

Guide to Development of the

**PROGRAMMATIC ENVIRONMENTAL,
SAFETY, AND OCCUPATIONAL HEALTH
EVALUATION (PESHE)**



Prepared for the
Department of the Army

Prepared by the
U.S. Army Environmental Center

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PREFACE

The content of this guide is based on the latest information contained in Department of Defense (DoD) Regulation 5000.2-R, Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs, dated June 2001.

Because relevant statutes, standards, regulations, and executive orders are subject to change, this guide will be updated as necessary. Any questions, suggestions, or enhancements to the guide should be directed to the following:

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ACRONYMS AND ABBREVIATIONS

AAPPSO	US Army Acquisition Pollution Prevention Support Office	DOPAA	Description of Proposed Action and Alternatives
ACAT	Acquisition Category	DOT&E	Director, Operational Test and Evaluation
ACSIM	Assistant Chief of Staff for Installation Management	DRMO	Defense Reutilization and Marketing Office
ACTD	Advanced Concept Technology Demonstration	DRMS	Defense Reutilization and Marketing Service
AoA	Analysis of Alternatives	DU	Depleted Uranium
AR	Army Regulation	EA	Environmental Assessment
AS	Acquisition Strategy	EIS	Environmental Impact Statement
ASA(ALT)	Assistant Secretary of the Army for Acquisition, Logistics and Technology	EMP	Environmental Management Program
ASA(FM&C)	Assistant Secretary of the Army for Financial Management and Comptroller	EO	Executive Order
ASARC	Army Systems Acquisition Review Council	EPA	Environmental Protection Agency
CAIV	Cost as an Independent Variable	EPCRA	Emergency Planning and Community Right-to-Know Act
CAM	Cost Analysis Manual	ESOH	Environmental, Safety, and Occupational Health
CARD	Cost Analysis Requirements Description	FAA	Federal Aviation Administration
CCA	Component Cost Analysis	FAADS	Forward Area Air Defense System
CFR	Code of Federal Regulations	FGS	Final Governing Standards
CJCSI	Chairman of the Joint Chiefs of Staff Instruction	FNSI	Finding of No Significant Impact
COTS	Commercial Off-the-Shelf	FY	Fiscal Year
CRB	Cost Review Board	GOTS	Government Off-the-Shelf
CX	Categorical Exclusion	HHA	Health Hazard Assessment
DA PAM	Department of the Army Pamphlet	HHAR	Health Hazard Assessment Report
DASA(ESOH)	Deputy Assistant Secretary of the Army for Environmental, Safety and Occupational Health	HMMP	Hazardous Materials Management Program
DCMA	Defense Contract Management Agency	HQDA	Headquarters Department of the Army
DDESB	Department of Defense Explosives Safety Board	HSI	Human Systems Integration
DENIX	Defense Environmental Network and Information Exchange	IPPD	Integrated Product and Process Development
DLA	Defense Logistics Agency	IPT	Integrated Product Team
DoD	Department of Defense	JG-PP	Joint Group on Pollution Prevention
DoDD	Department of Defense Directive	LCCE	Life-Cycle Cost Estimate
DoDI	Department of Defense Instruction	LMI	Logistical Management Information

LRIP	Low-Rate Initial Production	PM	Program/Project/Product Manager
MACOM	Major Army Command		
MAIS	Major Automated Information System	POE	Program Office Estimate
		REC	Record of Environmental Consideration
MANPRINT	Manpower and Personnel Integration	ROD	Record of Decision
MDAP	Major Defense Acquisition Program	SHPO	State Historic Preservation Officer
		SMMP	System MANPRINT Management Plan
MIL-STD	Military Standard		
MNS	Mission Need Statement	SOFA	Status-of-Forces Agreement
NAS	National Aerospace Standard	SSMP	System Safety Management Plan
		STARS	Strategic Target System
NASA	National Aeronautics and Space Administration	TEMP	Test and Evaluation Master Plan
		TOC	Total Ownership Cost
NATO	North Atlantic Treaty Organization	TRI	Toxic Release Inventory
		USACEAC	US Army Cost and Economic Analysis Center
NEPA	National Environmental Policy Act	USACHPPM	US Army Center for Health Promotion and Preventive Medicine
ODC	Ozone Depleting Chemical		
OEBGD	Overseas Environmental Baseline Guidance Document	USAEC	US Army Environmental Center
OEM	Original Equipment Manufacturer	USASMDC	US Army Space and Missile Defense Command
ORD	Operational Requirements Document	USATCES	US Army Technical Center for Explosives Safety
PEO	Program Executive Officer	USC	United States Code
PESHE	Programmatic Environmental, Safety, and Occupational Health Evaluation	UXO	Unexploded Ordnance
		VOC	Volatile Organic Compound

CHAPTER 1.0:

INTRODUCTION

The Department of Defense (DoD) recognizes, as a consequence of its experience in funding expensive pollution cleanups for past weapons system programs, that identification of environmental issues early in the acquisition process can avoid significant life-cycle costs, program delays, and risks to system performance. As a result, environmental, safety, and occupational health (ESOH) requirements must be considered an integral part of the systems engineering process from the time of program planning and initiation. ESOH requirements and constraints must be identified, communicated to design activities, and applied to weapon system components in the same manner as any other system requirement. A weapon system design cannot be considered successful if ESOH requirements are not integrated into its development.

The DoD 5000 Series require Program/Project/Product Managers (PMs) and other acquisition officials to identify and consider ESOH issues early in the acquisition process. The recent update to DoD Regulation 5000.2-R [*Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs*] specifies that the PM “shall ensure a system design that can be tested, operated, maintained, repaired, and disposed of in accordance with ESOH statutes, regulations, and policies...”. To help meet this requirement, the Regulation now specifies that PMs for *all programs*, regardless of acquisition category (ACAT), shall prepare a Programmatic ESOH Evaluation (PESHE) document early in the program, and maintain an updated PESHE throughout the program life cycle.¹

The PESHE is a management tool used to assist PMs and their staff in identifying and managing ESOH hazards and risks, and in determining how to best meet ESOH regulatory requirements and DoD standards. It is a living document that is continually updated and maintained throughout the progression of a program or project, from concept to disposal. Because the PESHE is a program document, it is not intended to supersede or replace other ESOH documents [e.g., System Safety Management Plans, Pollution Prevention Plans, and National Environmental Policy Act (NEPA) documents]. The primary objectives of the PESHE are as follows:

- Describe the PM’s strategy for integrating ESOH considerations into the systems engineering process.
- Evaluate program ESOH compliance in the six areas stipulated in Section C5.2.3.5.10 of DoD 5000.2-R (i.e., ESOH Compliance, NEPA Compliance, Safety and Health, Hazardous Materials Management, Pollution Prevention, and Explosives Safety).
- Delineate ESOH responsibilities.
- Identify ESOH risks.
- Document ESOH progress to date, and plans and schedules for future compliance.

¹ Although *not* a requirement for non-ACAT level programs and projects (i.e., Technology Projects and other programs and projects with non-developmental acquisition status), development of a PESHE for such programs and projects is strongly recommended.

1.1 PURPOSE OF THE GUIDE

The purpose of this guide is to assist PMs, ESOH support staff, and other program personnel in the development of a PESHE that helps in the formulation of a comprehensive ESOH management strategy; meets all of the DoD 5000.2-R requirements; and contains the program ESOH information necessary to support applicable Army Systems Acquisition Review Council (ASARC) reviews, and other major milestone decision/interim progress reviews.² It provides guidance, recommendations, and suggestions for preparing a PESHE applicable to Army programs. The information is presented in a simple, understandable, and manageable format, suitable for use throughout the Army acquisition community.

1.2 USE AND ORGANIZATION OF THE GUIDE

Use of the guide is recommended for all Army acquisition programs in the process of developing or revising their PESHE documents. The guide is intended to help make the PESHE a useful tool for PMs in carrying out their responsibilities to consider ESOH requirements and issues early in the design process, and throughout the acquisition life cycle. The approach presented here is not intended to generate excessive paperwork for PMs, but to make consideration of ESOH issues an integral part of weapon system design.

Following the introduction of the guide in Chapter 1, Chapters 2 through 4 provide comprehensive guidance and information on PESHE development. Chapter 2 identifies key players and describes their level of involvement in the PESHE development process. Chapter 3 describes the components of a PESHE document, recommended formats to use, and the types of information that are normally included. Chapter 4 describes the basic steps involved in developing the PESHE. Lastly, Chapter 5 lists the references that were used in preparation of the guide.

Users of this guide should understand that the information contained is provided as guidance only for conducting and documenting ESOH evaluations. Because the guidance is not all-inclusive, each PM should tailor his/her compliance review to program-unique system requirements, installation locations, and operational parameters during testing, fielding, maintenance, deployment, operation, and demilitarization and disposal.

1.3 DoD 5000 SERIES POLICY, PROCEDURES, AND GUIDANCE APPLICABLE TO PESHE DEVELOPMENT

The DoD has invested billions of dollars cleaning up pollution resulting from its past weapon system development and production activities. In 1993, as a result of an audit of selected MDAPs, the DoD Inspector General found that there was inadequate consideration of environmental requirements and effects in acquisition planning, potentially causing significant program costs or delays. In the Fiscal Year (FY) 1995 Defense Authorization Act, Congress directed the Secretary of Defense to issue guidance concerning how to comply with NEPA requirements to analyze environmental impacts of acquisition programs and how to analyze life-cycle environmental costs early in the acquisition process. DoD has since rewritten and

² A list of typical questions that PMs can be expected to respond to at ASARC and other milestone reviews is provided in Appendix A of the guide.

published policy and mandatory guidance in the DoD Directive 5000.1 (*The Defense Acquisition System*), DoD Instruction 5000.2 (*Operation of the Defense Acquisition System*), and DoD 5000.2-R to assist PMs and other acquisition officials in fulfilling their obligations to consider environmental effects and costs in acquisition planning.³

In the recent update of DoD 5000.2-R, it states that *all programs*, regardless of ACAT level, are to comply with ESOH requirements throughout the system life cycle. System development must either incorporate regulatory compliance (at a minimum), or risk creating systems that are not deployable due to unacceptable risks to personnel safety, system operability problems (including human-machine interface), unacceptable environmental impacts, or adverse public perception. It is essential to address these issues early in the development process to avoid expensive and time-consuming impacts on system readiness. DoD 5000.2-R specifically states, “To minimize the cost and schedule risks over the system’s life cycle that changing ESOH requirements and regulations represent, the PM shall regularly review ESOH regulatory requirements and evaluate their impact on the program’s life-cycle cost, schedule, and performance.” Compliance with applicable statutes and regulations can be met through the continuous integration of ESOH requirements into the systems engineering process.

To help PMs ensure full and continuous ESOH compliance for their programs, Section C5.2.3.5.10 of DoD 5000.2-R requires that all ACAT programs prepare and update a PESHE document as a means to manage and track the progress of compliance requirements. Although the preparation of a PESHE is not a requirement for non-ACAT programs, the Regulation’s Foreword section specifies that this and other procedures contained should serve as a “general model” for such programs to follow. In accordance with Section C5.2.3.5.10 of the Regulation, PESHEs are to address the following six ESOH technical and management disciplines, which form the basis for the overall evaluation.

- ESOH Compliance
- NEPA [including compliance with Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*, as applicable]
- Safety and Health
- Hazardous Materials Management (including the management of hazardous wastes)⁴
- Pollution Prevention
- Explosives Safety

The Regulation requires PMs to prepare and update the PESHE over the system life cycle to reflect changes in the program or compliance requirements. Figure 1-1 shows the program phases and sub-phases, activities, and major milestones of the new “5000 Model” of the acquisition life-cycle process, as defined in the latest update to DoD Instruction 5000.2.

³ The most recent versions of the DoD 5000 Series can be accessed at the following DoD web site:
<http://www.acq.osd.mil/ap/>.

⁴ A *hazardous material* is defined here as any material which, because of its quality, concentration, physical, or infectious characteristics, may pose a substantial hazard to human health or to the environment when released or spilled. A hazardous material becomes a *hazardous waste* when it can no longer be used for the purpose it was originally intended. A waste is considered hazardous if it is either listed on the Environmental Protection Agency (EPA) or state regulatory lists of hazardous wastes, or it exhibits one or more of the four hazardous characteristics (i.e., ignitability, corrosivity, reactivity, and toxicity).

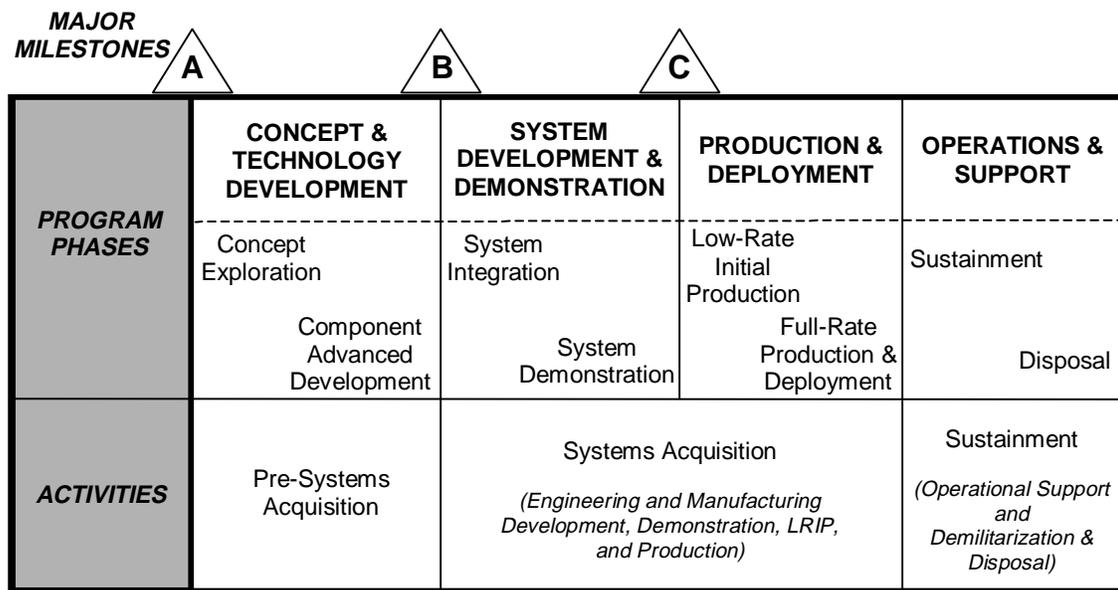


Figure 1-1. DoD 5000 Model of the Acquisition Life-Cycle Process

Preparation of a PESHE *must* begin when an acquisition program is initiated, usually Milestone B, but should begin sooner if at all possible. The actual point at which a program enters the acquisition process can vary, depending on concept and technology maturity of the program.

Since the ESOH requirements are mandatory, PMs must tailor an ESOH management approach that best supports their program. Per Section C5.2.3.5.10 of DoD 5000.2-R, this effort requires PMs to incorporate appropriate analyses of the six ESOH disciplines listed earlier (including any supporting documentation) into the systems engineering process as part of the program’s overall Integrated Product and Process Development (IPPD). Sections C2.8.6 and C5.2.3.5.10.5 of DoD 5000.2-R also stipulate that the Acquisition Strategy (i.e., the Support Strategy portion) for a program must contain a summary of the PESHE document, including ESOH risks, a strategy for integrating ESOH considerations into the systems engineering process, identification of ESOH responsibilities, a completion schedule for NEPA and EO 12114 compliance, and a method for tracking the progress of ESOH issues.

1.4 BENEFITS OF ESOH MANAGEMENT IN ACQUISITION PROGRAMS

There are many benefits, in addition to successful program reviews, that result from performing a thorough ESOH evaluation. The risks associated with “show stoppers” arising from NEPA or other compliance issues are reduced. Contractor production costs may be decreased by the reduction in the need for hazardous materials purchase and handling, and waste stream processing. Proactive hazardous materials and pollution prevention management programs will result in a cost savings to the Government in later years by eliminating or greatly decreasing the volume of hazardous materials that have to be handled during the operation, support, and disposal phases of the fielded system. In addition, the elimination or control of health and safety hazards reduces injuries and illness, compensation claims, lost time, and training restrictions; resulting in improved soldier and system performance and readiness.

ESOH management is not just a development area of interest, but an operational area as well. Unforeseen ESOH impacts can become operational impacts by restricting or halting missions, reducing the funds available for operations and maintenance, and increasing costs due to restrictive regulations.

The following are some examples of how ESOH issues and requirements have impacted Army programs and actions:

- **Forward Area Air Defense System (FAADS) Testing at White Sands Missile Range.** In May 1989, an Army drone helicopter being used in the FAADS testing crashed and caused a 5,000-acre range fire. The original environmental analysis did not address the potential for range fires. Testing was subsequently delayed for two months while an Environmental Assessment (EA) was prepared, in accordance with NEPA, that implemented adequate mitigation measures for possible range fires during testing.
- **Bradley Fighting Vehicle.** In FY 1996, the Bradley Fighting Vehicle Program Office established a Pollution Prevention Program requiring every prime and major subsystem contractor to establish pollution prevention programs based on National Aerospace Standard (NAS) 411 (*Hazardous Material Management Program*). Since then, the program has achieved significant reductions in the use of zinc chromate, methylene chloride, methyl ethyl ketone, acetone, ethylene glycol, and many other volatile organic compounds (VOCs). With the removal of hazardous materials from manufacturing operations, direct and overhead costs of prime and subcontractors were reduced. In addition, expenses for hazardous material fees, hazardous waste treatment and disposal, and remediation activities were also eliminated.
- **Use of Depleted Uranium in Armor-Piercing Rounds and Armor.** Large quantities of depleted uranium (DU) rounds were fired during the Gulf War and were very effective in penetrating Iraqi tanks. Moreover, US tanks with DU armor proved effective against enemy fire. However, a number of advocacy groups have attempted to demonstrate a causal link between exposure to DU from exploded rounds and certain Gulf War illnesses. There has also been a broader effort to demonstrate that production and testing of DU could expose the public to unacceptable health risks.

Prompted by the resulting controversy, DoD conducted a thorough review of reported incidents involving exposure of US soldiers to DU in light of existing scientific knowledge. In its 4 August 1998 report, the Office of the Special Assistant for Gulf War concluded that: “This investigation, and medical and scientific research to date, have not established any relationship between DU exposures and the undiagnosed illnesses presented by some Gulf War veterans.”

In this example, health issues were critical factors in the initial development of DU munitions and armor. Continuing evaluation of health issues has also been important in rebutting public claims concerning adverse health effects from DU exposure. Failure to adequately evaluate health effects or respond to public health concerns could have jeopardized the ability of DoD to field DU systems.

- **Strategic Target System (STARS) Testing at Pacific Missile Range Facility.** The Pacific Missile Range Facility on Kauai, Hawaii was selected for STARS test launches because the

Polaris rocket motors used by STARS had too short a range to be launched from Vandenberg Air Force Base to Kwajalein Atoll, and longer range Minuteman I boosters were not available. Because environmental concerns were not given sufficient consideration, the STARS Program decision to prepare an EA failed to anticipate public controversy, fully identify state and environmental review requirements, or provide adequate opportunity for public involvement. These unrecognized public concerns led to legal and political challenges which ultimately forced the Army to prepare an Environmental Impact Statement (EIS). The STARS program was delayed for two years at a cost of \$27 million.

- **Comanche (RAH-66) Pollution Prevention Program.** The Comanche Environmental Management Program (EMP) leverages current solutions to many of the ESOH problems associated with traditional materials and industrial processes, and identifies technologies which are projected to mature as the Comanche development effort proceeds towards its culmination over the next several years. Where alternatives to hazardous materials are not available, an open architecture concept will be used to permit infusion of new technology into the design process later, with minimal impact on performance, cost, and schedule.

In comparison to currently fielded weapon systems, the Comanche will pose generally less ESOH risks and impacts. For example, the program will not require any special testing, manufacturing, and maintenance that has not already been accomplished at DoD/industry test, production, and maintenance facilities. The Comanche system will also be more environmentally friendly due to the early incorporation of pollution prevention into the prioritization of hazardous materials and subsequent trade studies.

In addition, environmental risk mitigation measures have been imposed in the Comanche Engineering and Manufacturing Development contract that include: (1) implementation of an EMP with pollution prevention requirements; (2) bringing ESOH considerations into the Integrated Product Team (IPT) process; (3) integration of pollution prevention into the system engineering process and trade studies; (4) compliance with all environmental laws, regulations, and policies, including Toxic Release Inventory (TRI) reporting requirements; (5) prohibiting use of both Class I and Class II ozone depleting chemicals (ODCs) and high VOC content materials; and (6) implementation of Health Hazards and Safety Assessments, and in-process reviews, to address EMP progress.

ESOH management is like logistics management in that design influence is most effective early in the program. Consideration of ESOH issues by key program personnel is critical in the early stages when concepts and designs are fluid. During program definition and the development of operational requirements, a critical review of potential ESOH issues may result in changes that will greatly reduce life-cycle costs and environmental, safety, and health impacts, while maintaining or even enhancing system performance. As demonstrated by the Comanche program, prevention is the most effective way to handle ESOH problems, but is normally possible only when the problems are recognized early in the program life cycle. When corrections and changes for ESOH problems are dealt with later in the life cycle, they are more likely to be costly and impede the acquisition process, as Figure 1-2 shows.

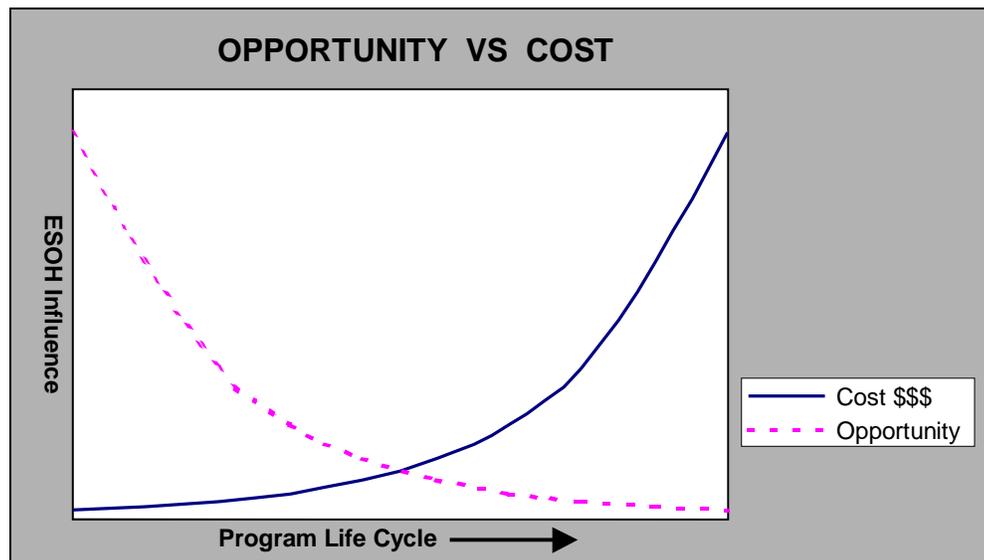


Figure 1-2. ESOH Opportunities for Influence vs Relevant Costs Over the Program Life Cycle

1.5 SOURCES FOR ADDITIONAL ASSISTANCE, GUIDANCE, AND INFORMATION

Depending on the complexity of the acquisition, developing and maintaining a useful, comprehensive, and informative PESHE can be an involved task. It is recognized that significant expertise is available to the PM, and members of his/her office, from local support organizations [e.g., Major Army Command (MACOM) environmental and safety offices] and systems engineering/technical assistance contractors; however, further assistance or guidance may become necessary. This section provides a list of sources for additional assistance, guidance, and information for use during development and maintenance of an acquisition program's PESHE.

Sources for Assistance

- US Army Acquisition Pollution Prevention Support Office (AAPPSO).** AAPPSO serves as the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)) principal staff for all environmental issues affecting acquisition. AAPPSO also leads the Army's Program to: (1) eliminate requirements for hazardous materials in the design, manufacture, maintenance, operation and demilitarization of weapon systems and materiel; (2) reduce the acquisition of hazardous materials and uses of these materials in manufacturing and industrial processes; (3) review and revise standardized documents, including specifications and standards, to eliminate hazardous material requirements; (4) eliminate the use of Class I ODCs in weapon systems; and (5) assist Materiel Developers in executing their environmental responsibilities as specified in Army regulations and the DoD 5000 Series documents.

Contact: (703) 617-9488, DSN 767-9488

Web Information: <http://www.aapps.com/>

- **US Army Environmental Center (USAEC).** In helping to implement the Army's Environmental Programs, the USAEC provides a broad range of environmental services and products to Headquarters Department of the Army (HQDA), MACOMs, and commanders worldwide. For acquisition programs, the USAEC provides support in several areas including: (1) support to the Assistant Chief of Staff for Installation Management (ACSIM) and the Deputy Assistant Secretary of the Army for Environmental, Safety and Occupational Health (DASA(ESOH)) for the ASARC and the Cost Review Boards (CRB); (2) membership on the IPTs of pertinent PMs whose systems or commodities have the potential to significantly impact Army installations and/or the environment; (3) support to Program Management Offices in the review of PESHEs for the purpose of assisting the PM in integrating ESOH requirements into their system engineering process; and (4) support to Program Offices in the review of their NEPA analyses and in the development of NEPA strategies.

Contact: (410) 436-6854, DSN 584-6854

Web Information: <http://aec.army.mil/>

- **US Army Center for Health Promotion and Preventive Medicine (USACHPPM).** The USACHPPM's mission is to provide worldwide technical support for implementing preventive medicine, public health, and health promotion/wellness services into all aspects of the Army community. The USACHPPM's support to acquisition programs includes: (1) the preparation of Health Hazard Assessments (HHAs) for Program Offices responsible for Army systems development or improvement; (2) evaluation of laser and optical radiation hazards to soldiers, aviators, and other Army personnel and civilians; (3) health risk assessments for soldiers and the general public exposed to ionizing radiation; (4) source emission (stack) testing and air pollution health impact assessments; (5) noise monitoring and modeling; (6) evaluation of hazardous waste management procedures; (7) pollution prevention opportunity assessments; and (8) industrial wastewater analyses.

Contact: (800) 222-9698

Web Information: <http://chppm-www.apgea.army.mil/>

- **US Army Safety Center.** The US Army Safety Center is responsible for administering the Army Safety Program. The program is designed to create safe air and ground operations, and promote safe practices by military and civilian personnel both on and off duty. The Center synchronizes efforts across the Army's major commands and the Army staff during the development and day-to-day management of safety policies, while commanders execute those policies and procedures at the unit level. Major responsibilities of the Army Safety Center include: (1) conducting independent system safety assessments for ACAT I programs; (2) assistance with on-site internal evaluations of risk management and command safety programs; (3) conducting safety training for military and civilian safety professionals; (4) developing, coordinating, and disseminating Army Safety Program policy, direction, and guidance; and (5) conducting accident investigations for aviation and certain ground accidents.

Contact: (334) 255-1390, DSN 558-1390

Web Information: <http://safety.army.mil/home.html>

- **US Army Technical Center for Explosives Safety (USATCES).** The USATCES is an element of the Defense Ammunition Center, established to review the Army's explosives safety program and implement sound vigilant explosives/chemical agent/ordnance and explosives safety principles. Some of the USATCES responsibilities include: (1) providing toxic chemical agent safety technical information and assistance to support and enhance the Army Chemical Agent Safety Program; (2) developing HQDA policies, procedures, and regulations addressing safety controls used during cleanup of ammunition and explosives; (3) providing on-site explosives mishap technical assistance in support of the US Army Safety Center; (4) tracking DoD Explosives Safety Board (DDESB) surveys to assist and support major commands in accomplishing corrective measures; and (5) maintaining and updating the DoD Joint Hazard Classification System database of final hazard classification data for the military services' ammunition and explosives.

Contact: (918) 420-8919, DSN 956-8919

Web Information: <http://www.dac.army.mil/es/default.asp?id=1>

- **US Army Cost and Economic Analysis Center (USACEAC).** As a Field Operating Agency of the Assistant Secretary of the Army for Financial Management and Comptroller (ASA(FM&C)), the USACEAC provides independent cost estimating support to the Army's resource management and acquisition process. USACEAC mission responsibilities include: (1) conducting Statutory Independent Cost Estimates and Component Cost Analyses for weapons and command, control, communications, and computer systems, as required; (2) preparing Independent Cost Estimates for ACAT IC programs, as required; (3) managing the CRB and Army Cost Position Process; and (4) developing and promulgating cost and economic analysis policy, cost estimating models, and cost databases for Army-wide use.

Contact: (703) 601-4187, DSN 329-4187

Web Information: <http://www.ceac.army.mil/default.htm>

- **Joint Group on Pollution Prevention (JG-PP).** The JG-PP is a partnership between the Military Services, the National Aeronautics and Space Administration (NASA), and the Defense Contract Management Agency (DCMA), chartered by the Joint Logistics Commanders to reduce or eliminate hazardous materials or processes within the acquisition and sustainment communities. The JG-PP can assist PMs with the following: (1) identify pollution prevention opportunities that can be undertaken jointly by multiple system managers in concert with one or more original equipment manufacturers (OEMs) or OEM facilities; (2) ensure critical system performance requirements are addressed; (3) identify environmentally acceptable alternatives that have the potential to replace hazardous materials; (4) identify testing costs, testing locations, sources of funding, and contract vehicles; (5) conduct or oversee validation testing; and (6) use the Single Process Initiative to implement validated alternatives on systems.

Contact: (703) 617-9488, DSN 767-9488 (for the Army point of contact on the JG-PP)

Web information: <http://www.jgpp.com/>

- **Department of Defense Explosives Safety Board (DDESB).** The DDESB was established to provide oversight of the development, manufacture, testing, maintenance, demilitarization, handling, transportation, and storage of explosives, including chemical agents, on DoD facilities worldwide. The DDESB mission is to provide objective advice to the Secretary of

Defense and Service Secretaries on matters concerning explosives safety, and to prevent hazardous conditions to life and property on and off DoD installations from the explosive and environmental effects of DoD titled munitions. Some of the DDESB's responsibilities include: (1) developing and promulgating explosives safety policies, regulations, and criteria that comply with federal, state, and local legislative requirements; (2) facilitating reporting of explosives safety mishaps; (3) supporting research, development, testing, and evaluation of explosion effects; (4) reviewing and approving site plans for storage of ammunition and explosives; and (5) establishing standards for the clearance of unexploded ordnance (UXO) from contaminated lands.

Contact: (703) 325-0969, DSN 221-0969

Web Information: <http://www.hqda.army.mil/ddebs/hotlinks.html>

Sources for Additional Guidance and Information

- **Defense Acquisition Deskbook.** The Deskbook is a web-based and compact-disc automated reference tool sponsored by the Deputy Under Secretary of Defense Acquisition Reform and the Office of the Under Secretary of Defense Acquisition, Technology, and Logistics. The Deskbook originated from an Acquisition Reform initiative aimed at reducing directives while helping acquisition professionals make informed decisions. As part of recent updates to the Deskbook, PMs can now access applicable ESOH information including: (1) summaries of ESOH statutory and regulatory requirements, (2) a review of DoD 5000 Series requirements and ESOH-related documents (e.g., PESHE and Acquisition Strategy), (3) guidance for integrating ESOH into the IPPD Process, (4) a listing of ESOH review considerations, (5) ESOH checklists by acquisition phase, and (6) a variety of lessons learned.

Web Access: <http://web1.deskbook.osd.mil/default.asp>

- **Defense Environmental Network and Information Exchange (DENIX).** DENIX provides DoD personnel in the environmental, safety, and occupational health arena with timely access to relevant legislative, compliance, restoration, cleanup, and DoD guidance information. It is intended to serve as a central electronic “meeting place” where information can be exchanged among environmental professionals worldwide.⁵

Web Access: <https://www.denix.osd.mil/>

- **Rules of the Road—A Guide for Leading Successful Integrated Product Teams.** This guide is designed to assist the PM and supporting acquisition community in developing and executing high-performance IPTs.

Web Access: <http://www.acq.osd.mil/ap/>

- **Guide to Environmental, Safety, and Occupational Health Compliance for Army Weapon Systems.** The purpose of this guide is to assist Army acquisition managers, ESOH

⁵ Because DENIX is a controlled web site, a user name and password is required for access to the DoD menu. To set up an account, contact the DENIX Account Manager via e-mail at acctmgr@www.denix.osd.mil.

support staff, and other program personnel in the identification of ESOH-related regulatory compliance requirements that may potentially affect acquisition programs.

Web Access: *(in progress)*

- **NEPA Manual for Materiel Acquisition.** This detailed manual is a “how-to” covering the integration of the NEPA into Army materiel acquisition programs.

Web Access: <http://aec.army.mil/prod/nepa/docs.htm>

- **Guide to Development of the Description of Proposed Action and Alternatives (DOPAA)—A Supplement to the US Army NEPA Manual Series.** This guide provides Army proponents, preparers, and other NEPA analysis participants with a more structured and effective approach to creating DOPAAs for Army EAs and EISs.

Web Access: *(in progress)*

- **US Army Space and Missile Defense Command (USASMDC)—Explosives Safety.** This USASMDC web page provides links to various DoD and Army explosives safety directives, regulations, standards, and other pertinent documents.

Web Access: <http://www.smdc.army.mil/SAFETY/explosiv.html>

- **Army Cost Analysis Manual (CAM).** The Army CAM provides the basic methodologies and procedures for implementing cost analysis policies. The recently revised Chapter 6 provides an overview of topics on environmental quality costing for any weapon system.

Web Access: <http://www.ceac.army.mil/default.htm>

- **Methodology for Developing Environmental Requirements for a Cost Analysis Requirements Description (CARD).** In support of developing the CARD, this methodology provides a suggested approach for identifying life-cycle environmental requirements for acquisition programs, so that their cost can be estimated.

Web Access: *(in progress)*

CHAPTER 2.0:

ROLES AND RESPONSIBILITIES

This chapter contains information on the roles and responsibilities of those key participants involved in the Army PESHE development process. For ESOH integration and compliance management to be successful, participants must understand their responsibilities and work as a team by maintaining a high degree of communication, interaction, and coordination. Experts in the program areas of engineering, testing, manufacturing, environmental management, system safety, health, program management, etc., as well as the eventual system user, should interface early and frequently via IPT meetings and through other means as part of the systems engineering process. This approach both assists in documenting the ESOH evaluation and ensures that ESOH strategies are implemented in the day-to-day program activities.

2.1 PROGRAM/PROJECT/PRODUCT MANAGER

As required by DoD Regulation 5000.2-R, the PM has overall responsibility for development of the PESHE. In preparing the PESHE document, the PM must understand that no one person is likely to be knowledgeable of all areas to be covered in an ESOH evaluation. However, those involved with developing the PESHE should be knowledgeable of the DoD 5000.2-R ESOH requirements, and should be given access to key personnel involved in the program planning and ESOH-related activities.

For a program to be successful in achieving and maintaining ESOH compliance, the PM must take a proactive, visible role to instill an ESOH ethic throughout his/her staff. To help accomplish this, the PM can formally release a policy statement identifying the importance of ESOH issues and regulatory requirements to the program, such as the example provided in Appendix B. This point cannot be overemphasized. The success of integrating ESOH requirements into the program is questionable without constant support and direction from the PM.

2.2 ESOH SUPPORT STAFF

In addition to relying on in-house environmental staff, the PM can usually obtain PESHE support through the MACOM environmental and safety offices, systems engineering/technical assistance contractors, or other environmental contractor support. In some cases, development of the PESHE will require a teaming of government and contractor personnel.

If the task of developing the PESHE document is assigned to a government and/or environmental contractor team, the team is going to need an in-depth understanding of many technical aspects of the program so that the outside ESOH experts can determine what regulatory requirements apply. Once this is done, the team will need to communicate the PESHE results back to the PM, and system planners and engineers, in ways that are meaningful to the program design, production, and operational efforts.

2.3 SYSTEMS ENGINEERING AND INTEGRATION CONTRACTOR

To help ensure ESOH compliance, the prime contractor responsible for weapon system development is often required to prepare a comprehensive environmental management plan, perform analyses to identify ESOH hazards, support all requirements associated with the use of hazardous materials, and implement a cost-effective pollution prevention program. As part of contract provisions, the contractor should be required to provide the PM's office with the appropriate data and information needed to support an ESOH evaluation.

If preparation of the PESHE document is also tasked to the prime contractor, it should be coordinated with their efforts on other acquisition programs being supported, and with the contractor's own internal process for maintaining ESOH compliance.

2.4 SYSTEM USER

The user will eventually inherit the weapon system. Decisions made early in the program will have ramifications for the life of the system. Because life-cycle analyses are a fundamental part of the ESOH evaluation, the user must contribute their sensitivities to ESOH issues as early as possible in the design process. For example, users at installations may identify possible impacts that can be proactively resolved by changes in system design or logistical support. Alternatively, they can plan and manage system fielding by modifying permits or preparing other mitigation procedures that eliminate local constraints on the use of the system.

2.5 INSTALLATIONS

It is often the case that developmental testing, fielding, maintenance, and the operation of weapon systems result in environmental impacts, with the most significant impacts occurring after fielding. To minimize such impacts at home and at host installations (including military facilities, ranges, training lands, and maintenance/supply depots), the environmental characteristics of a new or modified weapon system should be coordinated with Environmental Office staff at testing/gaining installations as early in development as possible, so potential impacts can be evaluated for special management or mitigation consideration. In developing a program ESOH strategy, early planning and cooperation with installations may reduce the total ownership cost (TOC) and help maintain program schedules.

2.6 OTHER SUPPORTING AGENCIES

At the request of the PM, other agencies, including AAPPSO, USAEC, USACHPPM, and the Army Safety Center can provide subject matter expertise in identifying ESOH compliance requirements and in developing ESOH strategies (see also Section 1.5 of the guide). The Defense Logistics Agency (DLA) can play a critical role in establishing supply support, and technical and logistics service requirements for weapons programs.¹ As a field activities service of the DLA, the Defense Reutilization and Marketing Service (DRMS) can provide insight into current and expected future problems of system disposal.²

¹ The DLA web home page is accessible at <http://www.dla.mil/>.

² The DRMS web home page can be accessed at <http://www.drms.dla.mil/>, or contact the local Defense Reutilization and Marketing Office (DRMO) for information.

CHAPTER 3.0:

COMPONENTS AND ORGANIZATION OF THE PESHE DOCUMENT

This chapter provides detailed descriptions of the individual components of an Army PESHE document, based on the outline shown in Table 3-1. The outline, and accompanying guidance, incorporates the latest DoD 5000.2-R requirements and is modeled after the PESHE outline guidance provided in the most recent update of the Defense Acquisition Deskbook (a brief description of the Deskbook is provided in Section 1.5 of the guide).

The organization of the PESHE outline is generally applicable to all ACAT level programs and should be used as a model in the development of Army PESHE documents. It is important to note that this format might not be fully suited for some Army programs, in which case, some variation in format is appropriate. When preparing a PESHE for a non-ACAT level program or project (e.g., Technology Project), some sections of the outline will likely not apply at all (e.g., ESOH accomplishments and future actions by life-cycle phase).

The format and content of a PESHE document will also vary depending on the program's current life-cycle phase and level of maturity. More mature programs will be able to provide greater detail regarding compliance status and issues. As programs mature, the level of detail provided in the PESHE will increase. Regardless of the stage of the program, the PESHE should address the required ESOH elements in sufficient detail to provide a "roadmap" for the PM to follow and to adequately summarize the ESOH activities in support of milestone reviews.

3.1 OVERVIEW OF THE PROGRAMMATIC ESOH EVALUATION (PESHE CHAPTER 1.0)

3.1.1 Purpose (PESHE Section 1.1)

This section serves as an introduction to the PESHE document. Presented in a very brief form, it describes the system and its mission in terms of what it does and why it is needed; it identifies the program office and agency responsible for development of the system; and it gives the current phase or status of system development. This section should also point out the regulatory basis for preparing the PESHE document (i.e., DoD 5000.2-R), and summarize the primary objectives for preparing the PESHE, such as the following:

- Describe the PM's strategy for integrating ESOH considerations into the systems engineering process.
- Evaluate program ESOH compliance in the six areas stipulated in Section C5.2.3.5.10 of DoD 5000.2-R (i.e., ESOH Compliance, NEPA Compliance, Safety and Health, Hazardous Materials Management, Pollution Prevention, and Explosives Safety).
- Delineate ESOH responsibilities.
- Identify ESOH risks.
- Document ESOH progress to date, and plans and schedules for future compliance.

Table 3-1. Suggested Outline for the PESHE Document**COVER****APPROVAL SIGNATURE PAGE****PREPARER'S SIGNATURE PAGE****EXECUTIVE SUMMARY****TABLE OF CONTENTS****ACRONYMS AND ABBREVIATIONS****CHAPTER 1.0 OVERVIEW OF THE PROGRAMMATIC ESOH EVALUATION**

- 1.1 PURPOSE
- 1.2 PROGRAM DESCRIPTION
 - 1.2.1 Acquisition Strategy and Background
 - 1.2.2 System Description
 - 1.2.3 Program Schedule
- 1.3 PROGRAM MANAGEMENT APPROACH TO ESOH REQUIREMENTS
 - 1.3.1 ESOH Management Strategy
 - 1.3.2 Organization Roles and Responsibilities for ESOH
 - 1.3.2.1 Program/Project/Product Manager
 - 1.3.2.2 ESOH Manager
 - 1.3.2.3 Systems Engineering and Integration Contractor
 - 1.3.2.4 System User
 - 1.3.2.5 Testing / Gaining Installations
 - 1.3.2.6 MACOM Environmental and Safety Offices
 - 1.3.2.7 Other Supporting Agencies
 - 1.3.3 ESOH Issues Tracking Methodology
 - 1.3.4 ESOH Budget Allocation
- 1.4 ESOH INTEGRATION INTO KEY PROGRAM REQUIREMENTS
 - 1.4.1 Mission Need Statement (MNS)
 - 1.4.2 Operational Requirements Document (ORD)
 - 1.4.3 Acquisition Strategy (AS) / Support Strategy
 - 1.4.4 Test and Evaluation Master Plan (TEMP)
 - 1.4.5 Performance Specifications
 - 1.4.6 Logistics Planning and Support Documents
 - 1.4.7 Analysis of Alternatives (AoA)
 - 1.4.8 Cost Analysis Requirements Description (CARD)
 - 1.4.9 Demilitarization and Disposal Planning
- 1.5 ESOH PROVISIONS IN CONTRACT PROCUREMENT AND MANAGEMENT
 - 1.5.1 Instructions, Conditions, and Notices to Offerors (Section L)
 - 1.5.2 Evaluation Factors for Award (Section M)
 - 1.5.3 Contract Clauses
 - 1.5.4 Statement of Objectives (SOO) / Statement of Work (SOW)
 - 1.5.5 Contract Data Requirements List (CDRL)
- 1.6 INTERNATIONAL CONSIDERATIONS

CHAPTER 2.0 ESOH COMPLIANCE

- 2.1 IDENTIFICATION OF ESOH COMPLIANCE ISSUES
- 2.2 ACCOMPLISHMENTS AND FUTURE ACTIONS BY LIFE-CYCLE PHASE
 - 2.2.1 Concept and Technology Development
 - 2.2.2 System Development and Demonstration
 - 2.2.3 Production and Deployment
 - 2.2.4 Operations and Support
 - 2.2.5 Demilitarization and Disposal
- 2.3 PROGRAM RISKS

CHAPTER 3.0 NATIONAL ENVIRONMENTAL POLICY ACT AND EXECUTIVE ORDER 12114 COMPLIANCE

- 3.1 IDENTIFICATION OF ACTIONS TRIGGERING NEPA AND EO 12114 COMPLIANCE
- 3.2 ACCOMPLISHMENTS AND FUTURE ACTIONS BY LIFE-CYCLE PHASE
 - 3.2.1 Concept and Technology Development
 - 3.2.2 System Development and Demonstration
 - 3.2.3 Production and Deployment
 - 3.2.4 Operations and Support
 - 3.2.5 Demilitarization and Disposal
- 3.3 MITIGATION STATUS FOR PROGRAM NEPA AND EO 12114 DECISIONS
- 3.4 PROGRAM RISKS

CHAPTER 4.0 SAFETY AND HEALTH

- 4.1 IDENTIFICATION OF SAFETY AND HEALTH ISSUES
- 4.2 ACCOMPLISHMENTS AND FUTURE ACTIONS BY LIFE-CYCLE PHASE
 - 4.2.1 Concept and Technology Development
 - 4.2.2 System Development and Demonstration
 - 4.2.3 Production and Deployment
 - 4.2.4 Operations and Support
 - 4.2.5 Demilitarization and Disposal
- 4.3 PROGRAM RISKS

CHAPTER 5.0 HAZARDOUS MATERIALS MANAGEMENT

- 5.1 IDENTIFICATION OF HAZARDOUS MATERIAL ISSUES
- 5.2 ACCOMPLISHMENTS AND FUTURE ACTIONS BY LIFE-CYCLE PHASE
 - 5.2.1 Concept and Technology Development
 - 5.2.2 System Development and Demonstration
 - 5.2.3 Production and Deployment
 - 5.2.4 Operations and Support
 - 5.2.5 Demilitarization and Disposal
- 5.3 PROGRAM RISKS

CHAPTER 6.0 POLLUTION PREVENTION

- 6.1 IDENTIFICATION OF POLLUTION PREVENTION ISSUES
- 6.2 ACCOMPLISHMENTS AND FUTURE ACTIONS BY LIFE-CYCLE PHASE
 - 6.2.1 Concept and Technology Development
 - 6.2.2 System Development and Demonstration
 - 6.2.3 Production and Deployment
 - 6.2.4 Operations and Support
 - 6.2.5 Demilitarization and Disposal
- 6.3 PROGRAM RISKS

CHAPTER 7.0 EXPLOSIVES SAFETY

- 7.1 IDENTIFICATION OF EXPLOSIVES SAFETY ISSUES
- 7.2 ACCOMPLISHMENTS AND FUTURE ACTIONS BY LIFE-CYCLE PHASE
 - 7.2.1 Concept and Technology Development
 - 7.2.2 System Development and Demonstration
 - 7.2.3 Production and Deployment
 - 7.2.4 Operations and Support
 - 7.2.5 Demilitarization and Disposal
- 7.3 PROGRAM RISKS

APPENDICES (examples)

- A Program Master Schedule
- B Program Office ESOH Policy Statement
- C Mitigation Measure Tracking List
- D Key Points of Contact
- E References

3.1.2 Program Description (PESHE Section 1.2)**Acquisition Strategy and Background (PESHE Section 1.2.1)**

This section should briefly discuss historical and projected acquisition activities, decision points, milestones, and prime contractor support. It should include an explanation of the type of acquisition [e.g., commercial off-the-shelf (COTS), modified COTS, Government off-the-shelf (GOTS), militarized, whole system or subsystem upgrade, technology program transition to acquisition program, or new developmental program]; production quantities expected; and a quick overview of fielding plans and locations. For those PESHE reviewers not intimately familiar with the program, this section provides an understanding as to where the program has been and where it is going.

System Description (PESHE Section 1.2.2)

For this section, provide a brief overview of the system, describing it in terms of basic operational characteristics and general design requirements (e.g., weight, dimensions, number of crewmen, etc.), including any unique system components or subsystems (e.g., propulsion systems, fuel requirements, batteries, ordnance, and sensor/tracking systems). This information should be supported with a photo or diagram of the system hardware. In addition, any new or added support equipment and facility requirements (e.g., portable generators and munitions storage) associated with the system should be described.

Program Schedule (PESHE Section 1.2.3)

This section provides a figure or chart of the master schedule for system development, or at least some description of it. Information should be addressed using fiscal or calendar years, acquisition phases and decision points, and other major milestones. It should include timeframes for major test and evaluation actions, procurement awards, system deliveries, and other key

events. Depending on the schedule's complexity, length, physical size, and dynamics for change, it might be prudent to place it in an appendix to the PESHE, and refer to it here in this section.

3.1.3 Program Management Approach to ESOH Requirements (*PESHE Section 1.3*)

ESOH Management Strategy (*PESHE Section 1.3.1*)

As part of the overall acquisition strategy for a program, the ESOH management strategy should be defined here in terms of the approach and organizational structure used to integrate and communicate ESOH requirements and considerations into the systems engineering process. The PM, or his/her designee, generally provides overall leadership for defining and implementing the program ESOH strategy. In most cases, an IPPD approach is established (as described in Section C5.1 of DoD 5000.2-R), where one or more multi-disciplined IPTs are formed. The IPTs and other similar forums are used to discuss ESOH issues, and to ensure each element of the program understands and fulfills the necessary ESOH requirements associated with design, testing, manufacturing, operation, maintenance, and disposal of the system. Normally chaired by the PM, the IPT process should have regular participation and effective communications between all members, including the user community, the prime contractor, and all functional areas of ESOH management. Members of each IPT and other ESOH support groups should be identified, along with the frequency of meetings.

Include within this section any crucial ESOH-related goals or objectives expected to be met during system development and over the life of the program, such as those stated in the Operational Requirements Document (ORD) or other acquisition requirements documents. It may also prove useful to reiterate here those principles identified in the PM's ESOH Policy Statement (see Section 2.1 and Appendix B of the guide).

Organization Roles and Responsibilities for ESOH (*PESHE Sections 1.3.2 through 1.3.2.7*)

It is the ESOH community's responsibility to assist the program office in producing a system that can be tested, operated, deployed, maintained, and disposed of with an acceptable level of risk to the environment and personnel. For those offices and management positions responsible for program ESOH requirements, this section should identify their primary roles and responsibilities for supporting this effort. It may include descriptions for the PM, the ESOH Manager (if one is designated), the systems engineering and integration prime contractor, system users, affected installations, MACOM Environmental and Safety Offices, and other supporting agencies involved in managing and implementing program ESOH requirements. Lines of communication should also be made clear. The range of ESOH support can vary widely, depending on the size, complexity, and phase of the program.

ESOH Issues Tracking Methodology (*PESHE Section 1.3.3*)

This section should explain the methods and procedures used by the program office and prime contractor (if more than one method is used) to document and track ESOH issues. This is often accomplished using an electronic tracking system that is regularly updated, along with other forms of records keeping.

ESOH Budget Allocation (PESHE Section 1.3.4)

This section should describe the ESOH budget allocation (execution funding) required for the program to comprehensively integrate ESOH into the systems engineering process and satisfy all related ESOH compliance requirements. Past year budgets, actual funding, and planned budgets (5-year minimum) should be addressed by environmental function or category. A recommended breakdown of environmental cost element categories is described in Chapter 6 (Environmental Quality Costing) of the latest update to the Army's CAM (described in Section 1.5 of the guide). The categories are as follows:

- **Overhead.** Compliance, plans, permits, reports, tests, and assessments; environmental management (personnel support); contractor environmental costs; and cost and liability risk. Costs associated with compliance outside the continental United States are included.
- **Tradeoff Analyses.** Environmental compliance reviews, safety and health, and development of a hazardous materials management program to track usage.
- **NEPA.** NEPA and EO Order 12114 analyses, documentation, and related mitigation actions.
- **Pollution Prevention.** Pollution prevention program development and implementation; and the storage, handling, and disposal of hazardous materials/wastes.
- **Conservation.** Natural and cultural resource maintenance and protection, and land conservation/management measures directly attributed to weapon system activity (e.g., actions that ensure sustainable use of training centers, test ranges, and fielding installations).
- **Remediation and Restoration.** Environmental cleanup of contaminated sites, including the remediation of soils, sediment, groundwater, surface water, and structures contaminated with hazardous and/or toxic materials from weapon system activities.
- **Demilitarization and Disposal.** The transfer, donation, selling, redistribution, and disposal of equipment and facilities at the end of their useful life. The complete deactivation and demilitarization of a weapon system entails not only the disposal of hazardous wastes but also the proper distribution of inert materials and support equipment as well.

The ESOH funding requirements identified must be sufficient to permit a PM to adequately integrate all ESOH issues and requirements into the overall management and execution of the systems engineering process. ESOH budgetary information can be derived from an acquisition program's Program Office Estimate (POE), Component Cost Analysis (CCA), and cost estimates created prior to the development of a POE/CCA in support of early trade-off and Cost as an Independent Variable (CAIV) analyses. These estimates and analyses are required by and conducted in accordance with Sections C1.3 and C1.4.3.3 of DoD 5000.2-R, and Section 5-14 of Army Regulation (AR) 70-1 (*Army Acquisition Policy*).

ESOH functional costs should be identified to the lowest level possible, given the information available at any particular phase of the program life cycle. Budget refinements, as necessary,

should then occur at major program milestones.¹ “Budget wedges”, based upon historical data from previous programs, may be used if sound estimates are not otherwise available. However, failure to adequately budget for ESOH execution may require the PM to utilize portions of his/her management reserve or to reprogram funding from other critical requirements to cover these costs.

3.1.4 ESOH Integration into Key Program Requirements (*PESHE Sections 1.4 through 1.4.9*)

These sections of the PESHE should document the *actual* ESOH language contained in the various acquisition requirements documents prepared for the program or project, even if they are still in draft form. For those documents containing extensive ESOH discussions, however, it is acceptable to summarize the information provided and/or to include such material in an appendix to the PESHE. If certain requirements documents are not yet available or do not currently contain the necessary ESOH requirements information, a status of their preparation, steps being taken to incorporate ESOH into them, and a timeframe for document availability should be identified. If and when requirements documents are updated, such information should be included in updates to the PESHE as well. Providing this information gives program personnel and other reviewers of the PESHE a single source to draw from for an understanding of the program’s overall ESOH requirements and objectives.

In order to better understand the program ESOH considerations normally associated with the requirements documents, a brief overview of each document identified in Sections 1.4.1 through 1.4.9 of the PESHE outline (Table 3-1) is provided below. Depending on the ACAT status and level of the program, some of these requirements documents may not apply.

- **Mission Need Statement (MNS).** All acquisition programs are based on identified, documented, and validated mission needs. In developing solutions to the identified mission need, both materiel and non-materiel alternatives must be considered. If a non-materiel solution (e.g., changes in tactics or doctrine) is not deemed to be feasible, the materiel need is described in a MNS. The MNS defines the mission need, identifies the constraints, and outlines the initial acquisition strategy. Constraints are described in Section 5 of the MNS (e.g., logistics, manpower, treaty, etc.). ESOH constraints should also be included. For example, the minimization of life-cycle environmental costs and impacts should be a priority when selecting and developing the materiel solution. The importance of including ESOH constraints in the MNS cannot be overstated. As technologies are being evaluated during Concept and Technology Development, the ESOH aspects of the technologies must be among the factors considered. Decisions made this early in the program life cycle can greatly affect ESOH issues and costs during the entire system life cycle.

In accordance with Enclosure 3 (Table 2) of DoD Instruction 5000.2, a validated MNS is required at Milestone A.

- **Operational Requirements Document (ORD).** The ORD is initially prepared during the Concept and Technology Development phase. The ORD describes the required system capabilities (e.g., speed, lethality, range, etc.) and establishes program support objectives,

¹ A list of possible ESOH cost analysis questions PMs can be expected to respond to at Cost Review Board (CRB) and other milestone reviews is provided in Appendix A of this guide.

such as maintenance, support equipment, and human systems integration. Within the specified ORD format², ESOH considerations that tend to affect system design, cost, and risks are addressed in Section 4.d, “Environmental, Safety and Occupational Health (ESOH) and Other System Characteristics.” For example, the ORD might contain language minimizing the use of hazardous materials and hazardous waste generation, or banning the use of ODCs during *any* phase of a system’s life cycle. Statements like these can result in early trade-off analyses and save considerable time and effort dealing with such issues later in the program development.

The ORD should specify ESOH requirements and goals for the entire life cycle of the system. In satisfying this requirement, any testing and training constraints must be identified. In some instances, this could result in revising operational requirements. In others, it could result in advance planning to create additional testing or training ranges, facilities, and related infrastructure. If any unique environmental compliance requirements are expected that pertain to logistical support, they should be addressed in Section 5.f of the ORD, “Other Logistics and Facilities Considerations”.

Because the ORD provides a basis for program and logistics support planning, it is of great importance that the materiel developer and user work closely together during preparation of the ORD to ensure the requirements identified are real and achievable.

In accordance with Enclosure 3 (Table 2) of DoD Instruction 5000.2, a validated ORD is required at Milestones B and C.

- **Acquisition Strategy (AS) / Support Strategy.** Section C2.8 of DoD 5000.2-R states that, “As part of the Acquisition Strategy, the PM shall develop and document a Support Strategy for life-cycle sustainment and continuous improvement of product affordability, reliability, and supportability, while sustaining readiness.” From its initiation during Concept and Technology Development, the Support Strategy evolves toward greater detail, so that by Milestone C it contains sufficient detail to define how the program will address support and fielding requirements that meet readiness and performance objectives, lower the TOC, reduce risks, and avoid harm to the environment and human health. The Support Strategy shall address all applicable support requirements, including Human Systems Integration (HSI) and ESOH.

Sections C2.8.6 and C5.2.3.5.10.5 of DoD 5000.2-R also stipulate that the AS (i.e., the Support Strategy portion) for a program must contain a summary of the PESHE document, including ESOH risks; a strategy for integrating ESOH considerations into the systems engineering process; identification of ESOH responsibilities; a completion schedule for NEPA and EO 12114 compliance; and a method for tracking the progress of ESOH issues.

In accordance with Enclosure 3 (Table 2) of DoD Instruction 5000.2, an AS, which includes the Support Strategy, is required at the Component Advanced Development decision review (if program initiation), Milestones B and C, and the Full-Rate Production decision review.

² The current format for preparation of ORDs is specified in Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01B (*Requirements Generation System*), Appendix A to Enclosure E (Operational Requirements Document Format), dated 15 April 2001.

- **Test and Evaluation Master Plan (TEMP).** Title 10, *United States Code (U.S.C.)* Section 2399(b)(1), *Operational Test and Evaluation*, requires the development of a TEMP for acquisition programs. The TEMP documents the overall structure and objectives of the test and evaluation program, and provides a framework within which to generate detailed test and evaluation plans. It contains test event or scenario descriptions and resource requirements [including special instrumentation, test articles, ranges and facilities, and threat targets and simulations validated in accordance with a Director, Operational Test and Evaluation (DOT&E)-approved process], as well as any test limitations that impact the system evaluation.

AR 385-16 (*System Safety Engineering and Management*) requires the PM to ensure safety and health issues are identified in the TEMP for purposes of obtaining data needed for safety verification of the system. In addition, test and evaluation programs will typically involve environmental concerns that must be evaluated under NEPA, as well as other environmental compliance requirements. The TEMP should indicate how these issues are to be handled during test and evaluation. The effectiveness of procedures and controls stated in the TEMP to eliminate impacts to human health, safety, and the environment during development and operational test and evaluation should be carefully scrutinized. Any deficiencies noted should result in a modification of the TEMP to correct them and/or incorporate mitigating actions to reduce the impacts. In some cases, the inclusion of environmental tests to measure the effectiveness of environmental design solutions may be appropriate.

In accordance with Enclosure 3 (Table 2) of DoD Instruction 5000.2, a TEMP is required at Milestones A (the evaluation strategy only), B, and C (update, if necessary); and at the Full-Rate Production decision review. Mandatory procedures and formats for preparing a TEMP are described in Appendix A2 of DoD 5000.2-R.

- **Performance Specifications.** The Army uses performance specifications (i.e., DoD performance specifications, commercial item descriptions, and performance-based non-government standards) when purchasing new systems, major modifications, upgrades to current systems, and commercial and non-developmental items for programs in all acquisition categories.

In addition to setting performance specifications for meeting military requirements, weapon systems can be designed with environmentally-responsive performance specifications that set limits for the usage of hazardous materials and ODCs, air pollutant emissions, noise generation, optical and electromagnetic radiation, and waste production. Such limits can benefit near-term system operations (e.g., allowing cleaner and quieter aircraft to be fielded at installations with more stringent air and noise emission standards), and reduce future costs and liabilities (i.e., demilitarization and disposal requirements).

- **Logistics Planning and Support Documents.** Logistical plans and support documents provide much of the information needed to understand weapon system material, transportation, facility, maintenance, and repair requirements and responsibilities of both the government and the contractor. Such information is critical in conducting pollution prevention and hazardous materials management evaluations for a program.

Logistics support information is often used to specifically monitor contractor environmental management. Sometimes referred to as a Logistics Management Information (LMI) system,

it is typically an electronic database generated by the contractor as part of the design process. The LMI system is one of the primary methods for recording important environmental information throughout the system acquisition cycle, as it provides a summary of all hazardous materials that are required to support the system or any component therein. Early identification of potential pollutants and hazardous materials can assist in implementing optimum prevention strategies. Reports generated from the electronic database can prove useful for cost estimates of hazardous materials, and their associated storage and disposal costs.

Logistics agencies, such as the DLA, need to become involved early in the system acquisition process since the use of hazardous materials and ODCs can greatly affect support concepts.

- **Analysis of Alternatives (AoA).** The AoA provides a comparison between the cost and operational parameters of a program and one or more alternative programs. The AoA also provides a structure to review design, acquisition, and life-cycle cost options. The primary benefit occurs during the conceptual phase of the acquisition life cycle. However, AoAs can also provide insight during the CAIV process, which is used to develop the TOC, schedule, and performance thresholds and objectives. It is during this early phase of the program when Army planners have the most flexibility to influence important design or hardware configurations.

Environmental quality professionals should provide inputs to the AoA. Pollution prevention considerations should be part of the assumptions, variables, and constraints, especially for the life-cycle cost of each alternative. Any updates to the initial AoA should be sufficiently detailed to permit the identification of a preferred alternative and its cost. Cost estimates for AoA should take into account gross estimates of investment and disposal costs. Most of the environmental quality costing associated with the AoA will focus on comparing life-cycle costs for material and manufacturing process alternatives to eliminate or reduce the use of hazardous materials.

In accordance with Enclosure 3 (Table 2) of DoD Instruction 5000.2, the AoA is required at Milestone B or C (if no Milestone B).

- **Cost Analysis Requirements Description (CARD).** Per Section C4.5.3 of DoD 5000.2-R, the DoD Component sponsoring an acquisition program shall establish, as a basis for cost estimating, a description of the salient features of the program and of the system being acquired. This information, which is usually the responsibility of the PM, is to be presented in the CARD. It is the source of a system's description for the development of the POE, CCA, and Independent Cost Estimate, and it also provides the basis for Life-Cycle Cost Estimates (LCCEs). Chapter 1 of DoD Manual 5000.4-M (*Cost Analysis Guidance and Procedures*) provides specific guidance for the program office to prepare and update the CARD.

The CARD is important to the environmental quality management of a program in that it provides the environmental quality baseline from a costing perspective. The importance of the CARD cannot be overstated because all program cost estimates are required to be consistent with the CARD. For this reason, it is essential that the CARD explicitly identify all environmental quality requirements, goals, and directives. Environmental quality

professionals and cost estimators must work together to identify the environmental quality content of the CARD.³

In accordance with Enclosure 3 (Table 2) of DoD Instruction 5000.2, a CARD is required for MDAPs only at Milestones B and C, and at the Full-Rate Production decision review.

- **Demilitarization and Disposal Planning.** Section C2.8.7 of DoD 5000.2-R states that “During systems engineering, the PM shall consider materiel demilitarization and disposal. The PM shall minimize DoD’s liability due to information and technology security, environmental, safety, and occupational health issues. The PM shall coordinate with Service logistics activities and DLA, as appropriate, to identify and apply applicable demilitarization requirements necessary to eliminate the functional or military capabilities of assets (DoD 4140.1-R and DoD 4160.21-M-1). The PM shall coordinate with DLA to determine reutilization and hazardous-property disposal requirements for system equipment and by-products (4140.1-R and DoD 4160.21-M).”

Although demilitarization and disposal planning normally does not require or result in a formal requirements document, the emphasis of planning for these particular actions remains high.⁴ Details on the ESOH strategy for demilitarization and disposal are normally discussed for each ESOH discipline later in the PESHE document, thus, it is not necessary to include specific language here. This discussion should be more generic in nature, providing an outline of the steps the program expects to take to identify and incorporate ESOH into key program requirements for demilitarization and disposal (e.g., development of a formal written plan).

3.1.5 ESOH Provisions in Contract Procurement and Management (*PESHE Sections 1.5 through 1.5.5*)

The procurement process and resulting contracts provide mechanisms for the Army to identify its program goals and requirements, including those for ESOH. Sections 1.5.1 through 1.5.5 of the PESHE outline (Table 3-1) serve to document the *actual* ESOH provision language used in the procurement process, from the beginning steps of soliciting proposals from potential offerors, to final preparation and monitoring of contracts awarded. It is critical that ESOH requirements be included at each step of the process. Using ESOH considerations as part of contractor down selection and establishing ESOH requirements early in a contract are some of the best ways to develop a strong ESOH ethic for the program.⁵

By making this information more widely available to PM office personnel and other government reviewers of the PESHE, it gives greater visibility of the contractor’s responsibilities for ESOH,

³ For a suggested approach to identifying life-cycle environmental requirements for the CARD, refer to USAEC’s draft *Methodology for Developing Environmental Requirements for a Cost Analysis Requirements Description (CARD)* described in Section 1.5 of this guide.

⁴ As part of demilitarization and disposal planning for *munitions* programs, the PM is required to document the parts of the system that will require demilitarization and disposal, and address the inherent dangers associated with ammunition and explosives. This documentation shall be in place before the start of developmental test and evaluation, and before the PM releases munitions or explosives to a non-military setting. (For additional requirements, refer to Section C2.8.7.2 of DoD 5000.2-R.)

⁵ Examples of ESOH provisions used in various contracting documents are provided in Appendix C of this guide.

and provides another tool for the government to track and monitor contractor progress in these areas.

3.1.6 International Considerations (*PESHE Section 1.6*)

The DoD's ESOH management responsibilities overseas are a product of DoD policy, US law, host nation law, and international agreements. International agreements regulate the conduct of visiting forces in a host nation. Agreements affecting military activities may be broad in scope, such as Status-of-Forces Agreements (SOFAs), or narrowly drafted basing agreements. These agreements may require the United States to comply with host-nation environmental, safety, and health protection requirements.

Although most agreements have generally not included specific ESOH provisions, general obligations are often sufficiently broad to address ESOH issues. For example, the North Atlantic Treaty Organization (NATO) SOFA obligates US forces to "respect the law of the receiving State". The Supplementary Agreement with Germany also specifically obligates visiting forces in Germany to cooperate with German authorities when seeking permits for an installation, to use low-pollutant fuels, to comply with emission regulations, to comply with regulations regarding transportation of hazardous materials, and to pay the costs of assessing and remediating environmental contamination resulting from their actions. This last provision referring to cost, is a clear sign that the trend of host nations is to transfer more of the ramifications of regulatory noncompliance to the visiting force.

Actions conducted at DoD installations in foreign nations are subject to the minimum standards for environmental compliance promulgated by DoD Instruction 4715.5 (*Management of Environmental Compliance at Overseas Installations*), which directs the DoD to comply with Final Governing Standards (FGS) when established for a particular foreign country.⁶ The FGS for each country, however, do not identify whether the requirements are based on US law or on the host-nation law. Therefore, unless each FGS is reviewed against US law, it is unknown what the unique regulatory requirements are for the host nation. For acquisition programs, this makes the process of identifying life-cycle environmental impacts much more difficult for those weapon systems that will eventually be stationed overseas.

In countries where FGS have *not* been established (e.g., Canada), the standards presented in DoD 4715.5-G [*Overseas Environmental Baseline Guidance Document (OEBGD)*] are used unless the OEBGD is inconsistent with applicable host-nation environmental standards or standards under applicable international agreements, and unless these other applicable standards provide more protection to human health and the environment. In cases of inconsistencies, the more protective standard will normally be used unless specific international agreements exist.

The Army's responsibility to comply with environmental standards in foreign nations, as defined in international agreements, the FGS, and the OEBGD, is also described in Chapter 14 of AR 200-1 (*Environmental Protection and Enhancement*).

Because of the variations in foreign nation environmental regulations and policy, it is important for each program office involved in co-development, foreign military sales, or international

⁶ Foreign countries where FGS have been established include the United Kingdom, Germany, Belgium, the Netherlands, Italy, Turkey, Egypt, Spain, Bermuda, Panama, Korea, Japan, and the Philippines.

deployment to develop a strategy to minimize ESOH impacts. A summary of this strategy should be provided in this section of the PESHE.

3.2 ESOH COMPLIANCE (*PESHE CHAPTER 2.0*)

Acquisition programs are required to comply with applicable federal, state, interstate, and local ESOH codes, statutes and regulations as well as EOs, treaties, and statutory agreements.⁷ These requirements constitute an external constraint beyond the PM's control with which he/she must comply. To the extent that materials/processes/uses associated with weapon systems could have an effect on the environment, these ESOH requirements may affect system design, construction, modification, testing, operation, support, maintenance, repair, demilitarization, and disposal.

Often, ESOH requirements prescribe what must be done and how to do it. Examples include prohibitions on the use of ODCs, consultation requirements where endangered species or historic properties may be affected, requirements relating to the management and disposal of hazardous materials and waste, and air and water permitting requirements. These requirements can be costly to comply with early in a program, such as during testing, and even more so later during operations and support of the system. To facilitate compliance, ESOH requirements should be fully evaluated early in the program, and then periodically reevaluated. In accordance with Section C5.2.3.5.10.4 of DoD 5000.2-R, the PM must regularly review ESOH compliance requirements and evaluate their impact on the program's life-cycle cost, schedule, and performance.

This chapter serves to plan and record the ESOH compliance activities for the program as it progresses through its life cycle. Focus is given to those compliance-related plans, permits, agency consultations, and other requirements *not* addressed elsewhere in Chapters 3 through 7 of the PESHE outline (Table 3-1). Compliance topics normally covered in this chapter include air quality, surface water and groundwater resources, threatened and endangered species, wetlands habitat, historic properties and archaeological resources, noise issues, land use and conservation, and airspace use. When writing this chapter of the PESHE, suggest including a brief introduction on its purpose and content before describing the specifics of ESOH compliance in the sections to follow.

Identification of ESOH Compliance Issues (*PESHE Section 2.1*)

The purpose of this section is to highlight the more important program ESOH compliance issues or areas of concern that currently exist or are expected in the future. For example, this might include planned field tests and ground disturbance in areas that potentially contain critical habitat, or the proposed expansion of contractor manufacturing operations within an air quality non-attainment area.

Accomplishments and Future Actions by Life-Cycle Phase (*PESHE Sections 2.2 through 2.2.5*)

This part of the PESHE should focus on describing the plans, actions, and accomplishments for ESOH compliance (as defined above), that are relevant and specific to the program. Applicable

⁷ A list of federal, DoD, and Army laws and regulations, applicable to acquisition program ESOH, is provided in Appendix D of this guide.

compliance actions and activities at all affected installations, primary depots, and major contractor and subcontractor facilities should be included. Discussions should be broken out by life-cycle phase, as the PESHE outline shows (Table 3-1). Although the DoD 5000 Series model of the acquisition life cycle (Figure 1-1) does not include a separate phase for demilitarization and disposal, which is covered under the Operations and Support Phase, the emphasis on these particular actions remains high. Thus, a separate subsection for describing ESOH compliance plans and activities in support of demilitarization and disposal has been included in the PESHE outline.

Each successive PESHE builds on the previous one. These sections should start with a summary of prior accomplishments within the current and past phases, and then discuss the ongoing actions and plans for meeting ESOH compliance requirements within the future phases and sub-phases. For each compliance activity, identify the agency or organization responsible and, if possible, include approximate timeframes for their completion. In particular, when multiple sites are involved, this information can be summarized in individual matrices or tables that address each location. Some examples of actions and plans for ESOH compliance are lists of all permits obtained and those being sought, findings from vegetation surveys of proposed test areas, the status of ongoing consultations with the State Historic Preservation Officer (SHPO), the results of government site inspections and compliance checks at contractor facilities, development of a wetlands mitigation plan, and the implementation of Best Management Practices for erosion control at construction sites. A sample format for presenting this information is provided in Table 3-2.

Table 3-2. Example of ESOH Compliance Activities at Fort X

Description	Issuing or Approving Agency	Responsible Organization	Approval Time	Status
Title V Air Permit	State Department of Env. Conservation	Program Office	6 months	In Process
Section 404 Permit (wetlands protection)	US Army Corps of Engineers	Fort X	6-12 months	In Process
Stormwater Management Plan	State Department of Env. Conservation	Construction Contractor	30-45 days	Completed 23 July 2001
Phase I Cultural Resource Assessment	SHPO	Program Office	30-90 days	To Be Scheduled

Program Risks (PESHE Section 2.3)

This section summarizes the cost, schedule, and performance risks associated with ESOH compliance for the program. Emphasis should be on those current and potential future risks categorized as high or medium level (see also the discussion on summarizing risk levels in the PESHE Executive Summary, Section 3.8.2 of the guide). It should also include discussion on actions being taken to reduce or eliminate the risks. The PM must establish procedures for identifying and mitigating ESOH risks during the design process and for each subsequent life-cycle phase. If certain mitigation measures are being taken, such as timing field tests to occur outside the breeding season of sensitive wildlife, the risk discussion should highlight how the

mitigation measures are expected to lower the risks. If no risks are currently identified, then that should be stated.

It is important to note that although the PM is not responsible for the system development contractor to satisfy all applicable ESOH compliance requirements at the contractor's facilities, the program could still be at risk should non-compliance problems occur. For example, if the contractor had to interrupt operations to incorporate capital improvements to meet compliance requirements, the program might risk schedule delays and cost impacts. Furthermore, should a DoD contractor or subcontractor be cited for a violation of environmental law, the adverse publicity generated could reflect poorly on the Army.

3.3 NATIONAL ENVIRONMENTAL POLICY ACT AND EXECUTIVE ORDER 12114 COMPLIANCE (PESHE CHAPTER 3.0)

The NEPA of 1969 requires federal agencies to consider and document the potential environmental effects associated with federal actions conducted within the United States, its territories, and its possessions. In accordance with Section C5.2.3.5.10.5 of DoD 5000.2-R, PMs for system acquisition programs must comply with the requirements of NEPA, its implementing regulations, and EO 12114 (*Environmental Effects Abroad of Major Federal Actions*), as applicable. The Army's implementing regulation for NEPA is AR 200-2 (*Environmental Analysis of Army Actions*). For the implementation of EO 12114, AR 200-2 refers to DoD Directive 6050.7 (*Environmental Effects Abroad of Major Department of Defense Actions*).

In an acquisition program, the NEPA analysis process begins in the early phases of the program, not only to ensure required analyses are completed in time for program decisions, but also to identify and incorporate system design features that could reduce or eliminate adverse environmental effects. Where it is not feasible to implement these design features, it is important to identify mitigation measures, which are then formally committed to in a decision document. NEPA analyses must be considered throughout the life cycle of a system acquisition program.

It is the responsibility of the PM to ensure that all reasonable and viable alternative actions undergo appropriate NEPA analyses, regardless of who accepts responsibility for conducting them. At test ranges, for example, installation environmental offices might offer to take the lead in addressing any NEPA requirements at their range. In such cases, existing range-wide NEPA documentation might adequately address program actions with only minor supplemental documentation [e.g., Record of Environmental Consideration (REC)] being required. Even in such cases, however, the PM is still responsible for funding the analyses, and must ensure the resulting NEPA documentation adequately and accurately covers his/her program.

This chapter of the PESHE serves to plan and record the NEPA analysis activities and any EO 12114 requirements of the program as it proceeds through its life cycle. As an introduction to this chapter of the PESHE, briefly describe its purpose before elaborating on the specifics of NEPA and EO 12114 compliance in the sections to follow.

Identification of Actions Triggering NEPA and EO 12114 Compliance (PESHE Section 3.1)

This section should provide a brief overview of future program actions that are expected to be subject to analyses under NEPA or EO 12114. Include identification of potential installations and other locations involved.

To assist PMs and other proponents on this issue, AR 200-2 contains descriptions of the general types of proposed actions requiring environmental impact analysis under NEPA, screening criteria for determining the application of categorical exclusions (CXs), and lists of actions normally requiring an EA or EIS.

Accomplishments and Future Actions by Life-Cycle Phase (*PESHE Sections 3.2 through 3.2.5*)

In describing the program's accomplishments and future actions for NEPA and EO 12114 compliance, this section should first summarize those analyses completed within the current and past life-cycle phases. Write-ups for each completed document [i.e., REC, EA/Finding of No Significant Impact (FNSI), EIS/Record of Decision (ROD), etc.] should summarize the following in one or two paragraphs:

1. Title, agency, and date of document, including dates of signed FNSIs and RODs
2. Identification of the action, the range of alternatives, and locations affected
3. Overall findings, in particular, any significant or major environmental impacts expected, and key mitigation measures to be implemented
4. Decision(s) made.

Within the program's current and future phases, this section should then identify those ongoing and planned analyses, and any others that potentially could be required. For each document expected, a brief description of the action to be analyzed should be included. In accordance with DoD 5000.2-R, the PM shall also include an appropriate completion schedule for any NEPA and EO 12114 analyses. Recommend showing the expected start and completion dates for each document.

With the completion of each NEPA analysis, DoD 5000.2-R requires the PM to forward a copy of the final document to the Defense Technical Information Center for archiving.⁸

Mitigation Status for Program NEPA and EO 12114 Decisions (*PESHE Section 3.3*)

Mitigation measures established in a NEPA document, and committed to as part of the decision, *must* be accomplished. The implementation of mitigation measures for an acquisition program is usually the responsibility of the PM. The PM is also responsible for monitoring mitigation measures for completion and effectiveness. Failure to properly implement mitigation measures can lead to litigation, schedule delays, and monetary fines.

This section of the PESHE should review the status of mitigation requirements, as specified in the program's completed NEPA and EO 12114 decision documents. Depending on the extent of mitigation requirements for the program, it may prove useful to document individual mitigation measures from each decision document in a tabular or matrix format, where such measures can be more easily tracked until their completion. This is particularly important if a mitigation monitoring plan is not already in place. Recommend placing the matrix in the appendices to the PESHE so it can be easily updated and expanded, as necessary.

⁸ For instructions on submitting documents to the Defense Technical Information Center, refer to their web home page at: <http://www.dtic.mil/>.

Program Risks (*PESHE Section 3.4*)

Similar to the discussion on ESOH compliance program risks in Section 3.2 of the guide (*Section 2.3 of the PESHE outline*), this section should summarize any NEPA/EO 12114-related compliance requirements that might present risks to program cost, schedule, and performance. For example, in the preparation of an EA, significant impacts are identified; or a project is expected to be highly controversial. Just as before, emphasis should be on those current and potential future risks categorized as high or medium level.

3.4 SAFETY AND HEALTH (*PESHE CHAPTER 4.0*)

Army safety and health programs focus on issues that affect those that operate, maintain, and dispose of weapon systems. Issues relating to public safety and health, while critical to program success, are typically not a part of the safety and health programs. These issues are more fully addressed through the NEPA process described earlier.

While DoD 5000.2-R groups safety and health under one heading (because of similar issues involved), they are often evaluated and reviewed under separate procedures and regulations, and have different proponents and technical channels within the Army. PMs have the flexibility to determine whether to combine safety and health issues into one program or to separate them for evaluation purposes.

Section C5.2.3.5.10.6 of DoD 5000.2-R requires PMs to establish a program that manages safety and health hazards associated with the development, use, and disposal of the system. The primary objective should be to eliminate hazards where possible. Where this is not possible, management decisions accepting risks associated with an identified hazard must be formally documented.

The Manpower and Personnel Integration (MANPRINT) process, described in the latest revision of AR 602-2 [*Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process*], has as its purpose to integrate all actions in the materiel acquisition process affecting human performance and reliability. System safety and health hazards, two of the MANPRINT domains, should be applied and tailored to all Army systems and integrated into other MANPRINT concerns. Objectives of the MANPRINT program include influencing system design and improving control of the TOC of weapon systems. MANPRINT assessments must be conducted prior to milestone decision reviews on all acquisition programs. While MANPRINT does not replace other Army safety and health programs, information developed during the MANPRINT process should be used in fulfilling safety and health evaluation requirements, and vice-versa.

Safety

AR 385-16 (*System Safety Engineering and Management*) describes system safety program activities and responsibilities for their accomplishment. PMs are responsible for developing and using three primary management tools in implementing the safety program: the System Safety Management Plan (SSMP), the System Safety Working Group, and the Hazard Tracking System. PMs must ensure that the SSMP is developed and updated as part of the AS, and that safety and health issues are identified in all TEMPs. The focus of the safety program should be on early

hazard identification and elimination, risk assessment, and risk management to influence design or allow the program to make informed decisions as to the acceptability of the safety risk. The hazard risk acceptance level should be determined for each individual program using AR 385-16 as a guide.

Military Standard (MIL-STD)-882D (*Department of Defense Standard Practice for System Safety*) also provides guidance for risk management, and the inclusion of system safety into the development and evaluation process. It provides both general and detailed DoD-wide guidance for PMs to develop and implement an acceptable system safety program that imposes design requirements and management controls on identified hazards of a system. These requirements and procedures give PMs the ability to eliminate hazards or reduce their associated risks on safety, health, and the environment, and apply them equally to contractor and in-house programs.

Health

HHAs are required throughout the life cycle of acquisition programs, including modification programs, Advanced Concept Technology Demonstrations (ACTDs), and programs for both developmental and non-developmental items. AR 40-10 (*Health Hazard Assessment Program in Support of the Army Materiel Acquisition Decision Process*) provides guidance on integration of health issues into all phases of the acquisition process. Health hazards must be considered in the AS and in the System MANPRINT Management Plan (SMMP) that supports program requirements documents.

Initial HHAs provide input into the early acquisition decision process. A HHA Report (HHAR) is prepared based on input from materiel developers, testers, and independent evaluators in the development phase. It provides a standard structure and approach for assessing system-generated threats to the health of soldiers and DoD personnel. The proponent for the Army's HHA Program is the Army Surgeon General. Program requirements for an independent HHAR are contained in AR 40-10 and managed by the Surgeon General's Executive Agent, the USACHPPM.

This chapter serves to plan and record the safety and health activities and compliance requirements for the program as it proceeds through its life cycle. As an introduction to this chapter of the PESHE, briefly describe its purpose before elaborating on the specifics of safety and health in the sections to follow.

Identification of Safety and Health Issues (*PESHE Section 4.1*)

The purpose of this section is to highlight the more important program safety and health issues or areas of concern that currently exist or are expected in the future. For example, this might include the potential for aircraft mishaps resulting from system software failures, or eye safety hazards associated with new laser targeting systems.

Accomplishments and Future Actions by Life-Cycle Phase (*PESHE Section 4.2 through 4.2.5*)

Similar to Section 3.2 of the guide (*Sections 2.2 through 2.2.5 of the PESHE outline*), these sections serve to describe the plans, actions, and accomplishments for safety and health that are relevant and specific to the program. Just as before, these discussions should be broken out by life-cycle phase, summarizing prior accomplishments within the current and past phases, and then

discussing the ongoing actions and plans for meeting safety and health requirements within the future phases and sub-phases. If possible, include approximate timeframes for the completion of individual safety and health requirements.

As part of this discussion, a summary of the program SSMP, all system or component level health hazard assessments, and any internal or independent safety assessments conducted on the system should be provided. It should also describe the procedures used to identify, evaluate, eliminate, and control hazards; define risk levels; identify high and medium risk hazards; track progress of hazard resolution and control; and summarize the impacts of projected accidental loss in terms of lives, medical costs, time, program mission, and equipment lost to accidents.

Program Risks (*PESHE Section 4.3*)

Similar to the discussion on ESOH compliance program risks in Section 3.2 of the guide (*Section 2.3 of the PESHE outline*), this section should summarize any safety and health related compliance requirements that might present risks to program cost, schedule, and performance. For example, not having an adequate or current Safety Assessment Report in place could delay obtaining the necessary safety release for conducting crucial tests. Again, emphasis should be on those current and potential future risks categorized as high or medium level.

3.5 HAZARDOUS MATERIALS MANAGEMENT (*PESHE CHAPTER 5.0*)

In accordance with Section C5.2.3.5.10.7 of DoD 5000.2-R, the PM is required to establish a hazardous material management program (HMMP) to consider eliminating or reducing the use of hazardous materials in processes and products. When the use of hazardous materials cannot be avoided, the PM must develop and implement plans and procedures for identifying, minimizing use of, tracking, storing, handling, packaging, transporting, and disposing of such material. By planning for the life-cycle management of those remaining hazardous materials selected for a program, it helps to reduce or eliminate harm to human health and the environment from releases of pollutants to the environment, consistent with the goals of EO 13148 (*Greening the Government Through Leadership in Environmental Management*).

NAS 411 is the current DoD-wide guidance for the development of a HMMP. The Under Secretary of Defense for Acquisition and Technology endorsed NAS 411 in January 1995, promoting its use throughout the DoD. NAS 411 establishes a blueprint for hazardous materials management, which not only can be used in the acquisition process of all weapons systems, but can be tailored to meet the specific needs of each contract or program. NAS 411 is typically made applicable to contractor activities during the procurement process.

DoD 5000.2-R also requires that, as alternate technologies become available, the PM must replace hazardous materials in the system through changes in the system design, manufacturing, and maintenance processes, where technically and economically practicable. To help minimize costs, the PM must, whenever possible, work with the contractor and other PMs to identify and test mutually acceptable alternatives.

This chapter serves to plan and record the hazardous material management activities and compliance requirements (including those for hazardous waste management) for the program as it proceeds through its life cycle. As an introduction to this chapter of the PESHE, briefly describe

its purpose before elaborating on the specifics of hazardous materials management in the sections to follow.

Identification of Hazardous Material Issues (*PESHE Section 5.1*)

The purpose of this section is to highlight the more important program hazardous material issues or areas of concern that currently exist or are expected in the future. For example, this might include the requirement to use highly toxic liquid fuel target missiles in order to emulate specific threats, or the continued use of hazardous materials in the manufacturing of semiconductors and printed wiring boards for military applications.

Accomplishments and Future Actions by Life-Cycle Phase (*PESHE Sections 5.2 through 5.2.5*)

Similar to Section 3.2 of the guide (*Sections 2.2 through 2.2.5 of the PESHE outline*), these sections serve to describe the plans, actions, and accomplishments for hazardous materials management that are relevant and specific to the program. Just as before, these discussions should be broken out by life-cycle phase, summarizing prior accomplishments within the current and past phases, and then discussing the ongoing actions and plans for meeting hazardous material requirements within the future phases and sub-phases. If possible, include approximate timeframes for the completion of individual hazardous material requirements.

As part of this discussion, an overview and status of the HMMP for tracking, storing, handling, and disposal considerations at those locations most affected should be provided. For example, has the program taken steps to identify all of the EPA 17 targeted chemicals, TRI chemicals, Emergency Planning and Community Right-to-Know Act (EPCRA) chemicals, Class I and II ODCs, and similarly listed materials used in the system. Any initiatives and progress made in eliminating, replacing, or reducing use of these hazardous materials should be documented in the PESHE.

Program Risks (*PESHE Section 5.3*)

Similar to the discussion on ESOH compliance program risks in Section 3.2 of the guide (*Section 2.3 of the PESHE outline*), this section should summarize any hazardous materials-related compliance requirements that might present risks to program cost, schedule, and performance. For example, the continued application of Class I and Class II ODCs in a system may result in significantly higher maintenance and disposal costs later in the program. Again, emphasis should be on those current and potential future risks categorized as high or medium level.

3.6 POLLUTION PREVENTION (*PESHE CHAPTER 6.0*)

Prudent pollution prevention can reduce life-cycle environmental costs and liability, while improving environmental quality and program performance. Pollution prevention planning should be initiated early in system acquisition to recognize and avoid the creation of pollutants. In designing, manufacturing, testing, operating, and disposing of systems, all forms of pollutants should be prevented or reduced at the source whenever feasible.

Section C5.2.3.5.10.8 of DoD 5000.2-R requires the PM to establish a pollution prevention program. The PM shall identify the impacts of the system on the environment during its life

(including disposal), the types and amounts of pollutants that will be released into the environment (air, water, soil, and noise), actions needed to prevent or control the pollutant impacts, ESOH risks associated with using the new system, and other information needed to identify source reduction, alternative technologies, and recycling opportunities. The pollution prevention program shall serve to minimize system impacts on the environment and human health, as well as environmental compliance impacts on program TOC. A fundamental purpose of the pollution prevention program is to identify and quantify impacts as early as possible during system development, and to identify and implement actions needed to prevent or abate the impacts.

In developing contract documents such as work statements, specifications, and other product descriptions, DoD 5000.2-R also requires PMs to look for opportunities to eliminate the use of virgin materials, as practicable. They must consider using recovered materials and reusable products, recycling program-generated wastes, using environmentally preferable products, waste prevention (including toxicity reduction or elimination), and disposal, as appropriate. Such methods are consistent with EO 13101 (*Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*).

This chapter serves to plan and record the pollution prevention activities and compliance requirements for the program as it proceeds through its life cycle. As an introduction to this chapter of the PESHE, briefly describe its purpose before elaborating on the specifics of pollution prevention in the sections to follow.

Identification of Pollution Prevention Issues (*PESHE Section 6.1*)

The purpose of this section is to highlight the more important program pollution prevention issues or areas of concern that currently exist or are expected in the future. For example, this might include trade-off analyses for the use of beryllium in missile seeker components, or halon as a fire-extinguishing medium on aircraft.

Accomplishments and Future Actions by Life-Cycle Phase (*PESHE Sections 6.2 through 6.2.5*)

Similar to Section 3.2 of the guide (*Sections 2.2 through 2.2.5 of the PESHE outline*), these sections serve to describe the plans, actions, and accomplishments for meeting pollution prevention requirements that are relevant and specific to the program. Just as before, these discussions should be broken out by life-cycle phase, summarizing prior accomplishments within the current and past phases, and then discussing the ongoing actions and plans for meeting pollution prevention requirements within the future phases and sub-phases. If possible, include approximate timeframes for the completion of individual pollution prevention requirements.

This discussion should include a summary of the pollution prevention plan/program requirements, initiatives, and goals; and identify opportunities the program office, contractor, or depot have taken to eliminate or reduce pollution at the source. It should identify the impacts of the system on the environment and the plans to prevent, eliminate, or reduce the impacts. It should also describe the types and amounts of those pollutants of greatest concern that will be released to the environment, ESOH compliance risks associated with using new technologies and alternative materials, and any other information that helps identify pollution source reduction and recycling opportunities.

Program Risks (PESHE Section 6.3)

Similar to the discussion on ESOH compliance program risks in Section 3.2 of the guide (*Section 2.3 of the PESHE outline*), this section should summarize any pollution prevention-related compliance requirements that might present risks to program cost, schedule, and performance. For example, alternative methods of paint stripping and repainting of aircraft parts would result in reduced VOC emissions, but they would also bring higher maintenance costs and potentially delay system readiness. Again, emphasis should be on those current and potential future risks categorized as high or medium level.

3.7 EXPLOSIVES SAFETY (PESHE CHAPTER 7.0)

As a separate discussion from safety and health (Section 3.4 of the guide), Section C5.2.3.5.10.9 of DoD 5000.2-R requires that the PM establish an explosives safety program that ensures that munitions, explosives, and energetics are properly hazard classified, and safely developed, manufactured, tested, transported, handled, stored, maintained, demilitarized, and disposed.

This chapter serves to plan and record the explosives safety activities and compliance requirements for the program as it proceeds through its life cycle. As an introduction to this chapter of the PESHE, briefly describe its purpose before elaborating on the specifics of explosives safety in the sections to follow.

Identification of Explosives Safety Issues (PESHE Section 7.1)

The purpose of this section is to highlight the more important program explosives safety issues or areas of concern that currently exist or are expected in the future. For example, this might include concerns over the need to extend explosive safety quantity distances into areas of unrelated operation in order to accommodate an increase in explosives classification at existing magazines.

Accomplishments and Future Actions by Life-Cycle Phase (PESHE Sections 7.2 through 7.2.5)

Similar to Section 3.2 of the guide (*Sections 2.2 through 2.2.5 of the PESHE outline*), these sections serve to describe the plans, actions, and accomplishments for explosives safety that are relevant and specific to the program. Just as before, these discussions should be broken out by life-cycle phase, summarizing prior accomplishments within the current and past phases, and then discussing the ongoing actions and plans for meeting explosives safety requirements within the future phases and sub-phases. If possible, include approximate timeframes for the completion of individual explosives safety requirements.

These sections should include a summary of any prior, ongoing, or planned waivers and/or exemptions to explosives safety requirements; hazard classification and compatibility groups of explosives involved; personnel protection measures; siting of explosives-related facilities and quantity-distance considerations; lightning protection; measures taken and planned for hazard identification for fire fighting and emergency planning; mishap reporting and investigation requirements; provisions and procedures for the storage of any waste military munitions and for the cleanup of UXO; and the demilitarization and disposal of explosives items.

Program Risks (*PESHE Section 7.3*)

Similar to the discussion on ESOH compliance program risks in Section 3.2 of the guide (*Section 2.3 of the PESHE outline*), this section should summarize any explosives safety related compliance requirements that might present risks to program cost, schedule, and performance. For example, implementing munitions facility modifications to eliminate a request for waiver or exemption, or to satisfy a denied request, could have a significant effect on both cost and schedule. The discovery of a significant violation, relative to quantity-distance requirements, might also have a measurable impact on program cost and/or schedule. Again, emphasis should be on those current and potential future risks categorized as high or medium level.

3.8 OTHER PESHE SECTIONS

3.8.1 Signature Pages

Since the completed PESHE will dictate ESOH activities and procedures for the project office to follow, it is imperative that all appropriate departments concur with the PESHE content, preferably via a signature block. The PESHE signature pages serve as documentation that key participants, including the PM, program executive officer, ESOH manager, and other supporting offices, have approved the evaluation. The PM should determine which personnel should be included on the approval page. A separate signature page for the office/organization responsible for preparing the PESHE should also be included. A PESHE revision page can be added later to track formal updates to the document over the long term.

3.8.2 Executive Summary

In no more than four or five pages, the Executive Summary should provide the following information:

1. Identification of the program.
2. Identification of the office(s)/organization(s) responsible for managing the program or project, including ESOH requirements.
3. A brief overview of the program ESOH goals and management strategy for integrating ESOH into the systems engineering process.
4. A review of the major issues and accomplishments identified in the document for ESOH Compliance, NEPA and EO 12114, Safety and Health, Hazardous Materials Management, Pollution Prevention, and Explosives Safety. A key part of this discussion should be on identifying the risks to the program in terms of cost, schedule, and performance. Particularly for larger programs, the PM may also want to include an ESOH risk matrix that gives the reader a quick, overall summary of risk levels. An example of such a matrix, along with the recommended definitions for risk levels, is shown in Table 3-3. The definitions for risk level are based on those used by the Army Product Engineering Services Office.

Table 3-3. Example of an ESOH Risk Assessment Summary

Category	Compliance Risk	Cost Risk	Schedule Risk	Performance Risk
ESOH Compliance	Low	Low	Low	<i>None</i>
NEPA and EO 12114	Low	Low	Low	Low
Safety and Health	Low	Low	Low	Low
Hazardous Materials Management	Moderate	Low	Low	Moderate
Pollution Prevention	Moderate	Low	Low	Low
Explosives Safety	Low	Low	Low	Low

Low Risk - Minor ESOH risks that are manageable within the PM's discretion.

Moderate Risk - ESOH risks having potential impacts, but that are manageable with current requirements and resources.

High Risk - ESOH risks having potentially significant impacts that would require program restructuring and/or revision.

5. A review of the methods and procedures used to track progress on ESOH issues.
6. The completion schedule for NEPA and EO 12114 compliance.

By including the above information in the PESHE Executive Summary, it can be easily incorporated (verbatim) into the Supportability Strategy portion of the program's AS, in accordance with DoD 5000.2-R (see Section 1.3 of the guide). The Executive Summary also serves as an important tool in ASARC and other program reviews.

3.8.3 Appendices

A list of possible appendices to include in the PESHE is provided below:

- The program master schedule, particularly if it is multiple pages in length, is oversized, or is rapidly changing
- Project Office ESOH policy statement signed by the PM
- Lengthy excerpts of ESOH requirements from the MNS, ORD, or other acquisition-related documents
- A mitigation measure tracking list or matrix
- A lists of laws, regulations, data sources, and other reference documents cited in the PESHE or used in its preparation
- Key points of contact for obtaining information used in the PESHE.

CHAPTER 4.0:

STEPS IN DEVELOPING THE PESHE DOCUMENT

In the sections to follow, the basic steps for preparing and updating the PESHE document are described.

4.1 STEP 1—ESTABLISH A CLEAR UNDERSTANDING OF THE PROGRAM SCOPE

Once the PM has tasked an individual or small team to prepare the PESHE (refer to Section 2.2 of the guide), the team's first step is to develop a clear understanding of the program's acquisition strategy, including its major milestones, decision points, and actions. The individual(s) undertaking this task can and should make use of existing requirements documents that have been part of the acquisition process (e.g., MNS, ORD, TEMP, AS, CARD, etc.). These documents can provide much of the information necessary to build a good understanding of the program and its life cycle.

Though it is not necessary to actually construct a detailed outline of the program's life cycle, doing so provides a chronological structure for evaluating program ESOH issues and events as they occur. Within each phase of the acquisition life cycle (see Figure 1-1), major tasks and activities are identified such as trade-off studies, fabrication of test articles, materials development, materials and subsystem tests, development and implementation of manufacturing processes, and activities associated with the disposal of the system.

To supplement the information gathered from existing acquisition requirements documents, the PESHE team will most likely need to speak with key program office and contractor personnel involved in the program planning.

4.2 STEP 2—ASSESS THE PROGRAM'S CURRENT ESOH STATUS

Following Step 1 above, the PESHE team will need to gather all of the existing ESOH information prepared for the program since its initiation. This will include the relevant ESOH objectives, requirements, and analyses contained in the various acquisition requirements documents (described in Section 3.1.4 of the guide), program NEPA documents, contractor procurement documents and environmental management plans, the SSMP, the HHAR, and any other ESOH information that is currently available.

With the understanding of program life-cycle activities identified in Step 1, the PESHE team will also need to review the applicable laws and regulations (see Appendix D of the guide for a list of federal, DoD, and Army requirements) to assess the status of ESOH compliance for the program and determine if there are any outstanding ESOH requirements that might have been overlooked. In an effort to ensure that *all* relevant ESOH information is identified and gathered, many organizations and programs will apply checklists of possible ESOH requirements (a sample ESOH requirements checklist is provided in Appendix E of the guide). Using these checklists to gather outstanding information, the PESHE team can coordinate directly with the responsible ESOH management personnel within the program office, on the program IPT(s), at the contractor

facilities, at the MACOM environmental and safety offices, and at affected installation environmental offices.

As part of this effort, any on-going and future ESOH actions and activities planned for the program should be identified.

4.3 STEP 3—PREPARE THE DRAFT PESHE DOCUMENT

Using the recommended PESHE outline described in Chapter 3.0, the PESHE team can begin describing and summarizing the program and ESOH information collected earlier in Steps 1 and 2. Areas of uncertainty or missing information should be highlighted until they are resolved. Follow-on coordination with program experts for additional information and clarification is to be expected. In some cases, it might be prudent to have the appropriate program experts pre-review certain sections of the draft PESHE document for accuracy and completeness.

The major objective of this step is to formulate the program's ESOH management strategy. This is represented primarily by the program management approach to ESOH (described in Section 1.3 of the PESHE outline), and the long-term compliance activities (Chapters 2 through 7 of the PESHE) to be followed as the program progresses. Depending on the maturity of the PM's strategy for integrating ESOH considerations into the program, the PESHE team may need to identify ESOH areas that could be strengthened and make appropriate recommendations for improvement. With the PM's approval, or approval from his/her designee, the proposed changes can be formally integrated into the overall approach presented in the PESHE document.

4.4 STEP 4—STAFFING THE PESHE FOR REVIEW AND APPROVAL

Once the draft PESHE is considered complete, the PM's office should formally staff the document for review. All of the appropriate program experts that had not yet reviewed the document or, at least, their particular areas of responsibility, should participate in the review. Comments are to be expected on the initial draft, and provided to the PESHE team for comment resolution. In some cases, a second or third draft of the PESHE might become necessary prior to obtaining approval.

With approval of the final document, all of the necessary signatures can then be added to the signature pages (described in Section 3.8.1 of the guide) near the front of the PESHE document.

4.5 STEP 5—UPDATING THE PESHE DOCUMENT

As required by DoD 5000.2-R, the PM must keep the PESHE updated over the system life cycle, to include those activities and decisions that have been completed, are on-going, and are projected. Because the PESHE is considered a living document, the components of the evaluation should be continually reviewed and updated as the acquisition program evolves. The PESHE should *not* be left idle and considered for update only in preparation for milestone reviews. Regularly reviewing PESHE elements at program IPT meetings, for example, helps to flush out ESOH issues and actions needing updates, and encourages IPT members to use it as a planning and tracking tool. Posting the most current PESHE on a program web site, or distributing hard copies in loose-leaf format, can simplify the process of disseminating change pages and other updates to the document.

The extent of changes made to the PESHE document will affect the level of staffing and review needed. A few minor changes may require only limited staffing, with no updates to signature pages needed. On the other hand, changes in strategies, extensive document changes, or the long-term accumulation of many smaller changes, would likely require a formal staffing and approval process, similar to that described in Step 4.

CHAPTER 5.0: REFERENCES

- Aerospace Industries Association of America, Inc., 1994. National Aerospace Standard (NAS) 411: *Hazardous Material Management Program*. 29 April.
- Department of Defense and the Armed Forces of the Kingdom of Sweden. 1999. *Environmental Considerations in the Systems Acquisition Process—A Handbook for Program Managers*. May
- Department of the Air Force, 1996. *Weapon System Environmental, Safety, and Health Evaluation Development Guide for Single Managers*. Prepared by the Air Force Materiel Command. November.
- Department of the Army, 1998. *Environmental Impact Analysis Manual for Off-Post Training and Deployments*. Prepared by the US Army Corps of Engineers (Mobile and Sacramento Districts). August.
- Department of the Army, 1999. *Programmatic Environmental, Safety, and Health (ESH) Evaluation Guide*. Prepared by the US Army Environmental Center. July.
- Department of the Army, 2000. *NEPA Manual for Materiel Acquisition*. Prepared by the US Army Environmental Center. November.
- Department of the Army, 2001. *Cost Analysis Manual*. Prepared by the US Army Cost and Economic Analysis Center. May.
- Department of the Navy, 2000. *Environmental, Safety, and Health Requirements for Acquisition Programs—A Program Managers Guide* (draft). Prepared by the Naval Air Systems Command. 20 June.
- National Missile Defense Joint Program Office, 2000. *National Missile Defense Programmatic Environmental, Safety, and Health Evaluation (PESHE)*. 14 July.
- Office of the Program Manager, Brigade Combat Team. 2000. *Interim Armored Vehicle (IAV) Milestone II Programmatic Environmental, Safety and Health Evaluation (PESHE)*. 21 October.
- Office of the Under Secretary of Defense. 2001. Web-based ESOH guidance presented in the Defense Acquisition Deskbook. Prepared by the Office of the Deputy Under Secretary of Defense for Installations and Environment. 18 September. <<http://web1.deskbook.osd.mil>>.
- Project Manager Soldier Systems. 2001. *Land Warrior Programmatic Environmental, Safety, and Occupational Health Evaluation*. March.

Note: The various laws and regulations cited in this guide are included in Appendix D.

APPENDIX A

***TYPICAL ESOH QUESTIONS FROM
ARMY SYSTEM ACQUISITION REVIEW COUNCIL
AND COST REVIEW BOARD REVIEWS***

Typical ESOH Questions from Army System Acquisition Review Council (ASARC) and Cost Review Board (CRB) Reviews

The following questions address program environmental, safety, and occupational health (ESOH) strategy and compliance requirements.

- (1) How are you planning to handle ESOH issues within your office?
- (2) What is the demilitarization/disposal plan for your system?
- (3) What ESOH related plans are you planning to or have prepared (e.g., Pollution Prevention Plan, System Safety Plan, Hazardous Material Management Plan)?
- (4) Is there a Hazardous Material Management Plan for your program? Is it based on National Aerospace Standard 411? If not, what is it based on?
- (5) Have all Class I Ozone Depleting Chemicals (ODCs) been eliminated from use by your system?
- (6) Are all required National Environmental Policy Act (NEPA) analyses and documentation complete for the next phase?
- (7) Has a safety program been established to identify, track, and resolve system-related hazards?
- (8) Are there any residual system-related safety hazards and how are they documented?
- (9) Have one or more Health Hazard Assessments been completed, and all health hazards identified, tracked, and resolved?
- (10) Will your system have similar hazardous materials to the system to be replaced? If so, why? Will your system have new hazardous materials? Why and what are they?
- (11) Have you performed ESOH-related trade-off studies? Would you describe them?
- (12) How is your system minimizing the use of Class II ODCs, which will be banned effective calendar year 2015?
- (13) How do you plan to investigate non-hazardous materials to replace ODCs and hazardous materials?
- (14) Is your system in compliance with federal, state, and local environmental laws and regulations and with all ESOH federal Executive Orders?
- (15) Do you have a pollution prevention program (P2) to address and/or correct P2 system deficiencies? What is it? What are the projected types and quantities of pollutants to be released to the environment over the life of the system?

- (16) Have or will you perform industrial/manufacturing process Environmental Assessments (EA) peculiar to your system's needs? If so, are those EAs available and how can they be obtained?
- (17) Do you have projected accident, incident, or personal injury rates for your system? What are those rates and how are they to be controlled?
- (18) Are there any high or medium risks identified in your System Safety Plan? What actions have been taken to minimize those risks?
- (19) Are personnel in the system's work place/facilities to be exposed to hazardous, radiological, or toxic substances?
- (20) Is personal protective equipment required to operate or maintain the system? How is it identified and documented?
- (21) Are you sponsoring any research or development on ESOH alternatives that will be considered for incorporation in/on your system?
- (22) What ESOH alternatives are being considered and how are they being/were they evaluated? Do you have any cost/benefit analyses completed or underway on those alternatives?
- (23) Are you planning for the installations for fielding your system to require an emergency response team for ESOH-related hazards? Do the installations know of those plans?
- (24) How much system ESOH-related training must installation personnel receive to handle hazardous materials from your system? Do the installations know of those plans?
- (25) Is there any required staffing of installation safety and civil engineering offices associated with your system? Do the installations know of those plans?
- (26) If personal protective equipment is required by your system, what are the productivity losses that may be experienced?
- (27) What items will be recycled during the system's life? What is the cost?
- (28) How has the system design been affected by minimizing noise and maintaining workspace noise levels below 84 decibels?

ESOH Cost-Related Questions

The following questions are specifically for system ESOH cost analysis purposes.

- (1) What is the system's environmental quality cost as identified in the program cost estimate? Has it changed since the last milestone review? If so, how?
- (2) What are the ESOH system cost drivers? For the ESOH cost drivers, can you identify the ESOH costs at the subsystem/component/level by Milestone III/C?
- (3) Where are the ESOH-related labor and material costs?
- (4) Who is responsible for and budgets for the disposal of your system when it is ready (the operating command, Army Materiel Command, etc.)? Will an estimate of those costs be available at the Milestone II/B review?
- (5) When you identify an installation(s) needed to support your system during its life cycle, have you identified funding needed for ESOH-related costs associated with that support? What are those costs by fiscal year?
- (6) Are any modifications/upgrades directly related to ESOH for existing systems? Can the ESOH costs be identified for those modifications/upgrades by Milestone III/C? At Defense Acquisition Board, ASARC, or MACOM level?
- (7) How does your system's environmental quality, life-cycle cost compare to analogous systems?
- (8) Did you analyze the ESOH required depot level costs to support your system and did you get any insight to ESOH-related costs and percentages? If so, what is the result?
- (9) Have any medical costs been identified for system-specified hazardous materials and, considering those costs, have those system-specified hazardous materials been prioritized for the purpose of eliminating or minimizing their use?

APPENDIX B

SAMPLE

PROJECT OFFICE ESOH POLICY STATEMENT

Sample Project Office ESOH Policy Statement

Policy Memorandum XX-1x

MEMORANDUM FOR ALL XYZ PROJECT OFFICE ASSIGNED, MATRIXED, AND SUPPORT PERSONNEL

SUBJECT: XYZ Project Office Environmental, Safety, and Occupational Health (ESOH) Policy

1. It is the policy of the XYZ Project Office to develop the XYZ system with minimum adverse impacts on the environment, human health, and safety, and in accordance with good business practices and the provisions of all applicable laws and their implementing Executive Orders and regulations.

2. To this end, I have directed the XYZ Environmental, Safety, and Occupational Health (ESOH) manager to begin integrating a tailored programmatic ESOH evaluation (PESHE) (required under DoD Regulation 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information System Acquisition Programs*) into the XYZ Integrated Product and Process Development. As the PESHE development process gets underway, it is imperative that everyone cooperate and provide the necessary input when requested.

3. As part of the PESHE, the XYZ ESOH management strategy will continue throughout the program life cycle and include steps to:

- a. Identify, reduce, or eliminate, where feasible, all toxic, hazardous, and banned materials required in the system/segment production specifications;
- b. Integrate known system related “lessons learned”;
- c. Conduct depot-level review of demilitarization and disposal planning;
- d. Include industry and government pollution prevention measures in XYZ technical data, technical manuals, and support concept and procedures development;
- e. Assess alternative materials substitutions in the system engineering and design review process;
- f. Address and plan for the total life-cycle costs and risks associated with ESOH compliance requirements;
- g. Plan and address identification and evaluation of system safety and health hazards, define risk levels, and manage the probability and severity of all safety and health hazards associated with development, use, and disposal of the system; and
- h. Assure that each management decision, which accepts risks associated with an identified safety and health hazard, is formally documented.

4. In addition, each XYZ segment Integrated Product Team should use the Project Office's available ESOH expertise for input to and review of their segment's demilitarization and disposal planning, Technical Manual preparation, and for assistance with environmental, safety, or health issues whenever identified or suspected.

5. Integrating the Army system acquisition ESOH lessons learned and emerging alternative materials technologies, into the XYZ system production and design reviews, represents a "best management practice" we can ill afford to ignore.

XXXXXX XXXXXX
LTC, XXXXXXXX
XYZ Product Manager

APPENDIX C

***EXAMPLES OF ESOH PROVISIONS USED IN
CONTRACTING DOCUMENTS***

Examples of ESOH Provisions Used in Contracting Documents

Instructions, Conditions, and Notices to Offerors (Section L)

No later than 30 days prior to proposal receipt, you must provide the Contracting Officer with (a) an environmental assessment addressing all hazardous and/or toxic materials and fluids used in the Bid Samples, (b) a Safety Assessment and/or Hazard Assessment Report, and (c) a Material Safety Data Sheet (MSDS) pursuant to FAR 52.223-3 entitled "Hazardous Material Identification and Material Safety Data Sheets". In the event the above documentation is not provided to the Contracting Officer 30 days prior to proposal receipt, the anticipated 30 day evaluation of the Offeror's Bid Samples may be shortened, on a day for day basis, for each day the documentation was delinquent provided. Under these circumstances, data to validate the written portion of the Offeror's proposal will not be collected on those days where no Bid Sample evaluation was conducted.

Contract Clauses

Federal Acquisition Regulation (FAR) Contract Clauses

52.223-3	Hazardous Material Identification and Material Safety Data
52.223-5	Pollution Prevention and Right-to-Know Information
52.223-7	Notice of Radioactive Materials
52.223-11	Ozone-Depleting Substances
52.223-13	Certification of Toxic Chemical Release Reporting
52.223-14	Toxic Chemical Release Reporting

Defense Federal Acquisition Regulation Supplement (DFARS) Contract Clauses

252.223-7001	Hazard Warning Labels
252.223-7002	Safety Precautions for Ammunition and Explosives
252.223-7006	Prohibition on Storage and Disposal of Toxic and Hazardous Materials

Statement of Work (SOW)

A.1 **Environmental Compliance.** The contractor (and its subcontractors) shall comply with all federal, state, and local environmental laws, regulations, and policies for all activities defined in this SOW, whether conducted at government or contractor facilities. Upon request, the contractor shall make available to the government applicable environmental permits and documentation. The contractor shall be solely responsible for the management, cleanup, protection, and disposal of any and all emissions, effluents, wastes, and hazardous materials used in, generated by, or associated with the actions required by this SOW. The contractor shall report the current status and impacts to program cost, schedule, and performance from the above mentioned at each management review.

A.2 **Safety Engineering.** The contractor shall develop and implement a safety program that is integrated with the concurrent engineering process used to develop, mature, and support the system. The program shall address each system variant/configuration. The contractor shall

use MIL-STD-882D in determining whether safety engineering objectives are met. As a minimum, the contractor shall do the following:

- a. Identify hazards associated with the system by conducting safety analyses and hazard evaluations. Analyses shall include both operational and maintenance aspects of each system variant/configuration.
- b. Eliminate or reduce significant hazards by appropriate design or materiel selection. If hazards to personnel are not avoidable or eliminated, take steps to control or minimize those hazards.

A.3 **Safety Assessment Report (SAR).** The contractor shall develop and implement a SAR IAW the CDRL. The safety assessment shall identify all safety features and inherent hazards, and shall establish special procedures and/or precautions to be observed by test agencies and system users. The assessment shall address each system variant/configuration. As an appendix to the SAR, the contractor shall identify and incorporate Health Hazards associated with the system. The contractor shall provide a description and discussion of each potential or actual health hazard of concern for each subsystem or component. The following are examples of some areas of concern that may contain safety and health hazards. This is not an all-inclusive list:

- a. Fire protection issues
- b. Toxic fumes (i.e., engine exhaust, weapons firing)
- c. Noise levels (i.e., steady-state, impulse)
- d. Electrical issues
- e. Weapons characteristics (i.e., blast overpressure, misfire, procedures, hangfire procedures, cook off, breech/barrel life, safety mechanisms, weapon/vehicle integration)
- f. Ammunition storage
- g. Operator's devices/procedures to ensure safe operation
- h. Analyses and tests conducted, with quantities involved, to demonstrate safety

A.4 **Radioactive Materials.** The contractor shall not use any radioactive materials without the approval of the Government. If any items furnished under this contract will contain Thorium, or other source material (see Title 10, Code of Federal Regulations, Part 40) in excess of 0.05 percent by weight or any other intentionally added radioactive material, the contractor shall provide a list to the Government for approval IAW the CDRL. If a Nuclear Regulatory Commission license is required, the contractor shall submit request for license within 30 days of contract award.

A.5 **Health Hazards.** The contractor shall identify potential health hazards that are indigenous to and generated by the system, and eliminate or reduce such health hazards to an acceptable level as determined by the Government. Health hazards shall be reported as a part of the SAR.

A.6 **Hazardous Materials.** The contractor shall not use cadmium, hexavalent chromium, or other highly toxic or carcinogenic materials without Government approval. No Class I or Class II ODCs shall be used. The contractor shall not use materials that are identified in the Registry of Toxic Effects of Chemical Substances, published by the National Institute for Occupational Safety and Health, as materials that will produce toxic effects via the

respiratory tract, eye, skin, or mouth. Moderately toxic materials may be used provided the design and control preclude personnel from being exposed to environments in excess of that specified in 29 CFR 1910, Occupational Safety and Health Standards.

- A.7 **Hazardous Materials Management Program/Plan.** The contractor shall establish, implement and maintain a Hazardous Materials Management Program using National Aerospace Standard 411, *Hazardous Materials Management Program*, as a guide.. The contractor shall develop a Hazardous Materials Management Plan which, at a minimum, shall identify and describe the organizational relationships and responsibilities for eliminating hazardous materials, define the process used to identify the hazardous materials utilized in the manufacturing process, and establish prioritization criteria for ranking the relative risks of these hazardous materials.
- A.8 **Hazardous Materials Management Report.** The contractor shall submit Hazardous Material Management Reports IAW the CDRL which, at a minimum, shall identify all hazardous materials required for system production, a listing of prioritized hazardous materials for minimization/elimination per the criteria established in the Hazardous Materials Management Plan, and identify those hazardous materials/processes for which non-hazardous substitute materials/technologies may be available for implementation.
- A.9 **Material Safety Data Sheet.** The contractor shall provide a Material Safety Data Sheet (MSDS) for each hazardous material item, without a National Stock Number, procured under this contract (IAW the CDRL). If applicable, a copy of the MSDS shall be submitted with each affected Special Group item. Content of MSDS shall be in accordance with Occupational Safety and Health Act (OSHA) 1910.1200(g) and annotated onto the contractor MSDS format.
- A.10 **Environmental Planning Report.** The contractor shall consider environmental effects and trade-offs at all levels of planning and test hardware development. Appropriate environmental considerations shall be implemented by establishing environmental objectives and performance criteria. These objectives and criteria shall be developed with consideration of constraints including but not limited to federal, state, and local environmental laws, regulations, and guidelines; environmental resource management; and cumulative environmental effects. The contractor shall use best commercial practices in documenting these considerations. How they relate to the overall program shall also be included in an Environmental Planning Report (IAW the CDRL).
- A.11 **Support for National Environmental Policy Act (NEPA) Compliance.** If data is needed by the government to develop applicable environmental analysis required under provisions of the NEPA, the contractor shall provide a description of proposed contractor actions along with qualitative and quantitative data describing the constituent materials, emissions, effluents, wastes, and hazardous materials used in and produced from these activities.

Contract Data Requirements List (CDRL)

- A016 Safety Assessment Report (draft report due 150 days after contract award)
A017 Radioactive Materials (due 60 days after contract award)
A018 Hazardous Materials Management Report (initial report due 240 days after contract award)

- A025 Material Safety Data Sheet (as required with each hazardous material item)
- A027 Environmental Planning Report (due 90 days after contract award)

APPENDIX D

***LIST OF FEDERAL, DoD, AND ARMY
LAWS AND REGULATIONS***

List of Federal, DoD, and Army Laws and Regulations

FEDERAL LAWS

10 UCS 2399(b)1	Operation Test and Evaluation
7 USC 136-136y	Federal Insecticide, Fungicide and Rodenticide Act of 1972
15 USC 2601-2671	Toxic Substances Control Act of 1976 (TSCA)
16 USC 470 et seq.	National Historic Preservation Act of 1966
16 USC 470aa, et seq.	Archaeological Resources Protection Act of 1979
16 USC 661 et seq.	Fish and Wildlife Coordination Act
16 USC 670a-670o	Sikes Act of 1960
16 USC 703-712	Migratory Bird Treaty Act of 1918
16 USC 1361-1407	Marine Mammal Protection Act of 1972
16 USC 1001 et seq.	Watershed Protection and Flood Prevention Act (WPFPA)
16 USC 1451-1464	Coastal Zone Management Act of 1972 (CZMA)
16 USC 1531 et seq.	Endangered Species Act of 1973
16 USC 3101-3233	Alaska National Interest Lands Conservation Act of 1980
16 USC 3501 et seq.	Coastal Barrier Resources Act (1988), reauthorized as Coastal Barrier Improvement Act of 1990
16 USC 3501 et seq.	Coastal Wetlands Planning, Protection, and Restoration Act (1988)
16 USC 4401-4412	North American Wetlands Conservation Act (1989)
16 USC 4901 et seq.	Wild Bird Conservation Act of 1992
25 USC 3001- 3013	Native American Grave Protection & Repatriation Act of 1990
29 USC 651-678	Occupational Safety and Health Act of 1970
33 USC 1251-1376	Clean Water Act of 1977, as amended (CWA)
33 USC 2702 to 2761	Oil Pollution Act of 1990 (OPA)
42 USC 134	Energy Policy Act
42 USC 300f et seq.	Safe Drinking Water act of 1974 (SDWA) 6939b: 15 USC 1261 et seq.
42 USC 1996	American Indian Religious Freedom Act
42 USC 4321-4347	National Environmental Policy Act of 1969, as amended (NEPA)
42 USC 4901	Noise Control Act of 1972
42 USC 4913	Quiet Communities Act of 1978
42 USC 6961, 6927(c)	Federal Facilities Compliance Act of 1992
42 USC 6901 et seq.	Resources Conservation and Recovery Act of 1976 (RCRA)

42 USC 7401-7671g	Clean Air Act of 1970 (CAA), as amended by the Clean Air Act Amendments of 1990 (CAAA)
42 USC 7412 (r)	Chemical Safety Information, Site Security and Fuels Regulatory Relief Act (Public Law 106-40, amendment to Section 112 (r) of the CAA)
42 USC 9620	Community Environmental Response Facilitation Act of 1992 (CERFA)
42 USC 9601-9675	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments Reauthorization Act of 1986 (SARA)
42 USC 11001-11050	Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA)
42 USC 13101-13109	Pollution Prevention Act of 1990
49 USC 5101 et seq.	Hazardous Materials Transportation Authorization Act of 1994
Public Law 98-616	Hazardous and Solid Waste Amendments of 1984
Public Law 101-615	Hazardous Materials Transportation Uniform Safety Act of 1990

FEDERAL REGULATIONS

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Occupational Safety and Health Standards for Construction
29 CFR 1960	Department of Labor Regulations on Federal Employee Occupational Safety and Health Programs
40 CFR	Protection of Environment (Various Sections)
49 CFR	Transportation (Various Sections)

EXECUTIVE ORDERS

EO 11514	Protection and Enhancement of Environmental Quality, as amended by EO 11991
EO 11593	Protection and Enhancement of the Cultural Environment
EO 11644	Use of Off-Road Vehicles on the Public Lands (as amended by EO 11989 and EO 12608)
EO 11738	Providing for Administration of the Clean Air Act and the Federal Water Pollution Control Act with Respect to Federal Contract, Grants, or Loans
EO 11988	Floodplain Management, as amended by EO 12148
EO 11990	Protection of Wetlands, as amended by EO 12608
EO 12072	Federal Space Management
EO 12114	Environmental Effects Abroad of Major Federal Actions
EO 12196	Occupational Safety and Health Programs for Federal Employees, as amended

EO 12777	Implementation of Section 311 of the Federal Water Pollution Control Act of October 18, 1972, as amended, and the Oil Pollution Act of 1990
EO 12898	Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, as amended by EO 12948
EO 13007	Indian Sacred Sites
EO 13031	Federal Alternative Fueled Vehicle Leadership
EO 13045	Protection of Children from Environmental Health Risks and Safety Risks
EO 13089	Coral Reef Protection
EO 13101	Greening the Government through Waste Prevention, Recycling, and Federal Acquisition
EO 13123	Greening the Government through Efficient Energy Management
EO 13148	Greening the Government through Leadership in Environmental Management
EO 13158	Marine Protected Areas
EO 13175	Consultation and Coordination with Indian Tribal Governments
EO 13186	Responsibilities of Federal Agencies to Protect Migratory Birds

DOD DIRECTIVES, INSTRUCTIONS, REGULATIONS, MANUALS, GUIDANCE, HANDBOOKS, & STANDARDS

CJCSI 3170.01B	Requirements Generation System
DoD 4140.1-R	Department of Defense Materiel Management Regulation
DoD 4145.26-M	Department of Defense Contractor's Safety Manual for Ammunition and Explosives
DoD 4160.21-M	Defense Reutilization and Marketing Manual
DoD 4160.21-M-1	Defense Demilitarization Manual
DoD 4715.5-G	Overseas Environmental Baseline Guidance Document (OEBGD)
DoD 4715.6-R	Low-Level Radioactive Waste Program
DoD 5000.2-R	Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information System (MAIS) Acquisition Programs
DoD 5000.4-M	Cost Analysis Guidance and Procedures
DoD 6050.5-G	Hazardous Materials Information System Users Guide
DoD 6050.5-G-1	DoD Federal Hazard Communication Training Program Trainer's Guide
DoD 6050.5-H	DoD Hazardous Chemical Warning Labeling System
DoD 6050.5-M	DoD Hazardous Materials Information System Procedures
DoD 6055.9-STD	DoD Ammunition and Explosives Safety Standards

DoDD 4540.1	Use of Airspace by US Military Aircraft and Firings Over the High Seas
DoDD 4700.4	Natural Resource Management Program
DoDD 4705.1	Management of Land-Based Water Resources in Support of Joint Contingency Operations
DoDD 4710.1	Archaeological and Historic Resources Management
DoDD 4715.1	Environmental Security
DoDD 4715.11	Environmental and Explosive Safety Management on Department of Defense Active and Inactive Ranges within the United States
DoDD 5000.1	The Defense Acquisition System
DoDD 5030.19	DoD Responsibilities on Federal Aviation and National Airspace System Matters
DoDD 5030.41	Oil and Hazardous Substances Pollution Prevention and Contingency Program
DoDD 6050.7	Environmental Effects Abroad of Major Department of Defense Actions
DoDD 6055.9	DoD Explosive Safety Board (DDESB) and DoD Component Explosives Safety Responsibilities
DoDD 6055.11	Protection of DoD Personnel from Exposure to Radio-Frequency Radiation and Military Exempt Lasers
DoDD 6230.1	Safe Drinking Water
DoDI 3030.2	Community Planning and Impact Assistance
DoDI 4145.26	Department of Defense Contractor's Safety Requirements for Ammunition and Explosives
DoDI 4150.7	DoD Pest Management Program
DoDI 4165.57	Air Installations Compatible Use Zones
DoDI 4170.10	Energy Management Policy
DoDI 4715.2	DoD Regional Environmental Coordination
DoDI 4715.3	Environmental Conservation Program
DoDI 4715.4	Pollution Prevention
DoDI 4715.5	Management of Environmental Compliance at Overseas Installations
DoDI 4715.6	Environmental Compliance
DoDI 4715.7	Environmental Restoration Program
DoDI 4715.9	Environmental Planning and Analysis
DoDI 4715.10	Environmental Education, Training, and Career Development
DoDI 5000.2	Operation of the Defense Acquisition System
DoDI 6050.5	DoD Hazard Communication Program
DoDI 6055.1	DoD Safety & Occupational Health (SOH) Program
DoDI 6055.5	Industrial Hygiene and Occupational Health
DoDI 6055.7	Mishap Investigation, Reporting, and Record Keeping

DoDI 6055.8	Occupational Radiation Protection Program
DoDI 6055.11	Protection of DoD Personnel from Exposure to Radio Frequency (RF) Radiation
MIL-STD-882D	Department of Defense Standard Practice for System Safety
MIL-STD-1474B(MI)	Military Standard Noise Limits for Army Materiel

ARMY REGULATIONS & PAMPHLETS

AR 11-9	The Army Radiation Safety Program
AR 11-34	The Army Respiratory Protection Program
AR 40-10	Health Hazard Assessment Program in Support of the Army Materiel Acquisition Decision Process
AR 50-6	Chemical Surety
AR 50-7	Army Reactor Program
AR 55-228	Transportation by Water of Explosives and Hazardous Cargo
AR 70-1	Army Acquisition Policy
AR 75-1	Malfunctions Involving Ammunition and Explosives (RCS CSGLD-1961(MI))
AR 200-1	Environmental Protection and Enhancement
AR 200-2	Environmental Analysis of Army Actions
AR 200-3	Natural Resources—Land, Forest, and Wildlife Management
AR 200-4	Cultural Resources Management
AR 200-5	Pest Management
AR 380-5	Department of the Army Information Security Program
AR 385-10	The Army Safety Program
AR 385-14	Transportation Accident Prevention and Emergency Response Involving Conventional Munitions and Explosives
AR 385-16	System Safety Engineering and Management
AR 385-40	Accident Reporting and Records
AR 385-61	The Army Chemical Agent Safety Program
AR 385-64	US Army Explosives Safety Program
AR 602-2	Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process
AR 700-141	Hazardous Materials Information System (HMIS) (RCS DD-FM&P (A,Q,&AR) 1486)
AR 700-143	Packaging of Hazardous Material
AR 740-32	Responsibilities for Technical Escort of Dangerous Materials
DA PAM 40-501	Hearing Conservation Program
DA PAM 40-503	Industrial Hygiene Program

DA PAM 70-3	Army Acquisition Procedures
DA PAM 200-4	Cultural Resources Management
DA PAM 385-16	System Safety Management Guide
DA PAM 385-64	Ammunition and Explosives Safety Standards

OTHER FEDERAL AGENCY REQUIRMENTS

FAA Order 7400.2C	Procedures for Handling Airspace Matters
FAA Order 7610.4	Special Military Operations

APPENDIX E
SAMPLE ESOH REQUIREMENTS CHECKLIST

Sample ESOH Requirements Checklist

General

- _____ Offices, organizations, and individuals assigned with responsibility for ESOH management
- _____ Copies of applicable requirements documents, including the MNS, ORD, CARD, TEMP, Acquisition Strategy, etc.
- _____ Management approach for integrating ESOH into systems engineering
- _____ List of all ESOH-related provisions in place for the system development contractor

ESOH Compliance

- _____ IPTs and other similar forums that oversee and track ESOH regulatory requirements, list of responsible members, and frequency of meetings
- _____ Mitigation monitoring plan, program, or process; identify the responsible DoD office
- _____ Existing and expected permits (e.g., air quality, NPDES, Section 404); provide list of applicable permits, their approval date or status, the issuing regulatory agency, and the responsible DoD office
- _____ Existing and expected plans (e.g., Spill Prevention Plan, Stormwater Plan, Environmental Management Plan); provide plan titles, their approval date or status, the issuing regulatory agency (if applicable), and the responsible DoD office
- _____ Agency coordination/consultation requirements (e.g., State Historic Preservation Officer and US Fish and Wildlife Service); include issues to be addressed and the responsible DoD office
- _____ Other ESOH compliance problems (e.g., real estate and coastal zone management) currently unresolved or anticipated, if any
- _____ Any program management risks to cost, compliance, schedule, or performance in association with required ESOH actions and activities; if so, explain
- _____ Additional points of contact for ESOH compliance, as necessary

National Environmental Policy Act (NEPA) and EO 12114 Compliance

- _____ Strategy and schedule for NEPA and/or EO 12114 compliance, analysis, and documentation
- _____ Program office, installation, or agency responsible for conducting NEPA analyses
- _____ Offices, IPTs, and working groups that oversee and track NEPA requirements/issues, and frequency of meetings
- _____ If NEPA analyses have already been conducted, include copies of the following types of documents:
 - _____ REC
 - _____ EA/FNSI
 - _____ EIS/ROD
- _____ Status of ongoing or planned NEPA/EO 12114 analyses, and schedule for completion
- _____ Any public or regulatory agency issues/concerns
- _____ Any program management risks to cost, compliance, schedule, or performance in association with meeting NEPA requirements

_____ Additional points of contact for NEPA compliance/document information, as necessary

Safety and Health (S&H)

- _____ System Safety Management Plan (SSMP) or program description for implementing and managing S&H requirements
- _____ Offices, IPTs, and working groups responsible for S&H management, and frequency of meetings
- _____ S&H documentation requirements for each test mission, such as those listed below:
 - ___ Range Safety Data Package
 - ___ Safety Assessment Report (SAR)
 - ___ Health Hazard Assessment Report (HHAR)
 - ___ Safety Release
- _____ Methodology or system used for tracking S&H hazards and risks
- _____ Any high or medium risk hazards currently identified, actions taken, and resolutions
- _____ Any range safety, flight safety, transportation, EMR, ionizing radiation, laser operation, OSHA compliance, or other S&H issues currently unresolved or anticipated
- _____ Any program management risks to cost, compliance, schedule, or performance in association with meeting S&H requirements
- _____ Other future actions for S&H management and schedules for completion
- _____ Additional points of contact for S&H management information, as necessary

Hazardous Materials Management

- _____ Hazardous Materials Management Program (HMMP) or similar plan currently used for hazardous materials management
- _____ Identify if the HMMP or similar program is based on NAS 411 or other standards
- _____ Offices, IPTs, and working groups responsible for hazardous materials management, and frequency of meetings
- _____ Methodology or system used for tracking hazardous materials and quantities used
- _____ Class I and II ODCs currently in use and plans for their elimination from system use
- _____ Any hazardous material issues currently unresolved or anticipated
- _____ Any program management risks to cost, compliance, schedule, or performance in association with hazardous materials management
- _____ Status of demilitarization and disposal planning
- _____ Other future actions for hazardous materials management and schedules for completion
- _____ Additional points of contact for hazardous materials management information, as necessary

Pollution Prevention (P2)

- _____ P2 plan or program, if separate from the HMMP (above)
- _____ Offices, IPTs, and working groups responsible for P2, and frequency of meetings
- _____ Trade studies to replace ODCs and hazardous materials with non-hazardous alternatives; provide list of materials being considered for replacement, if any
- _____ Additional points of contact for P2 information, as necessary

Explosives Safety

- _____ Offices, IPTs, and working groups responsible for explosives safety management, if different from S&H, and frequency of meetings
- _____ Explosives safety documents or hazard classifications, if any
- _____ Methodology or system used for tracking explosives safety hazards and risks, if different from S&H (above)
- _____ Any high or medium explosives safety risks currently identified, actions taken, and resolutions
- _____ Any program management risks to cost, compliance, schedule, or performance in association with meeting explosives safety requirements
- _____ Other future actions for explosives safety management and schedules for completion
- _____ Additional points of contact for explosives safety management information, as necessary