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BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 32-7080
XXX 1998

Civil Engineering

★COMPLIANCE ASSURANCE AND POLLUTION PREVENTION

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

This instruction implements Air Force policy directive (AFPD) 32-70, *Environmental Quality,* by establishing the Compliance Assurance and Pollution Prevention (CAPP) Program. Unless otherwise noted, the guidance and procedures outlined in this instruction apply to all Air Force installations within the United States, its territories, and in foreign countries. Additionally, this Air Force instruction (AFI) applies to the Air Force Reserves, the Air National Guard, government owned-contractor operated facilities, and direct reporting units (DRU) and field operating agencies (FOA) not located on Air Force installations. Send comments and suggested improvements on Air Force Form 847, **Recommendation for Change of Publication**, through channels, to Headquarters United States Air Force (HQ USAF), Deputy Chief of Staff for Installations and Logistics, Environmental Division (HQ USAF/ILEV), 1260 Air Force Pentagon, Washington DC 20330-1260. Any organization may supplement this instruction. Major commands (MAJCOM), FOAs, and DRUs send one copy of each supplement to HQ USAF/ILEV; other commands send one copy of each supplement to the next higher headquarters. See **Attachment 1** for a list of references and supporting information.

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed. This document revises AFI 32-7080, *Pollution Prevention* and changes the title to *Compliance Assurance and Pollution Prevention.* This is the second publication of AFI 32-7080, substantially revising the initial 1994 publication. The organization of this AFI has been revised to closely reflect the framework of an Environmental Management System (EMS). This AFI emphasizes the process of using pollution prevention (P2) to achieve environmental compliance.

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Chapter 1

INTRODUCTION

1.1. Purpose. The purpose of the Air Force Compliance Assurance and Pollution Prevention (CAPP) Program is to sustain and enhance mission readiness by implementing sound cost-effective strategies for complying with existing or new environmental requirements while minimizing or eliminating potential hazards to human health and the environment. The fundamental CAPP strategy utilizes pollution prevention (P2) as the preferred solution for assuring environmental compliance. This Air Force instruction (AFI) defines the compliance through P2 (CTP2) process to implement this strategy.

1.2. Concepts

1.2.1. Compliance Assurance. The goal of compliance assurance is to achieve and maintain immediate, full, and continuous compliance with all federal, state, and local environmental laws and requirements and to address past, present, and future threats to public health and the environment.

1.2.2. Pollution Prevention (P2). The Air Force will prevent pollution by reducing hazardous materials and releases of pollutants into the environment to as near zero as is technically and economically feasible. This will be done first through source reduction, e.g. chemical substitution, process change, and other techniques. Where environmentally damaging materials must be used, their use will be minimized. When the use of hazardous materials cannot be avoided, the spent material and waste will be reused or recycled whenever possible. When spent material and waste cannot be reused or recycled, dispose of the spent material and waste as a last resort in an environmentally safe manner, consistent with the requirements of all applicable laws. This concept is commonly referred to as the environmental management hierarchy.

1.2.3. Compliance Through P2 (CTP2) Process. To proactively identify and address potential compliance vulnerabilities, the CTP2 process utilizes the environmental management hierarchy to preferentially apply P2 solutions that achieve compliance while reducing Total Ownership Costs (TOC) (also referred to as Life Cycle Cost (LCC)), reduce risks as determined through the Operational Risk Management (ORM) process, improve environmental and mission performance, and reduce any other compliance requirement.

1.3. Responsibility and Accountability. Compliance and P2 are everyone's responsibility, from the installation commander to the shop worker. Organizational commanders and weapon system Single Managers (SM) are accountable for CAPP within their span of control. Installation commanders, working through the installation Environmental Protection Committee (EPC) or Environmental Safety and Occupational Health Committee (ESOHC), are accountable for ensuring the installation has an effective, integrated, and cross-functional CAPP program.

1.4. Management. This AFI creates an environmental management system (EMS) based on the International Organization for Standardization (ISO) 14001 and the Environmental Protection Agency's (EPA) Code of Environmental Management Principles (CEMP). ISO 14001 is an EPA-recognized option for Federal agencies implementing an EMS. CEMP incorporates common elements found in a number of EMS standards but with a stronger emphasis on sustainable development and regulatory compliance. The AFI structure reflects the five interconnected EMS elements of: policy, planning, implementation and operation, checking and corrective action, and management review.

Chapter 2

POLICY

2.1. Compliance with Environmental Regulations. The Air Force complies with policies, laws, Executive Orders (E.O.), the Overseas Environmental Baseline Guidance Document (OEBGD), and appropriate Final Governing Standards (FGS) for the operation of facilities, installations, and weapon systems (WS). Environmental

requirements for installations in foreign countries are found in AFI 32-7006, *Overseas Environmental Program in Foreign Countries.*

2.2. Vision. The Air Force vision emphasizes source reduction, reuse, and recovery methods as the primary means to achieve compliance while retaining the traditional end-of-pipe approach as an option when it is the most cost-effective solution. Air Force policy directive (AFPD) 32-70 states, "the Air Force is committed to...eliminating pollution wherever possible." However, the Air Force has focused on "end-of-pipe" treatment and disposal methods to achieve compliance. Environmental compliance that focuses only on end-of-pipe solutions may not always result in the best business decisions for the Air Force. P2 can reduce TOCs, compliance requirements, and pollutant discharges by addressing pollution as close to the source as possible.

2.3. Continuous Improvement. The Air Force must apply the CTP2 process to each environmental compliance requirement. The CTP2 process will be repeated as required to take advantage of new technologies or to accommodate mission change in order to achieve continuous improvement in environmental and mission performance, TOC reduction, and compliance requirement reduction.

Chapter 3

PLANNING

Section 3A—Strategy

3.1. Strategy. The Air Force strategy is to integrate its CAPP Program through a phased implementation of the CTP2 process to reduce compliance requirements and costs to the extent technically and economically feasible.

3.1.1. Because Air Force activities that drive most installation environmental compliance requirements are WS operations and maintenance (O&M) processes and procedures, P2 efforts must emphasize these processes and procedures.

3.1.2. Proposed P2 modifications of SM-controlled WS processes and procedures must be made using the Hazardous Materials Reduction Prioritization Process (HMRPP) described in AFI 32-7086, *Hazardous Materials Management.* This links installation compliance requirements with the SMs who have the authority to implement process modifications.

Section 3B—Goals

3.2. Goals. The Air Force goals for assuring environmental compliance through the application of P2 are to:

3.2.1. Comply with all relevant environmental legislation and regulations.

3.2.2. Identify and evaluate compliance sites and implement P2 solutions that:

3.2.2.1. Reduce TOCs and improve environmental and mission performance.

3.2.2.2. Reduce liability (potential for non-compliance, pollutant discharges, safety and health risks, etc.).

3.2.3. Permeate all mission areas through comprehensive education, training, and awareness of the CTP2 process.

3.2.4. Institutionalize P2 into all phases of the WS life cycle from concept exploration through operations and sustainment and disposal.

3.2.5. Incorporate the CTP2 process into all aspects of installation operations.

3.2.6. Transition innovative P2 technologies to the field.

Section 3C—Objectives for Environmental Program Areas

3.3. Scope. This section provides specific objectives for assuring compliance in each environmental program area, applying the environmental management hierarchy with P2 as the preferred option.

3.4. Air Quality. The air quality program covers all air emission sources regulated under the Clean Air Act (CAA) Sections 7401-7671q of Title 42, United States Code. AFI 32-7040, *Air Quality Compliance,* describes the overall program. Efforts to achieve air quality compliance must be based on a comprehensive, accurate, and current air emissions inventory and will be focused to:

3.4.1. Reduce emissions of National Ambient Air Quality Standards criteria pollutants, precursors of criteria pollutants, and state or locally regulated air pollutants where reduction will result in a reduced compliance burden.

3.4.2. Reduce the number of installations qualifying as "major sources" subject to CAA Title V permitting by:

3.4.2.1. Limiting the potential to emit criteria pollutants, if feasible, to below established major source threshold quantities, thereby eliminating the requirements to obtain a Title V permit.

3.4.2.2. Negotiating implementation of guidance provided in EPA's *Major Source Determinations for Military Installations*, August 2, 1996, with permitting authorities if segregation of sources results in emissions less than major source threshold quantities.

3.4.3. Eliminate or reduce the 188 Hazardous Air Pollutants (HAP) emissions below established major source threshold quantities for HAPs.

3.4.4. Reduce the storage or use of regulated substances (Title 40, Code of Federal Regulations (CFR) Part 68, *Chemical Accident Prevention Provisions*, current edition) requiring the development of Risk Management Plans (RMP), pursuant to CAA section 112(r) and Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) Plans, pursuant to 29 CFR section 1910.119, *Process Safety Management of Highly Hazardous Chemicals* and AFOSH Standard 91-119, *Process Safety Management (PSM) of Highly Hazardous Chemicals.* Application of source reduction and reuse principles is encouraged to reduce listed hazardous substances below applicable thresholds to eliminate costly RMP requirements.

3.4.5. Meet DoD goals for use of Alternative Fueled Vehicles (AFV) through a combination of vehicle procurement, conversions, and support infrastructure in accordance with AFI 24-301, *Vehicle Operations.* DoD AFV goals are driven by the Alternative Motor Fuels Act of 1988; Public Law 102-486; the CAA; the Energy Policy Act (EPACT) of 1992; E.O. 13031, *Federal Alternative Fueled Vehicle Leadership*, December 13, 1996; and DoD Instruction 4715.4, *Pollution Prevention*, June 18, 1996.

3.5. Water Quality. The water program covers all water supply (potable and nonpotable), wastewater (point source and nonpoint source), and stormwater.

3.5.1. Water supply. AFI 32-1067, *Water Systems* and AFI 48-119, *Medical Service Environmental Quality Programs* describe the overall water supply program as regulated under the Safe Drinking Water Act. Efforts to achieve water supply compliance will be focused to:

3.5.1.1. Implement source water protection measures, including wellhead protection areas.

3.5.1.2. Prevent contamination of water supplies during production, treatment, storage, and distribution.

3.5.2. Wastewater. AFI 32-7041, *Water Quality Compliance* describes the overall wastewater program as regulated under the Federal Water Pollution Control Act (FWPCA). Efforts to achieve wastewater compliance will be focused to:

3.5.2.1. Eliminate or minimize point sources (e.g., oil water separators) and the need for pretreatment and treatment of wastewater.

3.5.2.2. Eliminate or minimize discharge of hazardous pollutants to wastewater treatment facilities.

3.5.2.3. Reduce industrial wastewater flow to treatment facilities.

3.5.2.4. Promote beneficial reuse of wastewater sludges instead of landfill disposal.

3.5.2.5. Recycle or reuse wastewater.

3.5.2.6. Implement innovative point source treatment technologies and processes.

3.5.3. Stormwater. AFI 32-7041 and AFI 32-1045, *Snow and Ice Control,* describe the overall stormwater program as regulated under the FWPCA. Efforts to achieve stormwater compliance will be focused to:

3.5.3.1. Implement stormwater P2 best management practices.

3.5.3.2. Eliminate or minimize stormwater runoff from industrial activities.

3.5.3.3. Eliminate or minimize the flow of deicing chemicals into stormwater systems.

3.5.3.4. Increase awareness of efforts to prevent stormwater contamination.

3.6. HAZMAT. The HAZMAT management program includes the HAZMAT Pharmacy Program, HMRPP, and ozone depleting substances (ODS) Management. AFI 32-7086 describes the overall HAZMAT management effort. Efforts to achieve HAZMAT compliance must be focused to:

3.6.1. Support accomplishment of the Air Force mission by minimizing dependence on HAZMAT and reducing associated HAZMAT TOC.

3.6.2. Integrate WS HAZMAT reduction needs into the WS requirements, generation, prioritization, funding, and execution processes.

3.6.3. Manage requirements for both Class I and Class II ODS.

3.6.4. Utilize all instances where applicable toxic release inventory thresholds are exceeded to assess opportunities for implementing P2 projects.

3.6.5. Fully implement integrated pest management as described in AFI 32-1053, *Pest Management Program.*

3.7. Solid Waste (SW). SW includes non-hazardous waste (including municipal solid waste (MSW) and construction and demolition (C&D) debris), hazardous waste (including mixed waste), and special wastes (including polychlorinated-biphenyls (PCB), lead, asbestos, and industrial waste). C&D debris containing non-liquid PCBs will be treated as MSW in accordance with AFI 32-7042, *Solid Waste Management*, which also describes the overall SW management program. Efforts to achieve SW compliance should be focused to:

3.7.1. Reduce compliance burdens by eliminating or reducing SW generation at the source through materials substitution, process engineering, or administrative controls.

3.7.2. Enhance resource recovery and recycling to increase SW diversion rates where economically preferable through a Qualified Recycling Program described in AFI 32-7042. The SW management hierarchy is source reduction, reuse, recycling (and composting), and, finally, disposal.

3.7.3. Minimize hazardous waste (HAZWASTE) generation from industrial, maintenance, and cleanup operations to the most economically practicable extent.

3.8. Affirmative Procurement. Affirmative procurement provides for the purchase of environmentally preferable products, recovered materials, and biobased products. *A Guide to Buying Recycled: The Air Force Affirmative Procurement Program*, describes the Air Force program to comply with Resource Conservation and Recovery Act (RCRA) section 6002 and E.O. 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition*, September 14, 1998.

3.8.1. A program showing a preference for recycled products by procuring items that meet federal and state recycled-content standards and specifications. For example, all printing and writing paper must meet the minimum postconsumer content requirement.

3.8.2. A program designed to promote possibilities and procedures for affirmative procurement initiatives to employees, contractor personnel, and potential bidders.

3.8.3. Procedures for obtaining certifications to verify recycled or recovered material content for applicable EPA guideline items.

3.8.4. Procedures for tracking and reporting purchases of applicable products containing recycled materials.

3.9. Conservation. As mandated by E.O. 12902, *Energy Efficiency and Water Conservation at Federal Facilities*, March 8, 1994, the Air Force will accomplish initiatives to meet energy and water conservation goals.

3.9.1. Energy Conservation. AFPD 23-3, *Energy Management*, details the requirements for Air Force installations to manage their energy consumption properly. Converting fossil energy to usable energy sources such as electricity, mechanical energy, or thermal energy generates air pollutants as by-products. Increasing the energy efficiency of Air Force activities will reduce the demand for fossil energy requirements. Reduced energy demands and production requirements will result in less air pollution. Air Force installations shall increase energy efficiency as a P2 tool to reduce HAP emissions. E.O. 12902 implements the EPACT and mandates a 30 percent reduction by 2005.

3.9.2. Water Conservation. Installations will consider conservation efforts that can help protect clean water as a natural resource, by either minimizing the consumption of the resource, reusing the resource, or minimizing wastewater discharges. Ensure that grass and plants utilized on installations are suitable for the climate to keep irrigation requirements to a minimum. Wastewater effluent should be beneficially recycled/reused for irrigation or other purposes as dictated by AFI 32-1067 and AFI 32-7041.

3.10. Sustainable Facilities. Sustainability concepts will be employed during the planning design, construction, operation, and demolition of all Air Force facilities. Sustainable design techniques include design for HAZMAT reduction: design for eco-efficient materials management (including recycled material use), disassembly and recyclability, durability and life extension, maintenance, energy conservation, or water conservation. Refer to Air Force Environmentally-Responsible Facilities Guide for details.

3.11. Other Program Areas.

3.11.1. Lead. AFI 32-1002, *Facilities Lead-Based Paint Hazard Management*, describes the overall lead-based paint (LBP) management program. The goal of LBP management programs is to protect facility occupants, workers, and the environment from hazardous exposure to lead in LBP. Installations will prevent future LBP hazards and identify, evaluate, control, and eliminate existing LBP hazards.

3.11.2. Asbestos. AFI 32-1052, *Facility Asbestos Management*, details the requirements for installations to manage asbestos properly. To reduce possible exposure to airborne asbestos fibers, installations will develop and implement

the asbestos management programs. Damaged asbestos containing material must be repaired or removed to eliminate the potential hazard. Installations will abate the possibility of hazardous asbestos containing material through inventory management, isolation, and containment.

3.11.3. PCBs. AFI 32-7042 describes the PCB management program for the disposal of PCBs (both liquid and non-liquid). PCBs are regulated before disposal by their use (i.e., transformers, carbon paper). Once the decision is made to terminate the use of PCBs, however, PCB disposal depends on what type of PCB item is being disposed. PCB disposal requirements depend on the concentration of PCBs in the waste and on whether the items being disposed are PCB liquids, PCB articles, PCB remediation waste, PCB bulk product waste, or PCB household waste. C&D debris will usually contain PCB bulk product waste.

3.11.4. Underground storage tanks (UST). AFI 32-7044, *Storage Tank Compliance*, describes the Air Force storage tank program to comply with 40 CFR part 280. Releases from USTs, including spills, overfills, and leaks, can cause fires or explosions that threaten human safety, as well as contaminate soil and groundwater. Installations will ensure new USTs (including piping) are designed and constructed to provide: corrosion protection, release detection, spill and overfill prevention, proper installation, and secondary containment. By 22 Dec 1998, all existing USTs (any regulated UST installed before 22 Dec 1988) must be upgraded to meet the standards for new USTs.

3.11.5. Aboveground storage tanks (AST). Installations must comply with federal, state, and local AST requirements in order to protect health and the environment. ASTs should be provided with drainage to prevent any accidental discharges from endangering adjoining property or reaching waterways. Comply with AFI 32-7044 including requirements for reporting and cleaning up spills and testing for leaks.

3.11.6. Pest Management Program. AFI 32-1053 describes the responsibilities and procedures for pest management at Air Force installations. The goal of the pest management program is to implement the effective, economical, and environmentally sound prevention or control of animal pests and vectors, undesirable terrestrial and aquatic plants, and plant diseases. Installations will fully implement the pest management program to achieve this goal.

Chapter 4

IMPLEMENTATION AND OPERATION

Section 4A—CTP2 Process Implementation

4.1. P2 Management Action Plans (MAP). Installation P2 MAPs will include as a minimum:

4.1.1. Local procedures for implementing this AFI to include roles and responsibilities; implementation milestones; and application of the plan, do, check, adjust cycle.

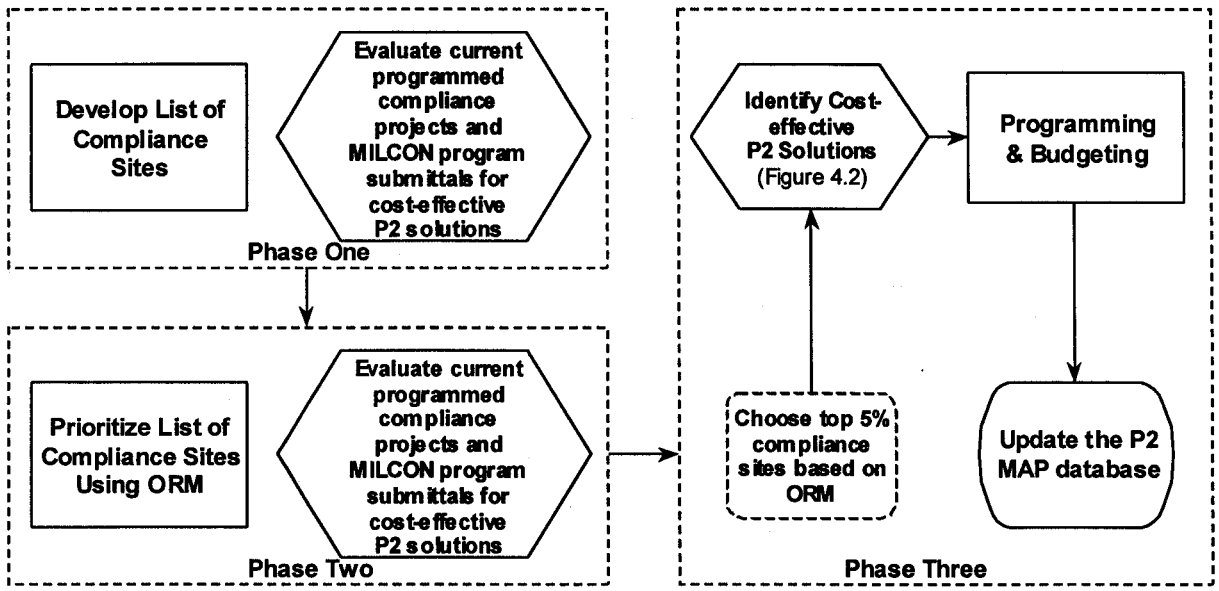
4.1.2. Database of all compliance sites as generated by the CTP2 process described below.

4.1.3. Program and budgeting data.

4.2. CTP2 Process Implementation. Figure 4.1 summarizes the CTP2 process. Implementation of the CTP2 Process will occur in three phases. Installations will define in the P2 MAP the schedule for implementing sequentially the three phases over a period of time consistent with available resources.

4.2.1. Phase One:

Figure 4.1
CTP2 Implementation Process



4.2.1.1. Develop a consolidated inventory listing all existing installation "compliance sites" defined as any regulated facility or process or discharge to a regulated facility or process. Compliance sites also include any discreet location under Air Force control wherein activity occurs that is subject to current or known future (resulting in known consequences) local, state, or federal environmental regulations.

4.2.1.2. Some compliance sites may be affected by currently programmed compliance and military construction (MILCON) projects. Therefore, parallel to developing the list of compliance sites, evaluate programmed compliance projects and MILCON program submittals for cost-effective P2 solutions that achieve or maintain compliance. Paragraph 4.5 of this AFI describes procedures for identifying cost-effective P2 solutions. Compliance sites associated with programmed compliance projects and MILCON program submittals will be incorporated into the consolidated inventory of compliance sites.

4.2.2. Phase Two:

4.2.2.1. Evaluate and prioritize compliance sites identified in the consolidated inventory using the process identified in AFI 91-213, *Operational Risk Management (ORM) Program* and Air Force Pamphlet 91-215, *Operational Risk Management (ORM) Guidelines and Tools*. Assign each compliance site a hazard category and risk level (extremely high, high, medium, and low risk). See **Attachment 2**. Prioritize all compliance sites by listing in order of hazard categories.

4.2.2.2. Some compliance sites may be affected by currently programmed compliance and MILCON projects. Therefore, parallel to prioritizing the list of compliance sites, evaluate programmed compliance projects and MILCON program submittals for cost-effective P2 solutions that achieve or maintain compliance. Compliance sites associated with programmed compliance projects and MILCON program submittals will be incorporated into the consolidated inventory of compliance sites.

4.2.3. Phase Three:

4.2.3.1. Installations will use the CTP2 process in conjunction with the normal programming process within the Program Objective Memorandum (POM) cycle to achieve or maintain compliance where feasible and cost effective.

4.2.3.2. Each year, select from the consolidated inventory at a minimum the top five percent of compliance sites that have not been evaluated for P2 solutions.

4.2.3.2.1. Review already evaluated compliance sites that remain in high and extremely high-risk categories in light of new technology, process changes, regulatory amendments or other changes in condition or knowledge affecting the viability of cost-effective P2 solutions.

4.2.3.2.2. Prioritize any new or newly identified compliance sites and incorporate into the CTP2 process.

4.2.3.3. Identify cost-effective P2 solutions for each selected compliance site by focusing on process changes to eliminate the site or reduce the risk category of each site. Paragraph 4.5 of this AFI describes procedures for identifying cost-effective P2 solutions.

4.2.3.4. Where cost-effective P2 solutions exist, program the requirements identified in the implementation plan through the appropriate program elements (PE) of the major commands (MAJCOM) POM and update the P2 MAP. Programming and budgeting procedures are discussed in paragraph 4.7.

4.3. Compliance Site Inventory. Installations will use a cross-functional CTP2 team and existing sources of information to identify compliance sites and develop a consolidated compliance site inventory.

4.3.1. A compliance site is any regulated facility or process or discharge to a regulated facility or process. This includes any discreet location under Air Force control wherein activity occurs that is subject to current or known future (resulting in known consequences) local, state, or federal environmental regulations.

4.3.1.1. A single process may generate multiple compliance sites. For example, an industrial process may discharge air pollutants, wastewater, and HAZWASTE--with each point of discharge constituting a separate compliance site.

4.3.1.2. Multiple compliance sites may discharge into another compliance site. For example, a HAZWASTE accumulation point is a compliance site in which multiple HAZWASTE generation compliance sites terminate.

4.3.1.3. Compliance sites include, but are not limited to:

4.3.1.3.1. Air Sources: Includes individual regulated sources accounted for under a title V permit (whether major, minor, or insignificant sources) or by individual permit or registration that must be periodically accounted for to ensure compliance. Does not include fugitive dust permits.

4.3.1.3.2. HAZWASTE Management Site: Includes initial accumulation points; 90-day accumulation sites; and treatment, storage, and disposal facilities (RCRA subpart B permitted or interim status sites). Does not include sites governed only by OSHA or the Installation Restoration Program (IRP).

4.3.1.3.3. RCRA Cleanup Sites: Includes confirmed Solid Waste Management Units subject to a regulatory (RCRA) compliance agreement or a Part B permit, sites that are still under the long term monitoring phase of cleanup, and UST cleanup sites. Does not include IRP sites or areas of concern.

4.3.1.3.4. USTs: Includes all regulated USTs and connected piping to include regulated hydrant systems.

4.3.1.3.5. ASTs: Applies to tanks with a capacity of 660 gallons or larger.

4.3.1.3.6. Drinking water: Includes potable water system components such as Air Force managed water sources (such as production wells or surface reservoirs), treatment systems (such as chlorination, air stripper, filtration, or a system with multiple unit processes), major storage sites (such as water towers), and distribution system(s).

4.3.1.3.7. Wastewater and Stormwater: Includes National Pollutant Discharge Elimination System and/or permitted stormwater out-falls; permitted regional connections; other permitted discharges (e.g., treatment plants discharging to evaporation ponds or land application); oil/water separators and other pretreatment systems which feed to regulated discharge points and sewage sludge land application sites. Does not include stormwater permits resulting from construction activities.

4.3.1.3.8. Emergency Planning and Community Right-to-Know Act (EPCRA) Sites: Includes hazardous material storage sites exceeding reporting thresholds defined under SARA section 312.

4.3.1.3.9. Pesticides: Includes all storage and mixing facilities operated by certified pesticide applicators.

4.3.1.3.10. Landfills: Includes on-installation solid waste permitted landfills. Does not include unauthorized disposal sites discovered on the installation (e.g., cans of paint found in dumpster and unauthorized construction demolition dumping).

4.3.1.3.11. Open Burn/Open Detonation: Includes RCRA Subpart X permitted or interim status sites.

4.3.2. The initial inventory of compliance sites will be a consolidation of information from existing sources, not the generation of new information. Existing sources of information include, but are not limited to, MAP/Opportunity Assessments (OA); Component Plans developed in accordance with AFI 32-7062, *Air Force Comprehensive Planning*; EPCRA documentation; Media Plans (air, water, SW, etc.); environmental permits; Environmental Compliance Assessment and Management Program (ECAMP) findings; Safety (SE) inspections; Bioenvironmental Engineer (BE) activity evaluations; National Environmental Policy Act (NEPA) documentation; notice of violations (NOV); RMP; PSM; and applicable environmental databases.

4.3.3. Installations will add or delete compliance sites to the inventory as necessary.

4.3.3.1. New or modified regulatory requirements may create or remove compliance sites.

4.3.3.2. New or changed activities or processes may also create or remove compliance sites. The NEPA process, as described in AFI 32-7061, *The Environmental Impact Analysis Process (EIAP)* should identify compliance sites potentially created or removed by new or changed activities or processes. Therefore, the CTP2 team should review new installation NEPA documents for changes to the compliance site inventory.

4.3.3.3. The evaluation of sites for P2 solutions may require the creation or removal of compliance sites.

4.3.4. The inventory of individual compliance sites will be maintained in a consolidated electronic database using existing software resources as part of the P2 MAP. For each compliance site on an installation, the consolidated compliance site inventory will include, at a minimum, the information listed in table 4.1.

4.3.4.1. At the end of Phase One of the CTP2 process, the status of all identified compliance sites will be "identified and not yet evaluated for P2 solution."

4.3.4.2. Thereafter, installations will change the status of compliance sites as appropriate.

Table 4.1

Compliance Site Inventory Data Requirements	
Data	**Data Description**
Compliance Site Ids	A unique compliance site identifier that is composed of the installation code and regulatory driver as used in A-106 system, location identifier (e.g., building number), and a sequential number identifying each compliance site.
Site Description	A brief description of the compliance site.
Controlling T.O.	If applicable (this identifies compliance sites handled through the HMRPP).
Initial Compliance Cost Estimate	Recurring annual environmental costs to maintain compliance prior to application of CTP2 process (rough order of magnitude estimate prepared during compliance site identification).
Hazard Category	See ¶ 4.4.
Risk Level	See ¶ 4.4.
Priority	See ¶ 4.4. (1-n listing)
Compliance Cost Estimate (before P2 solution)	Prepared during CTP2 process and includes all identifiable direct and indirect annual compliance costs. See ¶¶ 4.5.3.1. and 4.5.3.2.
Projected Compliance Cost Estimate (after P2 solution identified)	Prepared during CTP2 process and includes all identifiable direct and indirect annual compliance costs. See ¶ 4.5.3.3.
Projected Hazard Category	Projected hazard category following implementation of P2 project. See ¶ 4.5.4.1.
Projected Risk Level	Projected risk level following implementation of P2 project. See ¶ 4.5.4.1.
Site Status:	Identify which of the following categories apply to the site: (1) Identified and not yet evaluated for P2 solution - ¶ 4.3.4.1; (2) Under evaluation for potential P2 solution - ¶¶ 4.5.1.1 and 4.5.2.2; (3) Evaluated and accepted due to lack of cost-effective P2 solution - ¶¶ 4.5.1.3, 4.5.2.1.2, 4.5.2.2.1.2, and 4.5.2.2.2; (4) In progress - ¶¶ 4.5.1.2.1, 4.5.2.1.1, and 4.5.2.2.1.1; (5) Eliminated - ¶¶ 4.5.1.2.2, 4.5.2.1.1, and 4.5.2.2.1.1; or (6) Reduced - ¶¶ 4.5.1.2.2, 4.5.2.1.1, and 4.5.2.2.1.1.
Project No.	The Project No. identifies a programmed P2 project and links that project to all compliance sites included in the P2 project. The Project No. is cross-referenced from programming and budgeting information maintained elsewhere in the P2 MAP database.
Actual Compliance Cost Estimate (after P2 solution implemented)	Determined after P2 solution implemented and includes all identifiable direct and indirect annual compliance costs. See ¶ 4.5.3.4.
Actual Hazard Category (after P2 solution implemented)	Determined after P2 solution implemented for sites not eliminated. See ¶ 4.5.4.2.
Actual Risk Level (after P2 solution implemented)	Determined after P2 solution implemented for sites not eliminated. See ¶ 4.5.4.2.

4.4. Compliance Site Prioritization. Use the CTP2 team to prioritize compliance sites using the ORM process and hazard categories defined in **Attachment 2** to assess operational and Environmental, Safety, and Occupational Health (ESOH) risks in terms of severity and probability.

4.4.1. Identify hazards or undesired events associated with each compliance site. Consider at a minimum, potential impacts on mission performance and TOC; the volume and toxicity of effluent; compliance costs, to include but not limited to, permit, disposal, control equipment, training, energy, and other ESOH costs; potential or actual history of NOVs and ECAMP findings related to each effluent; and the potential for changes in compliance requirements and more restrictive regulations, ESOH laws, and other regulations.

4.4.2. Assign a hazard category and risk level as described in **Attachment 2** to each identified hazard or undesired event. This ORM assessment will include both operational and ESOH risks.

4.4.3. Assign a hazard category and risk level to each compliance site based on a consolidated assessment of the identified hazards or undesired events associated with that site.

4.4.4. Prioritize all compliance sites by listing in order of hazard categories, taking into account available cost information.

4.5. Identify P2 Solutions (Process Specific OAs). For each of the selected (minimum top five percent) compliance sites, use the process described in Figure 4.2 and below to identify, where possible, cost-effective P2 solutions by focusing on process changes that eliminate the site or reduce the risk of the site.

4.5.1. For compliance sites controlled directly by a technical order (T.O.), use the HMRPP procedures defined in Chapter Three of AFI 32-7086 to identify and advocate for P2 process modifications.

4.5.1.1. Pursue as appropriate the identification of a cost-effective P2 solution in conjunction with the program office that owns the T.O. and change the site status to "under evaluation for potential P2 solution."

4.5.1.2. If the HMRPP identifies a cost-effective P2 solution, the CTP2 team works with their respective MAJCOM requirements and budget offices to advocate for funding.

4.5.1.2.1. Categorize the compliance site as "in progress" while the HMRPP is under way.

4.5.1.2.2. After implementing the P2 solution, categorize the compliance site as "reduced" if its hazard category or risk level was reduced by the P2 solution. Categorize the compliance site as "eliminated" if the need for the site was eliminated by the P2 solution.

4.5.1.3. If the HMRPP does not identify a cost-effective P2 solution, categorize the compliance site as "evaluated and accepted." Review already evaluated compliance sites that remain in high and extremely high-risk categories in light of new technology, process changes, regulatory amendments, or other changes in condition or knowledge affecting the viability of cost-effective P2 solutions.

4.5.2. For a compliance site not controlled by a T.O., determine whether an OA exists.

4.5.2.1. If an OA exists, determine whether the OA identifies a cost-effective P2 solution.

4.5.2.1.1. If the OA identifies a cost-effective P2 solution, update the P2 MAP database as appropriate and program for funding and execution. Categorize the compliance site as "in progress" until the P2 solution has been fully implemented. After implementing the P2 solution, categorize the compliance site as "reduced" if its hazard category or risk level was reduced by the P2 solution. Categorize the compliance site as "eliminated" if the site was eliminated by the P2 solution.

4.5.2.1.2. If the OA does not identify a cost-effective P2 solution, categorize the compliance site as "evaluated and accepted." Review already evaluated compliance sites that remain in high and extremely high-risk categories in light of new technology, process changes, regulatory amendments or other changes in condition or knowledge affecting the viability of cost-effective P2 solutions.

4.5.2.2. If an OA does not exist, conduct an initial assessment to determine whether a P2 solution is feasible and change the compliance site status to "under evaluation for potential P2 solution."

4.5.2.2.1. If the initial assessment determines that a P2 solution for the compliance site is feasible, conduct a process specific OA.

4.5.2.2.1.1. If the process-specific OA identifies a cost-effective P2 solution, update the P2 MAP database as appropriate and program for funding and execution. Categorize the compliance site as "in progress" until the P2 solution has been fully implemented. After implementing the P2 solution, categorize the compliance site as "reduced" if its hazard category or risk level was reduced by the P2 solution. Categorize the compliance site as "eliminated" if the site was eliminated by the P2 solution.

4.5.2.2.1.2. If the process-specific OA does not identify a cost-effective P2 solution, categorize the compliance site as "evaluated and accepted." Review already evaluated compliance sites that remain in high and extremely high-

risk categories in light of new technology, process changes, regulatory amendments or other changes in condition or knowledge affecting the viability of cost-effective P2 solutions.

4.5.2.2.2. If the initial assessment determines that a P2 solution for the compliance site is not currently feasible, categorize the compliance site as "evaluated and accepted." Review already evaluated compliance sites that remain in high and extremely high-risk categories in light of new technology, process changes, regulatory amendments or other changes in condition or knowledge affecting the viability of cost-effective P2 solutions.

4.5.3. Cost-effectiveness determinations. The basis for cost-effective determinations will be the estimates of the compliance costs associated with the compliance sites affected by a given P2 solution project.

4.5.3.1. During the compliance site inventory development, installations will provide a rough order of magnitude estimate of direct and indirect annual compliance costs.

4.5.3.2. When determining whether a cost-effective P2 solution exists for a given compliance site (or sites) installations will prepare a more rigorous estimate of both direct and indirect annual compliance costs.

4.5.3.3. During the determination of whether a cost-effective P2 solution exists, installations will estimate the revised direct and indirect annual compliance costs resulting from implementation of the proposed P2 project.

4.5.3.4. After a P2 solution is implemented installations will estimate the revised direct and indirect annual compliance costs to validate and document the initial cost-effectiveness determination.

4.5.3.5. Refer to **Attachment 3** for payback and LCC analyses of cost-effectiveness.

4.5.4. Revise hazard categories and risk levels.

4.5.4.1. During the determination of whether a cost-effective P2 solution exists, installations will project the revised hazard categories and risk levels for all affected compliance sites not eliminated by the P2 solution.

4.5.4.2. After a P2 solution is implemented, installations will assess the revised hazard categories and risk levels of all affected compliance sites not eliminated by the P2 solution.

4.6. P2 Identification Tools. Use education, training, and awareness; partnering efforts; and P2 technologies to aid in identifying cost-effective P2 solutions.

4.6.1. Use education, training, and awareness to communicate P2 policies, goals, objectives, and programs. Comprehensive education and training will be used to permeate all mission areas with the P2 ethic. P2 awareness is required at the following educational levels: basic and technical training, commissioning programs, professional military and continuing education, acquisition certification training, base/squadron introduction programs, and shop level training.

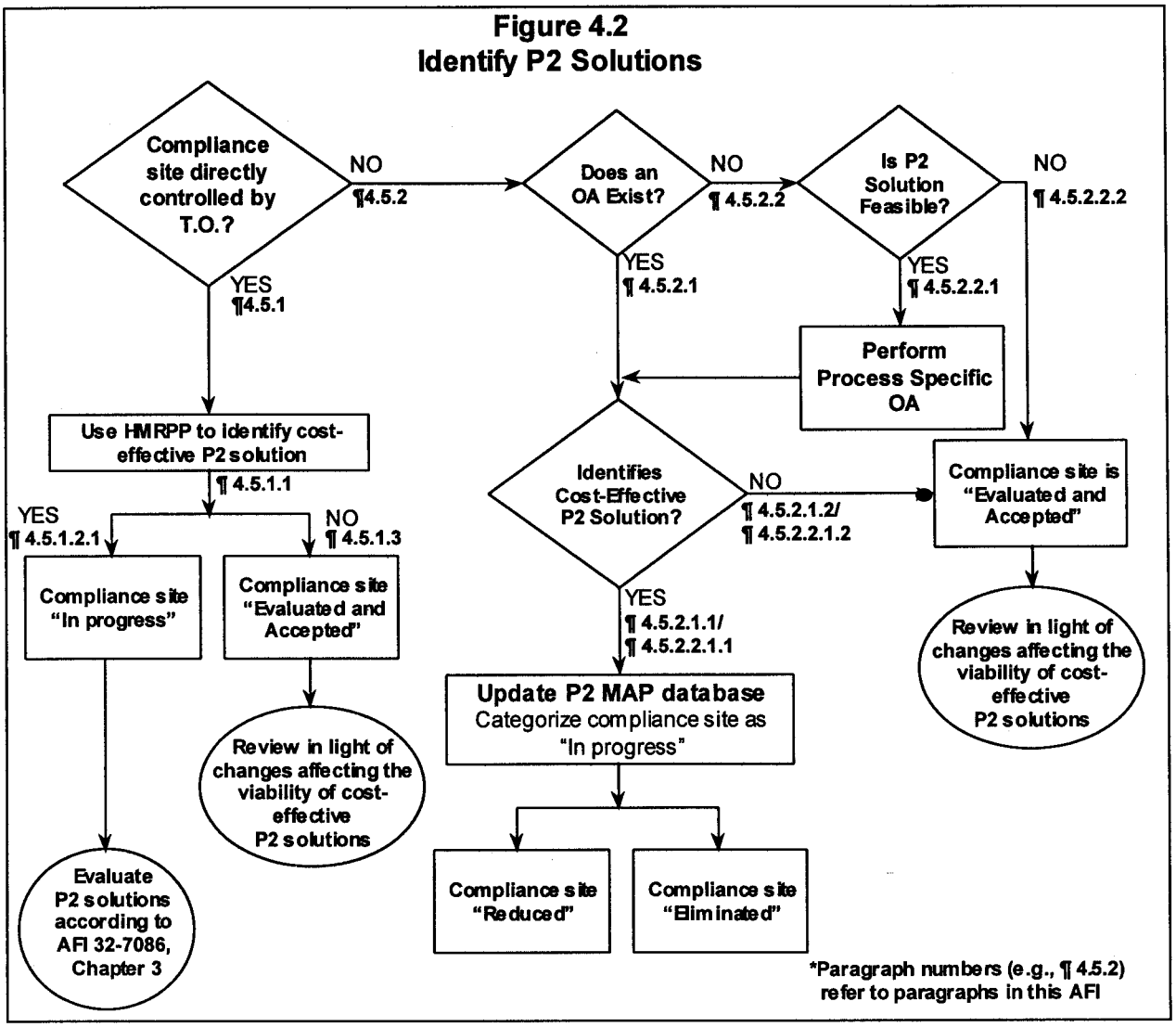
4.6.2. Use partnering for early identification of P2 solutions. Partnering is also valuable throughout implementation, operation, and management review activities.

4.6.2.1. Interagency and Intergovernmental Partnering. Effective implementation of AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, ensures well-informed decision making through a disciplined coordination process. Consult with the Air Force Center for Environmental Excellence (AFCEE) Regional Environmental Officers (REO) prior to contacting regulatory agencies regarding partnering initiatives. Use existing partnerships with state and federal agencies, wherever possible, to identify cost-effective P2 solutions.

4.6.2.2. WS Program Partnering. As described in DoD Regulation 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) Acquisition Programs*, March 23, 1998, the Defense Contract Management Command (DCMC) coordinates partnering activities at

contractor facilities under its cognizance. The Joint Logistics Commanders (JLC) Joint Group on Acquisition Pollution Prevention assists DCMC and the SMs as described in the Under Secretary of Defense for Acquisition and Technology Memorandum *Acquisition Pollution Prevention Initiative*, May 15, 1997. In addition, the JLC Joint Acquisition Sustainment Pollution Prevention Activity assists SMs in partnering on P2 initiatives at the depots.

Figure 4.2
Identify P2 Solutions



4.6.3. Use established programs, including the ESOH Technical Planning Integrated Product Team (TPIPT) to transition innovative P2 technologies to the field. AFPD 10-14, *Modernization Planning* and AFI 10-401, *Modernization Planning Documentation* define how the ESOH TPIPT planning process supports the Air Force Modernization Planning Process (MPP). The ESOH TPIPT planning process assists in identifying and finding solutions to ESOH technology needs. The ESOH TPIPT process identifies and collects validated ESOH technology needs (near and long term) for the Air Force, finds and assesses solution options, and offers integrated solutions to customers for use in Air Force planning.

4.6.3.1. AFI 63-118, *Civil Engineer Research, Development, and Acquisition* defines the ESOH Technology Needs Survey (TNS) that the ESOH TPIPT uses to collect, validate, and prioritize technology development requirements from installations and MAJCOMs. The 311th Human Systems Wing/ESOH TPIPT (311 HSW/XRE) is the Facilitator and Executive Secretary for the ESOH TPIPT.

4.6.3.2. At the direction of and with funding provided by either the MAJCOM or SM validating the need, the ESOH TPIPT will evaluate the need for solutions and prepares a Need Assessment Survey (NAS).

4.6.3.3. The 311 HSW/XRE provides the NAS to the specific need submitter for their action. A copy is maintained by the 311 HSW/XRE for use by the TPIPT. The need submitter reviews the NAS and decides how to proceed. The 311 HSW/XRE can be requested to develop a better solution and initiate the creation of an Air Force ESOH development plan (DP). The DP also contains a cost estimate, schedule, PPBS profile, and recommends execution agents for each portion of the development profile. The 311 HSW/XRE presents the draft DP to the TPIPT for consideration and acceptance. The need submitter must fund the 311 HSW/XRE's development of the DP.

4.6.3.4. The ESOH TPIPT reviews the draft DP, discusses, and prepares a statement representing the views of the ESOH TPIPT. If accepted by the ESOH TPIPT, the 311 HSW/XRE distributes the DP to the need submitter and all ESOH TPIPT members for their use in the MPP.

4.7. Programming and Budgeting. Use the following guidance in conjunction with AFI 32-7001, *Environmental Budgeting* to program and budget through the A-106 system for the requirements identified in the P2 MAP. For MILCON programming and budgeting guidance, refer to AFI 32-1021, *Planning and Programming of Facility Construction Projects*. Funding changes to compliance sites controlled by a T.O. requires working within the WS planning, programming, and budgeting system (PPBS). Refer to AFI 32-7086 for guidance on programming and budgeting for P2 requirements through the appropriate WS PE.

4.7.1. Installation A-106 Process. Installations will provide information per MAJCOM tasking until such time as the A-106 system is modified to incorporate P2 data requirements.

4.7.1.1. Installations will identify compliance sites and total compliance costs affected by each P2 project.

4.7.1.2. Installations will identify the projected risk reductions for each compliance site affected by a P2 project indicating degree to which risk is reduced or eliminated.

4.7.2. MAJCOM A-106 Programming. MAJCOMs will review the installations' A-106 submittals to develop the MAJCOM's POM.

4.7.2.1. MAJCOMs will develop their POM submittals to provide a general preference for cost-effective P2 solutions and take into account the environmental management hierarchy, risk assessments, TOCs, compliance burdens, projected gains in mission productivity, health and safety, and transferability to Air Force/DoD.

4.7.2.2. MAJCOMs will identify and fund common P2 projects across installations where economies of scale can be attained.

4.7.3. WS Programming. MAJCOMs are responsible for working with SMs to develop and submit WS PE POM submittals, to include WS P2 funding.

4.7.3.1. For P2 projects focused on compliance sites controlled by T.O.'s, installations and MAJCOMs will preferentially seek funding through the appropriate WS PE (using the HMRPP).

4.7.3.2. For P2 projects focused on compliance sites controlled by T.O.'s that affect more than one WS or for which WS PE funding is not timely, installations and MAJCOMs will consider funding through the Civil Engineering (CE) P2 PE.

4.7.4. Budgeting. In the execution year, MAJCOMs and installations will revalidate the distribution of the total of the combined compliance and P2 budgets across P2 projects and compliance costs to ensure all compliance requirements are met.

4.7.4.1. Distribution criteria will include cost-effective P2 solutions, environmental management hierarchy, P2

program areas, risk assessments, TOCs, compliance burdens, projected gains in mission productivity, health and safety, and projects involving more than one WS.

4.7.4.2. Once funds have been allocated to a specific project, resubmitting funding requests for that project because of local reallocation is not appropriate.

4.7.5. MILCON Projects. When submitting MILCON projects, installations will include a comparison of the cost of compliance and the cost of the P2 solutions on the AF Form 1391.

4.8. Defense Logistics Agency (DLA). DLA manages a program that can support the environmental management hierarchy by reusing or recycling excess materials wherever possible before disposal. DLA reuses, transfers, donates, or sells Air Force HAZMAT and disposes of Air Force HAZWASTE, except those categories listed in DoDI 4160.21-M, *Defense Reutilization and Marketing Manual*, March 1990. DLA Inventory Control Points respond to Air Force customer requests by searching out environmentally friendly consumable item products.

Section 4B—Responsibilities

4.9. Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment (SAF/MI). SAF/MI will provide over-arching Air Force ESOH leadership and direction and provide liaison activity with the Office of the Secretary of Defense (OSD), Congress, and external organizations.

4.10. Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health (SAF/MIQ). SAF/MIQ, as co-chair of the ESOHC, (AFI 32-7005, *Environmental Protection Committees*, describes the ESOHC and EPC) will:

4.10.1. Provide guidance, direction, and oversight on ESOH plans and policies.

4.10.2. Lead the ESOHC development of P2 goals and objectives.

4.10.3. Monitor the effectiveness of the Air Force P2 program, and the participation and support of ESOHC member organizations.

4.10.4. Report to OSD affirmative procurement data in accordance with E.O. 13101.

4.10.5. Integrate ORM into P2 decision making.

4.11. Assistant Secretary of the Air Force for Acquisition (SAF/AQ). SAF/AQ will:

4.11.1. Address ESOH concerns in program milestone reviews as appropriate.

4.11.2. Integrate ESOH considerations throughout the acquisition process.

4.11.3. Integrate ORM into P2 decision making.

4.12. Deputy Assistant Secretary of the Air Force for Contracting (SAF/AQC). SAF/AQC will:

4.12.1. Incorporate affirmative procurement program requirements into policies and procedures as appropriate.

4.12.1.1. Sponsor changes to contracting policies, regulations, and procedures that facilitate achieving compliance through P2, to include compliance with E.O. 13101.

4.12.1.2. Provide affirmative procurement direction that requires the purchase of recycled materials and biobased products, and the use of environmentally benign materials that minimize occupational health concerns.

4.12.1.3. Collect and report to SAF/MIQ affirmative procurement data in accordance with E.O. 13101.

4.12.1.4. Provide guidance to AFCEE on the maintenance and update of the affirmative procurement guide.

4.12.2. Provide guidance on including the application of P2 technologies when awarding Air Force contracts.

4.13. Deputy Assistant Secretary of the Air Force for Science, Technology, and Engineering (SAF/AQR). SAF/AQR will:

4.13.1. Participate in P2 and compliance program management reviews (PMR) with MAJCOMs.

4.13.2. Include partnering opportunities in WS P2 policies.

4.13.3. Provide oversight of the WS HMRPP according to AFI 32-7086.

4.13.4. Ensure the inclusion of P2 concepts and responsibilities in the education and training of acquisition professionals.

4.13.5. Participate in the development of the Air Force ESOH Research, Development, and Acquisition (RD&A) Strategic Plan.

4.13.6. Integrate ORM into P2 decision making.

4.13.7. Define hazard categories consistent with those in **Attachment 2** for use in assessing ESOH risks associated with design alternatives for new or modified systems.

4.14. Assistant Secretary of the Air Force for Financial Management and Comptroller (SAF/FM). SAF/FM will:

4.14.1. Provide financial management support to the P2 effort, as appropriate.

4.14.2. Provide support to the tracking of ESOH compliance costs and investment procedures.

4.14.3. Integrate P2 into the Cost and Economic Analysis Program.

4.14.4. Provide guidance for analyzing payback and TOC to capture the benefits that accrue to the Air Force as a result of P2 spending for both facilities and WSs.

4.14.5. Provide Resource Recovery and Recycling Program accounting and reimbursement policy.

4.15. Assistant Secretary of the Air Force, Office of Public Affairs (SAF/PA). SAF/PA will:

4.15.1. Communicate Air Force P2 initiatives and successes to national, regional, and local audiences, utilizing MAJCOM, field operating agencies (FOA), and installation-level public affairs offices.

4.15.2. Facilitate communication of P2 importance and criteria to Air Force personnel.

4.15.3. Assist environmental management with community involvement in P2 activities.

4.16. Headquarters United States Air Force Assistant Vice Chief of Staff (HQ USAF/CVA). HQ USAF/CVA, as co-chair of the ESOHC, will:

4.16.1. Lead the ESOHC development of P2 goals and objectives.

4.16.2. Monitor the effectiveness of the Air Force P2 program, and the participation and support of ESOHC member organizations.

4.17. Air Force Deputy Chief of Staff for Installations and Logistics (HQ USAF/IL). HQ USAF/IL will:

4.17.1. Advocate for P2 through the PPBS process.

4.17.2. Ensure the education and training of IL professionals on their P2 responsibilities.

4.18. Air Force Civil Engineer (HQ USAF/ILE). HQ USAF/ILE will:

4.18.1. Advocate for P2 through the PPBS process.

4.18.2. Lead P2 and compliance PMR with MAJCOMs.

4.18.3. Provide information management systems and procedures to monitor progress towards achieving the P2 goals and objectives.

4.18.4. Develop CE funding guidance to meet P2 goals and objectives, as appropriate.

4.18.5. Participate in the ESOH TPIPT development and prioritization of P2 and compliance technology needs.

4.18.6. Participate in identification and prioritization of technology solutions for the Air Force ESOH RD&A Strategic Plan, as appropriate.

4.18.7. Establish and maintain cooperative working relationships with environmental regulators.

4.18.8. Incorporate affirmative procurement program requirements into policies and procedures as appropriate.

4.18.8.1. Provide guidance to AFCEE on the maintenance and update of the affirmative procurement guide.

4.18.8.2. Provide affirmative procurement direction that requires the purchase of recycled materials and biobased products, and the use of environmentally benign materials that minimize occupational health concerns.

4.18.8.3. Include affirmative procurement compliance guidelines and P2 policies in outsourcing and privatization contracts, as appropriate.

4.18.9. Assess environmental risks associated with compliance sites and P2 solutions.

4.18.10. Ensure CE support and leadership is provided to CTP2 teams at all levels of the Air Force and is provided to support OAs.

4.18.11. Integrate ORM into P2 decision making.

4.19. Air Force Director of Maintenance (HQ USAF/ILM). HQ USAF/ILM will:

4.19.1. Advocate for P2 through the PPBS process.

4.19.2. Participate in P2 and compliance PMRs with MAJCOMs.

4.19.3. Incorporate P2 principles in policies, procedures, and training.

4.19.4. Include affirmative procurement compliance guidelines and P2 policies in outsourcing and privatization

contracts, as appropriate.

4.19.5. Participate in the ESOH TPIPT development and prioritization of P2 and compliance technology needs.

4.19.6. Participate in identification and prioritization of technology solutions for the Air Force ESOH RD&A Strategic Plan, as appropriate.

4.19.7. Ensure Logistics Group (LG) support is provided to CTP2 teams at all levels of the Air Force and is provided to support OAs.

4.19.8. Integrate ORM into P2 decision making.

4.20. Air Force Director of Supply (HQ USAF/ILS). HQ USAF/ILS will:

4.20.1. Advocate for P2 through the PPBS process.

4.20.2. Participate in P2 and compliance PMRs with MAJCOMs.

4.20.3. Incorporate P2 principles in policies, procedures, and training.

4.20.4. Incorporate affirmative procurement program requirements into policies and procedures as appropriate.

4.20.4.1. Provide affirmative procurement direction that requires the purchase of recycled materials and biobased products, and the use of environmentally benign materials that minimize occupational health concerns.

4.20.4.2. Collect and report to SAF/MIQ affirmative procurement data in accordance with E.O. 13101.

4.20.4.3. Include affirmative procurement compliance guidelines and P2 policies in outsourcing and privatization contracts, as appropriate.

4.20.4.4. Provide guidance to AFCEE on the maintenance and update of the affirmative procurement guide.

4.21. Air Force Surgeon General (HQ USAF/SG). HQ USAF/SG will:

4.21.1. Advocate for P2 through the PPBS process.

4.21.2. Participate in P2 and compliance PMRs with MAJCOMs.

4.21.3. Incorporate P2 principles in policies, procedures, and training.

4.21.4. Include affirmative procurement compliance guidelines and P2 policies in outsourcing and privatization contracts, as appropriate.

4.21.5. Ensure the education and training of SG professionals on their P2 responsibilities.

4.21.6. Participate in the ESOH TPIPT development and prioritization of P2 and compliance technology needs.

4.21.7. Participate in identification and prioritization of technology solutions for the Air Force ESOH RD&A Strategic Plan, as appropriate.

4.21.8. Implement policies to identify and categorize workplace activities in support of P2 efforts.

4.21.9. Assess health risks associated with compliance sites, workplace activities, and P2 solutions.

4.21.10. Ensure BE support is provided to CTP2 teams at all levels of the Air Force and is provided to support OAs.

4.21.11. Integrate ORM into P2 decision making.

4.22. Air Force Chief of Safety (HQ USAF/SE). HQ USAF/SE will:

4.22.1. Advocate for P2 through the PPBS process.

4.22.2. Participate in P2 and compliance PMRs with MAJCOMs.

4.22.3. Incorporate P2 principles in policies, procedures, and training.

4.22.4. Facilitate the integration of ORM into P2 decision making.

4.22.5. Ensure the education and training of SE professionals on their P2 responsibilities.

4.22.6. Participate in the ESOH TPIPT development and prioritization of P2 and compliance technology needs.

4.22.7. Participate in identification and prioritization of technology solutions for the Air Force ESOH RD&A Strategic Plan, as appropriate.

4.22.8. Assess safety risks associated with compliance sites and P2 solutions.

4.22.9. Ensure SE support is provided to CTP2 teams at all levels of the Air Force and is provided to support OAs.

4.23. Air Force Deputy Chief of Staff for Operations (HQ USAF/XO). HQ USAF/XO will:

4.23.1. Advocate for P2 (to include the WS HMRPP) through the PPBS process.

4.23.2. Incorporate P2 principles in policies, procedures, and training.

4.23.3. Ensure the education and training of XO professionals on their P2 responsibilities.

4.23.4. Integrate ORM into P2 decision making.

4.24. Air Force Deputy Chief of Staff for Plans (HQ USAF/XP). HQ USAF/XP will:

4.24.1. Assist in formulating and implementing corporate investment strategies for P2.

4.24.2. Incorporate P2 principles in policies, procedures, and training.

4.25. Air Force Environment, Safety, and Occupational Health Committee (ESOHC). HQ AF ESOHC will:

4.25.1. Charter a CTP2 team led by ILE consisting of representatives from at least BE, Judge Advocate (JA), SAF/AQC, SAF/AQR, ILM, ILS, PA, and SE.

4.25.2. Charter an affirmative procurement team led by SAF/AQC consisting of representatives from at least BE, ILE, JA, SAF/AQC, SAF/AQR, ILM, ILS, PA, and SE.

4.25.3. Develop P2 goals and objectives.

4.25.4. Monitor the effectiveness of the Air Force P2 program.

4.26. MAJCOM, FOA, and Direct Reporting Units (DRU) EPCs. MAJCOM, FOA, and DRU EPCs will:

4.26.1. Ensure installations implement a P2 program as described in Section 4A. The EPC will formalize the P2 strategy, communicate it, and ensure strategy implementation. The EPC chair will hold functional organizations accountable for implementing P2 projects and activities within their span of control.

4.26.2. Ensure installations plan, program, and budget for P2 program requirements. Whenever feasible, MAJCOM EPCs should consolidate like projects to obtain economies of scale.

4.26.3. Direct education and training on compliance through P2, ensuring that each installation implements a shop level P2 training program.

4.26.4. Collect, review, and validate data on installation P2 performance through the installation EPCs, as needed.

4.26.5. Ensure the implementation of affirmative procurement programs that promote the purchase of recycled materials and biobased products, and the use of environmentally benign materials that minimize occupational health concerns.

4.26.6. Collect and report affirmative procurement data in accordance with E.O. 13101 to HQ USAF/AQC and HQ USAF/ILS, as appropriate.

4.26.7. Use the ESOH TNS to submit P2 needs to either the ESOH TPIPT (for facility needs) or the HMRPP (for WS needs) as described in AFI 63-118 and AFI 32-7086, respectively.

4.26.8. Integrate ORM into P2 decision making.

4.26.9. Develop annual goals for MAJCOM.

4.26.10. Charter CTP2 team led by CE consisting of representatives from at least BE, JA, Contracting Squadron/Contracting (LGC/PK), Maintenance, Supply, PA, and SE.

4.26.11. Charter an affirmative procurement team led by LGC/PK consisting of representatives from at least BE, CE, JA, Maintenance, Supply, PA, and SE.

4.27. Installation EPCs. Installation EPCs will:

4.27.1. Ensure the implementation of a P2 program as described in Section 4A. The EPC will formalize the installation's P2 strategy, communicate it installation-wide, and ensure strategy implementation. The EPC chair will hold functional organizations accountable for implementing P2 projects and activities within their span of control.

4.27.2. Ensure installation personnel receive education and training on P2, to include a shop level P2 training program, as needed.

4.27.3. Ensure base organizations plan, program, and budget for P2 program requirements.

4.27.4. Provide program reviews to the MAJCOM, as needed.

4.27.5. Ensure the incorporation of sustainable design concepts in facility construction and maintenance.

4.27.6. Use the ESOH TNS to submit P2 needs to the MAJCOM for validation as described in AFI 63-118 and AFI 32-7086.

4.27.7. Charter a CTP2 team led by CE consisting of representatives from at least BE, JA, LGC/PK, Maintenance, Supply, PA, and SE.

4.27.8. Charter an affirmative procurement team led by LGC/PK consisting of representatives from at least BE, CE, JA, Maintenance, Supply, PA, and SE.

4.27.9. Integrate ORM into P2 decision making.

4.28. The EPC-chartered CTP2 team. The CTP2 team will:

4.28.1. Include representatives from LG, BE, SE, and CE for the purpose of identifying compliance sites.

4.28.2. Identify existing compliance sites and develop a consolidated inventory.

4.28.3. Prioritize compliance sites using the assigned hazard category and risk levels as described in Section 4.4.

4.28.4. Review installation P2 performance.

4.28.5. Integrate ORM into P2 decision making.

4.29. The EPC-chartered affirmative procurement team. The EPC affirmative procurement team will:

4.29.1. Direct the implementation of an affirmative procurement program.

4.29.2. Identify and promote specific opportunities for purchase of compliant products.

4.29.3. Promote the purchase of recycled materials and biobased products, and the use of environmentally benign materials that minimize occupational health concerns.

4.29.4. Collect and report affirmative procurement data as required.

4.29.5. Ensure installation service contract managers and construction project managers review and edit all specifications applying to EPA Guideline Items and biobased product purchases.

4.29.6. Ensure installation Quality Assurance Evaluators (QAE) for service and construction contracts focus on affirmative procurement requirements.

4.30. Headquarters, Air Education and Training Command (HQ AETC). HQ AETC will serve as the lead command for WS environmental unit level training.

4.31. Headquarters Air Force Materiel Command (HQ AFMC). HQ AFMC will:

4.31.1. Charter a CTP2 IPT with representatives from at least CE, SG, SE, Director of Requirements, Engineering, LG and the Air Force Research Laboratory (AFRL) to serve as the Office of Primary Responsibility to:

4.31.1.1. Administer the ESOH TPIPT and ESOH planning process.

4.31.1.2. Assist SMs in identifying common P2 opportunities.

4.31.1.3. Share P2 solutions across the WS and depot management communities within the Air Force and the services.

4.31.2. Ensure that the AFRL:

4.31.2.1. Incorporates consideration for P2 in its R&D.

4.31.2.2. Conducts R&D on Air Force-specific P2 needs as required.

4.31.3. The Institute for ESOH Risk Analysis will:

4.31.3.1. Provide technical support and guidance to MAJCOMs and installations in analyzing the ESOH risks associated with P2 programs.

4.31.3.2. Provide technical support to SMs in assessing ESOH risks.

4.32. Weapon System Single Manager (SM). SMs will:

4.32.1. Address ESOH considerations as an integrated component of systems engineering to accomplish compliance through P2. For WS programs, P2 is not a stand-alone activity, but rather an outcome of fully integrating the NEPA process, system safety, and environmental compliance requirements across program management and engineering phases of development with full consideration of logistical requirements throughout the WS life cycle.

4.32.2. Consider the ESOH aspects of cost, schedule, performance, and ESOH risks when developing new designs or modifying existing systems. SMs must seek to minimize ESOH risks and costs when developing new systems designs and may not increase ESOH risks when making modifications to existing systems.

4.32.3. Minimize HAZMAT use, risks, and the HAZWASTE generation in all WS phases, including conception, design, development, production, operation, maintenance, sustainment, modification, repair and disposal. (Refer to AFI 32-7086 for SM responsibilities to reduce or eliminate HAZMAT).

4.32.4. Include ESOH costs in TOC analyses. Perform life cycle analysis and measure WS TOC in the early development phase to avoid dependence on practices that cause avoidable ESOH impacts and increased TOC.

4.32.5. Decrease ESOH risks and TOC when modifying existing systems and develop new system designs with lower ESOH risks and TOC than the systems being replaced.

4.32.6. Apply the system safety risk assessment methodologies defined in MIL-STD-882C, *Standard Practice for System Safety Program Requirements*, January 19, 1993, and the SAF/AQ defined hazard categories to assess the ESOH risks associated with new designs, system design modifications, and operation and maintenance procedures.

4.32.7. Utilize the NEPA analysis process to identify potential environmental impacts and then mitigate those impacts by preventing pollution to the extent economically and technically feasible.

4.32.8. Identify opportunities to prevent or reduce pollution and provide to their customers (the MAJCOM operating commands and maintenance depots) for final decisions on funding and implementation.

4.32.9. Participate in the HMRPP as described in AFI 32-7086 when appropriate. Work closely with the MAJCOM functionals responsible for their systems to assist MAJCOMs in identifying and implementing opportunities to reduce ESOH risks with the goal of reducing pollution and TOC throughout the life cycle of a system.

4.32.10. Provide feedback to HQ AFMC on P2 successes of processes and technologies used to reduce or eliminate ESOH risks and TOC.

4.32.11. Include ESOH expertise on IPTs as necessary to ensure each IPT is employing the P2 ethic.

4.32.12. Address ESOH issues in program reviews as necessary, emphasizing ESOH risk management actions that impact (positively or negatively) the prevention of pollution.

4.32.13. Participate in the Joint Acquisition Sustainment Pollution Prevention Activity and the Acquisition

Pollution Prevention Initiative to the extent possible.

4.32.14. Identify and integrate state-of-the-art P2 technologies into WS processes when technically and economically feasible.

4.32.15. Apply the environmental management hierarchy to prevent or reduce all forms of pollution in designing, manufacturing, testing, operating, maintaining, and disposing of WSs.

4.32.16. Work closely with MAJCOM functionals to reduce pollution throughout the life cycle of a system.

4.32.17. Integrate ORM into P2 decision making.

4.33. Air Force Center for Environmental Excellence (AFCEE). AFCEE will:

4.33.1. Provide technical support and guidance to MAJCOMs and installations in implementing compliance P2 programs.

4.33.1.1. Assist in the collection and analysis of compliance data including tracking and reporting compliance sites.

4.33.2. Assist MAJCOMs and installations in identifying, developing, and programming P2 requirements.

4.33.3. Assist in the evaluation, demonstration, validation, and transfer of P2 technologies and techniques Air Force-wide.

4.33.4. Maintain and update as necessary, the P2 Toolbox.

4.33.5. Develop unit level training that at a minimum includes Shop Level P2 and HAZMAT Handling.

4.33.6. Update the training as needed to reflect the latest P2 policy and trends.

4.33.7. Use REOs to facilitate P2 partnerships and to serve as regional points of contact for liaison activities with state and federal agencies in support of P2. Additionally REOs will:

4.33.7.1. Assist in developing P2 workshops and OAs with the involvement of federal, state, and local regulators.

4.33.7.2. Perform trend analyses and forecast the impact of existing and proposed environmental regulations on Air Force operations.

4.33.7.3. Assist MAJCOMs and installations in implementing P2 partnerships between Air Force MAJCOMs, installations, other services, and defense-related federal agencies, and state and federal environmental agencies.

4.33.8. Integrate ORM into P2 decision making.

4.34. Air Force Civil Engineering Support Agency (AFCESA). AFCESA will:

4.34.1. Integrate P2 considerations with customary engineering criteria to promote cost-effective planning, design, construction, O&M, repair, replacement, and disposal of the facility infrastructure and ensure that all life-cycle aspects of facility programs incorporate P2 criteria.

4.34.2. Provide engineering technical and professional support to MAJCOMs and installations in implementing P2 programs and energy conservation programs.

4.34.3. Promote energy efficient standards for AF facilities and incorporate renewable energy technologies into building design.

4.34.4. Consult with AFCEE on facility-related P2 matters and sustainable development programs.

4.34.5. Integrate P2, energy conservation, and sustainable development requirements across facility program management.

4.34.6. Develop, distribute, and review affirmative procurement specifications for building materials and products and send them to the Army Corps of Engineers.

4.34.7. Integrate ORM into P2 decision making.

Chapter 5

CHECKING AND CORRECTIVE ACTION

5.1. Concept. The Air Force has established and maintains documented procedures for MAJCOM and installation EPCs to monitor and measure on a regular basis the performance of their P2 efforts. MAJCOM and installation EPCs also initiate corrective and preventive actions to ensure continuous improvement of the P2 program.

5.2. Checking.

5.2.1. Installation ECAMP Audits. AFI 32-7045, *Environmental Compliance Assessment and Management Program* provides documented ECAMP audit procedures. Installations perform ECAMP audits and develop corrective actions for all non-compliance findings. Corrective action plans include P2 initiatives for each non-compliance finding, where feasible. Use ECAMP findings and corrective action recommendations in the CTP2 process to identify P2 opportunities.

5.2.2. Air Force Inspection Agency (AFIA) and Air Force Audit Agency (AFAA) Reviews. The AFIA and AFAA both conduct periodic and special reviews of Air Force environmental programs. Consider using report findings to support continuous improvement of the CTP2 process.

5.2.3. Program Management Reviews (PMR). PMRs examine MAJCOM P2 program performance to ensure investments are being made to maintain or eliminate compliance requirements. MAJCOMs identify resource migration from traditional end-of-pipe compliance requirements to P2.

5.3. Corrective Actions.

5.3.1. Installation EPCs review any ECAMP non-compliance findings. The EPCs define responsibility and authority for handling and investigating non-compliance, mitigating impacts, and initiating corrective and preventive actions.

5.3.2. Installation EPCs direct the development of P2 OAs as part of the official ECAMP post-assessment activities. P2 solutions that correct the root cause of compliance problems identified during the ECAMP process must be implemented where feasible and cost-effective. These solutions are documented in MAPs and ECAMP final reports as prescribed in AFI 32-7045.

5.4. P2 Reporting.

5.4.1. The Work Information Management System-Environmental Subsystem is used to program, budget, and track P2 projects until it is replaced by the DoD-approved Environmental Project Reporting Module (EPRM) under Defense Environmental Security Corporate Information Management (DESCIM). EPRM will be DoD standardized and Defense Information System Agency certified software.

5.4.2. MAJCOMs and installation EPCs monitor and report progress toward Air Force and DoD P2 policies.

Reporting of progress toward specific P2 targets occurs on a semiannual basis to AFCEE.

Chapter 6

MANAGEMENT REVIEW

6.1. Concept. In order to maintain continual improvement, suitability, and effectiveness of the Air Force's P2 program, management at all levels reviews and evaluates the P2 program at defined intervals. The review of policy, objectives, and procedures is carried out by the level of management that defined them. The ESOHC and EPCs conduct these periodic reviews of all aspects of P2, with special emphasis given to the interaction and integration of installation and WS P2 efforts.

6.2. HQ USAF ESOHC Reviews. The ESOHC reviews, at regular intervals, the P2 program with MAJCOM EPC representatives, to ensure its adequacy and effectiveness. In addition, the ESOHC reviews the Air Force's P2 program with OSD management representatives.

6.3. MAJCOM EPC Reviews. MAJCOM EPCs:

6.3.1. Review, at regular intervals, their P2 programs with installation EPC representatives, to ensure their adequacy and effectiveness. In addition, MAJCOM EPCs review their P2 program with HQ USAF ESOHC representatives.

6.3.2. Review the participation and support of EPC member organizations.

6.3.3. Review WS Mission Needs Statements (MNS) and Operation Requirements Documents (ORD) for possible inclusion of P2 needs or requirements, as appropriate.

6.3.4. Review NEPA analyses and documents to ensure NEPA proponents consider P2 opportunities when mitigating identified environmental impacts.

6.3.5. Validate and prioritize P2 program requirements.

6.3.6. Review and approve installation P2 MAPs and OAs to validate installation P2 funding requests and identify potential command-wide applications.

6.3.7. Develop and use P2 investment strategies for prioritizing P2 projects based on cost-effectiveness, compliance site elimination or risk reduction, and mission performance.

6.4. Installation EPC Reviews. Installation EPCs:

6.4.1. Review, at regular intervals, their P2 programs, to ensure their adequacy and effectiveness. In addition, installation EPCs review their P2 programs with MAJCOM EPC representatives.

6.4.2. Review the participation and support of EPC member organizations.

6.4.3. Review WS MNS and ORD for possible inclusion of P2 needs or requirements, as appropriate.

6.4.4. Review NEPA analyses and documents to ensure NEPA proponents consider P2 opportunities when mitigating identified environmental impacts.

6.4.5. Validate and prioritize P2 program requirements.

6.4.6. Review and approve installation P2 MAPs and OAs to validate installation P2 funding requests.

6.4.7. Develop and use P2 investment strategies for prioritizing P2 projects based on cost-effectiveness, compliance site elimination or risk reduction, and mission performance.

EUGENE A. LUPIA, Major General, USAF
The Civil Engineer

Attachment 1. Glossary of References and Supporting Information

References

A Guide to Buying Recycled: The Air Force Affirmative Procurement Program

Air Force Environmentally Responsible Facilities Guide

Air Force Installation P2 Program Guide

AFI 10-401, *Modernization Planning Documentation*

AFI 24-301, *Vehicle Operations*

AFI 32-1002, *Facilities Lead-Based Paint Hazard Management*

AFI 32-1021, *Planning and Programming of Facility Construction Projects*

AFI 32-1045, *Snow and Ice Control*

AFI 32-1052, *Facility Asbestos Management*

AFI 32-1053, *Pest Management Program*

AFI 32-1067, *Water Systems*

AFI 32-7001, *Environmental Budgeting*

AFI 32-7005, *Environmental Protection Committees*

AFI 32-7006, *Overseas Environmental Program in Foreign Countries*

AFI 32-7040, *Air Quality Compliance*

AFI 32-7041, *Water Quality Compliance*

AFI 32-7042, *Solid Waste Management*

AFI 32-7044, *Storage Tank Compliance*

AFI 32-7045, *Environmental Compliance Assessment and Management Program*

AFI 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*

AFI 32-7061, *The Environment Impact Analysis Process (EIAP)*

AFI 32-7062, *Air Force Comprehensive Planning*

AFI 32-7086, *Hazardous Materials Management*

AFI 48-119, *Medical Service Environmental Quality Programs*

AFI 63-118, *Civil Engineer Research, Development, and Acquisition*

AFI 91-213, *Operational Risk Management (ORM) Program*

AFOSH Standard 91-119, *Process Safety Management (PSM) of Highly Hazardous Chemicals*

AF Pamphlet 91-215, *Operational Risk Management (ORM) Guidelines and Tools*

AFPD 10-14, *Modernization Planning*

AFPD 23-3, *Energy Management*

AFPD 32-70, *Environmental Quality*

Alternative Motor Fuels Act of 1988

Clean Air Act Amendments of 1990

DoD Instruction 4160.21-M, *Defense Reutilization and Marketing Manual,* March 1990

DoD Instruction 4715.4, *Pollution Prevention*, June 18, 1996

DoD Regulation 5000.2-R, *Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) Acquisition Programs,* March 23, 1998

Emergency Planning and Community Right-to-Know Act of 1986

Energy Policy Act of 1992

Executive Order 12843, *Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances*, April 21, 1993

Executive Order 12902, *Energy Efficiency and Water Conservation at Federal Facilities*, March 8, 1994

Executive Order 13031, *Federal Alternative Fueled Vehicle Leadership*, December 13, 1996

Executive Order 13101, *Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition,* September 14, 1998

Federal Water Pollution Control Act

International Organization for Standardization (IS0) 14001

Major Source Determinations for Military Installations, August 2, 1996

MIL-STD-882C, *System Safety Program Requirements,* January 19, 1993

National Environmental Policy Act

Policy memorandum, *HQ USAF/CEV FY99-03 Amended Program Objective Memorandum Submittals,* December 30, 1996

Resource Conservation and Recovery Act

Abbreviation or Acronym	*Definition*
AFAA	Air Force Audit Agency
AFCEE	Air Force Center for Environmental Excellence
AFCESA	Air Force Civil Engineering Support Agency
AFI	Air Force Instruction
AFIA	Air Force Inspection Agency
AFPD	Air Force Policy Directive
AFRL	Air Force Research Laboratory
AFV	Alternative Fueled Vehicle
AST	Aboveground Storage Tank
BE	Bioenvironmental Engineering
CAA	Clean Air Act
CAPP	Compliance Assurance and Pollution Prevention
CE	Civil Engineering
CFR	Code of Federal Regulations
CTP2	Compliance Through Pollution Prevention
CY	Calendar Year
C&D	Construction and Demolition
DCMC	Defense Contract Management Command
DESCIM	Defense Environmental Security Corporate Information Management
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DP	Development Plan
DRU	Direct Reporting Unit
ECAMP	Environmental Compliance Assessment and Management Program
EMS	Environmental Management System
EPA	Environmental Protection Agency
EPACT	Energy Policy Act
EPC	Environmental Protection Committee
EPCRA	Emergency Planning and Community Right-to-Know Act
EPRM	Environmental Project Reporting Module
ESOH	Environment, Safety, and Occupational Health
ESOHC	Environmental, Safety, and Occupational Health Committee
E.O.	Executive Order
FGS	Final Governing Standards
FOA	Field Operating Agency
FWPCA	Federal Water Pollution Control Act
HAP	Hazardous Air Pollutant
HAZMAT	Hazardous Material
HAZWASTE	Hazardous Waste
HMMP	Hazardous Materials Management Process
HMRPP	Hazardous Material Reduction Prioritization Process
HQ	Headquarters
HQ AETC	Headquarters, Air Education and Training Command
HQ AFMC	Headquarters, Air Force Materiel Command
HQ USAF	Headquarters, United States Air Force
HQ USAF/ CVA	Assistant Vice Chief of Staff
HQ USAF/	Deputy Chief of Staff for Installations and Logistics

IL	
HQ USAF/ILE	Civil Engineer
HQ USAF/ILEV	Deputy Chief of Staff for Installations and Logistics, Environmental Division
HQ USAF/ILM	Director of Maintenance
HQ USAF/ILS	Director of Supply
HQ USAF/SE	Chief of Safety
HQ USAF/SG	Surgeon General
HQ USAF/XO	Deputy Chief of Staff for Operations
HQ USAF/XP	Deputy Chief of Staff for Plans
HSW/XRE	311th Human Systems Wing/Development Planning/ESOH TPIPT
IG	Inspector General
IPT	Integrated Product Team
IRP	Installation Restoration Program
ISO	International Organization for Standardization
JA	Judge Advocate
JLC	Joint Logistics Commanders
LBP	Lead-Based Paint
LCC	Life Cycle Cost
LG	Logistics Group
LGC	Contracting Squadron
MAJCOM	Major Command
MAP	Management Action Plans
MILCON	Military Construction
MILSPEC	Military Specification
MILSTD	Military Standard
MNS	Mission Needs Statement
MPP	Modernization Planning Process
MSW	Municipal Solid Waste
NAS	Need Assessment Survey
NEPA	National Environmental Policy Act
NOV	Notice of Violation
NPV	Net Present Value
OA	Opportunity Assessments
ODS	Ozone Depleting Substances
OEBGD	Overseas Environmental Baseline Guidance Document
ORD	Operation Requirements Documents
ORM	Operational Risk Management
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
O&M	Operation and Maintenance
PA	Public Affairs
PAFB	Peterson Air Force Base
PCB	Polychlorinated Biphenyls
PE	Program Elements
PK	Contracting
PMR	Program Management Review

POM	Program Objective Memorandum
PPBS	Planning, Programming, and Budgeting System
PSM	Process Safety Management
PV	Present Value
P2	Pollution Prevention
P2 MAP	Pollution Prevention Management Action Plan
QAE	Quality Assurance Evaluators
RCRA	Resource Conservation and Recovery Act
RD&A	Research Development and Acquisition
REO	Regional Environmental Officer
RMP	Risk Management Plan
R&D	Research and Development
SAF/AQ	Assistant Secretary of the Air Force for Acquisition
SAF/AQC	Deputy Secretary of the Air Force for Contracting
SAF/AQR	Deputy Secretary of the Air Force for Science, Technology, and Engineering
SAF/FM	Assistant Secretary of the Air Force for Financial Management and Comptroller
SAF/MI	Assistant Secretary of the Air Force for Manpower, Reserve Affairs, Installations, and Environment
SAF/PA	Assistant Secretary of the Air Force, Office of Public Affairs
SAF/MIQ	Deputy Assistant Secretary of the Air Force for Environment, Safety, and Occupational Health
SE	Safety
SG	Surgeon General
SM	Single Manager
SW	Solid Waste
TOC	Total Ownership Costs
TNS	Technology Needs Survey
TPIPT	Technical Planning Integrated Product Team
T.O.	Technical Order
USAF	United States Air Force
UST	Underground Storage Tank
U.S.C.	United States Code
WS	Weapon System
WS HMRPP	Weapon System Hazardous Material Reduction Prioritization Process

Terms

Acquisition Program--A directed, funded effort that is designed to provide a new or improved material capability in response to a validated need (Department of Defense (DoD) Instruction 5000.2).

Affirmative Procurement--The purchase of environmentally preferable products manufactured from recycled and reclaimed materials. All affirmative procurement programs must have the following elements: a preference program, a promotion plan, procedures for obtaining/verifying estimates and certification of the content of recovered materials, and annual review/monitoring. Acquisition of recycled materials will be based on Environmental Protection Agency (EPA) procurement guidelines for purchasing recovered materials.

Allocation--An authorization by a designated official of a DoD component making funds available within a prescribed amount to an operating agency for the purpose of making allotments (i.e., the first subdivision of an apportionment).

Appropriation--The result of an appropriation enacted by Congress that provides a specified amount of funds to be used for designated purposes.

Authorization--An act of Congress which permits a federal program or activity to begin or continue from year to year. It sets limits on funds that can be appropriated, but does not grant funding, which must be provided by a separate congressional appropriation.

Budget--A plan of operations for a fiscal period in terms of: (a) estimated costs, obligations, and expenditures; (b) source of funds for financing, including anticipated reimbursements and other resources; and (c) history and workload data for projected programs and activities.

Compliance Site--Any regulated facility or process or discharge to a regulated facility or process. This includes any discreet location under Air Force control wherein activity occurs that is subject to current or known future (resulting in known consequences) local, state, or federal environmental regulations. Compliance sites include, but are not limited to air emissions from each stationary source; points where hazardous waste (HAZWASTE) is accumulated, treated, stored, or disposed; confirmed Solid Waste Management Units; underground storage tanks (UST); aboveground storage tanks (AST); potable water system components, treatment systems, major storage sites, and distribution systems; National Pollutant Discharge Elimination System and/or permitted stormwater out-falls and other permitted discharges; EPCRA sites; storage and mixing facilities operated by certified pesticide applicators; on-installation solid waste permitted landfills; and RCRA Subpart X permitted or interim status sites.

Compliance Through Pollution Prevention (CTP2)--CTP2 is an Environmental Management System (EMS) - based process that preferentially applies P2 solutions to achieve compliance while reducing Total Ownership Costs (TOC), reducing risks as determined through the Operational Risk Management (ORM) process, improving environmental and mission performance, and reducing the compliance burden. P2 solutions use processes, practices, materials, or products that avoid or reduce pollution and may include source reduction through process changes or material substitution, reuse, or recycling.

Compliance Through Pollution Prevent (CTP2) teams--At each level (Headquarters, United States Air Force, Major Command (MAJCOM), and installations) the Environmental Protection Committee (EPC) or Environmental, Safety, and Occupational Health Committee (ESOHC) chair will establish a cross-functional CTP2 team. The CTP2 team will be led by civil engineering (CE) and will report to the EPC or ESOHC chair. The CTP2 team will include, but is not limited to, representatives from CE, supply, maintenance, contracting, bioenvironmental engineer (BE), public affairs (PA), judge advocate (JA), and safety. Other functional representatives such as finance, requirements, and tenant organizations are encouraged to be members of the CTP2 team.

Cost-effectiveness--To be cost effective, CTP2 solutions must have shorter payback times and lower life cycle costs (LCC) (also known as total ownership costs (TOC)) than end-of-pipe treatment or disposal alternatives.

Environmental aspect--Element of an organization's activities, products or services that can interact with the environment.

Environmental impact--Any change to the environment, whether adverse or beneficial, resulting from an installation's activities, products, or services.

Environmental objective--Overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve and which is quantified where practicable.

Environmental performance--Measurable results of the environmental management system (EMS), related to an organization's control of its environmental aspects, based on its environmental policy, objectives and targets.

Environmental target--Detailed performance requirement, quantified where applicable, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

Environmental Quality Classes--This includes the following designations:

a) Class 0 (Level 0) - Activities needed to cover the recurring administrative, personnel and other costs associated with managing environmental programs that are necessary to meet applicable compliance requirements (federal, state, and local laws; regulations; Executive Orders (E.O.); DoD policies; and Final Governing Standards (FGS) overseas or the Overseas Environmental Baseline Guidance Document

(OEBGD)) or which are in direct support of the military mission. Also, includes environmental management activities associated with the operation of facilities, installations, and deployed Weapon Systems (WS). Recurring costs consist of manpower, training, supplies, HAZWASTE disposal, operating recycling activities, permits, fees, testing and monitoring and/or sampling and analysis, reporting and record keeping (e.g., Toxic Release Inventory reporting), maintenance of environmental equipment, and compliance self-assessments.

b) Class I (Level 1) - Projects and activities needed that are currently out of compliance (have received an enforcement action from a duly authorized federal, state, or local authority; have a signed compliance agreement or received a consent order; and/or have not met requirements based on applicable federal, state, and local laws, regulations, E.O.s, DoD policies, and FGSs overseas or the OEBGD). This class (level) also includes projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable requirements, but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented within the current program year. Those activities include the preparation of plans (e.g., National Environmental Policy Act, 42 U.S.C. 4321-4370(d) (reference (ee), documentation, master plans, emergency response plans, integrated natural and cultural resource management plans, CTP2 plans, etc.)), opportunity assessments, and inventories. The preferred approach is to use CTP2 projects or activities, if cost-effective, to bring a facility into compliance. Overseas, that class includes projects and activities necessary to alleviate the human health threats to ongoing operations or necessary to comply with applicable treaties and agreements.

c) Class II (Level 2) - Projects and activities needed that are not currently out of compliance (deadlines or requirements have been established by applicable federal, state, and local laws, regulations, E.O.s, DoD policies and FGSs overseas or OEBGD, but deadlines have not passed or requirements are not in force) but shall be if projects or activities are not implemented in time to meet an established deadline beyond the current program year. The preferred approach is to use CTP2 projects or activities, if cost-effective, as the means of maintaining or bringing a facility into compliance. Overseas, that class includes projects and activities identified using risk-based prioritization practices that meet the long-term objective of full implementation of the FGS for each foreign country where DoD maintains substantial installations.

d) Class III (Level 3) - Includes projects and activities that are not explicitly required by law but are needed to address overall environmental goals and objectives.

Environmental Security--The environmental security program enhances readiness by institutionalizing the DoD's environmental, safety and occupational health awareness, making them an integral part of the Department's daily activities. Environmental Security is comprised of cleanup, compliance, conservation, P2, safety, occupational health, explosives safety, fire and emergency services, pest management, environmental security technology, and international activities.

Hazardous Material (HAZMAT)--Any item or class of items referenced in Federal Standard 313D, paragraph 3.2 and all Class I and Class II ODS. Federal Standard 313D paragraph 3.2 reads as follows:
3.2.1. Any item or chemical which is a "health hazard" or "physical hazard" as defined by Occupational Safety and Health Administration in 29 CFR 1910.1200, which includes the following:
- chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes;
- chemicals which are combustible liquids, compressed gases, explosives, flammable liquids, flammable solids, organic peroxides, oxidizers, pyrophorics, unstable (reactive) or water reactive; and
- chemicals which in the course of normal handling, use, or storage operations may produce or release dusts, gases, fumes, vapors, mists, or smoke which may have any of the above characteristics.

3.2.2. Any item or chemical which is reportable or potentially reportable or notifiable as inventory under the reporting requirements of the Hazardous Chemical Reporting (40 CFR part 370), or as an environmental release

under the reporting requirements of the Toxic Chemical Release Reporting: Community Right to Know (40 CFR part 372), which includes the following:

- chemicals with special characteristics which in the opinion of the manufacturer can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other receptacles).

3.2.3. Any item or chemical which, when being transported or moved, is a risk to public safety or an environmental hazard and is regulated as such by one or more of the following:

- Department of Transportation HAZMAT Regulations (49 CFR parts 100-180);
- International Maritime Dangerous Goods Code of International Maritime Organization (IMO);
- Dangerous Goods Regulations of the International Air Transport Association (IATA);
- Technical Instructions of the International Civil Aviation Organization (ICAO); and
- US Air Force Joint Manual, Preparing HAZMAT for Military Shipments (AFJMAN 24-2204).

3.2.4. The item or chemical is a special nuclear source, or by-product material defined in 10 CFR or is regulated or referred to as radioactive under one or more of the referenced documents in 3.2.3.

Hazardous Material Management Process (HMMP)--A standard methodology used to manage the procurement and use of HAZMAT to support Air Force missions, ensure the safety and health of personnel and surrounding communities, and minimize Air Force dependence on HAZMAT. The HMMP is composed of three co-dependent areas: the HAZMAT Pharmacy Program, the WS Hazardous Material Reduction Prioritization Process, and the Ozone Depleting Substance Management Program.

Hazardous Substance--Any substance listed in Table 302.4 of 40 CFR part 302, EPA Designation, Reportable Quantities and Notification Requirements for Hazardous Substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 U.S.C. 9601 et. seq.).

Hazardous Materials Pharmacy (HAZMART)--The facility on an Air Force installation where LG personnel stock, store, issue, and distribute HAZMAT using the standard base supply system.

Hazardous Waste (HAZWASTE)--Any material subject to the HAZWASTE manifest requirements of EPA specified in 40 CFR part 262 and meets the definition in 40 CFR section 261.3 according to AFI 32-7042, *Solid Waste Management.*

Integrated Pest Management (IPM)--A planned program, incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materials, or the environment. IPM uses targeted, sustainable (effective, economical, environmentally sound) methods including education, habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and where necessary, the judicious use of least-hazardous pesticides.

Life Cycle--A series of stages or processes through which a system, product or entity passes from inception to termination and disposal. It includes conception, design, development, testing, production, deployment, training, maintenance, supply management, distribution, and disposal/demilitarization.

Life Cycle Analysis--The comprehensive examination of the environmental and economic effects of a product or process throughout its lifetime including new material extraction, transportation, manufacturing, operations, and ultimate disposal.

Life Cycle Cost--Total cost to the Government for a program over its full life, and includes the cost of research and development, investment in mission and support equipment (hardware and software), initial inventories, training, data, facilities, etc., and the operating, support, and where applicable, demilitarization or detoxification of long-term waste storage. Also referred to as total ownership costs (TOC).

Opportunity Assessments--A systematic procedure to identify and assess ways to prevent pollution by reducing or eliminating wastes.

Obligation--A duty to make a future payment of money. The duty is incurred as soon as an order is placed, or a contract is awarded for the delivery of goods and the performance of services. The placement of an order is sufficient. An obligation legally encumbers a specified sum of money, which will require outlay(s) or expenditure(s) in the future.

Ozone Depleting Substances (ODS)--The substances controlled internationally under the Montreal Protocol and nationally under Title VI of the Clean Air Act Amendments. This includes both Class I and Class II substances as follows:

a. "Class I substance" means any substance designated as Class I by EPA pursuant to 42 U.S.C. 7671(a), including but not limited to, chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform.

b. "Class II substance" means any substance designated as Class II by EPA pursuant to 42 U.S.C. 7671(a), including but not limited to, hydrochlorofluorocarbons.

Partnering or Partnership--Solving and/or preventing environmental problems by facilitating collaboration and cooperation among government, industry, environmental groups, regulatory agencies, citizens and neighbors, and research/support groups.

Pollution/Pollutants--The terms "pollution" and "pollutant" refer to all non-product outputs, irrespective of any recycling or treatment, that will or may reasonably be anticipated to cause deleterious effects to the public health or the environment.

Process Safety Management (PSM)--PSM is the proactive identification, evaluation, and mitigation or prevention of chemical releases that could occur as a result of failures in process, procedures, or equipment to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards.

Pollution Prevention (P2)--"P2" is any practice, which reduces the risk to health and the environment associated with the discharge of pollutants or contaminants. This term includes the use of processes, practices, materials or products that avoid or reduce pollution, which may include source reduction through process changes or material substitution; reuse; or recycling.

Pollution Prevention Management Action Plans (P2 MAP)--Installation P2 MAPs address the process required to implement a P2 program. These plans are based on process specific opportunity assessments (OA) that continually evaluate an installation's success in achieving P2 and include: the program required to fund P2 projects; the road map to achieve Air Force P2 goals; and the actions and milestones required to execute the program.

Qualified Recycling Program--Organized pursuant to 10 U.S.C. § 2577. A DoD Component program to recover recyclable materials from waste streams, and identify, segregate, and maintain or enhance marketability of the recyclable materials.

Quality Performance Indicator--A measurement, taken over a period of time, that communicates vital information about a process or activity. A quality performance indicator will drive appropriate leadership or management action. A quality performance indicator consists of an operational definition, measurement over time, and a presentation.

Recycling--The result of a series of activities by which materials, that would become or otherwise remain waste, are diverted from the solid waste stream by collection, separation, and processing, and are used as raw materials in the manufacture of goods sold or distributed in commerce, or the reuse of such materials as substitutes for goods made of virgin materials. Recycling covers reuse and recovery.

Reuse--The return of a material or product to the economy of reuse without any change in its identity by finding different purposes for the materials. Special processing is not required.

Risk--An expression of consequences in terms of the probability of an event occurring, the severity of the event, and the exposure of personnel or resources to potential loss or harm. Compliance through pollution prevention risks are hazards or undesired events associated with each compliance site.

Risk Assessment--The process of detecting hazards and their causes and systematically assessing the associated risks. For risk assessments used to prioritize compliance sites, consider at a minimum, potential impacts on mission performance and TOCs; the volume and toxicity of effluent; compliance costs, including but not limited to, permit, disposal, control equipment, training, energy, and ESOH costs; potential or actual history of notice of violations (NOV) and Environmental Compliance Assessment and Management Program (ECAMP) findings related to each effluent; and the potential for changes in compliance requirements and more restrictive regulations, Environment, Safety, and Health (ESOH) laws, and other regulations.

Risk Management Plan (RMP)--Section 112 (r)(7)(B)(ii) of the Clean Air Act requires the owner or operator of a stationary source at which more than threshold quantities of regulated substances are present to prepare a RMP. The RMP should establish methods for detecting and preventing or minimizing accidental releases of the regulated substances from the stationary source, and provide for a prompt emergency response to any such release to protect human health and the environment. The RMP must include: (1) a hazard assessment that assesses the potential effects of an accidental release of any regulated substance and includes an estimate of potential release quantities and a determination of downwind effects, including potential exposures to affected populations; (2) a program for preventing accidental releases of the regulated substances, including safety precautions and maintenance, monitoring, and employee training measures to be used at the stationary source; and (3) a response program providing specific actions to be taken in response to an accidental release of the regulated substances so as to protect human health and the environment, including procedures for informing the public and local agencies responsible for responding to accidental releases, emergency health care, and employee training measures.

Single Manager (SM)--The Air Force acquisition program manager is defined in DoD Directive 5000.1, *Defense Acquisition.* SMs are responsible for all aspects of planning, development, sustainment, and evolution of the systems or products their program offices acquire and support. The Air Force has approximately 70 SMs, although this number will vary as the Air Force continues to reorganize to improve efficiency and effectiveness. Program Management Directives (PMD) identify the SMs and funding sources and amounts for individual programs. SMs do not advocate for funding; that is the responsibility of the MAJCOMs that employ the systems or products provided and supported by the SMs. These MAJCOMs also define the cost, schedule, and performance requirements that the SMs must meet.

Source Reduction--As defined in the federal Pollution Prevention Act, source reduction is "any practice that: 1) reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise discharged into the environment (including fugitive emissions) prior to recycling, treatment, and disposal; and 2) reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants. The term includes material substitution; equipment or technology modification; process or procedure modification; reformulation or redesign of products; substitution of raw materials; and improvements in housekeeping, maintenance, training, or inventory control." Source reduction does not entail any form of waste management (e.g., recycling and treatment).

Sustainable--The ability to maintain an activity (WS, facility, or support process) through time without increasing harm to the environment. Overuse or non-renewable use of resources may decrease further productivity. An additional factor defining sustainability is the amount and kind of environmental impacts caused by natural resource use. Even if the resources are abundant, systems that rely on the resources may not be sustainable if this resource consumption results in major environmental impacts.

Sustainable Design--A systems-oriented approach for designing more ecologically and economically sustainable

product systems and facilities. Sustainable design couples the design cycle with the physical life cycle and integrates environmental requirements into the earliest stages of design, so the total negative impacts can be minimized. Sustainable design techniques include design for HAZMAT reduction, design for eco-efficient materials management (including recycled material use), design for disassembly and recyclability, design for durability and life extension, design for maintenance, design for energy conservation, or design for water conservation.

Total Ownership Costs (TOC)--See Life Cycle Cost.

Toxic Release Inventory--An inventory of routine toxic chemical emissions from certain facilities.

Weapon System Hazardous Material Reduction Prioritization Process (HMRPP)--The weapon system HMRPP provides a formalized way for installations to identify weapon system-driven HAZMAT reduction needs. This enables MAJCOM and installation priorities to drive weapon system HAZMAT reduction efforts. The weapon system HMRPP is not a separate requirements process. Rather, it integrates HAZMAT reduction requirements into the existing weapon system requirements, identification, prioritization, funding, and execution processes.

Attachment 2. Hazard Risk Assessment Matrix and ORM Process for Evaluating Compliance Sites

OPERATIONAL RISK MANAGEMENT (ORM)
HAZARD RISK ASSESSMENT MATRIX
OF
HAZARD CATEGORIES

FREQUENCY CATEGORIES / SEVERITY CATEGORIES	FREQUENT	LIKELY	OCCASIONAL	SELDOM	UNLIKELY
CATASTROPHIC	[redacted]	[redacted]	6	8	[redacted]
CRITICAL	[redacted]	5	7	[redacted]	15
MARGINAL	4	[redacted]	[redacted]	14	17
NEGLIGIBLE	[redacted]	16	18	19	20

Risk Levels	Hazard Categories
Extremely High	01 – 03
High	04 – 08
Medium	09 – 13
Low	14 – 20

HAZARD SEVERITY CATEGORY DEFINITIONS

Catastrophic—Complete mission failure, loss of system, loss exceeding $1 M, death, permanent total disability, or irreversible environmental damage that violates law or regulation.

Critical—Major mission degradation, major system damage, loss exceeding $200 K but less than $1 M, permanent partial disability, severe injury or occupational illness that may result in hospitalization of at least three personnel, or reversible environmental damage causing a violation of law or regulation.

Marginal—Minor mission degradation, minor system damage, loss exceeding $10 K but less than $200 K, injury or minor occupational illness resulting in a lost work day, or mitigable environmental damage where restoration activities can be accomplished without violation of law or regulation.

Negligible—Less than minor mission degradation, minor system damage, loss exceeding $2 K but less than $10 K, injury or occupational illness not resulting in a lost work day, or minimal environmental damage not violating law or regulation.

HAZARD PROBABILITY CATEGORY DEFINITIONS

Frequent
Qualitative Definition:
Individual item-Occurs often in the life of the system.
Fleet or inventory-Continuously experienced.
Individual Airman-Occurs often in career.
All Airmen exposed-Continuously experienced.
Quantitative Definition:
Probability of occurrence is greater than one in ten ($P>10^{-1}$)

Likely
Qualitative Definition:
Individual item-Occurs several times in the life of the system.
Fleet or Inventory-Occurs frequently.
Individual Airman-Occurs several times in career.
All Airmen exposed-Occurs frequently.
Quantitative Definition:
$10^{-1}>P>10^{-2}$

Occasional
Qualitative Definition:
Individual item-Will occur in the life of the system.
Fleet or Inventory-Occurs several times in the life of the system.
Individual Airman-Will occur in career.
All Airmen exposed-Occurs sporadically.
Quantitative Definition:
$10^{-2}>P>10^{-3}$

Seldom
Qualitative Definition:
Individual item-Unlikely but could occur in the life of the system.
Fleet or Inventory-Unlikely but can expect to occur in the life of the system.
Individual Airman-Unlikely but could occur in career.
All Airmen exposed-Occurs seldom.
Quantitative Definition:
$10^{-3}>P>10^{-6}$

Unlikely
Qualitative Definition:
Individual item-So unlikely you can assume it will not occur in the life of the system.
Fleet or Inventory-Unlikely but could occur in the life of the system.
Individual Airman-So unlikely you can assume it will not occur in a career.
All Airmen exposed-Occurs very rarely.
Quantitative Definition:
$10^{-6}>P$

Attachment 3. Payback and LCC Analysis Models for Evaluation of P2 Projects.

The models set forth in this Attachment are provided to help guide the evaluation of P2 projects. Evaluation may be necessary to 1) choose among competing P2 projects; or 2) justify a decision to implement a P2 project rather than continue reliance upon current (e.g., "end-of-pipe") pollution controls.

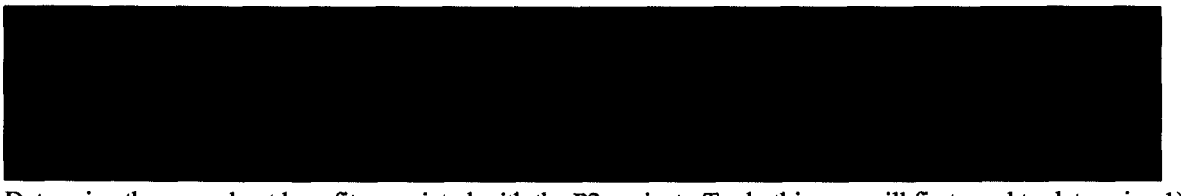
Although the models provided do not differ fundamentally from the standard analyses used by installations to justify any of their funding decisions, certain aspects are amplified to ensure that the special considerations applicable in the P2 context can be given appropriate recognition.

I. Model Payback Analysis.
The goal of payback analysis is to determine the period of time (i.e. "payback period") before the up-front costs of a given P2 project will be recouped through cost savings in subsequent years (i.e. the "out years"). The shorter the payback period, the more attractive the P2 project.

A. Simple Payback Analysis.
Simple payback analysis is most appropriate where the payback period is anticipated to be no more than three years. For projects with longer payback periods, a complex analysis that accounts for present value (PV) is more appropriate.

To conduct a simple payback analysis for a given P2 project, complete the following steps:

- Determine the total up-front costs involved with implementation of the P2 project. Typical up-front costs include:



- Determine the annual net benefit associated with the P2 project. To do this you will first need to determine 1) annual operating costs of the P2 project (i.e., operating costs over a one-year period); and 2) the current annual operating cost of taking no action (i.e., cost of maintaining current operations for a one-year period).

- Calculate annual net benefit using this formula:

[Annual net benefit] = [Current operating cost] – [P2 project operating cost]

Note: If the P2 project annual cost exceeds the baseline annual cost, then that P2 project does not provide savings and payback analysis is inappropriate.

- Calculate payback period using this formula:

[Payback period (in years)] = [Up-front costs] / [Annual net benefit]

Repeat this procedure for each P2 project under consideration. The P2 project with the shortest payback period is generally preferable, although other criteria, including LCC may need to be considered in making the ultimate funding decision.

Example Payback Analysis: Replacing Incinerators with Disintegrators at Peterson Air Force Base (PAFB).

For years, PAFB relied on two on-base incinerators for the destruction of classified materials. But high operating costs and the constant risk of air emissions compliance problems prompted base officials to search for a new solution. Ultimately, they identified a disintegrator machine (a powerful type of shredder) as a low-polluting P2 project. To analyze the financial benefits of the disintegrator, PAFB used the simple payback analysis outlined below:

Up-Front Costs—PAFB determined the up-front costs associated with the disintegrator, by taking the sum of the following costs:

- Purchased equipment: Cost to purchase two disintegrators, plus an initial one-year contract maintenance agreement.
- Installation: Cost to install disintegrators.
- Utility systems and connections: Cost of electrical modifications associated with installation.

The total up-front cost for the disintegrators was $46,000.

Annual Net Benefit—PAFB determined the annual net benefit associated with the disintegrator. Since annual net benefit measures the difference in annual operating costs between status quo operations and the P2 project, PAFB calculated operating costs for the incinerators as well as for the disintegrators:

Incinerators:

- Direct materials: Natural gas consumption costs (based on total hours of incinerator operation during calendar year 96).
- Direct labor: Cost to employ personnel to operate the incinerators for 20 hours per week, or 1040 manhours per year; plus maintenance and repair costs.
- Regulatory compliance: Emissions monitoring, recordkeeping, and reporting requirements.
- Utilities: Electrical.

The annual operating cost for the incinerators was $38,841.

Disintegrators:

- Direct labor: Cost to employ personnel to operate the disintegrators for eight manhours per week, or 416 hours per year; plus annual contract maintenance agreement.
- Utilities: Electrical.

The annual operating cost for the disintegrators was $11,520.

Having determined operating costs for both processes, PAFB calculated the annual net benefit of replacing incinerators with disintegrators:

$38,841 [Incinerators' annual cost]
-$11,520 [Disintegrators' annual cost]
=$27,321 [Annual net benefit]

Payback period calculation—Finally, PAFB calculated the payback period for disintegrators using the payback formula:

Payback period (in years) = Up-front costs / Annual net benefit

= $46,000 / $27,321

= 1.68 years (or 20 months)

B. Complex Payback Analysis.

For projects with an anticipated payback period greater than three years, a complex payback analysis that accounts for the PV of money is appropriate. PV is a concept that recognizes that it is better to have any given sum of money (e.g., one dollar) today than it would be to have the same amount in the future. Today's dollar, if invested, earns interest today; but future dollars do not earn interest until actually received and invested. Calculating PV is crucial for projects with longer payback periods because PV's importance increases exponentially with the number of years separating up-front costs from future savings.

II. Model LCC Analysis: Net Present Value (NPV).

LCC analysis was first used to evaluate weapons systems. The purpose of a LCC analysis is to account for the total ownership costs associated with a P2 project during the project's life cycle. A project's life cycle is defined as the time in which the project is within the control and responsibility of the purchasing agency, including productive use, storage, and disposal. Because a LCC analysis incorporates a wide range of costs besides the obvious up-front costs, it is well adapted to P2 projects that involve substantial start-up costs and modest but consistent savings in the out-years.

Before performing a LCC analysis, select an inventory of costs appropriate to the P2 project in question. The factors to consider include:

- Availability of information (e.g., data regarding material costs may be difficult to obtain if the installation conducting the analysis is not responsible for purchasing the material it consumes).
- Distinguishing the contribution of one type of cost where several types of cost are combined in a single overhead account (e.g., determining what share of facility-wide waste disposal costs to attribute to a particular process).
- Reliability of projections (e.g., projected cost savings for a technology are only available from the vendor and are based on limited field-testing).

An inventory of costs to consider when performing a LCC analysis should include:

- Up-front costs
- Operating costs
- Site closure/cleanup costs
- Disposal of equipment or materials

Once an appropriate cost inventory is selected, calculating LCC is relatively straightforward:

- For each calendar year (CY) in the anticipated life cycle, determine the annual costs associated with the P2 project. In the project's first year, up-front costs will probably predominate; in later years, annual cost will be comprised mainly of operating costs.

- Reduce the annual cost for each life cycle CY to PV, using the formula set forth below:

PV = Annual costs for CY99/(1 + R)^N; where

R = an appropriate discount rate, usually OMB-mandated for government projects; and

N = no. of years separating CY99 from the year in which the up-front costs were spent (e.g., CY99 – CY97 = 2).

- Add up the annual costs for all the years in the life cycle. The result of this calculation is the LCC for the P2 project, also called NPV.

Once you have calculated NPV for a P2 project, you should compare it to the NPV for other P2 projects. The lower the NPV, the more attractive the P2 project. It may also be helpful to compare a number of P2 projects against the baseline NPV of maintaining current operations over a period equivalent to the life cycle for each P2 project. This will demonstrate the savings in implementing P2 projects, as compared to current operations. Note that the NPV of most government projects will be a negative value, since profit is not usually generated. Therefore, the focus of comparison should be the relative quantities of the values, not the fact that they are negative.

Example LCC Analysis: Using Disintegrators at PAFB.

To illustrate LCC analysis, the following example shows how PAFB would proceed to cost the same disintegrators for which PAFB provided the simple payback analysis example, above. Some of the figures used in this example are hypothetical and were not provided by PAFB.

Selecting a Cost Inventory—PAFB would first select an inventory of costs, based on a thorough review of all the costs associated with the disintegrators, from purchase through disposal:

- Up-front costs: $46,000 (purchase price; installation; and electric utility connections).
- Operating costs: $11,520 (annual operating costs, including costs of personnel to operate the disintegrators; and maintenance contract with manufacturer).
- Site closure and cleanup costs: $3,000 (labor cost to shut down disintegrators; detach utility hookups; remove the machinery from the immediate site; and clean up any oil or waste material spills. These costs would be estimated, based on base experience with removing expired machinery, or perhaps on information supplied by the manufacturer).
- Disposal of equipment: $4,000 (costs associated with hauling the disintegrators to an appropriate scrapping or recycling facility: this cost would be estimated, based on base experience with disposing of expired machinery).
- Disposal of materials: $500 (annual costs of disposing of waste materials generated by the disintegrators, including spent lubricants and cleaning solutions, as well as disintegrated information media: this cost would be estimated based on proportion of base-total waste volumes and disposal costs attributable to disintegrator operation).

Determine the annual costs associated with the P2 project for each CY in the project life cycle—Having selected an appropriate cost inventory, PAFB would then assign all the costs identified in the inventory to a particular CY in the life cycle of the disintegrators. Based on information supplied by the manufacturer, assume an operational life of ten years. Assume further that PAFB purchases and installs the disintegrators in CY00:

CY00: $58,020 = $46,000 (up-front costs) + $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY01: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY02: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY03: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY04: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY05: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY06: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY07: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)

CY08: $12,020 = $11,520 (annual operating costs) + $500 (annual waste disposal costs)
CY09: $19,020 = $3,000 (site closure and cleanup) + $4,000 (equipment disposal) + $11,520 (annual operating costs) + $500 (annual waste disposal costs)

Reduce Annual Costs to PV—Having assigned all LCCs to different CYs, PAFB would reduce these annual costs to PV. Assume the OMB-mandated PV factor for a ten-year project is 7.9% in CY00. PAFB would calculate the PV for each of the ten annual figures, using the PV formula:

$$\textbf{PV = Annual costs for CYXX}/(1 + R)^N$$

CY00: PV of $58,020 = $58,020/(1 + 0.079)^0 = $58,020/(1.079)^0 = $58,020/1 = $58,020
CY01: PV of $12,020 = $12,020/(1.079)^1 = $12,020/1.079 = $11,140
CY02: PV of $12,020 = $12,020/(1.079)^2 = $12,020/1.164 = $10,330
CY03: PV of $12,020 = $12,020/(1.079)^3 = $12,020/1.256 = $9,570
CY04: PV of $12,020 = $12,020/(1.079)^4 = $12,020/1.355 = $8,870
CY05: PV of $12,020 = $12,020/(1.079)^5 = $12,020/1.463 = $8,220
CY06: PV of $12,020 = $12,020/(1.079)^6 = $12,020/1.578 = $7,620
CY07: PV of $12,020 = $12,020/(1.079)^7 = $12,020/1.703 = $7,060
CY08: PV of $12,020 = $12,020/(1.079)^8 = $12,020/1.837 = $6,540
CY09: PV of $19,020 = $19,020/(1.079)^9 = $19,020/1.982 = $9,600

Calculate NPV—Finally, PAFB would calculate the NPV of the LCC for the disintegrators by taking the sum of the ten PV figures shown above (CY00-09). These figures add up to $78,950.

NPV of Disintegrators = Sum of PV of annual costs for CY00-09 = $78,950

Attachment 4. P2 Resources

The P2 tool kit to assist installations with program implementation is available from the HQ AFCEE Internet site at http://www.afcee.brooks.af.mil/ep/epprod.htm.

PRO-ACT Environmental Information Clearinghouse:
- DSN 240-4214, 1-800-233-4356
- http://www.afcee.brooks.af.mil/pro_act/main/proact4.htm

DENIX Resources (Public access - no password required):
- Joint Service P2 Technical Library - http://enviro.nfesc.navy.mil/p2library/
- P2 Managers' Policy Library -http://denix.cecer.army.mil/denix/Public/Library/P2-Manager/toc.html