

USAF

**Installation Compliance Assurance and Pollution
Prevention (CAPP) Guide
(Interim)**

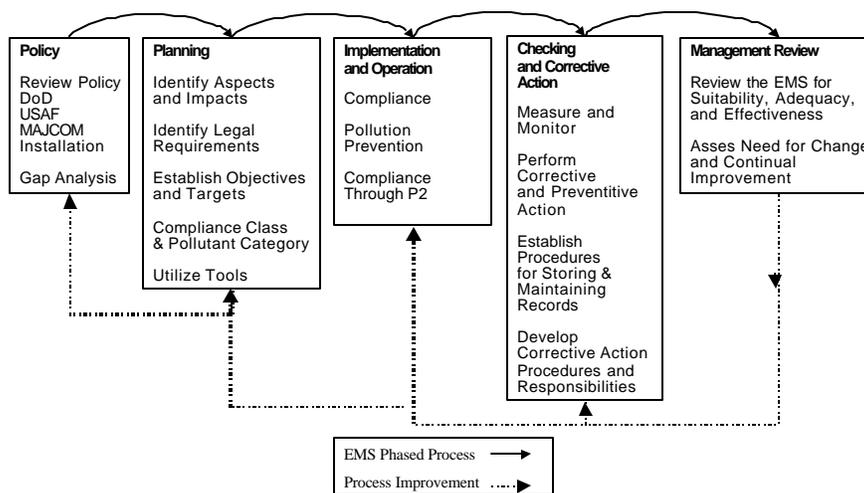
November 2000

USAF INSTALLATION COMPLIANCE ASSURANCE AND POLLUTION PREVENTION (CAPP) GUIDE (Interim)

PREFACE

The Air Force program of Compliance Assurance and Pollution Prevention (CAPP) is a holistic approach to managing environmental affairs. Environmental Compliance and Pollution Prevention are no longer two separate programs, but are being transformed into a single Environmental Management System (EMS). An EMS addresses environmental concerns throughout the installation's operations, including policy, planning, implementation, and review across the environmental spectrum, unlike the narrow compliance based approach. Instead of singularly focusing environmental compliance, the Air Force CAPP EMS will draw from the variety of active internal and external influences on the installation's environmental future.

Figure Preface EMS Phases and Elements Continual Process Improvement



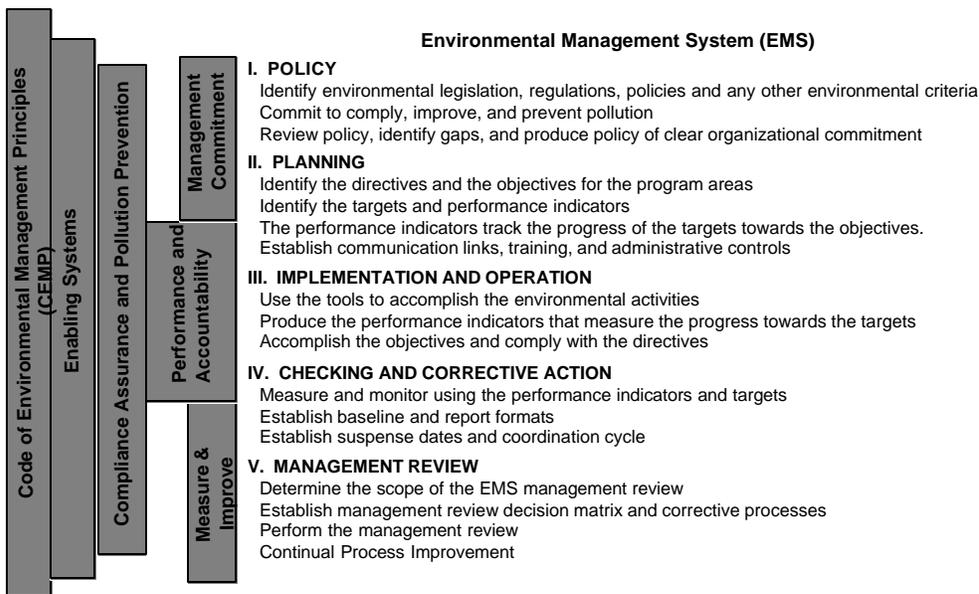
Guiding this transformation is the Code of Environmental Management Principles (CEMP). The CEMP is a set of management tools customized for environmental work. The principles are common to most comprehensive management systems; therefore they resemble, and thus validate, the EMS standards. Adhering to these principles helps the Air Force to evolve environmental activities into a smoother, more efficient, and cost-effective system. The CEMP also provides important indicators that installations can use to understand the effectiveness of their EMS.

THE PRINCIPLES

1. MANAGEMENT COMMITMENT
2. COMPLIANCE ASSURANCE AND POLLUTION PREVENTION
3. ENABLING SYSTEMS
4. PERFORMANCE AND ACCOUNTABILITY
5. MEASUREMENT AND IMPROVEMENT

The following figure provides an overview of the connection between the EMS and the CEMP.

Figure Preface EMS and CEMP Overview



This Guide is designed for installation environmental flight personnel to go beyond simple compliance with all governing laws and regulations. It provides concise steps to organize CAPP programs and answer the "How are we going to get there?" question. Instead of reactive management as compliance issues occur, CAPP will focus on proactively planning, programming, and cost-effectively implementing and operating a compliance program to prevent unexpected situations. It will establish long-term stability by providing a systematic method to understand and manage all present and future environmental responsibilities.

Additional copies of this Guide may be downloaded from the AFCEE P2 Toolbox at <http://www.afcee.brooks.af.mil/EQ/EQhome.asp>. Any comments or questions regarding this Guide should be directed to Beth Davis, Air Force Center for Environmental Excellence, Environmental Quality Directorate, AFCEE/EQP, DSN 240-4220, (210) 536-4220, elizabeth.davis@hqafcee.brooks.af.mil. AFCEE

strives for continual improvement in its products and services and welcomes feedback.

USAF Installation Compliance Assurance and Pollution Prevention (CAPP) Guide (Interim)

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CHAPTER 1

POLICY

Section 1.1 Overview of Compliance Assurance and Pollution Prevention (CAPP)

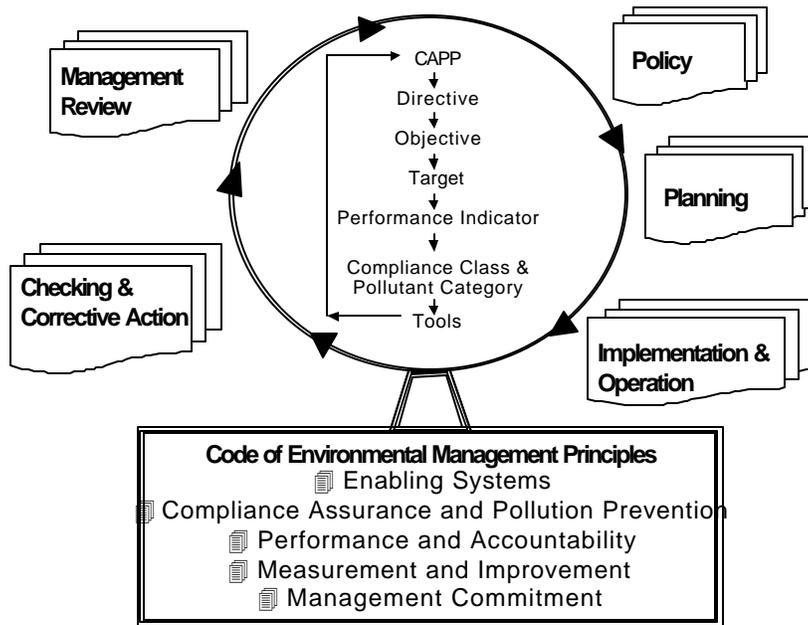
The Air Force Compliance Assurance and Pollution Prevention (CAPP) program is intended to:

- sustain and enhance mission readiness by implementing sound cost-effective strategies for complying with existing or new environmental requirements, and
- minimize or eliminate potential hazards to human health and the environment.

The fundamental CAPP strategy utilizes pollution prevention as the preferred solution to assure environmental compliance. This Guide, and Draft AFI 32-7080, CAPP, defines the Compliance through Pollution Prevention (CTP2) process to implement this strategy.

As stated in the preface, CAPP is based on the Code of Environmental Management Principles (CEMP). In addition, it is based on the International Organization for Standardization, (ISO) 14001 (Environmental Management Systems—Specification with Guidance for Use). This relationship is illustrated in Figure 1.1 below. The five CEMP elements outline effective management practices most commonly found among successful operations while ISO 14001 prescribes five elements of a management system that will achieve the ends defined by the established performance requirements or directives. The five chapters of this Guide, aligned with the five elements of ISO 14001, are shown around the CAPP circle in Figure 1.1. They include policy, planning, implementation and operation, checking and corrective action, and management review.

Figure 1.1 Overview of CAPP



This section provides a brief overview of the standard format and key terms and concepts used in defining the general policy and guidance for CAPP requirements.

1.1.1 Standard Format (this section needs a descriptive Figure)

The standard format for all environmental compliance assurance and pollution prevention programs will follow these six steps:

1. Identify the directive(s) that apply to the processes on the installation
2. Note the objectives of the directives
3. Identify the targets that relate meaningfully to the objectives.
4. Select the technical performance indicators that measure progress towards the targets
5. Choose the pollutant category that applies to the targets
6. Select tools to accomplish the pollutant category

To use CAPP, first determine if a policy exists to support the action. If one exists, consider all processes and any directives, objectives, targets, performance indicators, pollutant categories and tools assigned to them. Next, implement and operate the pollutant category activity, check the performance indicators for progress towards the targets, make corrections (if needed), measure again, and adjust the objectives or targets as necessary to meet the requirements of the directive. Finally, conduct management reviews of CAPP to

ensure the management system is working properly and to identify opportunities for improvement.

1.1.2 Key Terms and Concepts

The following terms are basic to the discussion that follows in this Guide. Other terms may be defined by request in future revisions.

Directive. Primarily laws or executive orders that drive compliance actions. To take advantage of the CAPP System, goals, or other mandates may be substituted for laws or executive orders in the system flow.

Objective. A directive-driven destination that meets the intent of the specific directives.

Target. A meaningful and measurable standard that can prove the objective was met.

Performance Indicator. A direct measure of or deliverable resulting from the accomplishment of the environmental activity (e.g., plan, survey, report, and inventory).

Pollutant Category. Activities accomplished with environmental funds linked to their specific legal drivers as defined by the Automated Civil Engineering System - Project Management (ACES-PM) Module.

Tools. Mechanisms, processes, procedures, and other resources used to accomplish the pollutant categories.

Section 1.2 CAPP Guidance

This section provides brief, but comprehensive, guidance for implementing CAPP policy mandated by federal and state legislative authorities, the President, Department of Defense (DoD), Major Commands (MAJCOMs), and installations. Mandates can be in the form of laws, federal regulations, Executive Orders (EOs), DoD Directives and Instructions, Air Force Policy Directives (AFPDs), Air Force Instructions (AFIs), and Air Force Policy Memos.

AFCEE's PRO-ACT has published the Air Force Environmental Governing Documents Fact Sheet in response to numerous requests received in past years from installation environmental personnel for a useful compilation of environmental references. This Fact Sheet provides a summary of environmental references grouped together by compliance category as presented in The Environmental Compliance Assessment and Management Program (ECAMP) Supplement to The Environmental Assessment and Management (TEAM) Guide.

The information presented in the Air Force Environmental Governing Documents Fact Sheet and in this CAPP Guide is not guaranteed to be all-inclusive. However, every effort has been made to list all laws, regulations, executive orders, policy documents, and guidance documents pertinent to each pollutant category. Specific questions on the application and interpretation of any governing document listed below may be directed to PRO-ACT and should be verified with MAJCOM Environmental Engineering staff and/or the Office of the Judge Advocate.

A general overview of laws, federal regulations, and executive orders is provided below to help describe their relationships and how they drive comprehensive DoD and Air Force policy and guidance.

1.2.1 Laws (<http://www.denix.osd.mil/>)

When Congress passes a law it is in the form of a Public Law (P.L.) (e.g., the Comprehensive Environmental Response and Compensation Liability Act [CERCLA] was enacted in P.L. 96-501). Most, but not all Public Laws are codified. If they are codified, it is in the U.S. Code (e.g., CERCLA is codified at 42 U.S.C. § 9601, et seq. with Title 42 of the U.S. Code starting at Section 9601). Sometimes the U.S. Code is listed as the U.S. Code Annotated. (Example, 42 U.S.C.A. § 9601, et seq.) The U.S.C.A. is the same citation as the U.S.C. However, the U.S.C.A. has supplemental reference material added. In some cases, both the U.S. Code and the P.L. citations are used. For example, 42 U.S.C. § 9620 is usually referred to as CERCLA § 120.

Note that these laws, often referred to as statutes, are not self-enforcing.

1.2.2 Federal Regulations (<http://www.denix.osd.mil/>)

Federal agencies (e.g., Environmental Protection Agency [EPA]) are tasked to draft rules and regulations to implement the laws. The formal process of drafting these rules includes publishing the agency-drafted proposed rules in the Federal Register. Other federal agencies and interested members of the public may review and comment on the proposed rules. The federal agency drafting the rules formally replies to the comments in the Federal Register. Once the process is completed, the rules or regulations implementing the law are 'promulgated.' The final rule comes into effect once published in its final form in the Federal Register and are then inserted by topical area in the Code of Federal Regulations (e.g., Title 40 CFR Parts 49 - 96 for Air Quality).

1.2.3 Executive Orders (EOs) (<http://www.denix.osd.mil/>)

An Executive Order is written direction from the President to his Executive Branch agencies (e.g., DoD) to take official action or impose a policy (e.g., EO 13148 addresses Environmental Management Systems [EMS]). An EO applies only to the Executive Branch. EOs are not 'promulgated' and are not found in the CFRs, although they may be published in the Federal Register. An EO does not require approval or coordination of the Congress and are not enforceable by law. Nonetheless, federal agencies give due deference to EOs.

Several EOs that are applicable to CAPP requirements are:

EO 13149 Greening the Government through Federal Fleet and Transportation Efficiency (Replaces EO 13031)

EO 13148 Greening the Government through Leadership in Environmental Management

EO 13123 Greening the Government Through Efficient Energy Management

EO 13101 Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition (Replaces EO 12995 and EO 12873)

EO 12873 Federal Acquisition, Recycling, and Waste Prevention (Replaced by EO 13101, Amended by EO 12995)

EO 12856 Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements

EO 12088-Federal Compliance With Pollution Control Standards

EO 11514 Protection and Enhancement of Environmental Quality

EOs can be downloaded from the DENIX web site cited above.

1.2.4 Department of Defense Policy and Guidance (<http://www.denix.osd.mil>)

1.2.4.1 DoD Directives (DoDDs) (<http://www.denix.osd.mil/denix/DOD/ES-Programs/Compliance/Policy/dod-toc.html>)

DoD Directives (DoDDs) provide policy required or authorized by legislation, the President, or the Secretary of Defense to initiate, govern, or regulate actions or conduct by the DoD Components. These are approved and signed by the Secretary or Deputy Secretary of Defense.

The following DoDD applies to CAPP requirements.

DoDD 4715.1 Environmental Security

Display environmental security leadership within DoD activities worldwide and support the national defense mission

Are there others? See AETC Environmental PPB&E Handbook.

1.2.4.2 DoD Instructions (DoDIs) (<http://www.denix.osd.mil/denix/DOD/ES-Programs/Compliance/Policy/dod-toc.html>)

DoD Instructions (DoDIs) implement DoDDs and assign responsibilities to the DoD Components (e.g., USAF). DoDIs are approved and signed by a Principal Staff Assistant (PSA) within the Office of the Secretary of Defense (OSD). PSAs are OSD officials who report directly to the Secretary or Deputy Secretary of Defense.

The following DoDIs apply to your CAPP requirements.

DoDI 4715.9 Environmental Planning and Analysis

DoDI 4715.6, Environmental Compliance

- Ensure environmental programs achieve, maintain, and monitor compliance requirements
- Pollution Prevention is the preferred means to attain compliance
- Compliance-type requirements satisfying source reduction, pollutant minimization, or recycling approaches shall be funded as “pollution prevention”

DoDI 4715.5 Management of Environmental Compliance Overseas

Comply with Final Governing Standards (FGS) to protect human health and the environment for each foreign country where the Department of Defense maintains substantial installations

DoDI 4715.4, Pollution Prevention

Emphasizes pollution prevention as the alternative of “first choice” in achieving compliance with applicable environmental requirements and Executive Orders

DoDI 4715.2 DOD Regional Environmental Coordination

The Heads of the DoD Components shall:

- a. Designate a Component Regional Environmental Coordinator (REC) (e.g., Air Force REC) in each region to coordinate environmental matters with DoD RECs.
- b. Implement the policies and procedures in this Instruction.

DoDI 4715.1 Environmental Security

Voluntary Environmental Audits (General Policy Memo dated 12 Feb 97)

- Prompt disclosure and correction of environmental violations by all regulated entities, including federal facilities
- Assure that no component of a federal department agency, including a contract operator at a federal facility, claims a privilege or immunity under a state environmental audit privilege or immunity statute

1.2.5 Headquarters (HQ) Policy and Guidance (<http://afpubs.hq.af.mil>)

1.2.5.1 Air Force Policy Directives (AFPDs) (<http://afpubs.hq.af.mil>)

The Air Force states its key policies in Air Force Policy Directives (AFPDs). AFPDs may also establish and describe success-oriented feedback and performance metrics to measure policy implementation. These directives are written and certified by the appropriate Secretariat or Air Staff office. These HQ USAF offices are responsible for Major Command (MAJCOM), Field Operating Agency (FOA), or Directive Reporting Unit (DRU) action supporting the development, execution, and maintenance of AFIs that implement AFPDs.

The Air Force relies on well-developed and clearly defined environmental policies. Air Force Policy Directive (AFPD) 32-70, Environmental Quality, establishes the USAF commitment in achieving and maintaining environmental quality, and addresses significant compliance assurance and pollution prevention concerns that are embodied in CAPP. Some of the policies defined in AFPD 32-70 include:

- Linking laws, directives and regulations to the applicable base processes;
- Planning for full compliance to all environmental standards;
- Maintaining efficient and cost-effective operations;
- Establishing the authorities and responsibilities for management oversight for SAF/MI, AF/ILE, and AFCEE
- Preventing future pollution by reducing use of hazardous materials and releases of pollutants into the environment to as near zero as feasible; and
- Accounting for environmental costs in computing hazardous material life-cycle costs

AFPD 90-8 Environment, Safety, and Occupational Health (90 Series, Command Policy)

AFPD 90-9, Operational Risk Management

1.2.5.2 Air Force Instructions (AFIs) (<http://afpubs.hq.af.mil>)

AFPDs are supported by Air Force Instructions (AFIs) when specific procedural guidance is essential to comply with legal or higher level guidance, to achieve Air Force-wide standardization, or to ensure the safety of personnel or property. AFIs are normally drafted by designated lead MAJCOMs, FOAs, or DRUs. HQ USAF will approve and issue all AFIs.

Draft AFI 32-7080, Compliance Assurance and Pollution Prevention, implements AFPD 32-70, Environmental Quality. In Chapter 1's Introduction, Draft AFI 32-7080 details the concepts of Compliance Assurance, Pollution Prevention, and Compliance through Pollution Prevention (CTP2) processes. The remainder of the AFI addresses the policy, planning, implementation and operation, checking and corrective action, and management review phases of the CAPP structure. Note that the Civil Engineering and Environmental Program AFIs are in the 32 Series (e.g., AFI 32-XXXX).

(This needs to be expanded into a discussion – from ILEVQ briefing dated ?, author?).

- Investment into end-of-pipe treatment and disposal is a consequence of viewing compliance as “must-do” and P2 as “nice to do.”
- The Air Force is aggressively working to break down artificial barriers that prevent integration of P2 and compliance.
- “Compliance” with laws, regulations, and policies is the ultimate objective.
- The Air Force should choose cost-effective P2 solutions over treatment and disposal whenever possible.
- The “right things” to do are reduce pollution, improve processes, reduce costs, and develop and utilize new technologies.
- The Air Force should focus on process changes to eliminate compliance requirements or reduce the compliance cost or risk

- Provide a methodical approach to evaluate all compliance requirements for potential P2 solutions

AFI 90-901, Operational Risk Management

1.2.5.3 Air Force Policy Memos (<http://www.denix.osd.mil/>)

In addition to AFPDs and AFIs, Air Force issues policy memos to specific subordinate organizations (e.g., MAJCOMs, FOAs, and DRUs). Several memos from AF/ILEV concerning Environmental Quality Funding Guidance are summarized below.

- 20 Aug 97 AF/ILEV memo, Pollution Prevention to Achieve Compliance
 - Emphasis is on P2 to achieve compliance
 - Compliance (not goals) drives P2 requirements
- 12 Sep 97 AF/ILEV memo, Pollution Prevention Funding Guidance
 - P2 funding guidance
 - “EC” requirements eligible for P2 funds
- 20 Nov 97 AF/ILE memo, Pollution Prevention to Achieve Compliance
 - Grow your P2 program
 - Increase P2 share of EQ budget to 20% from FY96 baseline
- 28 Jan 98 joint AF/ILE & SAF/FMB memo, Transferring Funds from Environmental Compliance to Pollution Prevention
 - Goal of transferring 20 percent of our EC budget to P2 by FY03 (Reference conversation with Bob Chabot, AETC/CEVQ, this policy is no longer enforced or required)
 - Level 0 recurring operations and services to keep the doors open
 - Level 1 non-recurring out-of-compliance projects in both the EC and P2 program elements must be viewed equally
- 20 Apr 98 AF/IL memo, FY00-05 POM Planning for Environmental Compliance Through Pollution Prevention Weapon Systems drive most compliance costs
 - Concerted team effort (e.g., XP, DO, LG, CE, and FM) for FY00–05 budget submissions
 - Identify P2 opportunities associated with fielded weapon systems
- 15 Apr 99 AF/ILEV memo, Compliance Through Pollution Prevention (P2) Implementation Guidance (Our Memo, 8 Jan 99)
 - Use the 8 Jan 99 guidance (and attached compliance site definition)
 - Develop and provide Phase One; Compliance Site Inventory

- 8 Jan 99 AF/ILEV memo, Compliance Through Pollution Prevention (P2) Implementation Guidance
 - CTP2 Implementation guidance
 - Identify and execute the “best “ P2 solutions
- 1 Jul 99 AF/ILEV memo, Environmental Quality (EQ) Funding Guidance
 - Supplement to AFI 32-7001, *Environmental Budgeting*, 9 May 1994
 - New definitions for Level 1 & 2 projects
 - Specific guidance for addressing budget shortfalls
- 9 Aug 00 AF/ILEV memo, Draft Policy on Environmental Quality (EQ) Funding Eligibility for Non-Recurring Infrastructure Projects
 - Funding non-compliant portions of infrastructure projects with EQ funds
 - Emphasizing the need for investing in routine maintenance and repair of infrastructure with Real Property Maintenance (RPM) funds

1.2.6 Major Commands (MAJCOMs), Direct Reporting Units (DRUs), and Field Operating Agencies (FOAs) (<http://afpubs.hq.af.mil>)

Draft AFI 32-7080 establishes the foundation for CAPP. This AFI applies to all Air Force units including the Air National Guard, direct reporting units (DRU) (e.g., United States Air Force Academy), and field operating agencies (FOA) (e.g., Air Force Civil Engineering Support Agency [AFCESA]). The missions and operational requirements among these agencies are diverse and may require mission- or command-specific guidance. Therefore, Major Commands (MAJCOMs), DRUs, and FOAs may supplement an AFI or related policy memos by publishing their own guidance documents (e.g., AFMC’s Supplement 1 to AFI 32-7086) as long as the requirements are no less stringent as Air Force guidance. Supplements clarifying CAPP policy instructions and memos are commonly generated at the MAJCOM level. As referenced in AFPD 90-1, Policy Formulation, AFPDs and AFIs are orders of the Secretary of the Air Force. Subordinate organizations will not supplement AFPDs.

1.2.7 Installations (<http://afpubs.hq.af.mil>)

As appropriate, installations reserve the right to supplement AFIs to clarify local roles, responsibilities, and authorities (i.e., supplements are written to add an additional level of guidance to material in higher headquarters publications). For example, several HQ Air Education and Training Command (AETC) installations have published supplements to AFI 32-7086, Hazardous Materials Management. Before doing so, contact your MAJCOM/CEV and consult <http://afpubs.hq.af.mil> to determine which other installations have already pursued this endeavor and whether document templates exist. Keep in mind that installations should issue supplements rather than separate publications to avoid extensive duplication of effort. In addition, installations (like MAJCOMs) are not authorized to supplement AFPDs (as directed by AFPD 90-1, Policy Formulation).

The following policy and standards govern how publications are created and managed:

- AFPD 37-1, Air Force Information Management (will convert to AFPD 33-3, Information Management)
- AFI 33-360, Publications Management Program
- AFI 90-1, Policy Formulation
- Writers Guide to Creating an Air Force Publication
(<http://afpubs.hq.af.mil/policy>)

CHAPTER 2

PLANNING

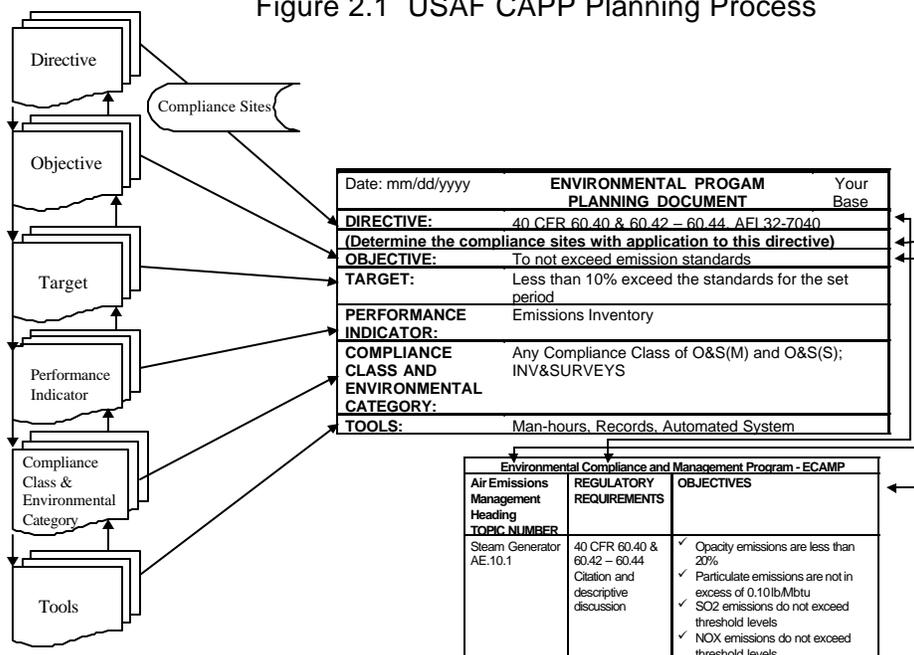
Section 2.1 OVERVIEW OF THE PLANNING PROCESS

CAPP planning requires the following:

- Identify a comprehensive listing of operations and processes and link them to the corresponding directive(s);
- Accomplish the inventory
- Identify tasks at hand and assign each an objective, target, and performance indicator; and
- Identify the compliance class, pollutant category, and resources (i.e., tools) to accomplish the tasks

As shown in Figure 2.1 below, proper planning provides an audit trail of all CAPP requirements. Once the baseline requirements are defined, program and media managers can more easily accomplish updates to existing records. These updates depend on program progress and the addition of new records or regulatory requirements.

Figure 2.1 USAF CAPP Planning Process



Section 2.2 Survey the Installation and Determine the Directives

2.2.1 Survey the Installation

Review Existing Documentation

USAF has spent several years surveying and evaluating the environmental aspects and impacts of its operation. Using existing documents, survey the installation for operations that may fall under an environmental mandate. Existing sources of information include, but are not limited to:

- CAPP Management Action Plans (MAPs);
- Process Specific Opportunity Assessments (PSOAs),
- Component plans developed in accordance with AFI 32-7062, Air Force Comprehensive Planning;
- Emergency Planning and Community Right-to-Know Act (EPCRA) documentation;
- Media plans (e.g., air, water, and solid waste) environmental permits;
- Environmental Compliance Assessment and Management Program (ECAMP) findings;
- Safety inspections;
- Bioenvironmental engineering (BEE) workplace surveys;
- National Environmental Policy Act (NEPA) documentation;
- 42 U.S.C 4321-4370d;
- Notice of violations (NOVs);
- Environmental Impact Analysis Process (EIAP);
- Host Nation Open Enforcement Actions;
- RMP (define);
- PSM (define); and
- Other available resources

Survey the Processes

Assign operations to groups based on specific industrial processes to ensure all operations have been identified.

One method used in grouping operations is described in the AETC Shop-Level Pollution Prevention Training Manual. This manual can be downloaded from <http://www.afcee.brooks.af.mil/EQ/EQhome.asp>. A refined list of process groups and their respective shops is shown below in Table 2.2.1. Review the process groups and take note of those groups that are active on the installation. The list in each box provides the types of shops that may be operating on the installation. Through their daily operations, these shops likely impact the environment and are therefore regulated by one or more directives. To determine what specific

processes are accomplished in the shops, conduct interviews as necessary with operators, supply technicians, and bioenvironmental engineering (BEE) staff. Personally visit these operations if possible to review hazardous material (HazMat) and hazardous waste (HazWaste) records. Take the time to document any cost or risk data during the survey of available information.

Table 2.2.1 Process Groups and their Shops

| <u>Aerospace Systems/Components</u> | <u>Installation Services & Operations</u> |
|--|---|
| <u>Aircraft Fuel Systems</u> <u>Armament</u> <u>Avionics Integrated Systems</u> <u>Circuit Card Repair Shop</u> <u>Egress</u> <u>Electro-Environmental</u> <u>LANTIRN Shop</u> <u>Munitions</u> <u>Pneudraulics</u> <u>PMEL (TMDE)</u> <u>Wheel & Tire</u> | <u>Armory</u> <u>Entomology</u> <u>Fire Protection</u> <u>Packaging and Crating</u> <u>Photo Lab</u> <u>Recreational/Rentals (Services)</u> <u>Reprographics</u> <u>Security Police/Armory</u> |
| <u>Aircraft Operations</u> | <u>Mechanical/Engine Maintenance</u> |
| <u>Flightline Maintenance</u> <u>Life Support</u> <u>Phase Docs</u> | <u>Aerospace Ground equipment (AGE)</u> <u>Auto Hobby</u> <u>Grounds Maintenance</u> <u>Propulsion</u> <u>Transportation (Vehicle Maintenance)</u> |
| <u>Fuels</u> | <u>Medical</u> |
| <u>Base Exchange Service Station</u> <u>Fuel Laboratory</u> <u>Fuels Maintenance</u> <u>Fuels Management</u> <u>Liquid Oxygen Plant/Unit</u> | <u>Biomedical Equipment Repair Center</u> <u>Clinical Laboratory</u> <u>Dental Clinic</u> <u>Housekeeping</u> <u>Occupational Therapy</u> <u>Pathology Laboratory</u> <u>Radiation Oncology</u> <u>X-ray</u> |
| <u>Installation Maintenance & Operations</u> | <u>Metals Treatment</u> |
| <u>Plant Operations</u> <u>Plumbing</u> <u>Power Production</u> <u>Pavements & Equipment</u> <u>Exterior Electric</u> <u>Facility Maintenance</u> <u>Interior Electric</u> | <u>Corrosion Control</u> <u>Metals Technology (Welding, Machining)</u> <u>Non-Destructive Inspection</u> <u>Structural Maintenance (Sheet Metal)</u> <u>Transportation (Allied Trades)</u> |

Use Existing Databases

Review HazMat and HazWaste information management systems used by your installation (e.g., AF-EMIS shop codes and the HMMS PEC codes) to track information about active processes.

2.2.2 Determine the Directives (<http://www.denix.osd.mil/>)

In Chapter 1 Policy, the directives discussed were the general environmental mandates. “Planning” directives are those required to justify your specific environmental CAPP requirements.

Once the operational processes with environmental impacts are identified, each process or individual compliance site must be linked to the appropriate compliance drivers or directives to be included in the installation environmental management program. Specific questions on the application and interpretation of any governing document listed below may be directed to PRO-ACT and should be verified with your respective MAJCOM/CEV staff and/or the Office of the Staff Judge Advocate. If no mandatory environmental directives are available, then the program is considered optional (e.g., Earth Day), and not contained within CAPP.

2.2.2.1 ECAMP

ECAMP is a useful planning tool to help determine compliance drivers. However, in order to best use this tool, you must understand how ECAMP assessments are conducted and which one of the three ECAMP location categories applies to the installation. The documents used for each ECAMP location category are shown below. These documents consist of checklists that are used throughout the Air Force by ECAMP teams and environmental staff (e.g., ECAMP Manager) in preparation for ECAMP assessments. General guidance on conducting an ECAMP is outlined in AFI 32-7045.

ECAMP Location Categories (need to insert a figure to show relationships)

- Continental United States (CONUS) installations in the contiguous 48 states, Hawaii, Alaska, Puerto Rico, District of Columbia, and Guam
 - The Environmental Assessment Management [TEAM] Guide
 - The Air Force Supplement for TEAM Guide
 - The State and Territory Supplements for TEAM Guide
 - MAJCOM ECAMP Supplement (if applicable)
- Final Governing Standards (FGS) for Overseas CONUS (OCONUS) installations listed in Table 2.2.2.6 (as shown below)
 - OCONUS Compliance Assessment Protocols (OCAP) (Note: These protocols are location specific [e.g., United Kingdom])

- OCAP, Air Force Supplement
- OCONUS installations not listed in Table 2.2.2.6
 - OCONUS OCAP, Overseas Environmental Baseline Guidance Document (OEBGD)
 - OCAP, Air Force Supplement

For planning purposes, take into account the following important considerations:

- The TEAM Guide does not apply to overseas installations.
- The OCAPs are location specific (e.g., United Kingdom).
- OCONUS Compliance Assessment Protocol, Air Force Supplement, applies to all overseas installations (even if they are not listed in Table 2.2.2.6 shown below).
- The ECAMP Supplement for TEAM Guide numbering is not the same as TEAM Guide numbering (Contact David Krooks, CERL, (800)872-2375 ext. 3432, for clarification).

Descriptions for each type of document are provided below and described throughout sections 2.2.2.1 through 2.2.2.6 and in Appendix 1. Copies can be downloaded from the DENIX web site:

<http://www.denix.osd.mil/denix/DOD/Library/Assessment/tools.html>.

TEAM Guide

The TEAM Guide includes such topics as management of air emissions, water quality, and solid waste. It was developed for use by all government agencies and they have agreed to share its development and maintenance

The Air Force Supplement for TEAM Guide

The Air Force Supplement for TEAM provides the ECAMP assessment supplement checklists to be used with the TEAM Guide during an ECAMP assessment. These environmental assessment checklists are based on Air Force and DOD regulations, directives, and instructions.

The State and Territory Supplements

The State and Territory Supplements, along with the TEAM Guide, serve as tools in conducting the environmental compliance assessment phase of the ECAMP process. There are 54 of these supplements for use in the contiguous 48 states, Hawaii, Alaska, Puerto Rico, District of Columbia, and Guam, and California (as

an supplement to their restrictive air quality policy/guidance). The individual state supplements are designed to augment the TEAM Guide with state environmental regulations.

MAJCOM ECAMP Supplement

If applicable to your MAJCOM (e.g., Air National Guard [ANG] Supplement to the TEAM Guide), this document provides the MAJCOM ECAMP assessment supplement checklists to be used with the TEAM Guide during an ECAMP assessment. In addition, it provides guidance for compliance with safety and occupational health criteria. These environmental assessment checklists are based on MAJCOM regulations (e.g., ACC).

OCONUS Compliance Assessment Protocol, Air Force Supplement

The OCONUS Compliance Assessment Protocol (OCAP), Air Force Supplement manual contains the Air Force and DoD environmental directives and instructions. This Air Force supplement, in combination with the OCONUS Compliance Assessment Protocols for the host nation, provides the ECAMP assessment checklists to be used during an ECAMP assessment. These two manuals serve as the primary tools in conducting the environmental compliance assessment phase of the ECAMP process.

The OCONUS OCAP OEBGD

The OCONUS OCAP, OEBGD (also known as the Worldwide Environmental Assessment Protocol), provides the checklists to be used during a Department of Defense (DOD) environmental compliance assessments in those countries that do not have host nation environmental protocols. Along with the OCONUS Compliance Assessment Protocol (OCAP), Air Force Supplement, these manuals serve as primary environmental auditing tools.

The ECAMP Protocol Database

<http://www.afcee.brooks.af.mil/eq/ecamp/ecampdb.htm>

The ECAMP Protocol Database is a Microsoft Access application to aid in the development of your protocol assessment checklist for all 13 environmental compliance protocols. This application is for use with Access 97. The database will help compliance personnel identify and record regulations that apply to base specific situations. The database:

- Allows the user to review, in a single location, the ECAMP checklist items from the Department of Defense (DoD) TEAM Guide and the Air Force Supplement to the TEAM Guide;
- Provides the user the opportunity to identify and select checklist items that pertain to their specific Air Force site; and

- Allows the user to print checklist items in a variety of formats, including customized checklists for specific Air Force sites. Printing capabilities include the option to print the entire database or only selected items from the database.

Using the ECAMP Database, compliance personnel can review DoD and Air Force environmental regulations in 21 protocol areas to identify those that apply to a specific Air Force site. When an applicable regulation is identified, a simple checkmark will flag the regulation, and add it to a customized list of base-specific regulations. The customized list can then be printed to create checklists for use during site audit activities. The “Other Environmental Issues” and “Toxic Substance Management” protocols are subdivided in specific categories.

Protocol Categories:

| | |
|-----------------------------------|---|
| Air Emissions | Pesticide Management |
| Cultural Resources | Petroleum, Oil, and Lubricants (POL) Mgt. |
| Hazardous Materials | Solid Waste |
| Hazardous Waste | Storage Tank Management |
| Natural Resources | Toxic Substance #1 - PCBs |
| Other Env. Issues | Toxic Substance #2 -Asbestos |
| Other Env. Issues #2 – EIAP | Toxic Substance #3 - Radon |
| Other Env. Issues #2 – Noise | Toxic Substance #4 –Lead-based Paint |
| Other Env. Issues #3 – IRP | Waste Water |
| Other Env. Issues #4 – P2 | Water Quality |
| Other Env. Issues #5 – Prog. Mgt. | |

The ECAMP Database is very simple to use, and requires only two functions:

- 1) Selecting and marking applicable regulations; and
- 2) Creating printed checklists.

As shown in Figure 2.2.2.1, the Protocol Selection Screen allows the user to make the desired protocol selection from of the database. A brief user's guide, available from <http://www.afcee.brooks.af.mil/eq/ecamp/ecampdb.htm>, outlines the actions required for successful operation of the ECAMP Protocol Database:

Figure 2.2.2.1 Protocol Selection Screen

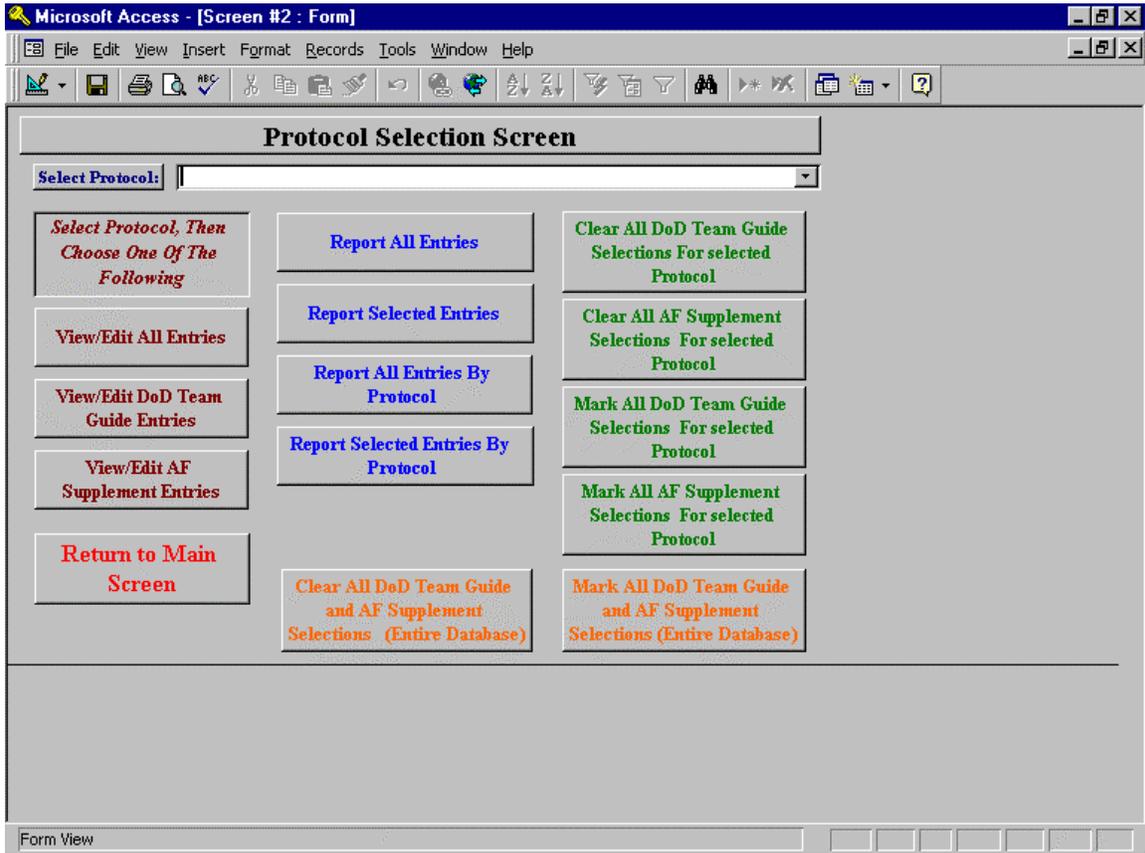


Table 2.2.2.1(a) presents a synopsis of the database numbering system including State and Local requirements. This numbering scheme has been further expanded to include multiple subcategories of media requirements.

TABLE 2.2.2.1(a) ECAMP Numbering Scheme

| U.S. TEAM Guide/AF Supplement Protocols | Topic Numbers (excluding State and Local Supplements) | State and Local Supplement Topic Numbers |
|---|---|--|
| Air Emissions | AE.1-AE.172 | AE.5-AE.9 |
| Cultural Resources | CR.1-CR.20 | CR.3 |
| Hazardous Materials Management | HM.1-HM.2, | HM.3 |
| Hazardous Waste Management | HW.1-HW.480 | HW.3 |
| Natural Resources Management | NR.1-NR.20 | NR.3 |
| Other Environmental Issues | O1.-1-O5.1 | O2.5, O3.20, O4.10 |
| Pesticide Management | PM.1-PM. | PM.65 |
| POL Management | PO.1-PO.115 | PO.95, PO.100 |
| Solid Waste Management | SO.1-SO.180 | SO.3 |
| Storage Tank Management | ST.1-ST.160 | ST.3 |
| Toxic Substances Management | T1.1-T4.20 | T1.3, T2.2, T3.3, T4.3 |
| Water Quality Management | WQ.1-WQ.120 | WQ.3 |
| Wastewater Management | WA.1-WA.155 | WA.3 |

Table 2.2.2.1(b) links the ECAMP protocol categories to the applicable regulatory requirements. By cross-referencing the types and details of an installation survey with the ECAMP protocol categories, specific regulatory drivers can be related to installation processes. Table 2.2.2.1(b) presents several examples of these relationships.

TABLE 2.2.2.1(b) ECAMP Topic and Regulatory Citation Cross-Reference

| Protocol Category | ECAMP Number | Topic | Citations |
|-------------------|--------------|--|---|
| Air Emissions | AE.85 | CFCs and Halons: Purchasing/Procuring | 40 CFR 82.42(c) 40 CFR 82.174(b) through 82.174(d) 42 USC 7671d(a) 40 CFR 82.34(b) and 82.42(b)(3) 40 CFR 82.154(g) and 82.154(h) |

| | | | |
|---------------------|--------|--------------------------|--|
| Hazardous Materials | HM.45 | Compressed Gases Storage | 29 CFR 1910.101 DODR 4145.19-1, paragraph 5-405d (1) and 5-405d(2) DODR 4145.19-1, paragraphs 5-405c(6) through 5-405c(9), 5-405c(14), and 5-405c(22) |
| Hazardous Wastes | HW.100 | Transportation | 40 CFR 263.10(a), 263.10(b), 263.11, 263.20(a) through 263.20(d), 263.21, and 263.22(a) 40 CFR 262.30 through 262.33 40 CFR 263.30 and 263.31 MP 40 CFR 263.12 |

2.2.2.2 ACES-PM Module (<http://cess.afit.af.mil/> and <http://www.afcesa.af.mil/Directorate/CEO/Automation/ACESWeb>)

The Automated Civil Engineering System - Project Management (ACES-PM) tool, formerly known as the IWIMS-ES or A-106 Module, is used by the Civil Engineering community to program and maintain facility projects. As shown in Figure 2.2.2.2, entering data into the Environmental Tab within the ACES-PM Module is the primary difference between environmental and non-environmental project programming and management. This Environmental Tab is used as the replacement for the majority of the A-106 Program software to manage environmental projects. It is the primary budgeting and programming tool used by the Air Force for preparation and presentation of Air Force Compliance, Pollution Prevention, and Conservation Environmental budgets and activities.

Figure 2.2.2.2 ACES-PM Module Environmental Tab

Statutory Authority

In order to have the need for a project, there must be a law, federal regulation, executive order, or DoD/Air Force policy and guidance (i.e., regulation) driving the requirement. This is commonly known as the Statutory Authority.

Similar to the ECAMP Protocol database, a number of codes have been developed within the ACES-PM Module to identify the statutory authority (i.e., law) mandating environmental requirements. There are currently 27 Statutory Authority Codes that may be entered into the ACES-PM Module. Reference Section 4, Pages 3–5 of the ACES Business Practices Manual: Environmental Management Manual for many of the common statutes.

Not all Statutory Authorities currently eligible for funding are currently included. Consequently, a program manager must use 'MU' (reference for multi-media) for many cultural resources or pollution prevention items.

ACES-PM Resources and Training (<http://cess.afit.af.mil/>)

For specific information on the Environmental Tab within the ACES-PM Module, refer to the ACES Business Practices Manual: Environmental Management and ACES-PM User's Manual: Environmental available from <http://cess.afit.af.mil/> (need to verify if and where Major George, ACES-PM Instructor, will place these documents).

Formal training is available at the Air Force Institute of Technology (AFIT). Initial ACES-PM instruction is provided as a one-week course either by in-residence or teleteach. The course covers all aspects of typical CE project management including MILCON, non-MILCON, and environmental project management. Automated Steering Group (ASG) has directed that the course cover not only the ACES-PM software but also the business rules behind the processes. Additionally, the course presents the report writing tool, Oracle Discoverer. For information on how to get into a class, contact your MAJCOM Engineering IPT member (do not call AFIT).

The latest ACES-PM Strategic Plan, Frequently Asked Questions (FAQs), and newsletters can be downloaded from:

<http://www.afcesa.af.mil/Directorate/CEO/Automation/ACESWeb>

2.2.2.3 Laws (<http://www.denix.osd.mil>)

Appendix 2 includes a quick reference to environmental laws arranged alphabetically by topic. All laws (or statutes) are shown in bold font. This reference is not intended to be all-inclusive.

Specific statutes (or laws) applicable to individual installation CAPP planning can be downloaded from the ECAMP Protocol Database or the Environmental Tab within the ACES-PM Module.

2.2.2.4 Federal Regulations (<http://www.denix.osd.mil>)

Appendix 2 includes a quick reference to federal regulations arranged alphabetically by topic. This reference is not intended to be all-inclusive.

2.2.2.5 Executive Orders (EOs) (<http://www.epa.gov/epahome/rules.html>)

Appendix 2 includes a quick reference to Executive Orders (EOs) arranged alphabetically by topic. This reference is not intended to be all-inclusive.

2.2.2.6 DoD Policy and Guidance

Appendix 2 includes a quick reference to DoD Policy and Guidance arranged alphabetically by topic. This reference is not intended to be all-inclusive.

2.2.2.7 HQ Policy and Guidance

Appendix 2 includes a quick reference to HQ Policy and Guidance arranged alphabetically by topic. This reference is not intended to be all-inclusive.

2.2.2.8 State Mandates (<http://www.epa.gov/docs/epacfr40/find-aid.info/state/>)

For planning purposes, state mandates also require review.

The Environmental Protection Agency (EPA) has regional offices with assigned geographic responsibility. A compilation of all state agency regulations and the ten EPA Regions and their respective assignments by state can be viewed at (<http://www.epa.gov/docs/epacfr40/find-aid.info/state/>). Direct links to state regulator web sites (where available) is provided from this site.

To assist the installation with state mandates in environmental compliance and management, the USAF has three AFCEE Regional Environmental Offices (REOs) located in Atlanta, Dallas, and San Francisco. The mission of the AFCEE REOs is to:

- Represent the Air Force to state and regional federal environmental regulators and authorities
- Provide environmental program oversight on a regional basis
- Facilitate consistent application of environmental standards across regions
- Assist installations with environmental management issues

- Monitor rulemaking at the state and federal level and provide USAF environmental leadership with updates on environmental compliance, status trends, and problem areas
- Provide regional support for all USAF installation restoration programs and third party site programs
- Serve as the Air Force's Regional Environmental Coordinators for specific EPA regions

Additional geographic responsibility and contact information on the REOs and RECs can be found at <http://www.afcee.brooks.af.mil/> under the "Organizations" menu.

2.2.2.9 Final Governing Standards (FGS) and Overseas Environmental Baseline Guidance Document (OEBGD) (<http://www.denix.osd.mil/>)

AFPD 32-70, Environmental Quality, and AFI 32-7006, Environmental Program in Foreign Countries requires that Air Force activities in foreign countries comply with DoD Final Governing Standards (FGS). These standards serve as tools in environmental compliance at overseas installations. Installations should use the FGS for their location or host country as detailed in the OCONUS Compliance Assessment Protocols (e.g., United Kingdom). These protocols can be downloaded from the DENIX web site. DoD has developed FGS for the countries listed in Table 2.2.2.6 (see DENIX for updates to listing).

TABLE 2.2.2.6 Countries Governed by Final Governing Standards

| | |
|---------------------|------------------|
| • Ascension Islands | • Greece |
| • Azores | • Greenland |
| • Bahrain | • Iceland |
| • Belgium | • Italy |
| • Bermuda | • Japan |
| • Caribbean | • Korea |
| • Andros Island | • Netherlands |
| • Antigua | • Panama |
| • Cuba | • Philippines |
| • GTMO | • Portugal |
| • Diego Garcia | • Spain |
| • Egypt | • Turkey |
| • Germany | • United Kingdom |

In the absence of FGS, the environmental criteria of the OEBGD apply. Additionally, overseas laws may apply as well (e.g., Albania, Bosnia, and Croatia) and can be found on the DENIX web site.

DENIX includes another excellent resource, *Environmental Law for Department of Defense Installations Overseas* (written by Lt. Col. Richard Phelps, Chief of Environmental Law, HQ USAFE). This document consolidates discussions on environmental law into a single reference benefiting environmental managers, attorneys, and other professionals who have a need to understand and apply the complicated overseas requirements.

2.2.2.10 Using Other Directives (DoD Goals, AF Goals, MAJCOM Goals, Installation Goals, EPA Goals, and State Goals [or Special Programs])

(<http://www.denix.osd.mil>)

DoD Goals (<http://www.denix.osd.mil>)

DoD is exploring areas to determine effectiveness in complying with regulatory requirements. This is an evolving process. Current "Measures of Merit" that DoD is routinely tracking are:

- Notice of Violations (NOVs) - The number of new enforcement actions issued by a regulatory agency for non-compliance with an environmental law or statute. This is further broken down into the number of NOVs that remain open because they have not been closed by the regulatory issuing agency; the number of NOVs that are unresolved because action has not yet been completed to bring that situation into compliance; and the number of NOVs that have been closed out.
- Underground Storage Tanks - The number of underground storage tanks meeting the 1998 requirements for the prevention, detection, and clean up of releases as identified under Subtitle I of the Resource Conservation and Recovery Act.
- National Pollutant Discharge Elimination System Permits (NPDES) - Number of NPDES permitted wastewater systems, under the Clean Water Act, meeting permit requirements. This measure is being reviewed.
- Toxic Releases (needs to be research)
- Non-Hazardous Waste Disposal (needs to be research)
- Pesticide Usage (needs to be research)
- Installations typically establish their own objectives and targets to exceed those established by higher headquarters. The most benefit can be drawn from activities that focus on consistent performance goals and ensure that views of interested parties are considered. Contact your environmental flight chief to research what goals your installation has achieved in the past and what it plans for future years.

Air Force Goals

The Air Force Chief of Staff goals are defined in the Air Force Commander's Guide to Environmental Quality. See AFCEE P2 Toolbox for more details.

MAJCOM Goals

Contact your HMMP Team Leader, ECAMP Manager or MAJCOM/CEV for specific goals pertaining to your governing MAJCOM.

Installation Goals

Contact your HMMP Team Leader or ECAMP Manager for specific goals pertaining to your installation.

EPA Goals (<http://www.epa.gov/epahome/>)

Contact your ECAMP Manager, MACJOM/CEV, AFCEE REO, and PRO-ACT for specific goals pertaining to your installation.

State Goals (or Special Programs) (<http://www.epa.gov/epahome/>)

Contact your ECAMP Manager or AFCEE REO for specific goals pertaining to your state.

Section 2.3 Identify the Objective

Use the ECAMP Protocol Database to find your federal and state compliance and pollution prevention objectives for each type of media (e.g., air and water). Use the ECAMP protocol categories (and ACES-PM statutory authority codes, if appropriate) to translate these regulatory requirements into objectives. For example, see Table 2.3 below.

Table 2.3 Example of a Translated Objective

| Protocol Category | Regulatory Requirement | Objective |
|----------------------------|---|---|
| Wastewater Management (WA) | WA.25.2 Specific pollutants shall not be introduced into a POTW/FOTW (40 CFR 403.5(b)) | In no case will discharges with a pH below 5.0 be released. |

For a comprehensive list of Air Force objectives and metrics, see Appendix 3.

In addition, the AFCEE REOs provide consultation on federal and state statutes (including proposed legislation). Additional objectives may be researched by contacting the REOs and RECs governing the region for the installation. Contact information is available at <http://www.afcee.brooks.af.mil/> under the "Organizations" menu.

Section 2.4 Research and Set the Target

Targets should be practical, attainable, and measurable. The data should be economical to collect. Targets should be tracked for completion within a specific timeframe. See Table 2.4 below with a sample target added to an objective for wastewater management. Specific targets can be built upon the comprehensive list of objectives shown in Appendix 3.

Table 2.4 Example of a Target Added to the Objective

| Heading | Regulatory Requirement | Objective | Target |
|----------------------------|---|---|--|
| Wastewater Management (WA) | WA.25.2 Specific pollutants shall not be introduced into a POTW/FOTW (40 CFR 403.5(b)) | In no case will discharges with a pH below 5.0 be released. | Discharge containing a pH below 5.0 detected in less than 10% of the samples during the set period |

Section 2.5 Determine the Performance Indicator

Performance indicators should provide objective and verifiable data. They also should be practical, cost-effective, and technologically feasible.

Examples of performance indicators include:

- Quantity of raw material or energy used
- Quantity or toxicity of emissions or other wastes (e.g., Toxic Chemical Release Inventory [TRI])
- Quantity of waste produced per quantity of finished product
- Efficiency of material and energy use
- Number of environmental incidents or accidents
- Percentage of wastes recycled
- Percentage of supplies purchased with recycled-material content
- Specific pollutant concentrations emitted to land, air, or water
- Number of violations
- Investment in environmental protection

Specific performance indicators can be built upon the comprehensive list of objectives shown in Appendix 3.

Section 2.6 Select the Compliance Class and Pollutant Category

Along with statutory authorities comes a timeframe to get the facility back into compliance that the Air Force must meet before suffering adverse legal action. This timeframe will determine the compliance class into which the requirement falls. Both statutory authorities and compliance class weigh heavily in determining the overall project scope and execution timelines.

As illustrated in Figure 2.2.2.2, the compliance class identifies the priority EPA places on the type of project programmed. The compliance class is used to prioritize project requirements based on the status of regulatory compliance. Items entered into the ACES-PM Module are comprised of Operations and Services Requirements (O&S or “Level 0”), Level I Projects, and Level II Projects included in the FYDP, Presidents Budget, and in the Financial Plan (FinPlan). The definition of O&S items is found in AFI 32-7001 and OSD Class Definitions.

Records in the ACES-PM Module generally cover a period of at least eight fiscal years, which is the current year plus seven future years. Data in the first three future fiscal years should be updated continuously (at least quarterly) and is used by the MAJCOM and Air Staff to develop and document the annual Budget Estimate Submission (BES) and the annual Financial Plan (FinPlan). Data in the outyears (the last five) is used to develop estimates for the Future Years Defense Plan (FYDP) in accordance with the Program Objective Memorandum (POM). Execution year data is also used to support the semi-annual Budget Execution Reports (BERs) or unfunded requests. The updated ACES-PM Module records are the mechanism Air Staff uses for validation of MAJCOM funding requests. MAJCOMs use this programming mechanism for supporting base requests. Therefore, bases and commands that use the ACES-PM Module properly will find greater success and ease in advocating for funds in all Air Force budget processes.

Along with the statutory authority codes describing the laws driving a requirement, there are pollutant categories within ACES-PM used to delineate the nature of the work. There are a series of pollutant categories available for each Statutory Authority and a separate set available for all Statutory Authorities when an Operations and Services (O&S) record is entered. Again, the Pollutant Categories are not all-inclusive or always current. Therefore, a program manager must select one pollutant category that comes closest if an exact match does not exist. Reference [Media Table in ACES-PM Environmental manual](#).

Section 2.7 Assign the Tools

Four primary tools are available to identify the pollutant categories. To be fully operational, ensure processes are in place for budgeting, automated systems, information and publication management, coordination, checking and corrective action, and an environmental records management system.

The four primary tools are as follows:

- Man-hours
- Automated Systems
- Records (Storage and Retrieval)
- Information and Publications

2.7.1 Four Steps to Prepare and Assign the Tools

There are four steps available to identify the pollutant categories and they include:

Step 1: Assign formal, environmental responsibility and accountability

Step 2: Provide training, awareness, and ensure competence

Step 3: Establish communication linkages and document control

Step 4: Establish operational control

2.7.2 Estimating Methods

Methods to estimate the capacity of the tools at your installation: **Need to beef up.**

2.7.3 Man-Hours

Consider the activities of in-house labor resources. To ensure efficient use of in-house labor resources, managers must understand how much time in-house personnel spend performing specific activities. Based on the activity lists and definitions developed and used, managers need to determine the following:

- What activities employees plan to perform,
- What estimated level of effort will be dedicated to these activities, and
- What priority actions will be accomplished in the specific activities?

Performing this type of analysis helps managers understand what drives costs in an organization, whether the activities performed provide value to the organization, and which activities are most valued by the organization's customers. By performing this cost and value analysis, an organization will

better determine what it should be doing to provide internal and external customers the quantity and quality of products are needed to meet compliance and performance requirements.

Planning and collecting labor costs by activity does not need to be an arduous process. Labor costs can be traced to specific activities by estimating the percentages of time planned and/or worked in specific activities for each employee. Using a simple worksheet like the one in Table 2.7.3 for the Water Quality Manager allows each employee’s level of effort for specific activities to be estimated based on the activities identified in the planning process or in the execution process. These utilization summaries allow managers to better understand how activities and CAPP programs are consuming their labor resources. The tracking, compilation, and accounting of such a process could be simplified by a database.

Table 2.7.3 Labor Utilization--Water Quality Manager

| Planned (or Actual) Labor Utilization—FY00 QTR 1 | | | | | | | | | |
|---|-----|-------|------|----------|---------|-------|-------------------|-------------|-------|
| Compliance Activities | Air | Water | Lead | Asbestos | UST/AST | Radon | RCRA Corr. Action | OB/OD | Total |
| Audits/Assessments | | 15% | | | | | | | 15% |
| Reporting | | 10% | | | | | | | 5% |
| Record Storage | | 2% | | | | | | | 2% |
| Develop Studies, Surveys, Plans | | | | | | | | | |
| Plan Maintenance | | 10% | | | | | | | 10% |
| Sampling, Analysis & Monitoring | | 25% | | | | | | | 25% |
| Hazardous Waste Management & Disposal | | | | | | | | | |
| Training | | 5% | | | | | | | 5% |
| Planning | | 5% | | | | | | | 5% |
| Permit Maintenance | | 15% | | | | | | | 15% |
| Spill & Emergencies | | 5% | | | | | | | |
| Partnering | | 5% | | | | | | | 3% |
| Coordination | | 3% | | | | | | | |
| | | | | | | | | Grand Total | 100% |

Completion of the utilization summary will answer the first two questions above:

- What activities will employees plan to perform?; and
- What estimated level of effort will be dedicated to these activities?

The next question from a planning perspective is:

What priority actions will be accomplished in the specific activities?

This is the first step in building an action plan for in-house personnel by program or media area related directly to labor utilization. Not all program or media area actions need to be captured. For example, there are normal day-to-day management actions that are repetitive in nature (e.g., normal coordination, record storage, and management actions). However, there are priority actions related to specific activities that may involve contract preparation, stakeholder interaction, or specific program or media initiatives that should be tracked in an action plan.

2.7.4 Automated Systems

- The ECAMP Protocol Database
- ACES-PM Module
- AFCEE P2 Toolbox
- EMIS
- HMMS

2.7.5 Administration - Records (Storage and Retrieval)

Need for web-based administrative library for expedient document retrieval and stringent document control.

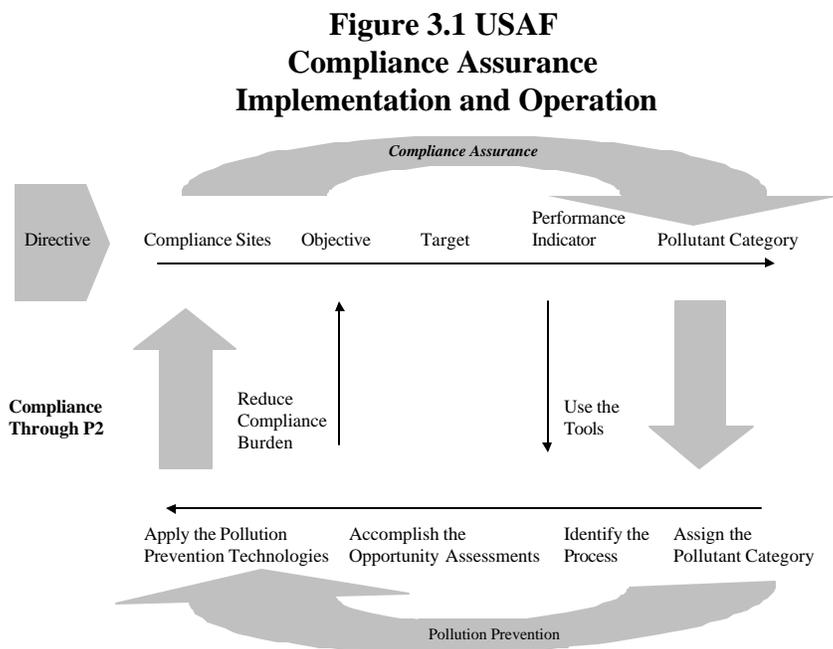
2.7.6 Other Direct - Information and Publications

- PRO-ACT Fact Sheets
- DENIX, P2 Toolbox
- HMIS (MSDS)
- Vendor supplied manuals
- Air University
- AFIT

Defense Services Environmental Training Courses CHAPTER 3

IMPLEMENTATION AND OPERATION

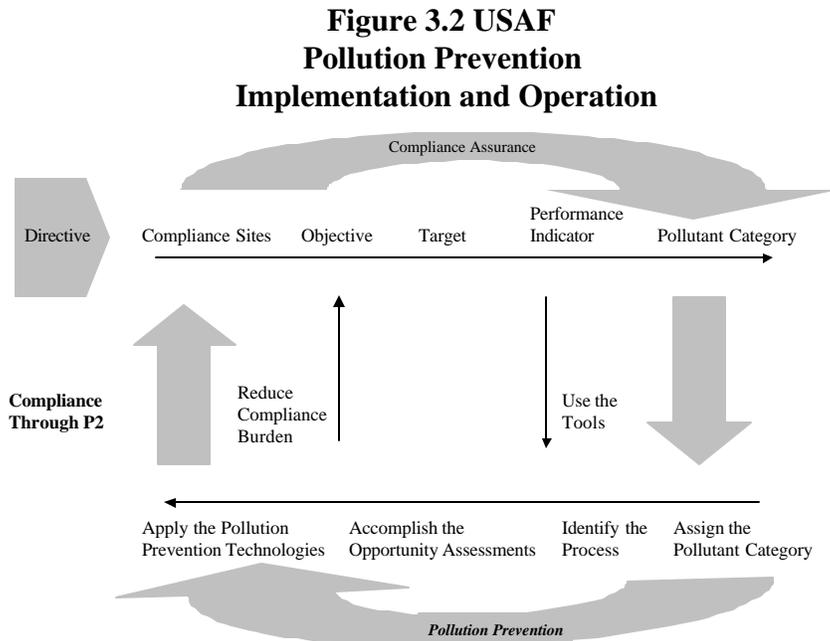
Section 3.1 Compliance Assurance



The goal of compliance assurance is to achieve and maintain immediate, full, and continuous compliance with all environmental requirements and to address past, present, and future threats to public health and the environment from Air Force operations and activities.

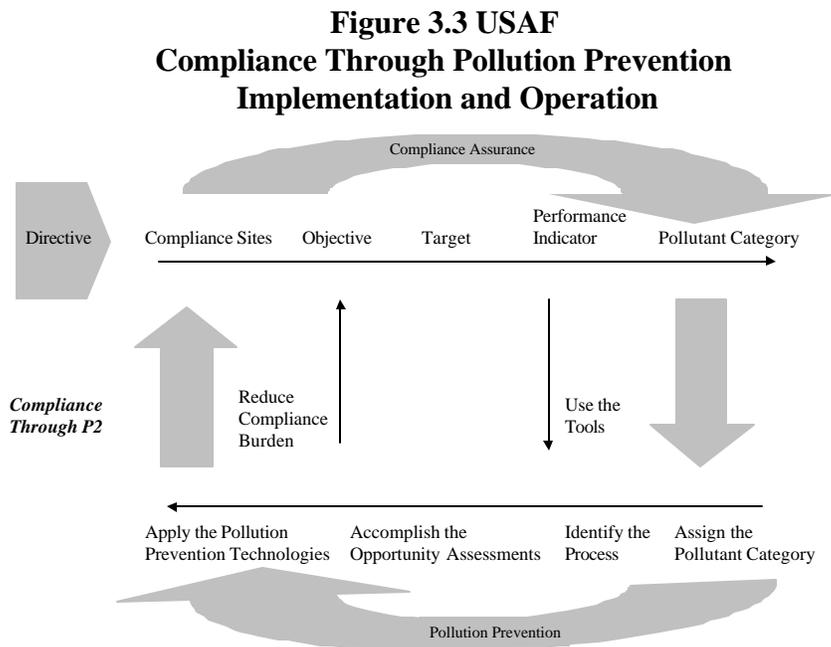
To implement and operate the installation compliance assurance program, use the Environmental Quality (EQ) Funding Guidance (1 Jul 99 AF/ILEV memo) in accordance with AFI 32-7001, Environmental Budgeting. Contact your MAJCOM/CEV to determine if supplemental guidance is available (e.g., Mar 99 AETC Environmental Planning, Programming, Budgeting, and Execution Handbook).

Section 3.2 Pollution Prevention



As shown in Figure 3.2, the Air Force will prevent pollution by reducing hazardous materials (HazMat) and releases of pollutants into the environment to as near zero as is technically and economically feasible. This will be done by applying the environmental management hierarchy, which begins with source reduction (e.g., chemical substitution, process change, and other techniques). The optimum time for implementing source reduction is during the design development phase. Where environmentally damaging materials must be used, their use will be minimized. When the use of hazardous materials cannot be avoided, the spent material or waste will be reused or recycled whenever possible. When spent material or waste cannot be reused or recycled, dispose of the spent material or waste as a last resort in an environmentally safe manner, consistent with the requirements of all applicable laws.

Section 3.3 Compliance Through Pollution Prevention (CTP2)



As shown in Figure 3.3, the purpose of the Compliance through Pollution Prevention (CTP2) process is to reduce both compliance costs, and operational and Environment, Safety, and Occupational Health (ESOH) risks. The CTP2 process supports Air Force efforts to fund projects that cost-effectively reduce pollutant generation and reduce risks even though they may not completely eliminate a specific environmental permit or compliance requirement. The CTP2 process also provides the Air Force with the ability to identify and track progress being made in reducing both compliance costs, and operational and ESOH risks. To proactively identify and address potential compliance vulnerabilities, the CTP2 process utilizes the environmental management hierarchy to preferentially apply cost-effective P2 solutions that achieve compliance while reducing total ownership costs (TOC), reduce risks as determined through the operational risk management (ORM) process, improve environmental and mission performance, and reduce any other compliance requirement. This combination of compliance costs, and operational and ESOH risks is referred to as the compliance burden.

The Air Force's investment strategy for CTP2 is to eliminate "compliance sites" and reduce compliance burden using a three-phase implementation process. AF/ILEV issued guidance on 8 Jan 99 to drive compliance through P2 solutions to eliminate compliance sites and lower the Air Force's overall compliance burden. Initial startup costs to execute this initiative will lead to reduced total

ownership costs (TOC) through lower compliance costs as well as decreased operational and ESOH risks.

3.3.1 Phase I: Compliance Site Inventory

3.3.1.1 Compliance Site Definition

In general, 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) federal, state, and local statutes and regulations; Executive Orders; DoD and Air Force policies; and OEBGD, FGS, and international agreements.

It should be noted, 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. In addition, 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.

Compliance sites include, but are not limited to:

- **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.
- **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).
- **Resource Conservation and Recovery Act (RCRA) Cleanup Sites:** Includes confirmed solid waste management units subject to a regulatory 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.
- **Underground Storage Tanks (USTs):** Includes all regulated USTs and connected piping to include regulated hydrant systems.
- **Above-ground Storage Tanks:** Applies to tanks with capacity of 660 gallons or larger.

- 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).
- Wastewater and Storm water: Includes National Pollutant Discharge Elimination System and/or permitted storm water outfalls; 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 storm water permits resulting from construction activities.
- Emergency Planning and Community Right-to-Know Act (EPCRA) Sites, 42 U.S.C. 11001-11050: Includes hazardous material storage sites exceeding reporting thresholds defined under SARA section 312.
- Pesticides: Includes all storage and mixing facilities operated by certified pesticide applicators.
- 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).
- Open Burn/Open Detonation: Includes RCRA Subpart X permitted or interim status sites.

Each compliance site is assigned a compliance site ID (identifier noted as Data Item #1 in the AFCEE/CCR-D automated reporting system). A unique compliance site identifier is composed of the installation code and regulatory driver as used in the ACES-PM Module, location identifier (e.g., building number), and a sequential number identifying each compliance site.

The compliance site definitions are not designed to be all inclusive. Installations may need to add regulated sites particular to a given location. Installations and MAJCOMs may choose to collect data outside the parameters of the compliance site definition in anticipation of new regulatory requirements. However, the compliance site inventory should only include compliance sites that are currently regulated. Do not report sites that are not regulated.

New or modified regulatory requirements may create or eliminate compliance sites. In addition, new or changed activities or processes may also create or eliminate compliance sites. The process described in AFI 32-7061, Environmental Impact Analysis Process, identifies compliance sites potentially

created or eliminated by new or changed activities or processes. It is important to review new installation NEPA documents for changes to the compliance site inventory. Installations should add compliance sites to the inventory, as necessary. Note: Though a compliance requirement may be eliminated, the affected compliance sites should remain in the inventory for record keeping purposes.

Please note that the ACES-PM User's Manual defines the environmental site ID as a unique identifier for environmental sites. Need to confirm that this number is the same as the compliance site ID.

3.3.1.2 Cost

While developing the compliance site inventory, installations will provide a rough order of magnitude estimate of annual compliance costs, considering all aspects of compliance. Compliance costs include, but are not limited to, permit, disposal, control equipment training, energy, as well as other operational and ESOH costs.

Cost data for Phase I will be available in the Environmental Tab of the ACES-PM Module. Refer to the ACES Business Practices Manual: Environmental Management and ACES-PM User's Manual: Environmental available from <http://cess.afit.af.mil/> (need to verify if and where Major George will place these documents).

3.3.2 Phase II: Compliance Site Prioritization

3.3.2.1 Compliance Cost Rankings

Following the initial Compliance Site Inventory, review and update the data to ensure it effectively manages the CAPP program. This is especially critical for geographically separated units (GSUs) (e.g., radar sites, co-located operating bases, satellite sites, and semi-active facilities) that may not have been fully included in the initial inventory.

Assess the relative compliance costs of each of the compliance sites. Compliance costs include, but are not limited to, permit, disposal, control equipment, training, energy, and other ESOH costs. Also consider the potential for changes in compliance requirements and more restrictive regulations, ESOH laws, and other regulations. The objective is to establish a relative ranking of installation compliance site costs from the highest to the lowest. One approach is to first identify the compliance sites with the highest and the lowest compliance costs. Rank order the remainder of the compliance sites by comparing their compliance costs to the highest and lowest costs and then to the compliance costs of those remaining sites. This can be achieved by employing the definitions of compliance cost categories listed below.

Relative Compliance Cost Category Definitions. Relative compliance cost category definitions are assigned to the existing costs of maintaining compliance at that compliance site, assuming that nothing has gone wrong or that no undesired events have occurred.

Highest -- Compliance site compliance costs in the top 20% of all individual installation compliance site compliance costs

High -- Compliance site compliance costs in the second 20% (21-40%) of all individual installation compliance site compliance costs

Medium -- Compliance site compliance costs in the third 20% (41-60%) of all individual installation compliance site compliance costs

Low -- Compliance site compliance costs in the fourth 20% (61-80%) of all individual installation compliance site compliance costs

Lowest -- Compliance site compliance costs in the lowest 20% (81-100%) of all individual installation compliance site compliance costs

3.3.2.2 Risk Assessment

Assess the risk that something could go wrong at a given compliance site. Employ the ORM thought process described in AFI 91-213, Operational Risk Management Program and Air Force Pamphlet 91-215, Operational Risk Management Guidelines and Tools to accomplish the risk assessment. This begins with identifying a realistic worst case scenario (or undesired event) for each compliance site. Then, assess the probability and severity of the realistic worst case scenario to determine the hazard category and risk level for that undesired event. Consider at a minimum, potential impacts on mission performance; the volume and toxicity of effluent; and potential or actual history of NOV's and ECAMP findings related to each effluent. To accomplish this assessment, employ Figures 3.3.2.2 (a) and (b) shown below.

Figure 3.3.2.2(a) ORM RISK ASSESSMENT MATRIX OF HAZARD CATEGORIES

| PROBABILITY CATEGORIES SEVERITY CATEGORIES | FREQUENT | LIKELY | OCCASIONAL | SELDOM | UNLIKELY |
|---|----------|--------|------------|--------|----------|
| CATASTROPHIC | 1 | 2 | 6 | 8 | 9 |
| CRITICAL | 3 | 5 | 7 | 10 | 15 |
| MARGINAL | 4 | 12 | 11 | 14 | 17 |
| NEGLIGIBLE | 13 | 16 | 18 | 19 | 20 |

Figure 3.3.2.2(b) Hazard Categories and Risk Levels

| Hazard Categories (Numerical Identification) | Risk Levels (Text Description) |
|---|-----------------------------------|
| 01 – 03 | Extremely High |
| 04 – 08 | High |
| 09 – 13 | Medium |
| 14 – 20 | Low |

Severity Category Definitions. Severity category definitions are used to describe the results of the occurrence of the realistic worst case scenario (or undesired event) at a given compliance site).

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

Critical -- Major mission degradation, major system damage, loss exceeding \$200K but less than \$1M, 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 \$10K but less than \$200K, 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 \$2K but less than \$10K, injury or occupational illness not resulting in a lost work day, or minimal environmental damage not violating law or regulation.

Probability Category Definitions. Probability category definitions are used to describe the probability of the occurrence of the realistic worst case scenario (or undesired event) of something going wrong at a given compliance site)

Frequent

Qualitative Definition -- Occurs often in the life of the system.

Quantitative Definition -- Probability of occurrence is greater than one in ten

Likely

Qualitative Definition -- Occurs several times in the life of the system.

Quantitative Definition -- Probability of occurrence is less than one in ten but greater than one in a hundred.

Occasional

Qualitative Definition -- Will occur in the life of the system.

Quantitative Definition -- Probability of occurrence is less than one in a hundred but greater than one in a thousand.

Seldom

Qualitative Definition -- Unlikely, but could occur in the life of the system.

Quantitative Definition -- Probability of occurrence is less than one in a thousand but more than one in a million.

Unlikely

Qualitative Definition -- So unlikely you can assume it will not occur in life of the system.

Quantitative Definition -- Probability of occurrence is less than one in a million.

3.3.2.3 Compliance Burden Identification

Using Figures 3.3.2.3(a) and (b) shown below, combine the risk assessment of each compliance site with the assessment of the relative environmental compliance costs to assign a compliance burden to each compliance site

Figure 3.3.2.3(a) ORM Compliance Burden Matrix of Compliance Sites

| COMPLIANCE COST CATEGORIES RISK LEVELS | HIGHEST (TOP 20%) | HIGH | MEDIUM (MIDDLE 20%) | LOW | LOWEST (BOTTOM 20%) |
|--|-------------------|------|---------------------|-----|---------------------|
| EXTREMELY HIGH | 1 | 2 | 6 | 8 | 9 |
| HIGH | 3 | 5 | 7 | 10 | 15 |
| MEDIUM | 4 | 12 | 11 | 14 | 17 |
| LOW | 13 | 16 | 18 | 19 | 20 |

Figure 3.3.2.3(b) Compliance Burden Categories and Levels

| Compliance Burden Categories | Compliance Burden Levels |
|------------------------------|--------------------------|
| 01 – 03 | Extremely High |
| 04 – 08 | High |
| 09 – 13 | Medium |
| 14 – 20 | Low |

Compliance Cost Categories and Risk Levels

Compliance cost categories -- Obtained from the assignment of relative cost categories which are defined in 3.3.2.1.

Risk levels -- Risk levels are obtained from the risk assessment of the compliance site realistic worst case scenario (or undesired event) which are defined in 3.3.2.2.

3.3.2.4 Prioritization

Assign each compliance site a priority by listing the sites in order of compliance burden (with the highest priority going to the sites with the greatest compliance burdens), utilizing the assigned hazard categories to discriminate between sites assigned the same compliance burden.

NOTE: The intent is that this prioritization effort be qualitative in nature, dependent upon the collective judgment of your team members. The methodology described above provides a thought process for arriving at this rank ordering of compliance sites. It relies on the collective judgment of the team members to assign the relative compliance cost categories to the compliance sites. It also relies upon the collective and subjective judgments of the members of your team to make the assessments of probability and severity of the identified realistic worst case scenarios. However, an installation team may be able to develop a rank ordering or prioritization of the compliance sites based on

compliance costs and risks without employing each step in this thought process. Installations will rely on the collective judgment of their teams to determine the level of rigor required to arrive at a rank ordering of the installation compliance sites that effectively reflects the relative compliance burden of the sites based on a combination of relative compliance costs and risk levels.

3.3.3 Phase III: Identify Cost-Effective P2 Solutions

This section contains a step-by-step approach that will assist MAJCOMs in defining the Phase III PSOA methodology. This information will be used as a basic standard for completing PSOAs.

Appendix 4 contains the revised compliance site inventory data requirements. The compliance site inventory data items have been renumbered to accommodate additional requirements. They have also been revised to consistently track compliance burden before, during, and after implementation of the P2 solution and to leverage resources, such as ECAMP protocol categories and the waste minimization activity codes from the 1995 RCRA biennial report. These RCRA codes are used annually by installations subject to TRI Form R reporting for source reduction and recycling activities. Appendixes 5–7 contain a sample PSOA worksheet, a process cost factor list, and an economic analysis to aid installations in completing smaller PSOAs. To aid installations in completing larger PSOAs, Appendix 8 contains an example for applying a weighted average of P2 solution costs to multiple compliance sites. Appendix 9 contains the waste minimization codes for source reduction and recycling activities to standardize the types of P2 solutions entered in the compliance site inventory. Appendix 10 contains several CAPP research web sites to aid installations in their PSOA research. Appendix 11 contains background material on cause and effect analysis with sample diagrams.

3.3.3.1 PSOA Assumptions

To ensure an installation can follow through on each step of the Phase III methodology, three assumptions were made:

- 1) The installation has completed all required data items under Phases I and II for all compliance sites linked to the PSOA process
- 2) The installation uses AF-EMIS to identify the process codes in the compliance site inventory; and
- 3) the installation has secured P2 solution funding from their respective MAJCOM to proceed with steps 14–16.

3.3.3.2 PSOA Methodology

Step 1: Select and Review Compliance Sites

If an installation is considering a PSOA, Air Force policy (8 Jan 99 Compliance Through P2 Implementation Guidance) states that each installation must select (at a minimum) the top 4 percent of those compliance sites not already evaluated for a possible P2 solution. In addition, the installation must review all compliance sites (regardless of burden category) in light of new technologies, process changes, regulatory amendments, or other changes for P2 solutions. It is important to note that this step must be accomplished in conjunction with the POM cycle.

Step 2: Group Compliance Sites

The 11–12 Apr 00 CTP2 workshop determined that in order to accomplish a PSOA, the select compliance sites from step 1 must first be grouped by process (either through the use of the AF-EMIS Shop Code or AETC process group), weapon system, location, or owner. AFMC field testing at Robins AFB has indicated that the compliance site inventory may not contain enough information to support an effective and efficient grouping of compliance sites due to the need to leverage other resources. Therefore, this step must be accomplished in an intuitive manner that meets the installation's needs.

Step 3: Prioritize Groups of Compliance Sites

The 11–12 Apr 00 CTP2 workshop determined that the PSOA groups must be prioritized on the basis of “local considerations” with emphasis placed on mission criticality, local regulatory climate, and compliance burden. The installation must determine that the compliance burden significantly outweighs the cost of a PSOA. This step may be highly subjective in nature to accommodate installation needs. PSOAs must address this prioritized list of site groups. *A placeholder for determining how to complete this step has been instituted to research this methodology in greater detail.*

Step 4: Identify PSOA Groups to MAJCOM

Unlike past PSOAs that were sometimes conducted “ad hoc” and without corporate coordination, installations must now identify the PSOA groups prioritized in step 3 to their governing MAJCOM/CEV for validation. In order to minimize any future duplication of effort, this step also applies to PSOAs currently being programmed through in-house or contract resources.

Step 5: MAJCOM to Coordinate PSOA Groups with AFCEE

In order to corporately manage and validate future PSOAs, all PSOA groups must be coordinated with AFCEE's PSOA central office before their execution. AFCEE will coordinate all PSOA groups with the MAJCOMs to determine how many other installations would benefit from a PSOA. The crossfeed of PSOA

results could easily be posted on the internet within AFCEE's existing P2 Toolbox.

Step 6: Assign Lead Installation

The 11–12 Apr 00 CTP2 workshop determined that if more than one MAJCOM has submitted a similar PSOA need to AFCEE in the same fiscal year, a lead installation to complete the PSOA would be assigned by consensus. The lead installation will then secure project funding from their respective lead MAJCOM to proceed with the execution of the PSOA as outlined in steps 7–13. If a PSOA is needed by more than one installation, a majority of the installations should contribute to the funding requirement and be included in the PSOA. By including more than one installation, a solution that is in the best interest of the Air Force can be determined. In some cases, what is beneficial for the lead installation may not work for other affected installations. Performing a PSOA on three installations in one effort may be less expensive than performing three separate PSOAs because the first solution was not practicable for the other two installations.

Step 7: Form a PSOA Team

For the lead MAJCOM and installation, the first step in executing a PSOA is to form a cross-functional PSOA team and decide if contractor or "in-house" support will be the method for completing steps 8–13. (This step is also referenced as build an OA team and team formation by other resources). *It is MAJCOM/CEVQ's responsibility, unless delegated to the installation, to assign a government PSOA technical lead with the authority and responsibility to form and facilitate a PSOA team through steps 7–16.* It is suggested that the PSOA technical lead duties include:

- Define time requirements for core team members (e.g., initially 1–2 weeks of full-time on-site effort with recurring in-progress reviews every 3–6 months thereafter for 1–2 years)
- Recognize that the team can be loosely formed and expanded depending on the level of technical input needed (i.e., management of the "in-house" PSOA team effort will follow the existing Environmental Protection Committee (EPC) P2 Subcommittee structure and Hazardous Material Management Process team membership)
Note: To facilitate interdisciplinary management review, the Air Force intends to convert existing Environmental Protection Committees at all levels of command to Environmental, Safety, and Occupational Health Committees (ESOHC) by 31 Dec 02. It is important to note that some MAJCOMs have already implemented the ESOHC structure (e.g., AETC).
- Define and facilitate training requirements for team members not familiar with CAPP (e.g., complete the four-hour Shop-Level Pollution Prevention training

course within AFCEE's Web University at:
<http://www.afcee.brooks.af.mil/eq/EET/webu.asp>)

- Ensure team members can commit to time and training requirements
- "Home" videotape, digitally snapshot, or flow chart the PSOA process to provide the PSOA team an opportunity to brainstorm ideas and begin applying the assembled background material during step 8

Suggested members of the PSOA team include:

- PSOA Technical Lead (more than likely a CE or LG representative with CAPP responsibilities)
- Unit Environmental Coordinator (if applicable)
- Bioenvironmental Engineer (BEE) Representative
- Ground Safety Representative
- Shop Workers
- Waste Management Representative
- Hazardous Materials Pharmacy Representative from LG or CE
- Process Owner or Operator (if not PSOA Technical Lead)
- Technical Order Representative (if process is directly controlled by a technical order)
- Cost Analyst to define total ownership cost using tools such as integrated computer aided manufacturing definition and activity based costing

Step 8: Pre-PSOA Background Development

Prior to examining the PSOA process, it is the PSOA technical lead's responsibility to gather and review all applicable background material and assemble it for team members to utilize throughout the PSOA. Valuable material may include:

- Compliance site data inventory for Phases I–III as shown in Appendix 4
- PSOA worksheets (refer to sample in Appendix 5 for smaller PSOAs)
- Existing PSOAs
- HazMat Reports
- Draft AFI 32-7080 CAPP
- Sample process cost factor list (refer to sample in Appendix 6)
- Model shop report for flightline maintenance, civil engineering, food services, pesticide reduction, retail services, and transportation (Reference: <http://www.afcee.brooks.af.mil/eq/resources>)
- Economic analysis tool from transportation model shop report (refer to sample in Appendix 7 for smaller PSOAs)
- Existing process information (e.g., technical orders, vendor literature, and MSDS)

Other issues for the PSOA technical lead to consider include:

- Determine the future of the process
- Determine if research is underway to improve or change the process (e.g., as one resource referenced in Appendix 10, solutions may be posted on the ESOH TPIPT web site at <http://xre22.brooks.af.mil/> as one of the Needs Assessment Summaries)
- Allocate time for team members to review contents of the PSOA binder
- Preview “home” videotape or digital snapshots of PSOA process during kickoff meeting
- As a final screening test, make a determination that collected information indicates that a PSOA is justified (i.e., yes or no)

Step 9: Examine the Process

After thoroughly reviewing all background material, the PSOA team must examine the PSOA process by developing an accurate process flow diagram of materials used and wastes generated for each process step. This step is also referenced as a process diagram by other resources with a sample PSOA worksheet shown as Data Collection Form #2 in Appendix 5. Data Collection Forms #1 and #5 contain supplemental information that can be used during the site visit and interview process. This worksheet can also be used for the next higher process level, applicable lower levels, and any ancillary and intermittent operations. During this step, the AF-EMIS Shop Code (Suggested Data Item 50), as shown in Appendix 4, must be completed for each compliance site linked to the PSOA process.

Step 10: Establish a Baseline

After examining the PSOA process, it is necessary for the PSOA team to establish a baseline for costs and quantities of materials used and wastes generated for each process step. This step is also referenced as non-product inputs and outputs defined by other resources with a sample PSOA worksheet shown as Data Collection Form #2 in Appendix 5. The PSOA team must define all assumptions and qualifiers for the PSOA process during this step. *A placeholder has been inserted into this step for tools being developed to estimate costs and risks for PSOAs of all sizes.* Appendix 6 contains a sample list of direct and indirect operating costs and capital costs, and Appendix 7 contains a sample economic analysis for smaller PSOAs.

As appropriate, the PSOA team must update Suggested Data Items 10–210, as shown in Appendix 4, in the compliance site inventory for all compliance sites impacted by the PSOA process. The other core Suggested Data Items (220–260) that must be populated in the compliance site inventory include:

- controlling T.O.
- compliance cost estimate (before P2 solution),

- compliance cost category (during compliance through P2 process),
- compliance risk level,
- compliance burden level, and
- projected hazard category

In addition, the compliance site status must be categorized “under evaluation for potential P2 solution,” which is referenced as Suggested Data Item 320.

In determining the compliance cost estimate (before P2 solution), it may be necessary to distribute the estimated costs of the P2 solution to all impacted sites using a weighted average. An example of how to apply this tool is illustrated in Appendix 8 for larger PSOAs.

Step 11: Cause and Effect Analysis

Once a baseline for the PSOA process has been established, the PSOA team must complete a cause and effect analysis. (This step is also referenced by the AFMC PSOA tool as the step to critically examine the multiple causes and effects that resulted in the PSOA). Appendix 11 contains cause and effect analysis sample diagrams. A determination must be made regarding why a particular chemical is being used or if there is a legal driver impacting the PSOA process. The PSOA team must define the threshold-level and objective-level requirements for the PSOA process before proceeding to the next step in identifying potential solutions. Without defining the PSOA process requirements, solutions cannot be identified to reduce or eliminate compliance burden.

Step 12: Identify Potential Solutions

The PSOA must identify potential solutions that can meet the threshold-level requirements of the PSOA process. (This step is also referred to as identify opportunities by other resources). For example, if a halon 1301 replacement in an Air Force Hush House cannot operate under extreme weather conditions (e.g., temperature range of -40° to 130° Fahrenheit), then it will no longer be considered a potential solution because it does not meet the threshold-level requirement.

A placeholder has been inserted into this step for tools being developed to estimate costs and risks for PSOAs. To identify P2 solutions score the possible solutions from least beneficial/matching (score of 1) to most beneficial/matching (score of 10), consider technical, economic, environmental, safety, and occupational health feasibility shown as Data Collection Form #3 in Appendix 5. The categories in determining economic feasibility can be further broken down by using the process cost factor list in Appendix 6. The PSOA team must define all assumptions for each potential P2 solution during this step.

As appropriate, the PSOA technical lead may interject step 8 of this PSOA process to apply background material. Solutions may be posted on the ESOH TPIPT web site at <http://xre22.brooks.af.mil/> as one of the Needs Assessment Summaries. Other possible sources of information include: SERDP, ESTCP, JG-PP, PEWG, HCAT, CTSC, JOCAST, JCAT, AFRL, etc.

If a solution is not readily identified, the PSOA technical lead must coordinate this issue with AFCEE, MAJCOMs with a similar PSOA process, the weapon system Single Manager (if process directly controlled by a technical order), and outside experts to solicit their input. If a contractor is accomplishing the PSOA, the PSOA technical lead must monitor the budget to determine if the level of effort past this step will exceed programmed dollars. A determination must be made that the PSOA team can adequately address the technical and economical feasibility of prioritizing the P2 solutions.

If the PSOA does not identify cost-effective P2 solutions, categorize the compliance site status as referenced in Suggested Data Item 320 of the compliance site inventory in Appendix 4 as “evaluated and accepted due to lack of cost-effective P2 solution.” The PSOA may be delayed by several years if additional funds must be allocated for outside experts or full-scale research and development. *For example, the Air Force Hush House Halon 1301 Alternatives Study identified a need to test water mist technologies at an approximate cost of \$4M and 4 years in delay of schedule.* In addition, the PSOA need must be coordinated by the ESOH TPIPT planning process to assess solution options.

Step 13: Prioritize Potential Solutions

Using the Data Collection Form #4 in Appendix 5, rank the potential solutions by totaling the feasibility scores from step 12 for each category. *A placeholder has been inserted into this step for tools being developed to prioritize potential solutions by ROI and TOC.* The potential solutions are ranked after totaling the feasibility scores from step 12 for each category. If two solutions are close in total score, additional feasibility categories from step 12 may be added to differentiate their rank.

Assuming that a cost-effective P2 solution can be readily identified, the PSOA team must complete all necessary forms (e.g., if a technical order change is required, complete the AFTO Form 22 Technical Order Change Form as referenced in the AETC Shop-Level Pollution Prevention Training Manual at http://www.afcee.brooks.af.mil/eq/p2toolbox/Tool_Index.asp). The PSOA team must work together in drafting an outline to justify funding from the MAJCOM. In conjunction with the POM cycle, the PSOA technical lead must populate the compliance site inventory for the projected compliance cost estimate (after P2 solution identified) and the project number. These requirements are shown in Appendix 4 as Suggested Data Items 270 and 330, respectively.

The PSOA team must work together in drafting an outline to justify funding from the MAJCOM. In conjunction with the POM cycle, the PSOA technical lead must populate the compliance site inventory for the projected compliance cost estimate (after P2 solution identified) and the project number. These requirements are shown in Appendix 4 as Suggested Data Items 270 and 330, respectively.

To determine the projected hazard category, projected risk level, compliance burden cost category and burden level (projected following implementation of P2 project for Suggested Data Items 280–310 in Appendix 4), it may be necessary to distribute the estimated costs of the P2 solution to all impacted sites using a weighted average. An example of how to apply this tool is illustrated in Appendix 8 for larger PSOAs.

After securing a project number, the PSOA technical lead (or designated alternate) must debrief the installation's governing MAJCOM of the PSOA findings. If the findings are noteworthy, the PSOA technical lead may also provide an abstract to AFCEE for possible presentation at a Joint Service P2 & Hazardous Waste Management Conference held annually in San Antonio, TX.

Step 14: Implement Selected Solution

Assuming the installation has secured P2 solution funding from their respective MAJCOM, the installation is now obligated to implement the selected solution unless conditions for implementation have significantly changed since step 13. This step is also referenced as action plan by other resources. Since a P2 solution may take time to implement, any interim fixes should be undertaken while the long-term changes are being worked through its implementation (e.g., HMRPP). The PSOA team must complete all necessary forms (e.g., if a technical order change is required, complete the AFTO Form 22 Technical Order Change Form as referenced in the AETC Shop-Level Pollution Prevention Training Manual at http://www.afcee.brooks.af.mil/eq/p2toolbox/Tool_Index.asp). If implementation is not feasible, the installation will coordinate this issue with their respective MAJCOM.

The PSOA technical lead has the responsibility to organize a PSOA implementation team that closely matches the functional areas of the original team members from steps 7–13. It is the PSOA team's responsibility to monitor the implementation of the P2 solution and ensure that process personnel are trained in how to work with any new equipment and processes impacted by the P2 solution.

In determining the waste minimization activity codes (Suggested Data Item 390 in Appendix 4), refer to Appendix 9. If the P2 solution directly benefits a TRI chemical at the installation during a reporting year, ensure that all source reduction activity codes are reported in section 8.10 of the EPA Form R.

After implementing the P2 solution, categorize the compliance site status (Suggested Data Item 320 in Appendix 4) in the compliance site inventory as “reduced” or “compliance requirement eliminated.”

Step 15: Review Results and Update ACES-PM Module and Compliance Site Inventory

Following implementation of the P2 solution, the installation has one year to conduct a thorough review of their results. This step is also referenced as evaluate solution by other resources.

The PSOA technical lead has the responsibility to organize a PSOA review team that closely matches the functional areas of the original team members from steps 7–14. To determine the actual compliance cost estimate, actual hazard category, actual risk level, compliance burden cost category, and compliance burden level (following implementation of P2 project for Suggested Data Items 340–380 in Appendix 4), it may be necessary to distribute the estimated costs of the P2 solution to all impacted sites using a weighted average. An example of how to apply this tool is illustrated in Appendix 8 for larger PSOAs. In addition, the installation must review the P2 solution on an annual basis and revise Suggested Data Items 340–380 as appropriate.

After reviewing the P2 solution, categorize the compliance site status (Suggested Data Item 320 in Appendix 4) in the compliance site inventory as “reduced” or “compliance requirement eliminated.”

Step 16: Communicate Lessons Learned

The installation must communicate any PSOA lessons learned to at least their respective MAJCOM in the form of a technical paper, briefing, or cross-feed session. A determination must be made if the PSOA methodology was robust enough in meeting the needs of the installation. If significant cost savings were realized, the installation may provide an abstract to AFCEE for possible presentation at the Joint Service P2 & Hazardous Waste Managers Conference.

3.3.3.3 PSOA Issues

Listed below are summaries of the cost areas for PSOAs. All need further definition and refinement. Cost definition is an action item from the 11–12 Apr 00 CTP2 workshop.

Step 10 Compliance Cost Estimate (before the P2 solution is identified) –

- determine the cost of the process as it exists today
- distribute the cost among the compliance sites that are part of the process

Step 13 Projected Compliance Cost Estimate (after the P2 solution is identified) –

- project the cost of the process as it will be after the identified P2 solution is accomplished
- distribute the cost among the compliance sites that are part of the process

Step 15 Actual Compliance Cost Estimate (after the P2 solution) –

- determine the cost of the process as it is after the selected P2 solution has been implemented
- distribute the cost among the compliance sites that are part of the process

Draft AFI 32-7080, Figure 4.2 clearly shows two avenues for P2 solutions; one is by the HMRPP, and the other through a traditional OA. This approach, however, appears to be too simplified. The magnitude of the PSOA most likely will encompass compliance sites in both categories, not just one. Since a PSOA is accomplished on a process, not a single compliance site, this figure begins at a detailed level, ignoring the process level. It should be redrawn to include the PSOA steps that lead up to the examination of the individual compliance sites.

This section of the Guide is intended to include examples; however, we are not including any examples until it is closer to its final form.

CHAPTER 4

CHECKING AND CORRECTIVE ACTION

Section 4.1 MEASURING AND MONITORING ONGOING PERFORMANCE

As stated in section 5.1 of Draft AFI 32-7080, environmental performance evaluation is an ongoing process. Installation EPCs/ESOHCs shall measure and monitor the performance of their CAPP efforts on a regular basis. They will also initiate corrective and preventive actions to ensure continuous improvement of the CAPP program.

Measuring and monitoring CAPP efforts enables the installation EPC/ESOHC to:

- Gauge the environmental performance
- Analyze root causes of problems (see Step 11 of Chapter 3's Phase III PSOA methodology and Appendix 11)
- Identify areas where corrective or preventive action is needed
- Improve performance and increase efficiency on a continual basis

5.2. Checking Tools: (examples include)

5.2.1. Installation ECAMP Audits. AFI 32-7045, Environmental Compliance Assessment and Management Program (ECAMP) provides documented ECAMP audit procedures. Installations perform ECAMP audits and develop corrective actions for all non-compliance findings. In addition, ECAMP teams can assess progress in reducing the compliance burden.

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. Report findings may support continuous improvement of the CAPP program.

5.2.3. Program Management Reviews (PMR). PMRs will examine MAJCOM CAPP program performance to ensure investments are being made to reduce compliance burden within the context of minimizing TOC within acceptable levels of risk.

5.2.4. P2 Reporting. MAJCOMs and installation EPCs (or ESOHCs) will monitor and report progress toward achieving P2 goals, as required.

5.3. Corrective Actions:

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

5.3.2. ECAMP identified compliance deficiencies are to be resolved using P2 as the preferred solution. Installation EPCs (or ESOHCs) monitor compliance deficiency resolution.

An effective measurement program consists of the following attributes:

- Simple
- Flexible
- Consistent
- Ongoing
- Results communicated
- Reliable data produced

Monitor key characteristics of operations and activities that can have significant environmental impacts. CAPP performance can be measured in the following areas:

- Total plant site emissions (tons per calendar year)
- Energy consumption (BTU per heating/cooling degree-day)
- Hazardous materials usage (pounds per calendar year)
- Hazardous waste generation (pounds per calendar year)
- Hazardous waste diversion (pounds per calendar year)
- Solid waste generation (pounds per calendar year)
- Solid waste diversion (pounds per calendar year)

Track performance to determine how well you meet your objectives and targets. Consider using the EMSAT checklist of 12 ISO 14001 topics available at <http://www.afcee.brooks.af.mil/EQ/EQhome.asp>. The checklist provides a “score” indicating how well all levels of management are performing its environmental management responsibilities relative to a predetermined standard.

An effective monitoring program should:

- Identify the problem
- Identify the cause and effect (see Appendix 11)
- Come up with a solution
- Provide a process to implement the solution
- Provide a process to document the solution
- Provide a method to communicate the solution

Section 4.2 PERFORM CORRECTIVE AND PREVENTIVE ACTION

Establish and outline the process for identifying, documenting, analyzing, and implementing preventive and corrective actions. Preventive and corrective actions may be initiated for any environmental or CAPP problem affecting the organization. Reference AFIA, AFAA, PMRs, and P2 reporting?

4.2.1 General

Corrective action is generally a reactive process used to address problems after they have occurred. Corrective action may be triggered by a variety of events, including internal audits and management reviews. Other items that might result in a corrective action include neighbor complaints or results of monitoring and measurement.

Preventive action is generally a proactive process intended to prevent potential problems before they occur or become more severe. Preventive action is initiated to identify negative trends and to address them before they become significant. Events that might trigger preventive action include monitoring and measurement, trends analysis, tracking of progress on achieving objectives and targets, response to emergencies and near misses, and customer or neighbor complaints, among other events.

The office assigned the responsibility reviews the issues affecting CAPP, the application and maintenance of this procedure, and any updates to CAPP documents affected by the preventive and corrective actions. In addition, they are responsible for logging the preventive and corrective actions, and tracking and recording submission of solutions in the database. The requestor and recipient of these actions are responsible for verifying the effectiveness of the solution. They are also responsible for overall tracking and reporting on preventive actions.

Personnel receiving preventive and correct actions are responsible for instituting the required corrective or preventive action, reporting completion of the required action, and assuring sustained effectiveness.

Completed records of preventive and corrective actions are maintained for at least two years after their completion.

Placeholder for inserting text from Section 13 of KFI)

4.2.2 Procedures

Issuing a Corrective or Preventive Action

A corrective or preventive action may be requested by any employee. The employee requesting this action is responsible for bringing the problem to the attention of the responsible office. Responsibility for resolving the problem is assigned to a specific individual (the “recipient”) with a due date.

Determining and Implementing Corrective and Preventive Actions

Corrective and preventive actions are issued to the recipient, who is responsible for investigation and resolution of the problem. The recipient is also responsible for communicating the corrective or preventive action taken.

If the recipient cannot resolve the problem by the specified due date, the recipient is responsible for negotiating a new due date.

Tracking Corrective and Preventive Actions

Corrective and preventive actions whose resolution dates are overdue appear on a report. The responsible office issues this report on a weekly basis to the responsible authority and to the recipient of any overdue Notices. Records of notices are maintained for at least two years after the completion of the corrective or preventive action.

Tracking Effectiveness of Solutions

The recipient of a corrective or preventive action and the requestor are responsible for verifying the effectiveness of the solution. If the solution is deemed not effective, the CAN or PAN will be reissued to the original recipient.

Section 4.3 CAPP RECORDS AND INFORMATION MANAGEMENT

The implementation of an effective Records and Information Management procedure results in the ability to achieve cost-effective solutions to environmental compliance objectives and is an excellent tool for identifying opportunities for pollution prevention. As specified in AFI 32-7002, Environmental Information Management System, AFI 37-122, Air Force Records Management Program, and AFI 37-138, Records Disposition, a good records and information management procedure will:

- Provide one definitive, easy-to-find location where each distinct source of data is stored;
- Keep data density to a minimum (i.e., data is periodically reviewed, revised, and approved to discard obsolete versions);
- Focus on the output of information (e.g., web-based distribution of reports);
- Ensure data is legible, identifiable, dated, and retrievable; and
- Assign responsibility for the creation and modification of document

Documents archived for legal purposes or knowledge preservation will be identified and maintained in accordance with AFRD 37-1, Air Force Information Management.

CHAPTER 5

MANAGEMENT REVIEW

Section 5.1 DETERMINE THE SCOPE OF THE MANAGEMENT REVIEW

The review of CAPP requirements and efforts should be broad enough in scope to address the environmental dimensions of all activities, products, and services of the installation. This should include their impact on cost of operation and mission performance as measured against the DoD, USAF, MAJCOM, and installation environmental policy. Management reviews are used to demonstrate top management's ongoing support for the environmental program. The management review should assess how changing circumstances might influence the suitability, effectiveness, or adequacy of your CAPP. Changing circumstances may be internal to your installation (e.g., new facilities, new materials, changes in products or services, or new customers) or may be external factors (e.g., new laws, new scientific information, or changes in adjacent land use). As CAPP is reviewed, consider how it will be integrated into the overall installation management and strategy and take into account other organizational plans and goals.

Compliance Management Program Elements (adapted from EPA's final policy statement on self-auditing: 22 Dec 95):

- Organization policies and standards that describe how employees are to meet the regulations
- Assignment of responsibility for compliance oversight
- Processes to systematically ensure that policies and standards are carried out (e.g., monitoring and auditing)
- Appropriate incentives and disciplinary procedures
- Prompt disclosure of findings
- Prompt and appropriate correction of problems

5.1.1 Key Personnel

The Management Review process is intended to provide a forum for discussion and improvement of CAPP and to provide management with a vehicle for making any changes to CAPP necessary to achieve the organization's goals. Two types of key personnel should be involved in management reviews: personnel with the right information or knowledge, and personnel with the authority to make a decision. Although some pilot programs have held senior management reviews in conjunction with EPC meetings, the installation must raise the profile of its environmental program

to the absolute highest level of executive leadership at each installation. The chairperson for the CAPP management review must be the installation's top manager. The highest-ranking senior managers from every primary tenant organization must also participate and actively engage in management reviews. The EPC/ESOHC chair (typically the installation vice commander) will brief the CAPP chair and senior managers in this forum.

5.1.2 Documentation

The purpose of the Management Review procedure is to document the process and primary agenda of issues to be included in the Management Review meetings for evaluating the organizational status of CAPP. Each review should include a document or briefing following a process flow that describes which issues were discussed, what decisions were made, and what actions were taken. All Management Reviews must be documented.

EO 12088, Environmental Management Review (EMR), offers suggested disciplines upon which the review can be focused. The seven EMR disciplines are listed below (along with the CEMP and ISO 14001 Sections) from Phase 3 of the *Generic Protocol for Conducting Environmental Audits of Federal Facilities* (EPA Environmental Management Review Policy and Guidance for Federal Facilities). While the wording of the EMR disciplines and the elements of the CEMP and ISO 14001 are not identical, the similarities are significant.

- Organizational Structure (CEMP Principle 1 and ISO 14001 Section 4.4)
- Environmental Commitment (CEMP Principle 1 and ISO 14001 Section 4.2)
- Environmental Planning and Risk Management (CEMP Principles 2 & 3 and ISO 14001 Sections 4.3 & 4.4)
- Staff Resources, Training, and Development (CEMP Principles 2 & 3 and ISO 14001 Sections 4.3 & 4.4)
- Formality of Environmental Programs (e.g., P2, auditing, and compliance) (CEMP Principles 2 & 3 and ISO 14001 Sections 4.2, 4.4, & 4.5)
- Internal and External Communication (CEMP Principle 3 and ISO 14001 Section 4.4)
- Program Evaluation, Reporting, and Corrective Action (CEMP Principles 3 & 5 and ISO 14001 Sections 4.5 & 4.6)

Section 5.2 PERFORM THE MANAGEMENT REVIEW

The level of detail addressed by the review may be based on the interval between meetings. At a minimum, each Management Review meeting will consider the following:

5.2.1 Evaluate the Suitability, Adequacy, and Effectiveness of CAPP

Evaluate the suitability, adequacy, and effectiveness of CAPP by considering:

- changing legislation
- changing expectations and requirements of interested parties
- changes in the products or activities of the organization
- advances in science and technology
- lessons learned from environmental incidents
- market preferences
- reporting and communication

Some issues to consider in the review of CAPP:

1. Is the system working (i.e., is CAPP suitable, adequate, and effective)?
2. Has CAPP implementation enhanced public and/or regulatory perception of the installation?

5.2.2 Staff Training

The review should determine the suitability, adequacy, and effectiveness of staff training efforts. Need to determine how training will be conducted (i.e., in-house versus contractor). Need to determine if Air Force will provide video/computer-based training.

5.2.3 Framework for Objectives and Targets

Evaluate the suitability, adequacy, and effectiveness of the environmental objectives and target.

5.2.4 Documentation

Document the status of corrective and preventive actions and results of any action items from the previous Management Review meeting.

Section 5.3 CONTINUAL IMPROVEMENT

Management review of the CAPP should be a day-to-day activity and not conducted exclusively in recurring meetings (e.g., EPC/ESOHC meeting). In fact, it should be fully integrated into core business practices utilizing a full cost accounting system such as activity-based costing for determination of Total Ownership Costs (TOC). The bottom line of CAPP implementation is to ensure the environmental management profile is raised to the same level of other high priority business operations. In addition, this allows management to continually evaluate the environmental performance of the CAPP against its environmental policies, objectives, and targets to identify opportunities of improvement.

Formal management reviews must be conducted at regular time intervals (e.g., monthly, quarterly, or annually) to complement the day-to-day activities of CAPP implementation and installation management. At a minimum, they should be held annually and combined with other meetings (e.g., installation commander meeting with primary tenant directors). Based on the Robins AFB EMS pilot program, quarterly meetings were deemed to be the appropriate time interval. Senior management benefits from this type of recurring forum. They are offered an opportunity to openly discuss if environmental risks are being managed effectively to match changing business needs and if the installation is achieving improvement in environmental performance.

Appropriate steps to address continual improvement include:

- Develop procedures to address the root cause of current deficiencies and prevent future deficiencies (refer to Appendix 11 that was also used in the Phase III PSOA methodology);
- Develop a “lessons learned” program to educate personnel;
- Develop partnerships with other organizations, particularly those considered “best in class,” to effectively conduct inter-organizational comparisons; and
- Encourage suggestions for improvement from all personnel

The installation commander is best suited for providing direct feedback to the MAJCOMS on changing Air Force policies. The approach used in providing feedback to the MAJCOMs and policy makers depends on the significance of the changes recommended by the CAPP management review team and whether the installation commander decides to delegate this action to another organization.

Overall Comments/Suggestions/Questions for CAPP Guide

- In order to facilitate a comprehensive review of this Guide, recommend that latest draft of 32-7080 be included in Appendix (will not be available from AF Pubs web site until it is approved by HQ USAF)
- Confirm whether ISO 14001 should be introduced in Preface or in section 1.1.

- Facilitate CAPP conference call with MAJCOM/CEVs, AF/ILEV, and SAF/MIQ (Lt Col John Coho) to solicit their input prior to delivery of this document as a final draft deliverable (Yes. After 1 Nov 00 internal review by AFCEE/EQP)
- Insert more descriptive figures for budgeting (ref. ACC Environmental Symposium briefings from last two years)
- Insert descriptive figure for ECAMP location categories
- Determine if Major George will host the ACES-PM User's Manual: Environmental and ACES Business Practices Manual: Environmental Management on the AFIT web site.
- Include comments from Renee Roberts, URS Radian consultant for ANG
- Reference ACES-PM in PSOA Methodology in addition to CSIs?
- Robert Leong commented that Osan and Kunsan Air Base may not have guaranteed access to the internet to download some of these references. May need to mention that copies of all references may be provided by AFCEE.
- Reference page 30 of the ACES-PM User's Manual (only reference to Environmental Site ID)
 - Question 1: The "Environmental Site ID" is vaguely defined as "a unique identifier for environmental sites." Is this ID the same as the Compliance Site Inventory (CSI)'s Compliance Site ID (Data Item 1) from AF/ILEV's memo dated 8 Jan 99 (available on DENIX at <http://www.denix.osd.mil/denix/DOD/Policy/AF/Letters/toc.html>)? The Compliance Site ID is defined as a "unique compliance site identifier that is composed of the 4 –digit installation code and 4-digit sequential."
 - Question 2: Assuming that the Environmental Site ID is the same as the Compliance Site ID, could the ACES-PM programmers change the name of the Environmental Site ID to Compliance Site ID and define it as an "unique compliance site identifier that is composed of the 4 –digit installation code and 4-digit sequential"? This will eliminate the need to do a data conversion when all Compliance Site IDs are loaded into ACES-PM. In addition, users will not be confused over what the definition of a site ID is. A huge benefit as this tool is fielded throughout the Air Force. The developers of ACES-PM may not understand AF/ILEV's Compliance Site Inventory Access database since it is an environmental database not already part of ACES.

Appendix 1

Environmental Quick Reference List

1. The Internet site <http://www.access.gpo.gov/nara/cfr> is a searchable database of all CFRs and the Federal Register. Full text of CFR Title 40: Protection of Environment is retrievable by chapters, subchapters, and parts in portable document format (pdf).
2. The Internet site <http://www.denix.osd.mil/denix/Public/Legislation/legislation.html> also contains all current Executive Orders, Proposed Rules, EPA Regulations & Legislation (with a quick search feature), and a link to all AF Policy Directives and Instructions (AFIs).
3. The Internet site <http://afpubs.af.mil> provides access to all 32 Series Civil Engineering and Environmental Program AFIs.
4. The Internet site <http://www.epa.gov/epahome/rules.html> contains the Federal Register for all environmental documents, full text of CFR Title 40: Protection of Environment, and a link to State Government regulations.
5. The REG-Trieve® State and TEAM Libraries are in CD-ROM format. They contain the TEAM Guide, Air Force and Army Supplements, ANG Supplements, 29 Code of Federal Regulation (CFR) and 40 CFR citations and text. The CD-ROMs are searchable for all Federal and State regulations by citation. These CDs are provided by HQ AFCEE, through REG-Trieve® at no cost to the installation or MAJCOM. The CDs are updated quarterly with all current TEAM component and state supplement information.
6. Copies of the TEAM Guide (referenced as U.S. TEAM Guide in DENIX), Air Force Supplement for TEAM Guide, State Supplements for the TEAM Guide, OCONUS Compliance Assessment Protocols – OEBGD, and the listed FGS are located on the Defense Environmental Network & Information eXchange (DENIX) web site at <http://www.denix.osd.mil>. The TEAM Guide combines the Code of Federal Regulations (CFRs) and management practices (MPs) into checklists that show legal requirements and the specific operations or items to review. The TEAM Guide is supplemented by component-specific manuals detailing regulations and policies.
7. DoD Instructions can be downloaded from DENIX at <http://www.denix.osd.mil> (Policy->DoD->DoD Instructions & Directives).
8. Air Force Policy Memos can be downloaded from DENIX at <http://www.denix.osd.mil/denix/DOD/Policy/AF/Letters/toc.html> (Policy->Air Force-> Letters of Instruction).

9. Additional information regarding the ACES-PM Module can be found at <http://www.afcesa.af.mil/Directorate/CEO/Automation/ACESWeb/ACES.HTM>.

10. Listed below are Air Force Instructions (AFIs) and Air Force Policy Directives (AFPDs) with applicability to CAPP programs. For complete information, see <http://afpubs.hq.af.mil/>.

AFI 32-1002, Facilities Lead-Based Paint Hazard Management
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 32-4002, Hazardous Material Emergency Planning and Response Compliance
AFI 32-7001, Environmental Budgeting
AFI 32-7002, Environmental Information Management System
AFI 32-7005, Environmental Protection Committees
AFI 32-7006, Environmental Program in Foreign Countries
Draft AFI 32-7080, Compliance Assurance and Pollution Prevention
AFI 32-7040, Air Quality Compliance
AFI 32-7041, Water Quality Compliance
AFI 32-7042, Solid and Hazardous Waste Compliance
AFI 32-7044, Storage Tank Compliance
AFI 32-7045, Environmental Compliance Assessment and Management Program
AFI 32-7047, Compliance Tracking and Reporting
AFI 32-7086, Hazardous Materials Management
AFPD 23-3, Energy Management
AFI 48-119, Medical Service Environmental Quality Programs
AFI 63-118, Civil Engineer Research, Development, and Acquisition
AFPD 90-3, Environment, Safety, and Occupation Health
AFI 91-213, Operation Risk Management Program
AFI 91-215, Operational Risk Management Guidelines and Tools

APPENDIX 2

ENVIRONMENTAL AUTHORITIES

. L. Fronimos
HQ AFCEE/JA
1 July 1999

This listing is simply a source for quick reference to various environmental authorities. It is not intended to be inclusive of all policy and guidance letters. All statutes are in bold. Topics are arranged alphabetically. If time permits, Greg Fronimos will provide an updated Appendix 2 of environmental authorities within the next six months. Suggest putting this appendix 2 on the AFCEE Web Site (i.e., within the P2 Toolbox under ECAMP Regulatory Drivers).

Abandoned shipwrecks

Abandoned Shipwrecks Act of 1987, 43 U.S.C. § 2101

Above ground storage tanks

See storage tanks, *infra*

Administrative procedures

Administrative Procedure Act (APA), 5 U.S.C. § 7

EO 12146, Interagency Legal Disputes

Air conformity determination

Clean Air Act § 126

Air emissions

Clean Air Act, Titles I & II

40 CFR 50, National Primary & secondary ambient air quality standards

40 CFR 53-58, 69-71

40 CFR 60, Standards of Performance for New Stationary Sources

40 CFR 61, National Emission Standard for Hazardous Air Pollutants

40 CFR 70, State Air Permitting Program

40 CFR 80, Regulation of Fuels & Additives

40 CFR 80, Thermal Processing of Solid Wastes

40 CFR 93, Conformity of Federal Actions to SIP

EO 11738, Providing for Administration of CAA, 10 Sep '73

EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct '78, as amended by EO 12580, 23 Jan '87

EO 12843, Procurement Requirements & Policies for Federal Agencies for O3-depleting Substances, 21 Apr '93

EO 12844, Alternative Fueled Vehicles

EO 12856, Fed compliance with Right to Know Requirements, 3 Aug '93

EO 12969, Fed Acquisition & Right to Know, 8 Aug '95
EO 13031, Federal Alternative Fueled Vehicles, 13 Dec 1996
AFI 32-7040, Air Quality Compliance, 9 May '94
AFI 48-119, Medical Services Environmental Quality, 25 Jul '94
DoD Dir. 4120.14, Environmental Pollution Prevention and Abatement, 30 Aug 1977
DoD Dir. 6050.9, CFCs & Halogens, 13 Feb 1989
AF Ban on Purchases of Ozone Depleting Chemical (ODCs), SECAF & AF Chief of Staff, 7 Jan '93
USAF Conformity Guide, HQ USAF/CEV, Aug 1995

Air Installation Compatible Use Zone Program (AICUZ)

Noise Control Act (NCA), 42 U.S.C. § 4901, *et seq.*

Aviation Safety & Noise Abatement Act, 49 U.S.C. § 2101

32 CFR 256, AICUZ Zones

DoD Dir. 4165.57, AICUZ, 8 Nov 1977

AFI 32-7063, Air Installation Compatible Use Zone Program, 1 Oct 1998

Schaefer, AICUZ article, 31 A.F.L. Rev. 165 ('89)

Air pollution / particulate matter

See **CAA**, *infra*

American Indian issues

See Native American issues, *infra*

Animal damage

Animal Damage Control Act, 7 U.S.C. § 426

EO 11643, Environmental Safeguards on Activities for Animal Damage Control on Federal Lands

Animal conservation

See Fish and wildlife, *infra*

Anti-Deficiency

Anti-Deficiency Act, 31 U.S.C. § 1341

AFR 177-16, para. 40c

FAR 32.703-2

61 Comp. Gen. 184

60 Comp. Gen. 440

60 Comp. Gen. 523

Kopel, ADA: Deficient Excuse for Federal Violation of Environmental Laws, 23 ELR 10481

Hanash, Effects of ADA on Federal Compliance with Hazardous Wastes Law, 18 ELR 10541

Antiquities / archaeological resources

Antiquities Act of 1906, 16 U.S.C. §§ 431-433

Archaeological and Historical Preservation Act of 1974 (Reservoir Salvage Act),

16 U.S.C. §§ 469-469c

Archaeological Resources Protection Act of 1979 (ARPA), 16 U.S.C. §§ 470aa-470ll**National Historic Preservation Act (NHPA),** 16 U.S.C. § 470

32 CFR 229, Protection of Archeological Resources

36 CFR 60, National Register of Historic Places

36 CFR 61, Procedures for State, Tribal, & Local Historic Preservation Programs

36 CFR 63, Determination of Eligibility for Inclusion in National Register

36 CFR 79, Curation of Federally Owned & Administered Archaeological Collections

36 CFR 800, Protection of Historic & Cultural Properties

36 CFR 805, Procedures for Implementing NEPA

41 CFR 101, Federal Property Management Regulation

43 CFR 3, Preservation of American Antiquities

43 CFR 7, Protection of Archaeological Resources

43 CFR 10, National American Graves Protection & Repatriation

DoD Dir. 4710.1, Archaeological & Historical Resource Management, 21 Jun 1984

DoD I 4715.3, Environmental Conservation Program, 3 May 1996

EO 11593, Enhancement of Cultural Environment, 13 May 1971

EO 13007, Indian Sacred Sites, 24 May 1996

AFI 32-7064, Integrated Natural Resource Management, Jul 94

AFI 32-7065, Cultural Resource Management, 13 Jun 1994

HQ SAF/MI, Historic Preservation at Closure Installations, 20 Aug 1992

HQ USAF/CE, Interim Guidance on Cold War Resources, 29 Jun 1993

Nat. Register Bulletin 38, Guidelines for Evaluation of Tradition Cultural Properties

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Federal Insecticide, Fungicide, and Rodenticide, 7 U.S.C. § 136, *et seq.*

40 CFR 152, Pesticide Registration & Classification Procedures

40 CFR 165, Regulations for the use of the Acceptance of Certain Pesticides & Recommended Procedures for the Disposal and Storage of Pesticides

40 CFR 166, Exemption of Federal and State Agencies for Use of Pesticides Under Emergency Conditions

40 CFR 171, Certification of Pesticides Applicators

DoDI 4150.7, DoD Pest Management Program, 26 Apr 1996

AFI 32-1053, Pest Management Program

AFI 32-1074, Aerial Application of Pesticides

AFI 48-102, Medical Entomology Program

Petroleum, Oil, & Lubricant Management**CERCLA**, 42 U.S.C. § 9601, *et seq.***RCRA**, 42 U.S.C. § 6901, *et seq.*

33 CFR 153, Control of Pollution by Oil & Hazardous Substances

40 CFR 110, Discharge of Oil

40 CFR 112, Oil Pollution Prevention

40 CFR 279, Standards For Management of Used Oil

40 CFR 300, Nat. Oil & Hazardous Substances Pollution Contingency Plan

EO 12088, Federal Compliance with Pollution Control Standards

EO 12580, Superfund Implementation

EO 12777, Implementation of § 311 of CWA

AFI 13-212, Weapons Range, 28 July '94

AFI 23-201, Fuels Management 1 Oct '96

AFI 23-502, Recoverable & Unusable Liquid Petroleum Products, 6 Apr '94

POL managementSee Petroleum, Oil, & Lubricant Management, *infra*Pollution prevention**Disposal of Recyclable Materials**, 10 U.S.C. § 2577, *et seq.***EPCRA**, 42 U.S.C. § 11001, *et seq.*, (SARA Title III)**Pollution Prevention Act (PPA)**, 42 U.S.C. § 13101, *et seq.*

EO 12780, Federal Agency Recycling

EO 12856 @ 42 U.S.C. § 11001 note, Federal Compliance with Right to Know Laws, 3 Aug '93

EO 12873, Affirm. Procurement Program, 20 Oct '93

EO 12902, Energy Efficiency at Federal Facilities, 8 Mar '94

OFPP Policy Letter 92-4 (FAR 23.402)

AFI 32-7045, ECAMP, Apr '94

AFI 32-7080, Pollution Prevention Program, 12 May '94

AFI 32-7086, HazMat Management Program, 1 Aug '97

HQ AFCEE/EP, Installation Pollution Prevention Program Guide, July 1994

Radioactive waste / material

Low Level Radioactive Waste Policy Act, 42 U.S.C. § 2021
Curlee, Regulation of Radioactive Materials, 31 A.F.L. Rev. 69 ('89)

Radon

TSCA, Subchapter III

RCRA

Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. § 6901,
et seq.

See also **FFCA**, *infra*

29 CFR 1910, OSHA

40 CFR 22, Civil penalties

40 CFR 256-300, Waste Management

40 CFR 355, Emergency notification

40 CFR 372, Toxic chemical reporting

40 CFR 761, PCB use prohibitions

40 CFR 300, National Contingency Plan

EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct '78

32 AFI 32-7042, Solid & Hazardous Waste Compliance, May 1994

AFI 32-7006, Environmental Program in Foreign Countries, Apr 1994

AFI 32-7020, Environmental Restoration, Mar 94

AFI 32-7042, Solid & Hazardous Waste Compliance, Mar 1994

River & Harbors Act

Rivers and Harbors Act of 1899, 33 U.S.C. §§ 401-430, 441-454

33 CFR 114, 115, Construction on navigable waters of the U.S.

33 CFR 320, COE permit authority

Safe Drinking Water

Safe Water Drinking Act, as amended, 42 U.S.C. § 300f, *et seq.*

40 CFR 141-147

EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct '78

DOD Dir. 6230.1, 1978

SARA

See **EPCRA**, *infra*

See **CERCLA**, *infra*

Sikes Act

Sikes Act (Conservation Programs on Military Reservations), 16 U.S.C. § 670, *et seq.*

See Federal land management, *infra*.

See fish & wildlife, *infra*

Soil conservation

Soil and Water Conservation Act, 16 U.S.C. § 2001

Soil Conservation and Domestic Allotment Act, 16 U.S.C. 590a, *et seq.*

Solid waste management

Solid Waste Disposal Act / RCRA, 42 U.S.C. § 6901-6992k

Federal Facility Compliance Act (FFCA), 42 U.S.C. § 962, *et seq.*

40 CFR 240-258, Waste Management

EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct 1978, as amended by EO 12580, 23 Jan 1987

AFI 32-7042, Solid and Hazardous Waste Compliance

AFI 32-7080, P2 Program, 12 May 1994

Storage tanks

RCRA, 42 U.S.C. Sub-Chapter IX, §§ 6991-6991I

40 CFR 112, Oil Pollution Prevention

40 CFR 279, Standards For the Management of Used Oil

40 CFR 280, Tech Standards & Corrective Actions for USTs

EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct 1978, as amended by EO 12580, 23 Jan 1987

AFI 23-201, Fuels management, 1 Oct 1996

AFI 23-204, Organizational Fuel Tanks, 27 Apr 1994

AFI 32-4002, Hazardous Materials Emergency Planning & Response Compliance, 1 Dec 1997

AFI 32-7044, Storage Tank Compliance, 25 Apr '94

Superfund

Superfund Amendments and Reauthorization Act (SARA)

See **CERCLA**

Taylor Grazing Act

See Federal land management, *infra*

Title V air permits

Title V of **CAA**

Toxic substances

Toxic Substances Control Act, as amended (**TSCA**), 15 U.S.C. § 2601, *et seq.*

40 CFR 700-766, Toxic substances regulations

EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct '78
Troost, PCB article, 31 A.F.L. Rev. 117 ('89)

Transportation of hazardous wastes

See Hazardous materials transportation, *infra*

49 CFR 172-179, HazMat regulations

Underground storage tanks (USTs)

See Storage tanks, *infra*

Used oil

RCRA, 42 U.S.C. § 6905, 6912-6927,
CERCLA, 42 U.S.C. § 9601(37), 6914(c)
40 CFR 279, Standard For Management of Used Oil

Water

Federal Water Pollution Control Act of 1972, as amended (a/k/a **Clean Water Act**, CWA), 33 U.S.C. §§ 1251-1387
40 CFR 121-125, 129-136,
40 CFR 141, National Primary Drinking Water Regulation.
40 CFR 149, Sole Source Aquifers
40 CFR 401, Effluent standards
EO 12777, Compliance with FWPCA
EO 12088, Federal Compliance with Pollution Control Standards, 13 Oct 1978, as amended by EO 12580, 23 Jan 1987
EO 11288, Prevention Control & Abatement of Water Pollution, 2 Jul 1966
DoDD 6230.1, Safe Drinking Water, 24 Apr 1978
AFI 32-1067, Water Systems, 25 Mar 1994
AFI 32-7041, Water Quality Compliance, 32 May '94

Weapons range management

AFI 13-212, Weapons Range

Wetlands

§ 404 of **CWA**, 33 U.S.C. § 1344
Coastal Wetlands Planning, Protection & Restoration (CWPPRA), Chapter 59A, 16 U.S.C. §§ 3951-3956
CZMA, 16 U.S.C. § 1456
RHA, 33 U.S.C. §§ 403, 406
23 CFR 777, Mitigation of impact to wetlands
33 CFR 320, COE permit authority
33 CFR 323, Dredge fill permit
33 CFR 328, 329, Navigable waters of the U.S.
33 CFR 330, Nationwide permits
40 CFR 230-233, § 404 permits
EO 11990, Protection of Wetlands, 24 May '77
AFI 32-7061 A2.2.6 & A2.2.7, EIAP
AFI 32-7064, Chap. 3 & 4, Integrated Nat. Res. Management, Jul '94

Wild and Scenic Rivers

Wild and Scenic Rivers Act (W&SRA), 16 U.S.C. §§ 1271-1287
36 CFR 297, W&SR regulations

Wild horses and burros

See Fish and wildlife, *infra*

Wilderness preservation

Wilderness Act, 16 U.S.C. §§ 1131-1136

36 CFR 251, Land Uses

36 CFR 293, Wilderness & Primitive Areas

43 CFR 19, Wilderness Preservation

50 CFR 35, Wilderness Preservation & Management

Appendix 3

USAF Directive/Objective/Target/Performance Indicators

| Statute, E.O., Other Goal | Objective | Target | Performance Indicator |
|---------------------------------|---|--------|--------------------------|
| Air | Reduce emissions of NAAQS, precursors, and state or locally regulated air pollutants to reduce compliance burden. <i>AFI 32-7080 (Draft)</i> | | |
| | Reduce the number of installations qualifying as CAA Title V “major sources” by limiting the potential to emit criteria pollutants and negotiating with permitting authorities if segregation of sources results in emissions less than major source threshold quantities. <i>AFI 32-7080 (Draft)</i> | | |
| | Eliminate or reduce HAP emissions below major source threshold quantities. <i>AFI 32-7080 (Draft)</i> | | |
| | Reduce storage or use of regulated substances requiring development of RMPs and OSHA PSM plans. <i>AFI 32-7080 (Draft)</i> | | |
| | Meet DoD goals for use of Alternative Fueled Vehicles (AFV). <i>AFI 32-7080 (Draft)</i> | | |
| Water Supply | Implement source water protection measures. | | |
| | Prevent contamination of water supplies. | | |
| Wastewater | Eliminate or minimize point sources and the need for pretreatment and treatment of wastewater. | | |
| | Eliminate or minimize discharge of hazardous pollutants to wastewater systems and treatment facilities. | | |
| | Reduce wastewater flow to treatment facilities. | | |
| | Promote beneficial reuse of wastewater sludges instead of landfill disposal. | | |
| | Recycle or reuse wastewater, as appropriate. | | |
| Storm Water | Implement stormwater P2 best management practices. | | |
| | Eliminate or minimize storm water runoff from industrial activities. | | |
| | Eliminate or minimize the flow of deicing chemicals into storm water systems, consistent with mission requirements. | | |
| | Increase awareness of efforts to prevent storm water contamination. | | |
| HAZMAT | Minimize dependence on HAZMAT and reducing associated HAZMAT TOC. | | |
| | Integrate WS HAZMAT reduction needs into the WS requirements, generation, prioritization, funding, and execution processes. | | |
| | Reduce compliance burdens by eliminating or reducing HAZMAT use at the source through materials substitution, process engineering, or administrative controls. | | |

| Statute, E.O., Other Goal | Objective | Target | Performance Indicator |
|---------------------------------|---|--------|--------------------------|
| | Manage requirements for both Class I and Class II ODS, with the objective of eliminating or reducing usage. | | |
| | Assess for P2 opportunities, where applicable, all exceedances of toxic release inventory thresholds. | | |
| | Fully implement integrated pest management (IPM). | | |
| EPCRA | | | |
| HAZWASTE | Reduce HAZWASTE generation at the source through materials substitution, process engineering, or administrative controls. | | |
| | Establish a HAZWASTE minimization program that reduces the volume and toxicity of waste generated in accordance with the Resource Conservation and Recovery Act (RCRA) Section 3002(b), 42 U.S.C. 6901-6992k. | | |
| | Reduce, where feasible, RCRA permits for HAZWASTE storage, treatment, or disposal. | | |
| Solid Waste | Eliminate or reduce MSW generation at the source through materials substitution, process engineering, or administrative controls. | | |
| | Enhance resource recovery and recycling to increase MSW diversion rates where cost-effective through a Qualified Recycling Program described in AFI 32-7042 | | |
| | Divert MSW from entering disposal facilities through composting, mulching, recycling, reuse, and donation. | | |
| | Pursue cost-effective management approaches that decrease the landfill space required for C&D debris and decrease the amount of HAZWASTE or toxic constituents contaminating C&D debris | | |
| AST | Comply with federal, state, and local AST requirements in order to protect health and the environment. | | |
| | Comply with AFI 32-7044 including requirements for leak testing and preventing, responding to, reporting, and cleaning up spills. | | |
| UST | Ensure new USTs (including piping) are designed and constructed to provide the following: corrosion protection, release detection, spill and overflow prevention, proper installation, and secondary containment. | | |
| | Upgrade all existing USTs (any regulated UST installed before 22 December 1988) to meet the standards for new USTs. | | |
| Integrated Pest Management | Implement the effective, economical, and environmentally sound prevention or control of animal pests and vectors, undesirable terrestrial and aquatic plants, and plant diseases. | | |
| RCRA Cleanup | | | |
| OB/OD | | | |
| PCB | Eliminate target polychlorinated biphenyls (PCB) equipment and reduce future liability for | | |

| Statute, E.O., Other Goal | Objective | Target | Performance Indicator |
|---------------------------------|--|--------|--------------------------|
| | cleanup and disposal costs. | | |
| Asbestos | Develop and implement the asbestos management programs. | | |
| | Repair or remove damaged asbestos containing material to eliminate the potential hazard. | | |
| | Reduce the risks from hazardous asbestos containing material through inventory management, isolation, containment, or removal. | | |
| Lead-Based Paint | Protect facility occupants, workers, and the environment from hazardous exposure to lead in LBP. | | |
| | Prevent future LBP hazards and identify, evaluate, control, and eliminate existing LBP hazards. | | |
| Radon | | | |
| Affirmative Procurement | Establish affirmative procurement programs to ensure that purchases of all designated guideline items comply with EPA recycled content requirements unless an exemption applies. | | |
| | Show a preference for recycled and biobased products by procuring items that meet federal and state standards and specifications. | | |
| | Promote possibilities and procedures for affirmative procurement initiatives to employees, contractor personnel, and potential bidders. | | |
| | Establish procedures for obtaining certifications to verify recycled or recovered material content for applicable EPA guideline items | | |
| | Track and report purchases of applicable products. | | |
| Energy Conservation | Increase energy efficiency as a P2 tool to reduce regulated air emissions. E.O. 12902 implements the EPACT and mandates a 30 percent reduction by 2005. | | |
| Water Conservation | Consider conservation efforts that can help protect clean water as a natural resource, by minimizing the consumption of the resource, reusing the resource, or minimizing wastewater discharges. | | |
| | Ensure that grasses and plants utilized on installations are suitable for the climate to minimize irrigation requirements. | | |
| | Beneficially recycle/reuse wastewater effluents for irrigation or other purposes, where appropriate and as dictated by AFI 32-1067 and AFI 32-7041 | | |
| Sustainable Facilities | Employ sustainability concepts during the planning, design, construction, operation, and demolition of all Air Force facilities. Sustainable design techniques include design for HAZMAT reduction, disassembly and recyclability, durability and life extension, maintenance, energy conservation, or water conservation. | | |

APPENDIX 4

Revised Compliance Site Inventory Data Requirements

Phase One

| Suggested Data Item No. | Original Data Item No. | Data | Data Description |
|--|-------------------------------|----------------------------------|--|
| 10 | 1 | Compliance Site IDs | A unique compliance site identifier that is composed of the 4 –digit installation code and 4-digit sequential |
| 20 | * | Base | |
| 30 | * | Wing | |
| 40 | * | Compliance Site Category | Compliance Site Inventory (e.g., 01-a-Permitted Air Stationary Air Source and 02-b-90-day HW Satellite Accumulation Point) |
| 50 | * | AF-EMIS Shop Code | AF-EMIS Shop Code that applies to the compliance site |
| 60 | 2 | Site Description | A brief description of the compliance site |
| Replaced by Data Item No. 70 shown below | 3 | Media Category | e.g., CAA, CWA, and CERCLA |
| 70 | Not Available | ECAMP Protocol Category | e.g., Topic Number ST.4 (Storage Tank Management) |
| 80 | 6 | Initial Compliance Cost Estimate | Recurring annual environmental costs to maintain compliance prior to application of compliance through P2 process (rough order of magnitude estimate prepared during compliance site identification) |

Phase Two

| Suggested Data Item No. | Original Data Item No. | Data | Data Description |
|-------------------------|------------------------|--|---|
| 90 | 4 | Owning Organization | Office symbol for owning organization |
| 100 | 5 | Organization's POC | Name of POC |
| 110 | * | DSN telephone | Number for POC |
| 120 | * | Comments | Reference site where data were found |
| 130 | 7 | (Undesired Event) | The realistic worst case event (Narrative) |
| 140 | * | Severity Category | i.e., Catastrophic, Critical, Marginal, or Negligible |
| 150 | * | Probability Category | i.e., Frequent, Likely, Occasional, Seldom, or Unlikely |
| 160 | 8 | Hazard Category | i.e., 1-20 |
| 170 | 9 | Risk Level | i.e., Extremely High, High, Medium, or Low |
| 180 | 10 | (Compliance Burden) Compliance Cost Category | Combination of compliance costs, and operational and ESOH risks (i.e., Highest, High, Medium, Low, or Lowest) |
| 190 | * | Compliance Burden Category | i.e., 1-20 |
| 200 | * | Compliance Burden Level | i.e., Extremely High, High, Medium, or Low |
| 210 | *11 | Priority | |

Phase Three

| Suggested Data Item No. | Original Data Item No. | Data | Data Description |
|-------------------------|------------------------|---|---|
| 220 | 12 | Controlling T.O. | If applicable (this identifies compliance sites handled through the HMRPP) |
| 230 | 13 | Compliance Cost Estimate (before P2 solution) | Prepared during compliance through P2 process and includes all identifiable annual compliance costs |
| 240 | * (added) | <i>(Compliance Burden) Compliance Cost Category</i> | <i>Prepared during compliance through P2 process with combination of compliance costs and operational and ESOH risks (i.e., Highest, High, Medium, Low, or Lowest)</i> |
| 250 | * (added) | <i>Compliance Risk Level</i> | <i>Prepared during compliance through P2 process (i.e., Extremely High, High, Medium, or Low)</i> |
| 260 | * (added) | <i>Compliance Burden Level</i> | <i>Prepared during compliance through P2 process (i.e., Extremely High, High, Medium, or Low)</i> |
| 270 | 14 | Projected Compliance Cost Estimate (after P2 solution identified) | Prepared during compliance through P2 process and includes all identifiable annual compliance costs |
| 280 | 15 | Projected Hazard Category | Projected hazard category following implementation of P2 project (i.e., 1-20) |
| 290 | 16 | Projected Risk Level | Projected risk level following implementation of P2 project (i.e., Extremely High, High, Medium, or Low) |
| 300 | * (added) | <i>(Compliance Burden) Compliance Cost Category</i> | <i>Projected following implementation of P2 project with combination of compliance costs and operational and ESOH risks (i.e., Highest, High, Medium, Low, or Lowest)</i> |
| 310 | * (added) | <i>Compliance Burden Level</i> | <i>Projected following implementation of P2 project (i.e., Extremely High, High, Medium, or Low)</i> |
| 320 | 17 | Site Status | Identify which of the following categories apply to the site: (1) Identified and not yet evaluated for P2 solution (2) Under evaluation for potential P2 solution (3) Evaluated and accepted due to lack of cost-effective P2 solution (4) In progress (5) Reduced or (6) Compliance requirement eliminated |
| 330 | 18 | Project No. | The Project No. identifies a programmed P2 project and links that project to all compliance sites included in the P2 project (cross-referenced from programming and budgeting information maintained elsewhere in the CAPP MAP database) |
| 340 | 19 | Actual Compliance Cost Estimate | Determined after P2 solution implemented and includes all identifiable annual compliance costs |
| 350 | 20 | Actual Hazard Category | Determined after P2 solution implemented for sites not eliminated (i.e., 1-20) |
| 360 | 21 | Actual Risk Level | Determined after P2 solution implemented for sites not eliminated (i.e., Extremely High, High, Medium, or Low) |
| 370 | * (added) | <i>(Compliance Burden) Compliance Cost Category</i> | <i>Determined after P2 solution implemented with combination of compliance costs and operational and ESOH risks (i.e., Highest, High, Medium, Low, or Lowest)</i> |
| 380 | * (added) | <i>Compliance Burden Level</i> | <i>Determined after P2 solution implemented (i.e., Extremely High, High, Medium, or Low)</i> |

| | | | |
|-----|---------------|---|--|
| 390 | Not Available | <i>Waste Minimization Activity Codes (Determined After P2 Solution Implemented)</i> | <i>Determined after P2 solution implemented. Reference all applicable codes found on pages 101–102 of 1995 RCRA Biennial Report (e.g., W51 instituted closed-loop recycling)</i> |
|-----|---------------|---|--|

APPENDIX 5

Sample PSOA Worksheet

Reference: Pollution Prevention Tools, Techniques, and Technologies Course, AFCEE P2 Opportunity Assessment Workshop, and AFIT ENV 022 Pollution Prevention Program Operations and Management Course

Sample PSOA Worksheet – Data Collection Form #1

Contact Information

Group Members:

Date:

Shop(s) Visited:

Building Number(s):

Contact Name(s):

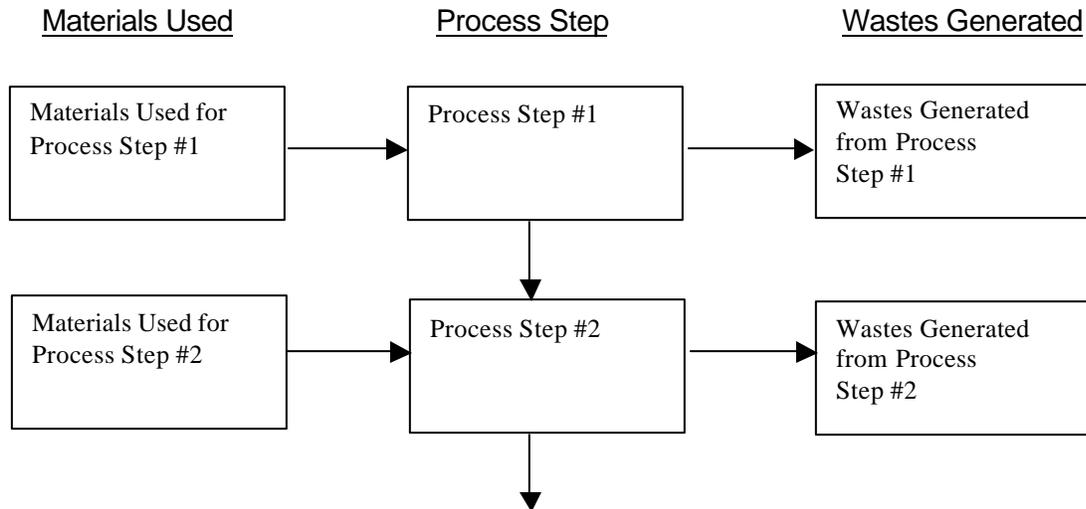
Telephone Number(s):

Sample PSOA Worksheet – Data Collection Form #2

PSOA Process Flow Diagram

Step 9: Examine the Process

Based on your understanding of shop procedures, develop an accurate process flow diagram. Once you have completed the flow diagram, match the materials used and wastes generated with the appropriate process step. For each process step, define all assumptions

**Step 10: Establish a Baseline**

Estimate the quantity of materials used and wastes generated for each process step shown above.

Sample PSOA Worksheet – Data Collection Form #3

Feasibility Analysis

Perform a feasibility analysis for each potential P2 solution in the categories of technical, environmental, and economic feasibility. Provide the reasoning for your analysis.

Potential P2 Solution #1:

Title:

Technical Feasibility: _____ out of 10

Environmental Feasibility: _____ out of 10

Safety Feasibility: _____ out of 10

Occupational Health Feasibility: _____ out of 10

Economic Feasibility: _____ out of 10

Potential P2 Solution #2:

Title:

Technical Feasibility: _____ out of 10

Environmental Feasibility: _____ out of 10

Safety Feasibility: _____ out of 10

Occupational Health Feasibility: _____ out of 10

Economic Feasibility: _____ out of 10

Sample PSOA Worksheet – Data Collection Form #4

Potential P2 Solution Ranking

Total the feasibility scores for each potential P2 solution using the score card below. Rank is determined by the highest score.

| Feasibility | Potential P2 Solution #1 | Potential P2 Solution #2 | Potential P2 Solution #3 | Potential P2 Solution #4 |
|---------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Technical | | | | |
| Environmental | | | | |
| Safety | | | | |
| Occupational Health | | | | |
| Economic | | | | |
| Total | | | | |

Sample PSOA Worksheet – Data Collection Form #5

Miscellaneous Notes

APPENDIX 6

Sample Process Cost Factor List

Reference: Pollution Prevention Tools, Techniques, and Technologies Course (Course Number B30ZY000E-005)

Below is a process cost factor list that demonstrates the types of costs that should be analyzed when performing an economic evaluation.

| DIRECT OPERATING COSTS | INDIRECT OPERATING COSTS | CAPITAL COSTS |
|--|--|--|
| Utilities Electricity Steam Water Plant Air Fuel/Natural Gas Cooling/Process Water Materials Procurement Hazardous Nonhazardous Transport Hazardous Nonhazardous Storage Hazardous Nonhazardous Management Hazardous Nonhazardous Tools Procurement Equipment Procurement Maintenance Materials Repair Materials Waste Management Disposal Transportation On-site Off-site On-site Handling Predisposal Treatment | Regulatory Compliance Manifesting On-site Off-site Testing Sampling Analysis Labeling For Accumulation For Disposal (off- Permitting Air Wastewater Hazardous Waste Monitoring Air Wastewater Record Keeping Air Wastewater Compliance Training Reporting Air Wastewater Hazardous Waste Hazardous Materials Safety/Industrial Personal Protective Equipment Spill Response | Equipment Process Equipment Delivery Sales Tax Initial Spare Parts Monitoring Equipment Materials Piping Electrical Instruments Structural Insulation Utility Connections/New Utility Systems Electricity Steam Sewerage Water Refrigeration Fuel Plant Air/Inert Gas General Plumbing Cooling Water Process Water Gas Connection Oil Connection Site Preparation Demolition/Cleaning Old Equipment Disposal Walkways/Roads/Fencing Grading/Landscaping Construction/Installation In-house |

| DIRECT OPERATING COSTS | INDIRECT OPERATING COSTS | CAPITAL COSTS |
|--|---|--|
| Recycling Direct Labor Operating Supervisory Inspection Training Equipment Maintenance Equipment Repair | Materials Equipment Labor Disposal Medical Exams Industrial Hygiene Surveys Medical Surveillance Injuries Safety Inspection Fire Inspection | Contractor Vendor Engineering/Contractor In-house Planning In-house Engineering Procurement Contractor/Consultant Design Start-up/Training In-house Vendor/Contractor Trials Training Permitting Fees In-house Contractor/Consultant |

APPENDIX 7

Sample Economic Analysis from Transportation Model Shop Report

Reference: <http://www.afcee.brooks.af.mil/eq/programs/>

2.4 Presentation Aids

The electronic version of this report includes spreadsheets in Microsoft Excel (Version 5.0) that allow users to insert facility or installation-specific costs and quantities into the economic analysis. The analyses presented use typical or default cost and other values. These spreadsheets have been imbedded into the document itself. Using the electronic document file, the user can place the cursor over the table and double-click the spreadsheet. The user can input specific values rather than the default ones. Rows that are **shaded** do not require any adjustments by the user. These rows contain calculations that are automatically updated by the spreadsheet.

An example of a typical spreadsheet (Table 2.5.1) and example of assumptions (Tables 2.5.2 and 2.5.3), followed by an explanation of entries (Table 2.5.4), are shown below. The status quo operation represents the typical operation without implementing P2. The alternatives illustrate the possible P2 alternatives to the status quo operating conditions. The assumptions used to develop the spreadsheet are presented in the two tables following the spreadsheet. Capital cost assumptions are separated from annual operating cost assumptions. The user is urged to make their own assumptions and adjust the costs and other values in the spreadsheet to reflect the installation-specific values. It should be noted that not all cost elements apply to each alternative. An example of how a spreadsheet might look after a user has inputted new values is presented in Table 2.5.5. Tailored spreadsheets have been developed in Section 4 that reflect the applicable cost elements relating to the assumptions made for each PPO presented.

Table 2.5.1
Sample PPO Economic Analysis

| Row | Cost Item | Status Quo | Alternative I | Alternative II |
|-----|---|---------------------------|--------------------------------|--|
| | | Manual Paint Gun Cleaning | Clean Guns in Automatic Washer | Automatic Washer with Solvent Filtration |
| 1 | Capital Cost | | | |
| 2 | Automatic paint gun washer (\$) | \$ - | \$ 1,000 | |
| 3 | Automatic washer with filtration (\$) | | | \$ 2,500 |
| 4 | Total Capital Cost (\$) | \$ - | \$ 1,000 | \$ 2,500 |
| 5 | Annual Cost | | | |
| 6 | Workhours for paint gun cleaning (hr/yr) | 250 | 42 | 42 |
| 7 | Labor rate (\$/hr) | \$ 20 | \$ 20 | \$ 20 |
| 8 | Total Labor Cost (\$) | \$ 5,000 | \$ 840 | \$ 840 |
| 9 | Unit cost of solvent (\$/gallon) | \$ 7.50 | \$ 7.50 | \$ 7.50 |
| 10 | Quantity of solvent required (gallons/yr) | 63 | 30 | 1 |
| 11 | Unit cost of filters (\$/filter) | | | \$ 1.00 |
| 12 | Quantity of filters required (filters/yr) | | | 12 |
| 13 | Total Operating Cost (\$) | \$ 473 | \$ 225 | \$ 20 |
| 14 | Unit cost of solvent disposal (\$/gallon) | \$ 7.50 | \$ 7.50 | \$ 7.50 |
| 15 | Quantity of solvent disposed (gallons/yr) | 63 | 30 | 10 |
| 16 | Total Disposal Cost (\$) | \$ 473 | \$ 225 | \$ 75 |
| 17 | Total Annual Cost (\$) | \$ 5,945 | \$ 1,290 | \$ 935 |
| 18 | Payback Period (yrs) | N/A | 0.2 | 0.5 |
| 19 | First Year Savings (\$) | N/A | \$3,655 | \$2,511 |
| 20 | Three Year Savings (\$) | N/A | \$12,965 | \$12,532 |

A negative payback period means that the alternative annual cost exceeds the status quo annual cost.
N/A = not applicable.

Double Click in Spreadsheet to Open

Table 2.5.2
Example of Capital Cost Assumptions for Table 2.5.1

Status quo (manual paint gun cleaning)

No capital costs.

Alternative I (clean paint guns in recirculating unit)

Automatic paint gun cleaner: \$1,000. Based on purchase of Herkules Equipment Corporation combination gun and can washer.

Alternative II (clean paint guns in recirculating unit with solvent filtration)

Automatic cleaner with solvent filtration: \$2,500. Based on purchase, from Gulf Coast Filters, of Herkules unit modified with solvent filtration.

Table 2.5.3
Example of Annual Operating Cost Assumptions for Table 2.5

| |
|--|
| <p>General assumptions common to all alternatives: Basis of one gun cleaning per business day, rounded to 250 guns / year. Purchase of new cleaning solvent = \$7.50 / gallon. Disposal of solvent = \$7.50 / gallon. Labor rate = \$20 / hour.</p> <p><i>Status quo (manual paint gun cleaning)</i> Labor to clean paint guns = 1 hour / gun x 250 guns / year = 250 hours / year. Quantity of solvent used and disposed = 1 quart / gun x 250 guns / year = 63 gallons / year.</p> <p><i>Alternative I (clean paint guns in recirculating unit)</i> Labor to clean paint guns = 10 minutes / gun x 250 guns / year = 42 hours / year. Quantity of solvent used and disposed = one reservoir per year = 30 gallons / year.</p> <p><i>Alternative II (clean paint guns in recirculating unit with solvent filtration)</i> Labor to clean paint guns = 10 minutes / gun x 250 guns / year = 42 hours / year. Quantity of solvent purchased = 1 gallon / year. Assume solvent lasts for three years; quantity of solvent disposed = 10 gallons per year. Filters changed 12 times per year. Filters elements are paper towels, cost = \$1 / filter. Filter disposal as hazardous waste = \$1/filter.</p> |
|--|

Table 2.5.4
Explanation of PPO Spreadsheet Entries Shown in Table 2.5.1

| Row | Explanation |
|----------------|--|
| 1 | CAPITAL COSTS This is the heading for the capital cost category and does not require editing . Under this heading, the user will record equipment, installation, training, and other start-up costs associated with the alternative. No capital costs will be associated with the status quo operation. |
| 2&3 | EQUIPMENT COST (\$) This row includes any equipment that needs to be purchased to implement the alternative. The user should enter the name of the equipment under the Cost Item column and the cost associated with each alternative. In this example, the implementation of Alternative I will require an automatic washer at a cost of \$1,000 and Alternative II will require an automatic washer with solvent filtration unit at a cost of \$2,500. |
| 4 | TOTAL CAPITAL COSTS (\$) In this row, the spreadsheet calculates the total capital costs required to implement the alternative. The calculation is based on the information entered in Rows 2&3. The user does not manipulate this row. |

| | |
|---|---|
| 5 | ANNUAL COSTS This is the heading for the annual cost category and does not require editing . Under this heading the user will record labor costs, operating costs, and disposal costs. All annual costs are based on differential costs. Therefore, the user is only required to include cost elements that, by implementing the alternative, will be different from the status quo operation. |
| 6 | LABOR REQUIREMENTS (hrs) This row includes the labor requirements that are needed to annually support the implemented alternative. In this example, the status quo requires 250 hours and Alternatives I and II each require 42 hours. |
| 7 | LABOR RATE (\$/hr) This row contains the labor rate for the labor required in row 6. An average labor rate of \$20/hr is used throughout this report. |

Table 2.5.4 (Continued)
Explanation of PPO Spreadsheet Entries Shown in Table 2.5.1

| Row | Explanation |
|-------|--|
| 8 | TOTAL LABOR COST (\$) In this row the spreadsheet calculates the total annual labor costs of the alternatives. The calculation is based on the information entered in rows 6 and 7. The use does not manipulate this row. |
| 9&11 | UNIT COST OF MATERIAL (\$/UNIT) These rows contain the unit costs of the materials required by the alternatives (see rows 10 and 12). The unit costs are multiplied by the quantity to get total operating costs. |
| 10&12 | QUANTITY OF MATERIAL (UNIT) These rows contain the annual quantity of materials used for the alternatives. In this example solvent is required for all alternatives and filters are required for Alternative II. |
| 13 | TOTAL OPERATING COSTS (\$/yr) In this row, the spreadsheet calculates the total operating costs of the alternative using the information provided in rows 9-12. The use does not manipulate this row |
| 14 | UNIT DISPOSAL COST (\$/UNIT) This row contains the unit cost for the disposal of a particular waste stream. In this example, the cost for used solvent disposal is \$7.50/gallon. |
| 15 | QUANTITY OF WASTE DISPOSED (UNIT) This row contains the yearly quantity of waste stream generated by each alternative. In this example, the status quo operation generates 63 gallons, Alternative I generates 30 gallons, and Alternative II generates no waste solvent annually. |
| 16 | TOTAL DISPOSAL COST (\$) In this row the spreadsheet calculates the total disposal costs of the alternative. The calculation is based on the information entered in rows 14 and 15. The user does not manipulate this row. |
| 17 | TOTAL ANNUAL COSTS (\$/yr) In this row, the spreadsheet calculates the total annual costs of the alternative. The calculation is based on the information entered in rows 6-16. The user does not manipulate this row. |

| | |
|----|---|
| 18 | <p>PAYBACK PERIOD (in years)</p> <p>The payback period is the length of time it takes to recover the initial capital investment from the savings achieved by implementing the PPO. This value is a measure of whether an investment is a positive or negative one. The payback period is never applicable for the status quo. If the calculated payback period is zero, there is no initial investment and the payback period is not applicable. If the calculated payback period is less than zero, the alternative results in the alternative costing more than the status quo, and the value of the initial investment will never be recovered. The payback period is computed for each alternative by dividing the capital cost by the annual savings. The user does not manipulate this row.</p> |
| 19 | <p>FIRST YEAR SAVINGS</p> <p>This row is calculated by subtracting the first year cost (for Alternative I and higher) from the status quo annual cost, row 17. The first year savings to maintain the status quo is always zero. For alternatives other than the status quo (Alternatives I and higher), this value will be the first year savings gained by implementing the new practice. If this value is negative, then the new process will actually net a first year cost for implementing the new alternative. The user does not manipulate this row.</p> |
| 20 | <p>THREE YEAR SAVINGS</p> <p>This row is calculated by subtracting the capital cost of the alternative (row 4) and three times the total annual cost of the alternative (row 17) from three times the status quo annual costs. The three-year savings to maintain the status quo is always zero. For alternatives other than the status quo (Alternatives I and higher), this value will be the three year savings gained by implementing the new practice. If this value is negative, then the alternative will actually net a three-year cost for implementing the new alternative. The user does not manipulate this row.</p> |

If your installation's current practice, or status quo operation, is one of the alternatives shown in the spreadsheets in this Model Shop Report, move the cost and quantity information for that alternative to the status quo column. For example, if your installation is using an automatic gun washer to clean paint guns and is considering purchasing a gun washer with a filtration unit you should do the following. First, delete the information in the unshaded rows in the status quo column. Second, move the cost and quantity information from Alternative I into the status quo column, leaving the alternative I column blank. Rename the Status Quo title with your current practice. The resultant spreadsheet will now look like Table 2.5.5 below.

**Table 2.5.5
Modified PPO Economic Analysis**

| Row | Cost Item | Status Quo | Alternative I | Alternative II |
|-----|---|--------------------------------|---------------|--|
| | | Clean Guns in Automatic Washer | None | Automatic Washer with Solvent Filtration |
| 1 | Capital Cost | | | |
| 2 | Automatic paint gun washer (\$) | \$ 1,000 | | |
| 3 | Automatic washer with filtration (\$) | | | \$ 2,500 |
| 4 | Total Capital Cost (\$) | \$ 1,000 | \$ - | \$ 2,500 |
| 5 | Annual Cost | | | |
| 6 | Workhours for paint gun cleaning (hr/yr) | 42 | | 42 |
| 7 | Labor rate (\$/hr) | \$ 20 | | \$ 20 |
| 8 | Total Labor Cost (\$) | \$ 840 | \$ - | \$ 840 |
| 9 | Unit cost of solvent (\$/gallon) | \$ 7.50 | | \$ 7.50 |
| 10 | Quantity of solvent required (gallons/yr) | 30 | | 1 |
| 11 | Unit cost of filters (\$/filter) | | | \$ 1.00 |
| 12 | Quantity of filters required (filters/yr) | | | 12 |
| 13 | Total Operating Cost (\$) | \$ 225 | \$ - | \$ 20 |
| 14 | Unit cost of solvent disposal (\$/gallon) | \$ 7.50 | | \$ 7.50 |
| 15 | Quantity of solvent disposed (gallons/yr) | 30 | | 0 |
| 16 | Total Disposal Cost (\$) | \$ 225 | \$ - | \$ - |
| 17 | Total Annual Cost (\$) | \$ 1,290 | \$ - | \$ 860 |
| 18 | Payback Period (yrs) | N/A | 0.0 | 5.8 |
| 19 | First Year Savings (\$) | N/A | \$1,290 | -\$2,070 |
| 20 | Three Year Savings (\$) | N/A | \$3,870 | -\$1,209 |

A negative payback period means that the alternative annual cost exceeds the status quo annual cost.
N/A = not applicable.

Double Click in Spreadsheet to Open

APPENDIX 8

Applying a Weighted Average of P2 Solution Costs to Impacted Compliance Sites

Below is an example of how to distribute and link the costs of a large-scale P2 solution to multiple compliance sites. For example, assume the P2 solution will benefit six compliance sites (two extremely high burden, one high, zero medium, and three low) and is programmed as a project for \$1,000,000 as Data Item 18 in the compliance site inventory (Suggested Data Item 330 in Appendix 4). In order to apply a weighted average of costs per site, each compliance burden category must be assigned a weighted factor to stress that an extremely high burden compliance site constitutes a more significant cost sharing of the P2 solution than a low burden compliance site. Compliance sites categorized as extremely high burden are assigned a weighted factor of 4, high burden a factor of 3, medium burden a factor of 2, and low burden a factor of 1. The same approach can be applied in determining baseline costs of the PSOA process and how they link to each compliance site before the P2 solution is implemented.

| Burden Category | # of Sites | Weighted Factor | Site Multiplier |
|------------------------|-------------------|------------------------|------------------------|
| Extremely High | 2 | 4 | 8 |
| High | 1 | 3 | 3 |
| Medium | 0 | 2 | 0 |
| Low | 3 | 1 | 3 |
| Total | 6 | N.A. | 14 |

| Burden Category | Cost/Site | Total Cost/Category |
|------------------------|---|--|
| Extremely High | $(\$1,000,000 \times 8) / (14 \times 2) = \$285,714.29$ | $\$285,714.29 \times 2 = \$571,428.58$ |
| High | $(\$1,000,000 \times 3) / (14 \times 1) = \$214,285.71$ | $\$214,285.71 \times 1 = \$214,285.71$ |
| Medium | $(\$1,000,000 \times 0) / (14 \times 0) = \0 | $\$0 \times 1 = \0 |
| Low | $(\$1,000,000 \times 3) / (14 \times 3) = \$71,428.57$ | $\$71,428.57 \times 3 = \$214,285.71$ |
| Total | N.A. | \$1,000,000 |

Note: $\text{Cost/Site} = (\text{Cost of P2 Solution} \times \text{Site Multiplier}) / (\text{Total Multiplier} \times \text{\# of Sites})$
and $\text{Total Cost/Category} = (\text{Cost/Site}) \times (\text{\# of Sites/Category})$

APPENDIX 9

Waste Minimization Codes for Source Reduction and Recycling Activities

Reference: 1995 RCRA Biennial Report and TRI Form R Section 8.10
Activity Codes

Code Waste minimization activity

Code Waste minimization activity

RECYCLING ACTIVITY

W01 On-site beneficial use/reuse

W02 On-site beneficial use/reuse

SOURCE REDUCTION ACTIVITY

GOOD OPERATING PRACTICES

W11 Began to segregate types of hazardous waste to make them more amenable to recycling

W12 Began to segregate (stopped combining) hazardous waste from non-hazardous waste (Note: for purposes of hazardous waste reporting, reduces volume of hazardous waste, but does not reduce total waste volume)

W13 Improved maintenance scheduling, recordkeeping, or procedures

W14 Changed production schedule to minimize equipment and feedstock changeovers

W19 Other changes in operating practices (Specify in Comments)

INVENTORY CONTROL

W21 Instituted procedures to ensure that materials do not stay in inventory beyond shelf-life

W22 Began to test outdated material—continue to use if still effective

W23 Eliminated shelf-life requirements for stable materials

W24 Instituted better labeling procedures

W25 Instituted clearing house to exchange materials that would otherwise be discarded

W29 Other (Specify in Comments)

SPILL AND LEAK PREVENTION

W31 Improved storage or stacking procedures

W32 Improved procedures for loading

W36 Implemented inspection or monitoring program of potential spill or leak sources
W39 Other (Specify in Comments)

RAW MATERIAL MODIFICATIONS

W41 Increased purity of raw materials

W42 Substituted raw materials

W49 Other (Specify in Comments)

PROCESS MODIFICATIONS

W51 Instituted closed-loop recycling

W52 Modified equipment, layout, or piping

W53 Changed process catalyst

W54 Instituted better controls on operating conditions (flow rate, temperature, pressure, residence time)

W55 Changed from small volume containers to bulk containers to minimize discarding of empty containers

W58 Other (Specify in Comments)

CLEANING AND DEGREASING

W59 Modified stripping/cleaning equipment

W60 Changed to mechanical stripping/cleaning devices (from solvents or other materials)

W61 Changed to aqueous cleaners (from solvents or other materials)

W62 Reduced the number of solvents used, to make waste more amenable to recycling

W63 Modified containment procedures for cleaning units

W64 Improved draining procedures

W65 Redesigned parts racks to reduce dragout

| | | | |
|-----|--|-----|-------------------------------------|
| | unloading, and transfer operations. | W66 | Modified or installed rinse systems |
| W33 | Installed overflow alarms or automatic shut-off valves | W67 | Improved rinse equipment design |
| W34 | Installed secondary containment | W68 | Improved rinse equipment operation |
| W35 | Installed vapor recovery systems | W71 | Other (Specify in Comments) |

Code Waste minimization activity

SOURCE REDUCTION ACTIVITY (Continued)

SURFACE PREPARATION AND FINISHING

| | |
|-----|-------------------------------------|
| W72 | Modified spray systems or equipment |
| W73 | Substituted coating materials used |
| W74 | Improved application techniques |
| W75 | Changed from spray to other system |
| W78 | Other (Specify in Comments) |

PRODUCT MODIFICATIONS

| | |
|-----|--------------------------------|
| W81 | Changed product specifications |
| W82 | Modified design or composition |
| W83 | Modified packaging |
| W89 | Other (Specify in Comments) |

OTHER SOURCE REDUCTION ACTIVITY

| | |
|-----|---------------------|
| W99 | Specify in Comments |
|-----|---------------------|

APPENDIX 10

CAPP Research Web Sites

Air Force Pollution Prevention Toolbox. The AFCEE toolbox provides access to a library of tools (e.g., handbooks, guides, training software, and videos) related to the CAPP process. The toolbox is based on the planning, programming, budgeting, and execution of typical environmental quality projects in the Air Force.

<http://www.afcee.brooks.af.mil/eq/p2toolbox/>

PRO-ACT Air Force Environmental Information Exchange. PRO-ACT is a service administered by the HQ AFCEE/EQ to provide a single point of contact for all questions related to environmental issues. This service includes verbal and written responses to each inquiry, copies of documents, and/or research. HQ AFMC has contracted the maintenance of the Portable Document Format HazMat Search Tool (PHAST) program and the Process and Potential Alternatives (PAPA) database to PRO-ACT as two product substitution tools for Single Managers and their staffs to use.

http://www.afcee.brooks.af.mil/pro_act/pro_acthome.asp

Enviro\$en\$. Enviro\$en\$, part of the U.S. EPA's web site, provides a single repository for pollution prevention, compliance assurance, and enforcement information and databases. Their search engine searches multiple web sites (inside and outside the EPA), and offers assistance in preparing a search providing pollution prevention, regulatory compliance, and solvent substitution information.

<http://es.epa.gov/index.html>

Joint Service Pollution Prevention Technical Library. The Joint Service Pollution Prevention Technical Library is a comprehensive on-line resource for information on equipment, technologies, and management practices which reduce or eliminate the generation and disposal of pollutants at DoD installations.

<http://enviro.nfesc.navy.mil/p2library/>

USAF Environment, Safety, and Occupational Health (ESOH) Technical Planning Integrated Product Team (TPIPT). The ESOH TPIPT planning process assists in identifying and finding solutions to ESOH technology needs, both near and long term, for customers to use in Air Force planning.

<http://xre22.brooks.af.mil/>

Defense Environmental Network and Information Exchange (DENIX). DENIX provides DoD personnel in the environmental security arena with timely access to environmental legislative, compliance, restoration, cleanup, and DoD guidance

information. It is intended to serve as a central electronic “meeting place” where information can be exchanged among environmental professionals worldwide.

<http://www.denix.osd.mil/>

Air Force Total Ownership Cost (AFTOC)

This web site presents evolving cost of ownership systems for Air Force weapon systems. As stated on the web site, “The Air Force Total Ownership Cost (AFTOC) Management Information System responds to the Secretary of Defense’s Year 2000 goal for each Service to develop a system to provide senior leadership’...routine visibility into weapon system life cycle costs.’ Additionally, it supports the acquisition community in meeting the Defense Systems Affordability Council direction to the Services’ Senior Acquisition Executives to ‘...establish aggressive, time-phased TOC reduction goals.’ By completion of the third phase of AFTOC development, the system will provide detailed cost information on all major weapon systems, inclusive of aircraft, space systems, and missiles. The AFTOC system, when fully implemented, will be the authoritative source across the Air Force for financial, acquisition, and logistics information.” SAF/FM

<http://www.aftoc.com>

Air Force Product Data Systems Modernization Program Office. This web site provides users with ready access to accurate product data to support the life cycle processes of weapon systems. Product data are technical information such as tech orders, manuals, engineering data, and sustainment data necessary for the technical management of a weapon system throughout its life cycle.

<http://www.pdsm.wpafb.af.mil/index.html>

Solvent Alternatives Guide (SAGE). SAGE is a comprehensive guide designed to provide pollution prevention information on solvent and process alternatives for parts cleaning and degreasing. SAGE was developed by the Surface Cleaning Program at Research Triangle Institute in cooperation with the U.S. EPA Air Pollution Prevention and Control Division.

<http://clean.rti.org/>

UCLA Center for Clean Technology (CCT). This web site provides information about a wide range of environmental research and related activities for developing innovative pollution prevention technologies at the University of California, Los Angeles. A wide range of CCT projects are addressing many of the substantial engineering challenges in developing innovative pollution prevention technologies.

<http://cct.seas.ucla.edu/>

APPENDIX 11

Cause and Effect Diagram

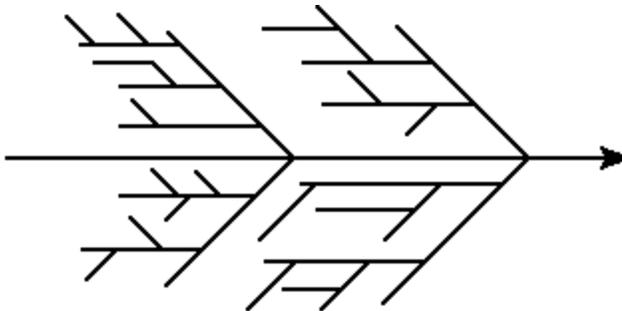
The cause and effect diagram is the brainchild of Kaoru Ishikawa, who pioneered quality management processes in the Kawasaki shipyards, and in the process became one of the founding fathers of modern management. The cause and effect diagram is used to explore all the potential or real causes (or inputs) that result in a single effect (or output). Causes are arranged according to their level of importance or detail, resulting in a depiction of relationships and hierarchy of events. This can help you search for root causes, identify areas where there may be problems, and compare the relative importance of different causes.

Causes in a cause and effect diagram are frequently arranged into four major categories. While these categories can be anything, you will often see:

- manpower, methods, materials, and machinery (recommended for manufacturing)
- equipment, policies, procedures, and people (recommended for administration and service).

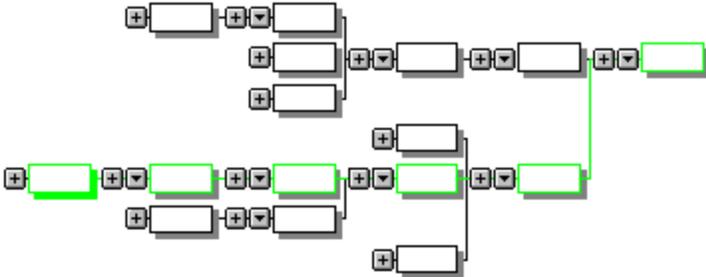
These guidelines can be helpful but should not be used if they limit the diagram or are inappropriate. The categories you use should suit your needs.

The cause and effect diagram is also known as the fishbone diagram because it was drawn to resemble the skeleton of a fish, with the main causal categories drawn as “bones” attached to the spine of the fish, as shown below.



Cause and effect diagrams can also be drawn as tree diagrams, resembling a tree turned on its side. From a single outcome or trunk, branches extend that represent major categories of inputs or causes that create that single outcome. These large branches then lead to smaller and smaller branches of causes all the way down to twigs at the ends. The tree structure has an advantage over the fishbone-style diagram. As a fishbone diagram becomes increasingly complex, it becomes difficult to find and compare items that are the same distance from the effect because they are dispersed

over the diagram. With the tree structure, all items on the same causal level are aligned vertically.

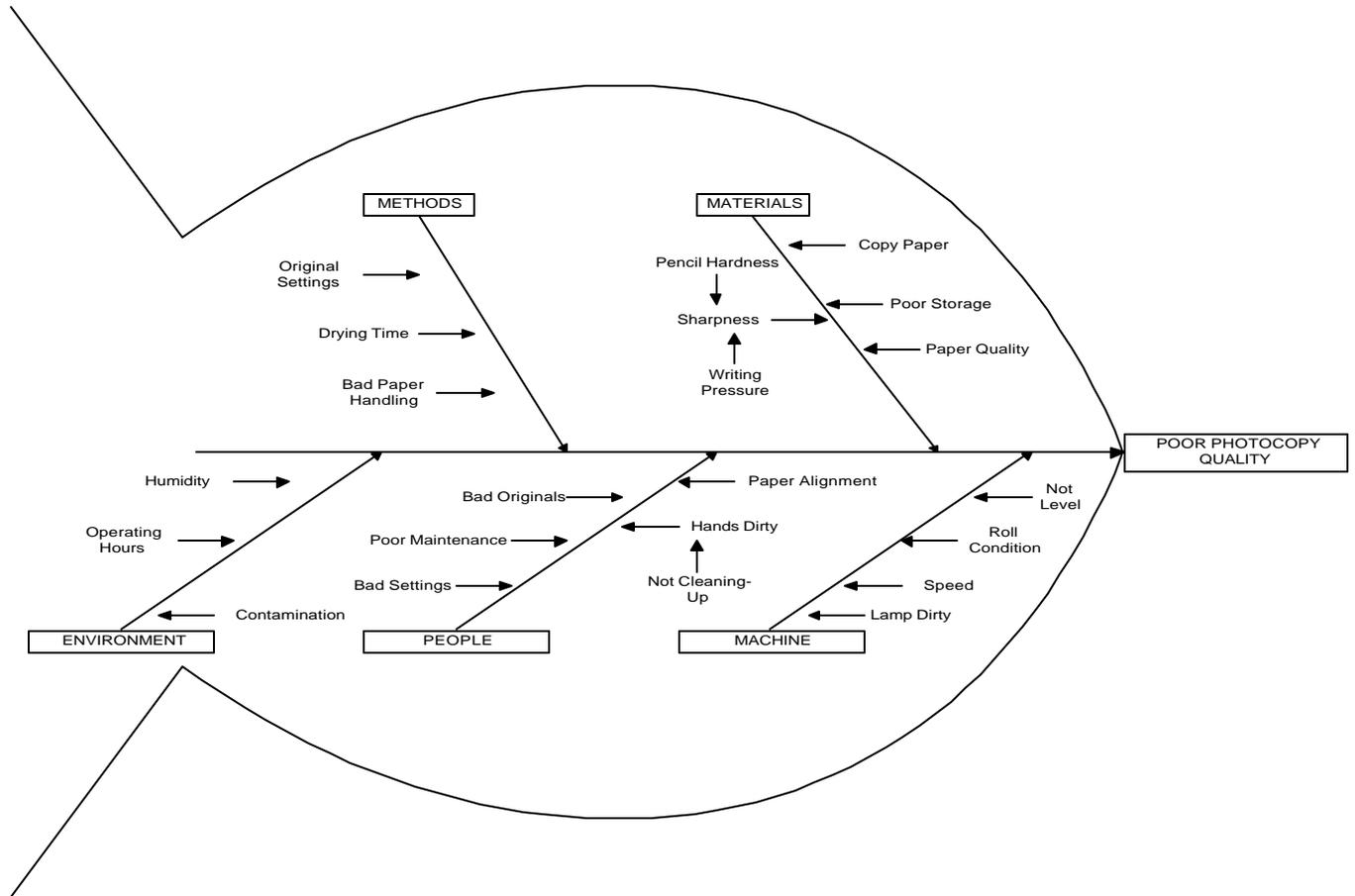


To successfully build a cause and effect diagram:

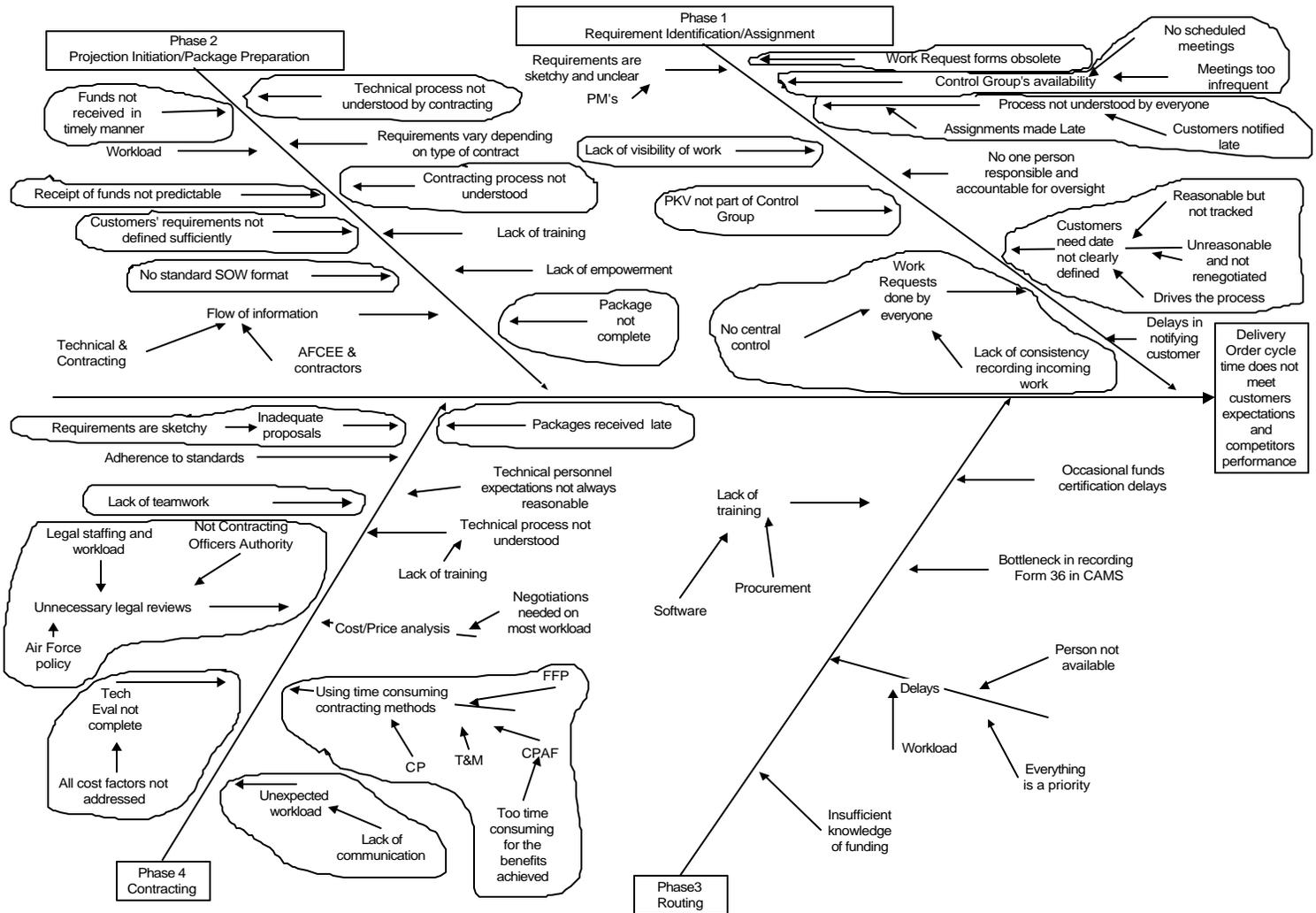
1. Be sure everyone agrees on the effect or problem statement before beginning.
2. Be succinct.
3. For each node, think what could be its causes. Add them to the tree.
4. Pursue each line of causality back to its root cause.
5. Consider grafting relatively empty branches onto others.
6. Consider splitting overcrowded branches.
7. Consider which root causes are most likely to merit further investigation.

Other uses for the Cause and Effect tool include the organization diagramming, parts hierarchies, project planning, tree diagrams, and the 5 Why's.

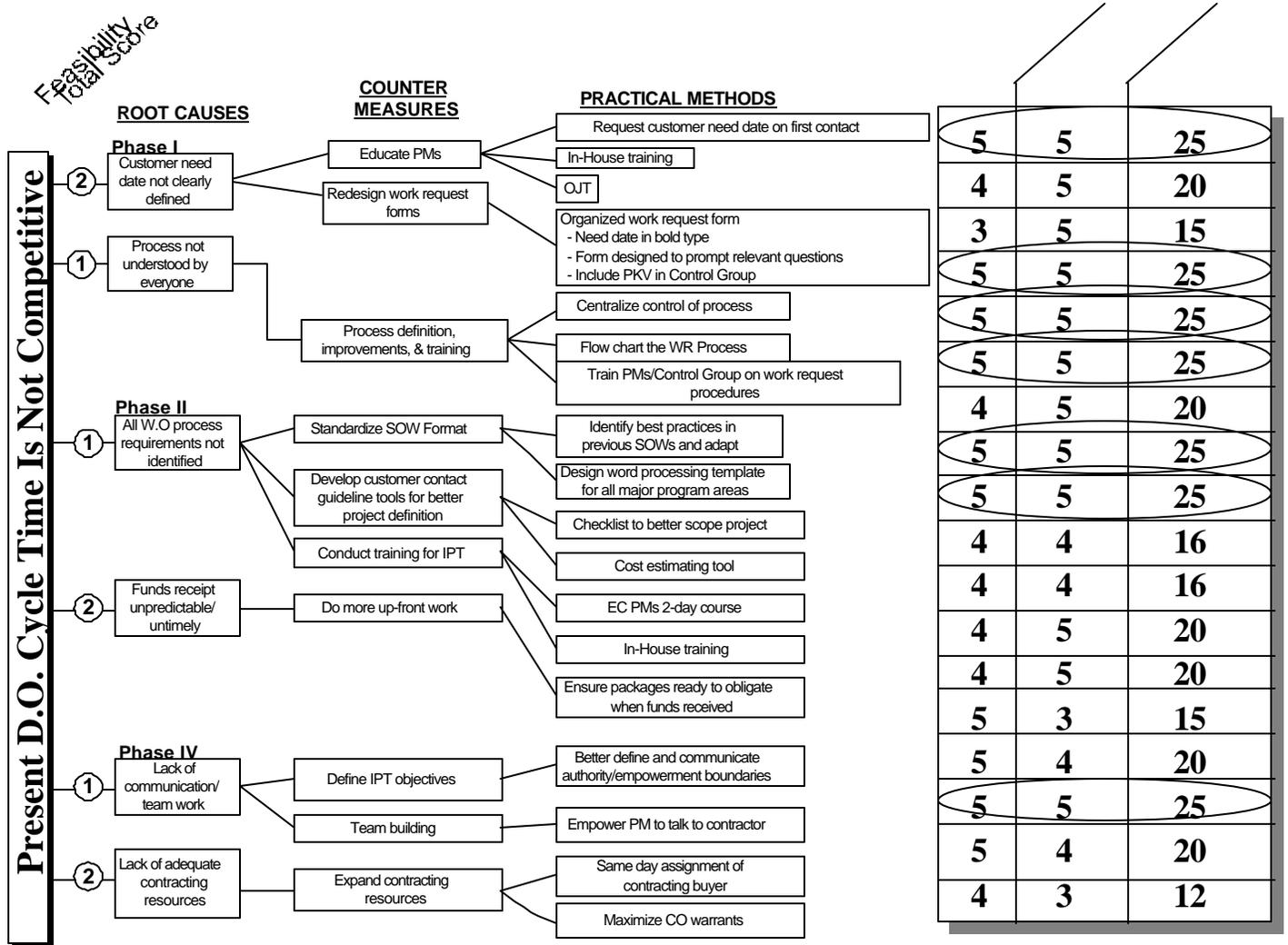
SAMPLE CAUSE-AND-EFFECT DIAGRAM USING ISHIKAWA DIAGRAM (FISHBONE)



Sample Cause and Effect Analysis (Circled Area Denotes Potential Root Causes Identified by Team)



Take Action Matrix



Appendix 12

Glossary of References and Supporting Information

AFPD 90-8, Environment, Safety, and Occupational Health

AFH 90-502, "The Quality Approach," AFMIA.

"A Primer for Financial Analysis of Pollution Prevention Projects," EPA, 1993.

"Transportation Pollution Prevention Model Shop Report," AFCEE, July 1998.

"Pollution Prevention Tools, Techniques, and Technologies Course," 1996.

"Pollution Prevention Programs Operations and Management Course," 1996.

"Pollution Prevention Opportunity Assessment Workshop," 1996.

"Environmental, Safety, and Health (ESH) Cost Analysis Guide," AFMC, 1998.

"AETC Logistics Installation Environmental Coordinator Management Guide," AETC, 2000.

"AETC Environmental, Safety, and Occupational Health, Technology Needs Planning, Programming, & Budgeting Management Guide," AETC, 2000.

"AETC Shop-Level Pollution Prevention Training Manual," AETC, 1996.

"Shop-Level Pollution Prevention Training," AFCEE Web University, 2000.

Environmental Cost Analysis Methodology Handbook, 1998.

Garland, J.; Wallen, A.; and Rice, A. *Applied Activity Based Costing Briefing*, 4th Annual Joint Service Pollution Prevention/Hazardous Waste Management Conference; Air Force Center for Environmental Excellence, 1999.

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