dry Container CSC Reinspection AMMO-43	Naval Motor Vehicle and Railroad Inspection AMMO-51	ESO Orientation Course AMMO-74	Material Handling Equipment (MHE) Operator Course	AE Driver 12-Hour Training Course	Munitions Rule Training	Apprentice Trainer Course	Crane Safety (Non-Cab Operated Cat 3)	Crane Rigger	Ammunition Supply Administration	USN/USMC Conventional Ammunition Sentencing Course	Explosives Safety Stand Down
Crane riggers who handle ordnance	R 18											M	M			R
Personnel who operate Category 3, non-cab cranes for moving ordnance on Naval Air Stations, Marine Corps Air Station, and other activities												M				
Navy and USMC personnel who are directly involved in sentencing of conventional ammunition	M 49														M	
Personnel assigned as Retail Ordnance Logistics Management System operators and data base administrators who process and maintain records relating to ordnance assets														M		
Personnel required by OPNAVINST 8023.24 (series) to be qualified and certified to handle ordnance and explosives, i.e., ordnance workers	M 18															R

Table C.2. NAVSEA OP 5, Volume 1, Explosives Safety Training Requirements, continued

Positions*	Navy Explosives Safety Courses M = Mandatory; R = Recommended															
	Basic Explosives Safety AMMO-18/49	Electrical Explosives Safety for Naval Facilities AMMO-29	Explosives Safety and Environmental Risk Management AMMO-33	Explosives Safety for Naval Facility Planning AMMO-36	Intermodal Dry Container CSC Reinspection AMMO-43	Naval Motor Vehicle and Railroad Inspection AMMO-51	ESO Orientation Course AMMO-74	Material Handling Equipment (MHE) Operator Course	AE Driver 12-Hour Training Course	Munitions Rule Training	Apprentice Trainer Course	Crane Safety (Non-Cab Operated Cat 3)	Crane Rigger	Ammunition Supply Administration	USN/USMC Conventional Ammunition Sentencing Course	Explosives Safety Stand Down
Inspectors of explosives laden vehicles and railcars required to sign forms (DD 626, “Motor Vehicle Inspection (Transporting Hazardous Materials)” and/or NAVSEA-8023-3, “Railroad Car Inspection Report”),	M 18					M										R
Personnel who are required to inspect or reinspect intermodal dry cargo containers					M											R
Local instructor	R 18						M	M	M	M	M					R
Explosives MHE Operator	M† 18						M									R
*Based on actual duties performed, not job title. †Attendance for Marine Corps explosives MHE operators and explosives drivers recommended but not mandatory in accordance with MCO P8020.10B. ‡This course via web-based training is recommended for Marine Corps explosives drivers who operate tactical vehicles and routinely transport ammunition from training ranges.																

Table C.3. US Navy Munitions Specialty Codes

Navy Munitions Specialty Codes		Navy Road Maps Link
Position Description	Specialty Code (Navy Enlisted Classification/Designator)	
EOD Technician (Enlisted)	533X	See Footnote
EOD Officer (Line/Limited Duty)	1140/6480	See Footnote
Special Warfare Operator (Enlisted)	MULTIPLE	See Footnote
Special Warfare Officer (Line/Warrant)	1130/7150	See Footnote
Gunners Mate Enlisted	07xx 08xx 09xx MULTIPLE	See Footnote
Fire Control Technician Enlisted	MULTIPLE	See Footnote
Surface Ordnance (Limited Duty Officer)	616X	See Footnote
Surface Ordnance (Chief Warrant Officer)	716X	See Footnote
Sub-Surface Ordnance (Limited Duty Officer)	726X	See Footnote
Sub-Surface Ordnance (Chief Warrant Officer)	626X	See Footnote
Aviation Ordnance (Enlisted)	MULTIPLE	See Footnote
Aviation Ordnance (Limited Duty Officer)	636X	See Footnote
Aviation Ordnance (Chief Warrant Officer)	736X	See Footnote
Mineman Enlisted	MULTIPLE	See Footnote
Machinist's Mate Submarine	MULTIPLE	See Footnote
Fire Control Technician Submarine	MULTIPLE	See Footnote
Footnote: www.nko.navy.mil		

APPENDIX D

US AIR FORCE ESSs

D.1. This section:

D.1.1. Outlines the training and education requirements for US Air Force personnel assigned explosives safety oversight responsibilities.

D.1.2. Provides basic guidance for career progression by identifying initial skills, and upgrade, qualification, advanced, and proficiency training requirements.

D.1.2.1. Initial skills training is the US Air Force specialty specific training that an individual receives upon entry into the US Air Force or upon retraining into this specialty for award of the 3-skill level.

D.1.2.2. Upgrade training identifies the mandatory courses, task qualification requirements, and correspondence course completion requirements for award of the 5-, 7-, and 9-skill levels.

D.1.2.3. Qualification training is actual hands-on task performance training designed to qualify an Airman in a specific duty position. This training program occurs both during and after the upgrade training process.

D.1.2.4. Advanced training is formal specialty training provided for selected Airmen.

D.1.2.5. Proficiency training is additional training (in-residence, exportable, advanced training courses, or OJT) provided to munitions personnel to increase their skills and knowledge beyond the minimum required for upgrade.

D.2. Active-duty US Air Force weapons (explosives) safety managers (WSMs) are:

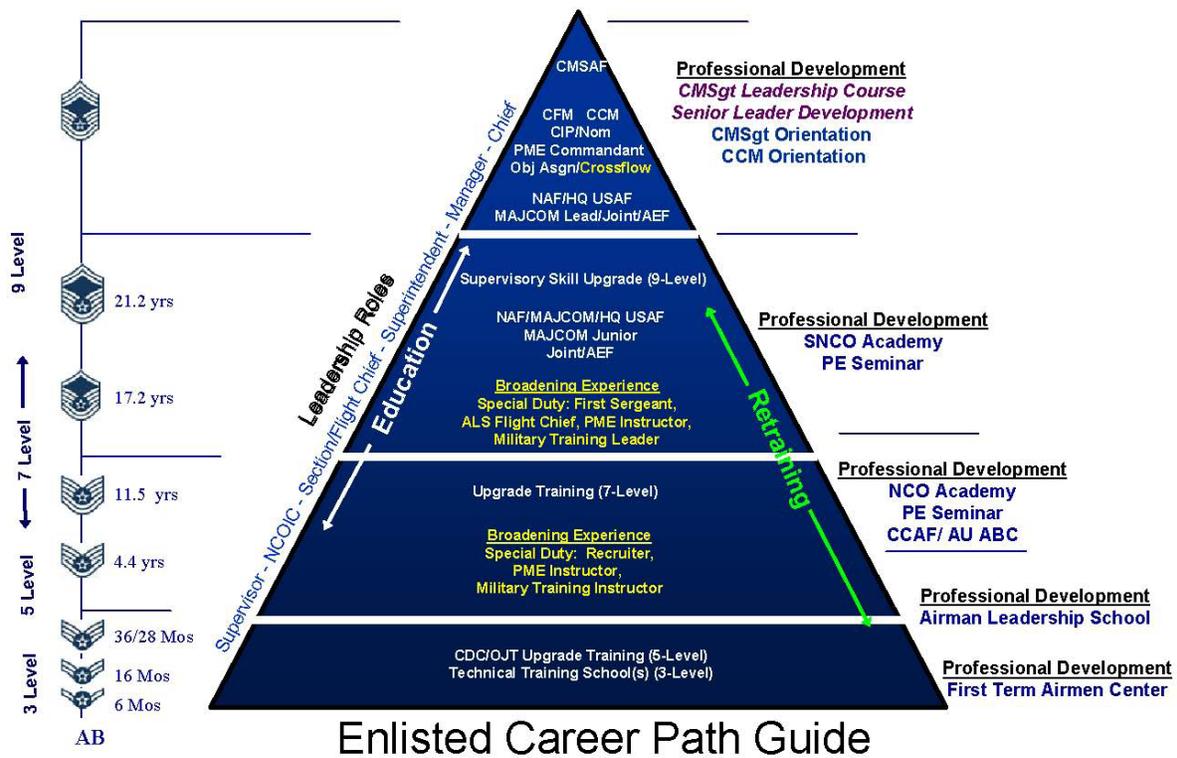
D.2.1. Comprised primarily of personnel selected from the enlisted 2W0X1 (Munitions Systems Specialty), 2W1X1 (Aircraft Armament Systems Specialty), and 2W2X1 (Nuclear Weapons Specialty) career fields in the E5 through E8 pay grades (7- and 9-skill levels).

D.2.2. Required to attend a formal 6-week Weapons Safety Management Course (L3AZR2W071 OC2A) at Lackland AFB, TX, within 90 days of assignment. A detailed description of this course is provided in paragraph D.4.

D.2.3. Upon completion of the Weapons Safety Management Course, awarded a 375 Special Experience Identifier (SEI) to track completion of Weapons Safety Management training throughout the remainder of their active duty career. This SEI is also used to identify trained personnel to fill WSM deployment and assignment vacancies where training in route is not a viable option or where previous WSM experience is required.

D.2.4. In addition to maintaining WSM proficiency, are required to complete a variety of formal and PME career planning requirements necessary to advance in grade and responsibilities (see Figure D.1).

Figure D.1. Enlisted Career Path Guide



D.3. The Weapons Safety Management Course provides 30 academic days of training to selected DoD personnel in the knowledge and skills needed to perform primary duties in weapons safety management. The training includes:

- D.3.1. Secretary of the US Air Force Mishap Prevention Program
- D.3.2. WSM responsibilities
- D.3.3. Nuclear surety
- D.3.4. Weapons safety training and education
- D.3.5. Hazard identification and reporting
- D.3.6. Deployed safety

- D.3.7. Personnel Reliability Program
- D.3.8. Safety inspection
- D.3.9. Assessment and staff assistance visits
- D.3.10. Explosives storage
- D.3.11. Explosives operations
- D.3.12. Explosives/nuclear transportation
- D.3.13. Firefighting/prevention
- D.3.14. Licensed explosives storage
- D.3.15. Flight line explosives locations/operations
- D.3.16. Ranges
- D.3.17. Hazards of electromagnetic radiation to ordnance analysis
- D.3.18. Explosives location/operation checklist
- D.3.19. Safety inspection of explosives locations/operations
- D.3.20. Safety inspection report
- D.3.21. Mishap investigation, human factors
- D.3.22. Mishap classifications and categories
- D.3.23. Mishap investigation and reporting
- D.3.24. QD separation
- D.3.25. Weapons safety for contingency operations
- D.3.26. Explosives site planning
- D.3.27. Glass breakage risk assessment
- D.3.28. Exceptions
- D.3.29. Explosives safety submissions

D.3.30. Explosives safety packages

D.4. Based on the complexity associated with many WSM tasks the Headquarters Air Force Safety Center developed a series of web-based AWST courses to complement the formal 6-week course. The courses provide refresher training but do not replace the requirement for WSMs to attend formal training. The AWST modules are on the AF portal at <https://www.my.af.mil/gcss-af/USAF/site/AFSC/SEW/Training>.

D.5. Historically, most civilian service personnel performing US Air Force WSM duties have prior active-duty military WSM experience in the three career series noted in paragraph D.1.2.2. (5-, 7-, and 9-skill levels) or have developed explosives safety skills serving in the 0018, SOH specialist or 0017, ESS/manager career series where explosives safety comprised a percentage of their overall duties. Civilians can also attend the formal Weapons Safety Management Course to develop WSM-required skills.

D.6. Figure D.2 depicts a high-level safety career progression pyramid for all active-duty and civilian service personnel. Table D.1 shows the desired levels of education, training and experience from trainee/intern (GS-07) through senior management (GS-13 through GS-15) levels. Additional information about safety civilian development is in AFMAN 36-606, "Civilian Career Field Management and Development," which details procedures and criteria for civilian career field management and force development.

Figure D.2. Safety Career Development Plan - Enlisted, Officer, and Civilian

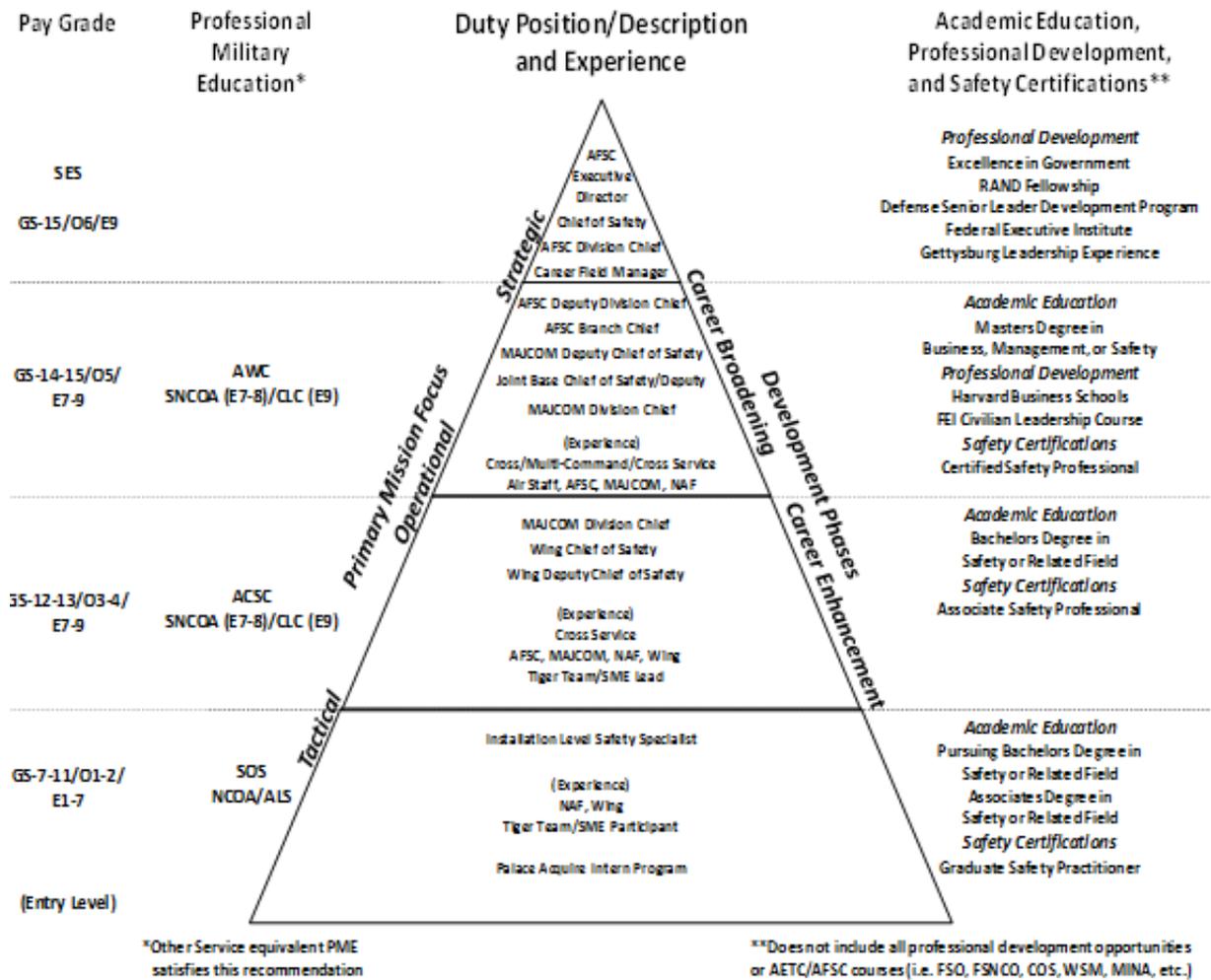


Table D.1. US Air Force Civilian Service Desired Education, Training, and Experience

Level	Desired Education and Self Development	Desired Education/Training/ Experience
Trainee/Intern GS-07	<ul style="list-style-type: none"> • Bachelor’s degree for interns • Equivalent Bachelor of Arts/Bachelor of Science experience for trainees 	<ul style="list-style-type: none"> • Safety Specialist • Munitions Systems Specialist • OJT and job assignments to meet specialty training standards skill levels • Occupational Safety and Health Administration (OSHA) Training Institute (OTI) • Safety Training Institute • Flight Safety NCO (L3AZR1S071-004) • Field Training Detachment courses • Basic data automation (application/operation) • Other OPM training • Weapons Safety Officer (Intern) (L3AZR2W171-004)
Intermediate GS-09-11	Bachelor’s or Associate’s degree in safety or related sciences	<ul style="list-style-type: none"> • National Safety Council • OTI • Safety Supervisor • Aircraft Mishap Investigation Course (WCIP05A) • Jet Engine Accident Investigation • Fire Protection and Life Safety (OSHA 207) • Technical Transportation of Hazardous Materials • Other federal training courses • Technical seminars/workshops • Field Training Detachment courses applicable to base mission • Environmental Protection Committee members (WMGT004) • Applicable Air Force Institute of Technology (AFIT) courses • Other OPM training • Flight Safety NCO (L3AZR1S071-004) • Weapons Safety Officer (L3AZR2W171-004) • System Safety and Human Factors • System Safety Analysis Course (WCIP06O) • Squadron Officer School Program offered both in residence at Maxwell AFB, AL, and by correspondence through the non-resident online course

Table D.1. US Air Force Civilian Service Desired Education, Training, and Experience, continued

Level	Desired Education and Self Development	Desired Education/Training/ Experience
Mid-Management GS-11-13	<ul style="list-style-type: none"> • Master’s or bachelor’s degree in safety, science, or engineering • Continuing education in advanced studies • Professional certifications 	<ul style="list-style-type: none"> • SOS Program offered both in residence at Maxwell AFB, AL, and by correspondence through the non-resident online course • Air Command and Staff College (ACSC) • Defense Management Education and Training short courses • Engineer-In-Training Refresher Course • OPM management development courses • Professional development seminars/workshops • Squadron Officer’s School • Safety Managers Course (WCIP05B) • Weapons Safety Officer Course (L3AZR2W171-004) • Flight Safety Officer Course (WCIP05C) • System Safety Management Course (WCIP057) • Chief of Safety Course (WCIP05B) • Applicable AFIT courses
Senior Management GS-13-15	<ul style="list-style-type: none"> • Ph.D. • Master’s degree through AFIT or civilian institution in safety, science, engineering, or management • Continuing education at the graduate level 	<ul style="list-style-type: none"> • ACSC; Air War College • Federal Executive Institute • Management Development Center courses • Industrial College of the Armed Forces • Other OPM training • University management courses • Professional development seminars/workshops • Chief of Safety Course (WCIP05B)

APPENDIX E

DCMA ESSs

E.1. This appendix: . Identifies the educational and training requirements for the DCMA explosives safety professional who is involved in AE operations that include;

E.1.1. The development, testing, storage, manufacture, modification, renovation, demilitarization, packaging, transportation, handling, disposal, inspection, repair, or any other use of AE.

E.1.2. Provides guidance for the establishment of management controls to enable the DCMA explosives safety professional to perform quality work.

E.2. It is important to maintain a highly qualified work force of professionals who are kept current in their knowledge and skills. The DoD explosives safety mission depends upon developing or hiring well-qualified explosives safety experts. The uniqueness of the AE business requires knowledge of contract administration, management ability, engineering/structure design, explosives manufacturing and munitions assembly, making it difficult to acquire fully qualified safety professionals.

E.3. The DCMA explosives safety professional:

E.3.1. Must be certified in the Defense Acquisition Workforce Improvement Act (DAWIA) for the Manufacturing, Production, and Quality Assurance career field.

E.3.2. May enter the Explosives Safety Program with varying degrees of safety-related training and/or experience. The qualification criteria for entry personnel is a combination of formal training and experience that establishes a minimum set of criteria for satisfactory performance:

E.3.2.1. Emphasize training when experience is lacking.

E.3.2.2. Stress experience when sufficient training has not been accomplished.

E.3.3. Enters the explosives safety career field as an intern or journeyman based on level of education and experience.

Figure E.1. DCMA Duty Position, Description and Experience

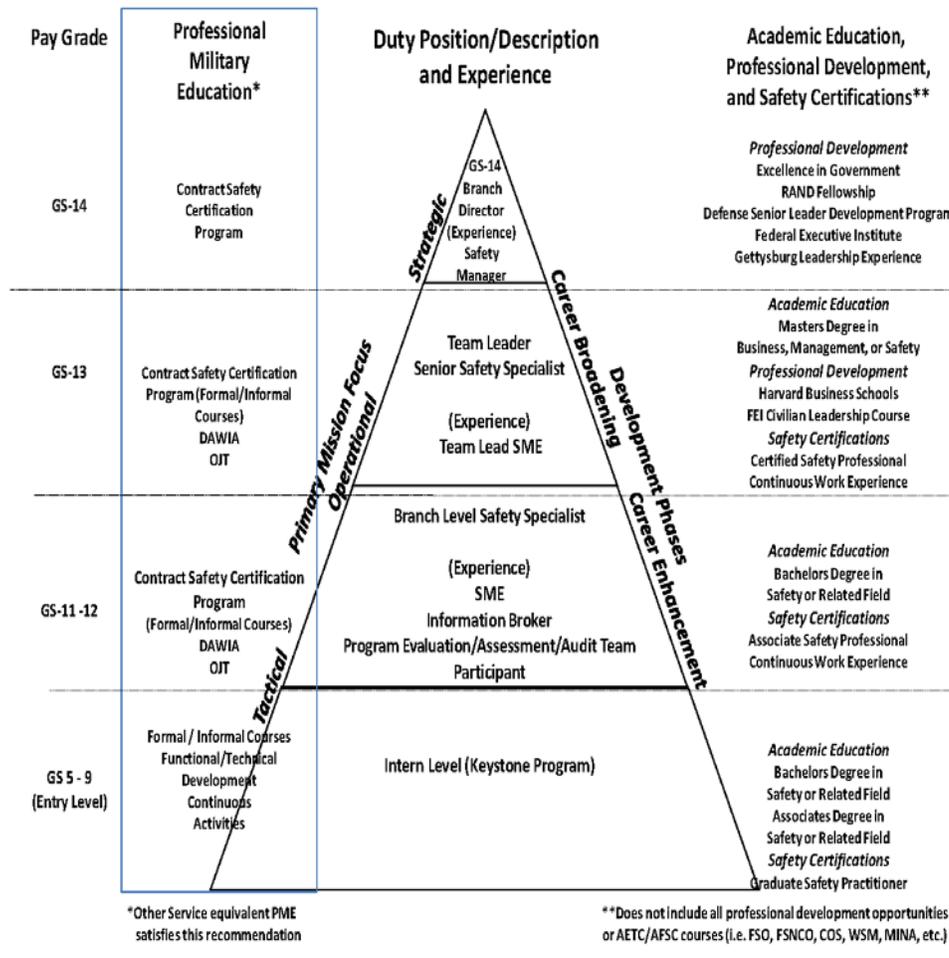


Table E.1. DCMA Desired Education and Training Experience by Level

Level	Desired Education and Self Development	Desired Education/Training/ Experience
Trainee/Intern GS-07	<ul style="list-style-type: none"> • College degree in health and safety • 3 years of continuous work experience in occupational health and safety • 50% or more of activities in duties to meet requirements of OPM position classification standards 	<ul style="list-style-type: none"> • Safety Specialist • OJT and job assignments to meet specialty training standards skill levels • OTI courses: <ul style="list-style-type: none"> • OSHA 511 - OSH Standards for General Industry • OSHA 521 - Guide to Industrial Hygiene • OSHA 3095 - Electrical Standards • National Fire Protection Association (NFPA) Life Safety Code • NFPA 13, Installation of Sprinkler Systems • National Safety Council Course #SE123 - Principles of Safety Management • DAC courses: <ul style="list-style-type: none"> • AMMO 45-DL - Introduction to Ammunition • AMMO 063 - US Army Explosives Safety Course • AMMO 77-P-DL - Bulk Propellants • AMMO 77-G-DL - Grenades • AMMO 77-B.DL – Bombs • AMMO 060 - Technical Ammunition • US Army Explosives Safety QD and Site Planning • DAWIA Acquisition Management: <ul style="list-style-type: none"> • ACQ 101 - Fundamentals of Systems Acquisition Management, Production, Quality and Management • PQM 101 - Production, Quality and Manufacturing Fundamentals courses • CLM 017 - Risk Management • US Department of Agriculture writing course • Basic data automation (application/operation) • Washington College course Chemistry of Pyrotechnics and Explosives • Georgia Tech course: OTI 2015 - Hazardous Material • Cross-Training at Ammunition and Explosives Facility • ACQ 201 – Intermediate Systems Acquisition, Part A • ACQ 201B – Intermediate Systems Acquisition, Part B
Trainee/Intern GS-07		<ul style="list-style-type: none"> • PQM 201A – Intermediate Production, Quality and Manufacturing, Part A • PQM 201B – Intermediate Production, Quality and Manufacturing Part B (R) • CLE 003 Technical Reviews

Table E.1. DCMA Desired Education and Training Experience by Level, continued

Level	Desired Education and Self Development	Desired Education/Training/ Experience
Intermediate GS-09/11	<ul style="list-style-type: none"> • Meet prerequisites for industrial certification • Completed all mandatory AE training courses within 18 months • 4 years of continuous work experience to include 50% or more activities in AE production and manufacturing 	<ul style="list-style-type: none"> • Safety Specialist • OJT and job assignments to meet specialty training standards skill levels • TCI Training, Inc (TCI) - DoD Contractor's Explosives Safety Course (AMMO065) • TCI - Process Safety Management and Classification • DAC courses: <ul style="list-style-type: none"> • AMMO 28 - US Army Electrical Explosives Safety • AMMO 050 - Naval Laboratory Explosives Safety • AMMO 054 - Risk Management and Preparation of SOPs for Ammunition & Explosives Operations • AMMO 060 - Technical Ammunition • US Army Explosives Safety QD and Site Planning • Washington College course Chemistry of Pyrotechnics and Explosives • Georgia Tech course: OTI 2015 - Hazardous Material • Cross-Training at Ammunition and Explosives Facility • ACQ 201 – Intermediate Systems Acquisition, Part A • ACQ 201B – Intermediate Systems Acquisition, Part B • PQM 201A – Intermediate Production, Quality and Manufacturing, Part A • PQM 201B – Intermediate Production, Quality and Manufacturing Part B (R) • CLE 003 Technical Reviews
Mid-Management GS-11-13	<ul style="list-style-type: none"> • College degree in safety • Continuous work experience • Continuing education 	<ul style="list-style-type: none"> • OPM management development courses • Professional development program (Glass Ceiling Program), seminars/workshop
Senior Management GS-13-15	<ul style="list-style-type: none"> • Continuous life work experience • Certification program • Leading change/ initiatives 	<ul style="list-style-type: none"> • Naval War College • Industrial College of the Armed Forces • Federal Executive Institute • Management Development Center courses • Other OPM training • University management courses • Professional development seminars/workshops

Table E.2. DCMA Civil Service Training and Education Requirements

DCMA Interns/Safety Professionals	DCMA AE Courses	
	Course	School Location
CSAF131	Safety Assessment for Explosive Risks	Applied Physics Technology, Huntsville, AL
CSAF132	Chemistry of Pyrotechnics and Explosives	Washington College, Chestertown, MD
CSAF133	Cross-Training at Ammunition and Explosives Facility	Various DCMA locations w/certified Contract Safety Personnel
CSAF134	Process Safety Management and Classification	Training and Consulting, Inc., Salt Lake City, UT
CSAF231	Ammunition and Explosives Cross Training at Military Installations	Various DoD facilities
CSAF232	Advanced Pyrotechnics Seminar	Washington College, Chestertown, MD
Course # to be assigned	DDESB Explosives Safety Seminar	Held biennially; site location varies

Table E.3. Basic DCMA Course Listing – GS-05 to GS-07

Mandatory	Technical
DCMA Learning Center (New Employee)	<p><u>Defense Acquisition University</u></p> <ul style="list-style-type: none"> • ACQ 101 - Fundamentals of Systems Acquisition Management • PQM 101 - Production, Quality, and Manufacturing Fundamentals • CLC 024 - Basic Math Tutorial • CLM 017 - Risk Management <p><u>DCMA</u></p> <ul style="list-style-type: none"> • Course Completion Requirements for Initial Industrial Certification: <ul style="list-style-type: none"> • CSAF121 - Occupational Safety and Health Standards for General Industry • CSAF122 Guide to Industrial Hygiene (OSHA 521) • CSAF123 - Electrical Standards • CSAF124 - Intro to Accident Investigation (OSHA 7505) • CSAF125 - Life Safety Code: Essentials with Focus on Occupancies • CSAF126 - Installation of Sprinkler Systems (NFPA 13) • CSAF127 - Principles of Safety Management • CSAF128 - Cross-Training at DCMA Industrial Facility • Course Completion Requirements for Initial Aircraft Certification: <ul style="list-style-type: none"> • CSAF111 - Aircraft Ground Safety • CSAF112 - Mishap Investigation • CSAF113 - Fall Arrest Systems • CSAF114 - ORM Integration and Execution • CSAF115 - Cross-Training at Aircraft Facility
Anti-Terrorism	
Fraud Awareness	
Computer Security	
Ethics	
Privacy Act	
Notification and Federal Employee Antidiscrimination and Retaliation Act	
Human Trafficking	

APPENDIX F

USACE OESSs

F.1. OESSs, CP 12, GS-0018, are individuals appointed by the USACE to support the execution of the MMRP and other work including clearance of operational ranges for maintenance purposes and to support new construction. Work may be performed in the continental United States and outside the continental United States. USACE OESSs are former military personnel graduated from the Naval EOD School.

F.2. The OESS:

F.2.1. Identifies fuzing and fuze condition.

F.2.1. Recognizes AE types by function, determines hazards, and makes risk assessments.

F.2.1. Applies explosives safety principles in various environments and/or media, including land and water.

F.2.1. Conducts reviews of project documents for proper application of explosives safety requirements (policy, regulations, guidance and standard operating procedures).

F.2.1. Conducts quality assurance inspections of contractor field operations with regard to applicable explosives and occupational health and safety requirements, and other assigned contract surveillance activities.

F.2.1. Assists with coordination of EOD and Chemical, Biological, Radioactive, Nuclear and Explosives Analytical and Remediation Activity (formerly known as Technical Escort Unit responses with the contractor operations, as required.

F.2.1. Serves as a project delivery team (PDT) member, at a minimum, representing explosives safety functional areas to the PDTs, regulators, stakeholders, and the public.

F.2.1. Advises and provides training for various stakeholders regarding explosives safety issues.

F.2.1. Ensures accidents are reported.

F.2.1. Participates in accident investigations.

F.3. Table F.1 outlines the training, certification and education requirements for USACE OESS personnel. Personnel at the GS-11/12 level are generally those conducting project level activities, while GS-13 personnel are team leaders or supervisors. Regardless of grade, all new hires must complete mandated training. Other courses may also be identified and considered to enhance personnel skills and abilities.

Table F.1. USACE OESS Training and Education Plan¹

Course	GS-11/12	GS-13	Duration	Source
EOD Technician ²	Mandated	Mandated	-	Naval EOD School
HAZWOPER ³	Mandated	Mandated	40	Resident (Vendor - refresher according to certificate)
USACE EM 385-1-97, "Explosives - Safety and Health Requirements Manual" ⁴	Mandated	Mandated	32	Resident (Environmental and Munitions Center of Expertise) http://www.environmental.usace.army.mil/workshops.htm
AMMO 68 - Military Munitions Rule ⁴	Mandated	Mandated	Self Paced	http://ammo.okstate.edu Updates when Rule changes.
Proponent Sponsored Engineer Corps Training (PROSPECT) Course #356 - CERCLA/RCRA Process	Recommended	Recommended	24	Resident (PROSPECT) http://ulc.usace.army.mil/
PROSPECT Course #215 Construction Safety ⁴	Mandated	Mandated	30	Resident (PROSPECT) http://ulc.usace.army.mil/
First Aid and CPR ⁴	Mandated	Mandated		Resident (Vendor – refresher according to certificate)
AMMO 62 - Technical Transportation of Hazardous Materials	Recommended	Recommended	80	http://ammo.okstate.edu
AMMO 37-DL General Transportation of Hazardous Materials – Refresher	Recommended	Recommended	40	http://ammo.okstate.edu
AMMO 20 - Chemical Agent Safety	Recommended	Recommended	32	http://ammo.okstate.edu

Table F.1. US Corps of Engineers OESS Training and Education Plan,¹ continued

Course	GS-11/12	GS-13	Duration	Source
AMMO 27 - Conventional Ammunition Radiation Hazards	Recommended	Recommended	24	http://ammo.okstate.edu
AMMO 45 – Introduction to Ammunition ⁵	Mandated	Mandated	8-DL	http://ammo.okstate.edu
AMMO 63 – Explosives Safety Familiarization ⁵	Mandated	Mandated	12-DL	http://ammo.okstate.edu
AMMO 78 – Ammunition Publications ⁵	Mandated	Mandated	6-DL	http://ammo.okstate.edu
AMMO 107 – ESM for Safety Professionals ⁵	Mandated	Mandated	18-DL	http://ammo.okstate.edu
PROSPECT Course #175-Dive Safety Administrator ⁶	Mandated	Mandated	88	Resident (PROSPECT) http://ulc.usace.army.mil/
PROSPECT Course #397-Dive Safety Administrator Refresher ⁶	Mandated	Mandated	40	Resident (PROSPECT) http://ulc.usace.army.mil/ Every 4-yrs, after completing PROSPECT course #175

¹ This plan may be modified after the Army completes the CP-12 Explosives Safety Competency Model. For Core competency, see Note 5. The Army Explosives Safety Training Working Group is currently developing advanced-level training requirements.

² USACE Pre-Requisite for appointment to OESSs.

³ Mandated prior to assignment to hazardous waste/MMRP operations.

⁴ To be scheduled within 6 months of initial employment or placement.

⁵ Mandated Core Competency, Level I (introductory-level training) courses mandated by Director of Army Safety, see Table B.2. Courses are to be completed for current employees by December 2013 and for those hired after December 2013, within 6 months of hiring.

⁶ Only for those OESSs involved in the oversight of under-water contractor MMRP work.

APPENDIX G

CONTINUED TRAINING AND EDUCATION OPPORTUNITIES

G.1. An ESS is a highly trained and skilled military or civilian professional that has been trained to evaluate risks and hazards involved with conventional guided missiles and toxic chemical ammunition operations. DoD Standards require that only trained and certified personnel are permitted to participate in operations involving ammunition, explosives, and/or explosive components, guided missiles, and toxic chemicals.

G.2. An ESS is responsible for:

G.2.1. Providing protection from the effects of AE by evaluating a set of standards developed by the DoD and reinforced by additional regulations by the branch of Military Service responsible for the explosives item.

G.2.2. Developing safety programs to minimize losses due to injuries and property damage.

G.2.3. Eliminating unsafe practices and conditions on sites where AE are used or stored. Military and civilian ESSs are deployed along with US Military forces to maintain safe storage and use of AE.

G.2.4. Recommending to military command ways to store AE that reduce the risk of injury or death to personnel in case of an accidental detonation or if the AE supply is hit by enemy attack.

G.3. ESSs receive OJT and classroom instruction. A college degree is desirable for this position; college programs and instruction provided by professional associations can assist individuals looking to begin and advance in a career in explosives safety.

G.3.1. Bachelor's and master's degree programs offer course work in explosives safety and blasting design and technology. These programs can help secure professional licensing while developing a professional network for future job opportunities.

G.3.2. Courses and training seminars offer specialty certifications. Acquiring learning credits through additional instruction can greatly supplement work experience.

G.3.2.1. Industry training seminars and certification preparation are available through programs accredited by the ISEE, such as the Explosives Academy (<http://www.explosivesacademy.org/certification.htm>) and RAM Inc. Explosives Educational Services (<https://ramets.com/>).

G.3.2.2. The Board of Certified Safety Professionals administers several qualifications for safety personnel.

G.3.2.3. Some states offer a professional engineer license in the safety discipline.

G.3.3. Table G-1 lists suggested continuing education, training, and other opportunities available for ESS personnel. It is not all inclusive and in no way constitutes a certification of the instructors, instruction methods, or graduates of the course, their products or services, and neither entity should represent or imply such endorsement.

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs

Blasting	
<p>American Society of Civil Engineers Continuing Education Department P.O. Box 79536 Baltimore, MD 21279-0536 Phone: 800-548-2723 or 703-295-6300 Fax: 703-295-6144 E-mail: conted@asce.org</p>	<p>Blasting Analysis International, Inc. 371 Daniel Street Allentown, PA 18104-8509 Phone: 610-530-7415 Fax: 610-395-5552 E-mail: BlastingAnalysis@worldnet.att.net</p>
<p>The Blasting Team 4th Blasting Team Conference at the Holiday Inn -- Skytop Center 20 Highway 411 SE Rome, GA 30161 Phone: 706-295-1100</p>	<p>Bridgemont Community and Technical College 619 2nd Avenue Montgomery, WV 25136 Phone: 304-734-6600 Website: www.bridgemont.edu</p> <p>Blasters Associate's Degree</p>
<p>Detonation Safety Engineering 121 Cherrywood Drive Nicholasville, KY 40356 Contact: Larry Schneider Phone: 859-312-0625</p>	<p>Dr. Edward J. Walter and Associates, Inc. 9241 Ravenna Road, C-6 Twinsburg, OH 44087 Phone: 800-964-0540</p>
<p>ESRA Consulting Corporation 1650 South Dixie Highway, 3rd floor Boca Raton, FL 33432 Phone: 561-361-0004 Fax: 520-844-8555 E-mail: blast@esracorp.com Website: www.esracorp.com</p> <p>ESRA offers monthly classes to prepare for the Blasting Contractor's License. Classes also available on the safe DOT transport of explosives. These courses are taught by an engineer and licensed blasting operator.</p>	<p>Explosives Academy 7777 Glades Road Boca Raton, FL 33434 Phone: 800-432-0840 E-mail: info@explosivesacademy.org Website: www.explosivesacademy.org</p> <p>Explosives Academy offers numerous online and in-person classes, training and certification on explosives safety and awareness training to prepare for blasters certification, blasting contractor licenses, Bureau of Alcohol, Tobacco, Firearms, and Explosives, DoD, and DOT explosives transportation. Regular classes are also available on improvised explosives devices (IEDs) and explosively formed penetrators (EFPs).</p>
<p>Explosives Educational Services, Inc. (EESI) 2326 River Road Granbury, TX 76048 Phone: 800-283-2331 E-mail: cayman@hpnc.com Website: www.exploseduvc.com</p> <p>EESI conducts regularly scheduled and on-site training courses on explosives safety and application.</p>	<p>Golder Associates Incorporated 6165 Ridgeview Court, Suite F Reno, NV 89509 Phone: 775-828-9604 E-mail: ????</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Blasting	
<p>ISEE 30325 Bainbridge Road Cleveland, OH 44139 Phone: 440-349-4400 Fax: 440-349-3788 Website: www.isee.org</p> <p>Visit the website, www.isee.org/calendar.htm, for a list of upcoming events sponsored by ISEE.</p> <p>ISEE is a professional society dedicated to promoting the safe and controlled use of explosives in mining, quarrying, construction, manufacturing, forestry, and many other commercial pursuits. They provide numerous courses related to explosives.</p>	<p>Lorne Bellamy and Associates 34 Lee Avenue Bradford, ON Canada L3Z 1A9 Phone: 905-775-4771 Fax: 905-778-9002 Website: lbellamy@technologist.com</p>
<p>Missouri University of Science and Technology Dr. Paul Worsey Rock Mechanics and Explosives Research Center 1006 Kings Highway Rolla, MO 65409-0660 Phone: 573-341-4317 E-mail: pworsey@mst.edu Website: http://www.mst.edu</p>	<p>Northwest Explosives Academy P.O. Box 841 Eugene, OR 97440 Phone: 541-554-6720 E-mail: nwexplosives@yahoo.com</p>
<p>National Stone, Sand and Gravel Association 1605 King Street Alexandria, VA 22314 Phone: 800-342-1415 or 202-342-1100 Fax: 202-342-0702 Website: www.nssga.org</p>	<p>Precision Blasting Services, Inc. Dr. Calvin J. Konya - President P.O. Box 189 Montville, OH 44064 Phone: 440-474-6700 Fax: 440-968-3967 E-mail: info@idc-pbs.com</p>
<p>Queens University Department of Mining Engineering Queen's University, Goodwin Hall Kingston, ON Canada K7L 3N6 Phone: 613-533-2197 or 613-692-0132 Fax: 613-533-6597 or 613-692-0131 Website: www.mine.queensu.ca</p>	<p>RAM Inc., Explosives Educational Services 2116 Hardin Lane Powell, OH 43065 Phone: 740-363-6976 Fax: 740-362-3946 E-mail: r.mcclure@ramets.com Website: www.ramets.com</p> <p>RAM offers on-site, custom, and scheduled training courses.</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Blasting	
<p>TerraDinamica Lucca-Brown, LLC 5 Meadow Brook Road Granby, CT 06035 Phone: 860-844-0506 Fax: 860-844-0507 E-mail: explosives@terradinamica.com Website: www.terradinamica.com</p>	<p>University of Washington Engineering Professional Programs Box 358725 Seattle, WA 98195-8725 Phone: 206-543-5539 E-mail: uw-epp@engr.washington.edu Website: www.engr.washington.edu/epp/</p>
<p>US Department of Labor, National Mine Health and Safety Academy Mine Safety and Health Administration Attention: Student Services 1301 Airport Road Beaver, WV 25813-9426 Phone: 304-256-3257</p>	
Detonation Mechanics	
<p>ABS Group 16855 Northchase Drive Houston, TX 77060 Phone: 281-673-2800 Fax: 281-673-2950</p>	<p>Baker Engineering and Risk Consultants, Inc. 3330 Oakwell Court, Suite 100 San Antonio, TX 78218 Phone: 210-824-5960 Fax: 210-824-5964 Website: www.BakerRisk.com</p>
<p>Colorado School of Mines Office of Special Programs and Continuing Education Golden, CO 80401 Contact: Dr. Vilem Petr, Assistant Research Professor, Mining Engineering Department Phone: 303-273-3321 Fax: 303-273-3314 Website: www.mines.edu/outreach/cont_ed</p>	<p>Computational Mechanics Associates P.O. Box 11314 Baltimore, MD 21239-0314 Phone: 410-532-3260 Fax: 410-532-3261 Website: www.compmechanics.com</p>
<p>Franklin Applied Physics, Inc. 98 Highland Avenue P.O. Box 313 Oaks, PA 19456 Phone: 610-666-6645 Fax: 610-666-0173 E-mail: FrankPhys@aol.com Website: http://members.aol.com/FrankPhy</p>	<p>University of Rhode Island DHS Center of Excellence Explosives Detection, Mitigation, Response Attn: Jimmie C. Oxley, Professor of Chemistry Kingston, RI 02881 Phone: 401-874-2103 Fax: 401-874-2103 E-mail: joxley@chm.uri.edu Website: www.chm.uri.edu/forensics/introexp.shtml</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Explosives Manufacture/Testing	
<p>Chilworth Technology Professional Process Safety Firm Call Victoria Jones at 732-274-0900 for information and registration for all classes.</p> <p>Offering classes in Fire, Explosion and Thermal Hazards Training; Fire and Explosion Prevention and Protection Techniques; Electrical Area Classification; Classification of Hazardous Materials for Transport; Thermal Stability Hazards; and Chemical Reaction Hazards.</p>	<p>Energetic Materials Research and Testing Center New Mexico Institute of Mining and Technology 801 Leroy Place Socorro, NM 87801-4796 Website: www.nmt.edu</p>
<p>Franklin Applied Physics, Inc. 98 Highland Avenue P.O. Box 313 Oaks, PA 19456 Phone: 610-666-6645 Fax: 610-666-0173 E-mail: FrankPhys@aol.com</p>	<p>The National Safety Education Center An OSHA Training Institute Education Center Phone: 800-656-5317 Website: www.earnyourcard.com/courses.cfm</p> <p>Call or visit the website to order a free course catalog.</p>
<p>RAM Inc., Explosives Educational Services 2116 Hardin Lane Powell, OH 43065 Phone: 740-363-6976 Fax: 740-362-3946 E-mail: r.mcclure@ramets.com Website: www.ramets.com</p> <p>RAM offers on-site, custom, and scheduled training courses.</p>	
Exporting	
<p>Export Control Seminars 3 Bethesda Metro Center, Suite 700 Bethesda, MD 20814 Phone: 301-664-8453</p>	
Higher Education	
<p>Colorado State University Department of Civil Engineering Fort Collins, CO 80523 Phone: 970-491-5048 Fax: 970-491-7727 Website: www.colostate.edu</p> <ul style="list-style-type: none"> • Undergraduate Program: General Civil Engineering Degree • Graduate Programs: M.S., M.Engr. and Ph.D. degrees in geotechnical engineering 	<p>Eastern Kentucky University College of Justice and Safety 220 Stratton Building 521 Lancaster Avenue Richmond, KY 40475-3102 Phone: 859-622-1052 Fax: 859-622-1530 Website: www.fireandsafety.eku.edu</p> <p>Program in Fire, Arson, and Explosion Investigation</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Higher Education	
<p>Michigan Technological University Mining and Materials Processing Engineering 309 Minerals and Materials Building 1400 Townsend Drive Houghton, MI 49931 Phone: 906-487-2610 Fax: 906-487-2495 E-mail: mining@mtu.edu Website: www.mg.mtu.edu/</p> <ul style="list-style-type: none"> • Undergraduate Program: Mining Engineering • Graduate Program Concentrations: Environmental Impacts of Mining; Geostatistics; Materials Handling; Mine Health and Safety; Mineral Economics; Rock Fragmentation; Rock Mechanics; Solution Mining; and Underground Construction 	<p>Missouri University of Science and Technology Department of Mining Engineering 226 McNutt Hall 1870 Miner Circle Rolla, MO 65409-0450 Phone: 573-341-4753 Fax: 573-341-6934 Website: http://www.mst.edu/</p> <ul style="list-style-type: none"> • Undergraduate Program: Mining engineering degree with quarry emphasis or minor in explosives engineering • Graduate Programs: M.S. or Ph.D. in mining engineering • Postgraduate Programs: Certificates in explosives engineering • Non-Traditional Program: On-line master's degree in engineering science
<p>Montana Tech of the University of Montana Mining Engineering Department 1300 W. Park Street Butte, MT 59701 Phone: 406-496-4262 Fax: 406-496-4260 Website: www.mtech.edu/mining</p> <ul style="list-style-type: none"> • Undergraduate Program: Mining engineering • Graduate Program: M.S. in mining engineering 	<p>New Mexico Institute of Mining and Technology Socorro, NM 87801 Phone: 505-835-5346 - Mineral Engineering Department Phone: 505-835-5693 - Mechanical Engineering Department Website: www.nmt.edu</p> <ul style="list-style-type: none"> • Undergraduate Program: B.S. in mineral engineering with an explosives engineering emphasis • Graduate Program: M.S. (a Ph.D. program has been proposed and is being reviewed) • Non-Traditional Program: Virtual Center for Blast Fragmentation and Control offers lectures via the Internet in drilling and blasting engineering and geotechnical dynamics
<p>Northwestern University and New Mexico Tech Website: www.it.northwestern.edu/</p> <ul style="list-style-type: none"> • Non-Traditional Program: Virtual Center for Blast Fragmentation and Control offers lectures via the Internet in drilling and blasting engineering and geotechnical dynamics 	<p>University of Rhode Island Chemistry and Forensic Science Department Attn: Jimmie Oxley Kingston, RI 02881 Phone: 401-874-2103 Fax: 401-874-2103 E-mail: joxley@chm.uri.edu Website: www.chm.uri.edu/forensics/introexp.shtml</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Higher Education	
<p>University of Utah Department of Mining Engineering 135 S. 1460 E, #313 Salt Lake City, UT 84112-0113 Phone: 801-581-7198 Fax: 801-585-5410 E-mail: mineeng@mines.utah.edu Website: www.mines.utah.edu/mining</p> <ul style="list-style-type: none"> • Undergraduate Program: Mining engineering • Graduate Programs: M.S., M.E., Ph.D. degrees in mining engineering 	<p>Virginia Tech Department of Mining and Minerals Engineering 100 Holden Hall Blacksburg, VA 24061 Phone: 540-231-6671 Fax: 540-231-4070 Website: www.mining.vt.edu</p> <ul style="list-style-type: none"> • Undergraduate Program: Mining and minerals engineering • Graduate Programs: M.S., M.E., Ph.D. degrees in mining and minerals engineering
Transportation	
<p>American Trucking Associations 2200 Mill Road Alexandria, VA 22314 E-mail: agardner@trucking.org</p>	<p>Dangerous Goods Advisory Council (DGAC) 1100 H Street, NW Suite 740 Washington, DC 20005 Phone: 800-634-1598 or 202-289-4550 Fax: 202-289-4074 E-mail: info@dgac.org Website: www.dgac.org</p> <p>DGAC offers a wide range of hazardous materials transportation regulatory compliance training programs. These programs are designed for individuals who participate in the development, implementation, evaluation, execution or training for their organization's regulatory compliance activities. Please contact them for a list of courses.</p>
<p>Emergency Film Group P.O. Box 1928 Edgartown, MA 02539 Phone: 800-842-0999 Fax: 508-627-8863 E-mail: info@efilmgroup.com</p>	<p>EPA Region III Hazardous Materials Transportation Incident Training Seminars Phone: 410-676-0882</p> <p>EPA Region III (Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia, West Virginia), will hold three seminars on preparing for hazmat transportation incidents.</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Transportation	
<p>Explosives Academy 7777 Glades Road Boca Raton, FL 33434 Phone: 800-432-0840 E-mail: info@explosivesacademy.org Website: www.explosivesacademy.org</p> <p>Explosives Academy offers numerous online and in-person classes on explosives safety and awareness training to prepare for blasters certification; blasting contractor licenses; Bureau of Alcohol, Tobacco, Firearms and Explosives; DoD; and DOT explosives transportation. Regular classes are also available on IEDs and EFPs.</p>	<p>J.J. Keller and Associates, Inc. 3003 W. Breezewood Lane P.O. Box 368 Neenah, WI 54957-0368 Phone: 800-327-6868 E-mail: sales@jjkeller.com Website: www.jjkeller.com</p>
<p>Long Island Productions, Inc. 106 Capitola Drive Durham, NC 27713 Phone: 800-397-5215 or 919-544-6663 Fax: 919-544-5800 E-mail: mail@longislandproductions.com Website: www.safetytrainingnetwork.com</p> <p>Offers variety of safety training products including DOT hazmat compliance videos. Please contact them for a catalog and additional information.</p>	<p>Lorne Bellamy and Associates 34 Lee Avenue Bradford, ON Canada L3Z 1A9 Phone: 905-775-4771 Fax: 905-778-9002 E-mail: lbellamy@technologist.com</p>
<p>National Transportation Consultants, Inc. P.O. Box 5728 Douglasville, GA 30154 Phone: 770-942-7460 or 770-942-2731 E-mail: t.dunaway@worldnet.att.net or r.tynes@bellsouth.net</p>	<p>Pipeline and Hazardous Materials Safety Administration (PHMSA) US Department of Transportation East Building, 2nd Floor 1200 New Jersey Avenue, SE Washington, DC 20590</p>
<p>RAM Inc., Explosives Educational Services 2116 Hardin Lane Powell, OH 43065 Phone: 740-363-6976 Fax: 740-362-3946 E-mail: r.mcclure@ramets.com Website: www.ramets.com</p> <p>RAM offers on-site, custom, and scheduled training courses.</p>	<p>Regulations Training, Inc. Based in Denver, CO Website: www.hazardousmaterials.com</p> <p>Offers multimodal hazardous materials and dangerous goods transportation training covering DOT 49 CFR, IATA DGR, and International Maritime Dangerous Goods Code regulations.</p>

Table G.1. Continuing Education, Training, and Other Opportunities Available for ESSs, continued

Transportation	
<p>Transportation Safety Institute (TSI) (DTI-30) 4400 Will Rogers Parkway, Suite 218 Oklahoma City, OK 73108 Phone: 405-949-0036, ext 374 Fax: 405-946-4345</p> <p>TSI is part of the DOT, they offer courses which are designed to train individuals in skills necessary to monitor the transportation of hazmat in their areas of responsibility. Please contact them for a list of courses.</p>	
Vibration	
<p>Dr. Edward J. Walter and Associates, Inc. 9241 Ravenna Road, C-6 Twinsburg, OH 44087 Phone: 800-964-0540</p>	<p>GeoSonics/Vibra-Tech P.O. Box 779 Warrendale, PA 15095 Phone: 724-934-2900</p>
<p>RAM, Inc., Explosives Educational Services 2116 Hardin Lane Powell, OH 43065 USA Phone: 740-363-6976 Fax: 740-362-3946 E-mail: r.mcclure@ramets.com Website: www.ramets.com</p> <p>RAM offers on-site, custom, and scheduled training courses.</p>	<p>Seismic Surveys, Inc. P.O. Box 1185 Frederick, MD 21702 Contact: David K. Miller, P.G., president Phone: 301-663-6630 Fax: 301-663-6647 E-mail: dmiller@seismicsurveys.net E-mail: dharrison@seismicsurveys.net Website: www.seismicsurveys.net</p>

GLOSSARY

ACSC	Air Command and Staff College
AE	Ammunition and Explosives
AFB	Air Force Base
AFI	Air Force Instruction
AFIT	Air Force Institute of Technology
AFMAN	Air Force Manual
AMCP	Ammunition Manager Career Program
AOC	Army Operations Center
AR	Army Regulation
AWST	Advanced Weapons Safety Training
CCDR	Combatant Commander
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CJCSI	Chairman of the Joint Chief of Staff Instruction
CNO	Chief of Naval Operations
CP	Career Program
CPR	Cardiopulmonary Resuscitation
DA	Department of the Army
DAC	US Army Defense Ammunition Center
DAWIA	Defense Acquisition Workforce Improvement Act
DCMA	Defense Contract Management Agency
DDESB	Department of Defense Explosives Safety Board
DGAC	Dangerous Good Advisory Council
DL	Distance Learning
DoD	Department of Defense
DoDI	DoD instruction
EESI	Explosives Educational Services, Inc.
EM	Engineering Manual
EOD	Explosive Ordnance Disposal
ES	Exposed Site
ESM	Explosives Safety Management
ESMP	Explosives Safety Management Program
ESMRM	Explosives Safety and Munitions Risk Management
ESO	Explosives Safety Officer
ESS	Explosives Safety Specialist
FCR	Functional Chief's Representative
GS	General Schedule
HAZWOPER	Hazardous Waste Operations
HQDA	Headquarters, Department of the Army
ISEE	International Society of Explosives Engineers
MCO	Marine Corps Order
MHE	Material Handling Equipment
MMRP	Military Munitions Response Program

MOS	Military Occupational Specialty
NAVSEA	Naval Sea Systems Command
NFPA	National Fire Protection Association
OESS	Ordnance and Explosives Safety Specialist
OJT	On-the-Job Training
OP	Ordnance Pamphlet
OPM	Office of Personnel Management
OPNAVINST	Chief of Naval Operations Instruction
ORM	Operational Risk Management
OSHA	Occupational Safety and Health Administration
OTI	OSHA Training Institute
PME	Professional Military Education
QASAS	Quality Assurance Specialist Ammunition Surveillance
QD	Quantity Distance
RCRA	Resource Conservation and Recovery Act
RDT&E	Research, Development, Test and Evaluation
RESS	Required Explosives Safety Submissions
SEI	Special Experience Identifier
SME	Subject Matter Expert
SOH	Safety and Occupational Health
TP	Technical Paper
TSI	Transportation Safety Institute
US	United States
USACE	United States Army Corps of Engineers
USAMC	US Army Materiel Command
U.S.C.	United States Code
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology, and Logistics
USMC	US Marine Corps
USN	US Navy
WSM	Weapons Safety Manager