Environmental Quality Assessment Guide

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EXECUTIVE SUMMARY

Chapter 20, *Environmental Quality Assessment Ashore*, of OPNAVINST 5090.1B, Change 2, establishes Navy policy for the assessment and oversight of Navy shore installations' environmental quality. The Environmental Quality Assessment (EQA) Guide provides guidance for planning and implementing the EQA Program.

The EQA program, which replaces the ECE program, comprises two major elements:

- The annual internal assessment
- The external assessment.

Since Navy installations vary significantly in mission, size, organizational structure, and environmental performance, the EQA Program provides for flexibility in the design and implementation of internal and external assessments to best suit the particular needs and circumstances at each installation.

This EQA Program emphasizes three key changes in the way the Navy manages its environmental quality efforts:

- The installation will design and conduct internal assessments to better ensure day-to-day compliance.
- Installation compliance programs will become "self correcting" through enhanced corrective action programs based on compliance evaluations and inspections to identify deficiencies and process improvements and through problem solving to address root causes.
- Major Claimant responsibilities will evolve from providing compliance inspections to evaluating the effectiveness of each installation's internal assessments, problem solving exercises, and environmental management system.

For many installations, achieving "self correcting" status will depend on:

- Critical evaluation and improvement of environmental management systems, and
- Greater responsibility for environmental performance by all units whose missions may impact environmental resources or the costs of compliance.

INTRODUCTION

The U.S. Navy Environmental Quality Assessment (EQA) Guide is intended to support Navy installation Commanding Officers (CO) and their chains-of-command in the successful implementation of the new EQA Program promulgated in Chapter 20 of OPMAVINST 5090.1B, Change 2. The Guide is designed primarily for use by the environmental professionals on staff at the shore installations and Major Claimants who will lead the EQA effort. The primary goal is to give the user various options and examples of how to design, implement, and document internal and external assessments.

The EQA Program and this Guide include ideas that have never been fully implemented in the Navy. As installations and Major Claimants gain experience in implementing the Program, we hope to capture lessons learned and to share useful tools and procedures developed in the field in a future revision or supplement to the Guide. As you work through Program implementation, please note your findings and recommendations and forward them to CNO/N457, Crystal Plaza 5, 2211 South Clark Place, Room 680, Arlington, VA 22202-3735 or mcvey.tami@hq.navy.mil.

How This Guide is Organized

The first three chapters provide a summary of Navy EQA policy and present concepts regarding environmental management systems (EMS) that need to be understood for full comprehension of the subsequent chapters.

Chapters 4 and 5 provide descriptions and examples of methodologies to accomplish and document internal and external assessments.

Chapter 6 presents problem solving methodologies essential to maintaining self-correcting environmental programs. Chapter 7 reviews support that is available to installations and Major Claimants as they implement the EQA Program.

The purposes of the Guide's seven chapters and seven appendices are:

Chapter 1	Summarizes the Navy's policy on EQA ashore.
Chapter 2	Defines the EMS Review.
Chapter 3	Describes the overall management systems concept and describes the management framework necessary to support the EQA Program.
Chapter 4	Provides detailed guidance on how to design and implement internal assessments and present results.
Chapter 5	Provides detailed guidance on how to design and implement external assessments and present results.
Chapter 6	Discusses problem solving concepts and methodologies and their role in the corrective action process.
Chapter 7	Describes tools and additional support available for use in the EQA process.
Appendix A	Lists acronyms and abbreviations used in this guide.
Appendix B	Lists references and discusses other resources that may be helpful in planning and conducting assessments.

Appendix C Presents examples of standard EMS models.

Appendix D Discusses maturity in environmental programs.

Appendix E Provides several case studies illustrating problem solving methods.

Appendix F Presents sample formats for required EQA internal assessment documentation.

Appendix G Presents sample formats for EQA external assessments.

Appendix H Selected portions of OPNAVINST 5090.1B Change 2, Chapter 20.

CHAPTER 1: ENVIRONMENTAL QUALITY ASSESSMENT (EQA) ASHORE

This chapter provides background on the development of the EQA Program and covers its key concepts and major elements.

1.1 Background

The Navy is committed to compliance with environmental and natural resource laws and regulations and considers compliance vital to operational readiness and mission accomplishment. Over the past decade, the Navy has developed important capabilities to achieve, maintain, and monitor compliance. Key among these capabilities was the Environmental Compliance Evaluation (ECE) Program, established in 1989, which was essential to building and improving the Navy's environmental program.

Based on nine years of experience in implementing the ECE program, the Navy has recognized opportunities for improvement. The ECE program, with its primary focus on the Major Claimant's Tier 2 ECE once every three years, provided only a snapshot view of an installation's compliance status and was not the best approach to support day-to-day compliance. With little guidance on Tier 1 self- ECEs, the installations did not clearly understand the scope and objectives, and, in many cases, self- ECEs did not add much value. To some installations, a self-ECE meant a simple review of previous Tier 2 ECE findings or a quick run-through of a requirements-based checklist without even getting up from the desk. Other installations recognized that a thorough and comprehensive compliance assessment provided valuable information that program managers could use to improve their programs.

In applying the principle of continuous improvement, the Director, Environmental Protection, Safety, and Occupational Health Division, Chief of Naval Operations (CNO-N45) tasked a Process Action Team made up of representatives from across the Navy to examine the ECE process and recommend a more effective and efficient program. The team designed the EQA program to support the following goals:

- Integrating environmental leadership into every level of management by promoting full awareness through effective training and by clearly defining environmental quality expectations.
- Implementing a quality assessment program that clearly defines internal and external assessments yet is flexible and tailored to the needs of the command.
- Identifying problems and their root causes, identifying and implementing quality improvements and pollution prevention opportunities, and developing corrective action plans including identification of funding sources.
- Providing COs and their chains-of-command with the tools and technical expertise necessary to verify whether effective management processes are in place, resources are adequate and efficiently used, and compliance is achieved.
- Providing technical assistance for corrective actions through an effective support network.

While considering the EQA program, the team recognized that not every installation is the same. Mission, size, organizational structure, program maturity, environmental performance, and other

circumstances may vary significantly. A "one size fits all" program would not offer the efficiencies the Navy needs. In addition, the team recognized a need to go beyond merely auditing for compliance toward a more proactive approach that incorporates the following:

- Problem solving and root cause analysis,
- Identification of pollution prevention opportunities,
- Implementation and evaluation of corrective and preventive actions, and
- Other process improvements.

1.2 Key Concepts of the EQA Program

Table 1- 1 summarizes key concepts of the EQA Program:

Table 1-1: Key EQA Program Concepts

Concept	Description
Internal and external assessments tailored to meet installation's needs.	Design internal assessments to address all applicable requirements and to focus resources on practices that pose the highest risks. Design schedule and scope of external assessments based on information known about and/or provided by the installation.
Increased emphasis on compliance evaluations by installation personnel.	Conduct compliance evaluations and inspections to better ensure day-to-day compliance. Shift in responsibility for conducting compliance assessments from Major Claimants to installations.
Change of external assessment focus from compliance auditing to EMS reviews.	Examine a new dimension of the program by looking at individual components of the EMS that apply across all environmental program areas. Focus of the Major Claimant external assessment shifts from compliance to management system review.
Problem solving and root cause analysis	Seek an understanding of the underlying causes of current or potential compliance problems by probing beyond the immediate symptoms of non-compliance and attempting to identify and address underlying causes, including management system deficiencies.
Self-correcting compliance programs.	Installations implement compliance evaluations and inspections and apply problem solving techniques incorporating root cause analysis targeted at correcting deficiencies and preventing them from happening again. Demonstrated effectiveness of self-correcting programs at installation level minimizes requirement for higher headquarters to inspect for compliance.
Proactive and promotes continuous improvement.	Identify and follow up on pollution prevention opportunities and other process improvements to address compliance problems. Periodically review program effectiveness and revise policy/procedures accordingly.

1.3 Major Elements of the EQA Program

Major elements of the EQA Program include internal and external assessments. Each element is discussed briefly in this section. Table 1-2 compares the internal and external assessment processes.

Table 1-2: Comparison of Internal and External Environmental Quality Assessments

Characteristic	Internal Assessment	External Assessment
Responsibility	Installation/host activity	Major Claimant of host activity
Frequency	At least annual. May be continuous throughout the year in accordance with the Internal Assessment Plan (IAP).	An annual document review. Site visit at Claimant's discretion and in accordance with the External Assessment Plan.
Scope	Development of an IAP. Performance of compliance evaluations, inspections, and problem solving. Preparation of an EQA Report. May also include EMS review.	Review the IAP, EQA Report, and other environmental performance data. Site visit is scheduled at Claimant's discretion. At a minimum during a site visit, the claimant evaluates the EMS and internal assessment documentation.
Primary Focus	Compliance	EMS effectiveness
Secondary Focus, as Appropriate	EMS effectiveness	Compliance
Target	All commands within the fenceline or regional complex (tenants, contractors and other governmental activities).	All commands within the fenceline or regional complex (tenants, contractors and other governmental activities).
Standards of Measure	- Regulatory requirements - Navy policy - Best business practices - Benchmarks - Installation targets and goals - Measures of merit	- Regulatory requirements - Navy policy - Best business practices - Benchmarks - Installation targets and goals - IAP - Internal Assessment documentation including Plan of Action and Milestones - EQA Report - Measures of merit

1.3.1 Internal Assessment

As defined in Chapter 20 of OPNAVINST 5090.1B, an internal assessment is:

> A systematic, documented, objective, and comprehensive environmental compliance review of installation processes, facilities, and practices completed within a 12-month period. Installation personnel or their designees conduct the assessment.[1]

The host activity, in coordination with tenant activities, conducts the internal assessment, which addresses, on a schedule based on the relative environmental impacts associated with various activities on the installation, all applicable compliance requirements within the "fenceline". The internal assessment may also include review of the EMS. For regional complexes, the Regional Commander is the host activity and the property owner, and the "fenceline" refers to all properties under direct control of the Regional Commander.

An internal assessment should provide for:

- Development of an Internal Assessment Plan (IAP);

[1] See Appendix H.

- Compliance evaluations by environmental professionals to identify, characterize, and document compliance deficiencies related to individual practices and environmental programs;
- Inspections of practices and associated environmental control measures by practice owners;
- Problem solving to define compliance problems, analyze their causes, and then select, implement, monitor, and modify corrective and preventive actions to achieve specified results;
- Preparation of an EQA Report annually; and
- Management review of problem solving results, the IAP, and EQA.

Chapter 4 of this guide describes how to develop an IAP.

1.3.2 External Assessment

As defined in the Chapter 20 of OPNAVINST 5090.1B, an external assessment is:

> A systematic, documented, objective and periodic review of the installation's environmental management system that may include compliance reviews of selected program areas. Designated persons from outside the organization of the inspected installation conduct the assessment. Those designated persons may be members of the Major Claimant, Naval Inspector General, Naval Audit Service, and/or others. In terms of the EQA Program, regulatory inspections are not considered external assessments.

The Major Claimant of the host installation, in coordination with Major Claimants of tenant organizations, usually conducts the external assessment. An external assessment has two main parts:

1. An annual document review of the installation's IAP and EQA Report, plus any other information available on the installation's environmental performance.
2. A site visit with a schedule and scope determined by the Major Claimant, based on review of the installation's IAP, EQA Report, environmental performance record, and other available information.

The schedule and scope of the site visit are flexible and should be tailored to meet the installation's needs. This allows for varied degrees of compliance or oversight assessments.

Schedule. Based on the results of the annual document review, the Major Claimant may elect to visit the installation immediately, once a year, once every two years, or less often, if appropriate, depending on the installation's condition and circumstances.

Scope. At a minimum, the Claimant will evaluate the installation's EMS and internal assessment documentation to determine if the installation is effectively evaluating its compliance status. A site visit may also include compliance reviews of all environmental program areas or target particular program areas, as appropriate. The external assessment site visit may be accomplished through the traditional command inspection process or as a separate assessment/assistance visit. Major Claimants are required to document their decisions regarding the scope and frequency of the site visits in an External Assessment Plan (EAP) that must be submitted annually to CNO/N45.

Chapter 5 of this guidance document presents guidelines for planning, conducting, and documenting the external assessment.

1.4 Key Terms

Several terms have specific meanings as used in this guide:

Compliance evaluation - Identification, characterization, and documentation of compliance deficiencies related to either practices or environmental programs conducted by environmental management office personnel or other environmental professionals designated by the installation. Includes oversight of any inspections that have been performed by practice owners.

Inspection - On-site examination of practices and related environmental control measures by or on behalf of practice owners to determine whether environmental compliance requirements are being satisfied. Includes documentation and reporting of deficiencies as arranged with the installation's environmental management office and any sampling, analysis, or other monitoring activities that the practice owners perform in order to maintain compliance.

Problem solving - The sequence of steps taken to define a compliance problem, analyze its causes, and then select, implement, monitor, and modify corrective actions to achieve specified results.

Practice - Any activity conducted by an installation or its tenants in performing their missions that has an actual or potential impact on the installation's assets. The term includes the processes, equipment, and facilities used in conducting the activities. Practices may be further distinguished as business practices and management practices:

> *Business Practice* - Work-related activities including operation and maintenance of industrial processes, pollution control equipment, and mission-critical equipment and facilities; weapons systems training operations; etc.
>
> *Management Practice* - Activities conducted to manage, coordinate, or support business practices, such as provision of environmental training for personnel, documentation of EMS elements, development and implementation of plans and standard procedures, etc.

Practice Owner - The person, unit, or organization that operates, conducts, controls, or is otherwise responsible for a "practice".

Asset (or Vulnerable Asset) - A resource on which the installation depends or over which it has some responsibility, and which may be impacted (adversely or beneficially) by the conduct of practices, such as environmental, historical, and cultural areas on and off the installation; personnel health and safety; mission effectiveness; military training lands; real property; financial resources; and public relations status.

Impact - The positive or negative effects on assets of conducting business and management practices.

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CHAPTER 2: ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) REVIEW

Chapter 1 of this guide introduces the term "EMS Review." Chapter 20 of OPNAVINST 5090.1B, Change 2, requires an evaluation of the EMS during external assessment site visits. In support of continuous improvement and environmental excellence and/or preparation for an external assessment site visit, installations may choose to include EMS Reviews in their internal assessments. This chapter defines the term "EMS" and describes the purpose and scope of an EMS Review.

2.1 Definition and Purpose of an EMS Review

Chapter 20 of OPNAVINST 5090.1B, Change 2 defines an EMS to be

> that part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental program and achieving environmental goals.

At an installation, an EMS exists whether it is deliberately designed or happenstance, and an EMS may or may not be effective. OPNAVINST 5090.1B requires some basic elements of EMSs that are in place at Navy installations. These elements and their relationships to some standard EMS models are described in Section 2.2.

We conduct EMS Reviews to evaluate the effectiveness of the installation's EMS and its role in supporting environmental performance. The results of EMS Reviews provide top management personnel with the information required to revise the EMS (if necessary) in support of continuous performance improvement. As the EMS matures and reaches its initial objectives, EMS Reviews should be conducted on a periodic basis.

Under the EQA program, EMS Reviews, conducted both internally and externally, focus either on environmental media-specific program management or on the comprehensive EMS.

EMS Reviews provide feedback to installation management and Major Claimants on:

- Strengths and weaknesses of individual media programs or the EMS as a whole;
- Underlying causal factors (root causes) that may contribute to the occurrence of observed compliance deficiencies;
- The ability of the installation's compliance programs to be self-correcting;
- Strengths and weaknesses of each of the individual components/elements of an EMS; and
- The effectiveness of the system and identification of opportunities for improvement.

2.2 Scope of an EMS Review

The scope of an EMS Review is based on key characteristics and elements of effective EMS models. Numerous EMS models have emerged since the mid-1980s. A number of components are common to most models. For example, the Code of Environmental Management Principles (CEMP) for Federal Agencies, developed by EPA in response to Executive Order 12856,

"Federal Compliance with Right-to-Know Laws and Pollution Prevention (P2) Requirements," is structured around the following components:

- Management Commitment;
- Compliance Assurance and Pollution Prevention;
- Enabling Systems;
- Performance and Accountability; and
- Measurement and Development.

International Organization for Standardization (ISO) Standard 14001 components include:

- Environmental Policy;
- Planning;
- Implementation and Operation;
- Checking and Corrective Action; and
- Management Review and Improvement.

EPA's *Generic Protocol for Conducting Audits of Federal Facilities* addresses the following "disciplines" derived from key characteristics and elements of effective EMSs:

- Organizational Structure;
- Environmental Commitment;
- Environmental Planning and Risk Management;
- Staff Resources, Training, and Development;
- Formality of Environmental Programs;
- Internal and External Communication; and
- Program Evaluation, Reporting, and Corrective Action.

The President gives the Malcolm Baldrige National Quality Award annually to U.S. companies based on evaluation in seven categories:

- Leadership;
- Strategic Planning;
- Customer and Market Focus;
- Information and Analysis;
- Human Resource Development and Management;
- Process Management; and
- Business Results.

Table 2-1 summarizes basic components and elements that are common to all or some of these models. Appendix C to this guide discusses CEMP, ISO 14001, and Malcolm Baldrige components in greater detail. This guide uses generic language throughout, when referring to

EMS components and elements, to illustrate principles of performance management without promoting a particular EMS model.

OPNAVINST 5090.1B prescribes Navy policies on environmental management. Table 2-2 presents a general outline of policy contained in OPNAVINST 5090.1B and relates it to components of the generic EMS described in Table 2-1, thus demonstrating that organizations at Navy installations should already have many basic EMS components and elements in place.

Table 2-1: Components and Elements of a Generic EMS

Component	Element
Policy	Develop, document, and communicate policy
Planning	Identify and track requirements
	Identify vulnerable assets and business and management practices which may impact them
	Identify pollution prevention (P2) opportunities
	Identify, document, and rank environmental impacts
	Develop objectives and targets based on environmental impacts
	Establish programs to meet objectives and targets
Implementation	Provide resources (funding, manpower, technical, material)
	Identify training needs and provide training
	Develop and control EMS documentation
	Develop and document standard operating procedures (SOPs) for practices associated with impacts
	Develop and test emergency procedures
Evaluation	Identify, characterize, and document problems (compliance and management system)
	Develop corrective/preventive actions (solutions)
	Secure management approval for solutions
	Implement solutions
	Management review of EMS
Improvement	Continual improvement

In the EMS framework described in Table 2-1, three ongoing processes are fundamental. These include:

- The planning loop (corresponding to the planning component);
- The corrective action loop (within the evaluation component); and
- The continuous improvement loop (encompassing the entire EMS process).

The processes are “loops” in that they should be conducted repeatedly; information available at the conclusion of one iteration should be used as a basis for the next iteration. These loops, their relationships with all EMS components and elements, and a systematic approach to establishing them are covered in Chapter 3 of this guide.

Table 2-2: Description of the Navy's EMS as Prescribed in OPNAVINST 5090.1B

EMS Component	EMS Element	OPNAVINST Chapter	Description
Policy	EMS Policy	Chapter 1— Environmental Policy, Organization, and Funding	General description of environmental policy and commitment to compliance and P2.
Planning	Requirements	Throughout	Legal requirements are identified in media chapters.
	Assets, Practices, and Impacts	Throughout	Vulnerable assets, business and management practices, and impacts are defined at Navy-wide level throughout.
	P2 Opportunities	Chapter 3—Pollution Prevention	Policy, program, and procedures are described.
	Objectives and Targets	Not specifically addressed in OPNAVINST	
Implemen-tation	Programs	Throughout	Media programs are defined and structure/responsibility provided throughout the OPNAVINST.
	Resources	Chapter 1— Environmental Policy, Organization, and Funding	Section 1-4 presents funding policy and procedures.
	Training	Chapter 24—Environmental and Natural Resources Training	Training requirements and responsibilities are described.
	EMS Documentation	Throughout	Documentation requirements reflect regulatory requirements, and are provided as applicable throughout the media program chapters of the OPNAVINST. As such, they partially conform to documentation provisions under an EMS.
	SOPs	The OPNAVINST provides management SOPs, but does not clearly stipulate SOPs for all business and management practices.	Presumably, SOPs should be developed at the installation level (where practices with the potential to impact the environment are conducted).
	Emergency Procedures	Chapter 4—Procedures for Implementing EPCRA Chapter 10—Oil and Hazardous Substance Contingency Planning	Emergency prevention and mitigation policies and procedures are described in Chapters 4 and 10, and in other media program chapters.
Evaluation	Identify problems	Chapter 20 (Change 2)—EQA Ashore	EQA problem solving/root cause analysis procedures meet the problem identification element.
	Corrective/ Preventive Actions	Chapter 20 (Change 2)—EQA Ashore	EQA corrective/preventive action procedures meet the corrective/preventive action element.
	Management Approval	Chapter 20 (Change 2)—EQA Ashore	EQA procedures for management approval of corrective/preventive actions meet the management approval element.
Improvement	Management Review	Not specifically addressed in OPNAVINST (Change 1).	The Navy's consideration of EMS principles (exemplified in the DoD pilot study, Change 2 of Chapter 20, and this guidance) constitutes a review of the existing EMS.

2.3 EMS Review Techniques

A number of techniques may be appropriate for reviewing the installation's EMS depending on the maturity of the EMS.

When conducting external assessments, the maturity of the installation's environmental program will affect where the evaluators will concentrate their assessment efforts. Environmental programs can mature from reactive through proactive levels. Table 2-3 describes how, as environmental programs mature, the evaluator's primary points-of-contact during the external assessments will shift from shop-level staff to installation management personnel. See Appendix D for additional discussion of EMS maturity.

Table 2-3: Evaluator's Focus Shift as Environmental Programs Mature

Environmental Program Maturity	Primary Points of Contact during External Assessments
"Reactive"	Media specific managers in the EMD and shop-level staff
"Progressive"	Media specific managers in the EMD, other EMD staff, and EMD management personnel
"Proactive"	EMD management personnel, managers of other functional areas (e.g., Facilities Department, tenants, other host activities), and installation management personnel

A fundamental, results-oriented measure of the effectiveness of an EMS is success in identifying and permanently correcting compliance problems in a timely manner. If the installation has implemented and documented its internal assessment and problem solving activities as recommended in this guide, the Major Claimant's job should be straightforward. A review of the documentation that the installation maintains regarding its problem solving efforts should demonstrate the installation's performance level. In such a review, it is not the number of deficiencies recognized that is important, but that the search for deficiencies is thorough and that problem solving exercises yield permanent corrective and preventive actions.

Additional management system evaluation approaches include:

Checklists—One effective method for reviewing EMS effectiveness is to develop checklists that specify OPNAVINST 5090.1B or other program management requirements. These EMS Review checklists can be incorporated into the ACE software (see Chapter 7). Additional information regarding EMS Review Checklists is included in Section 2.4.

Ad-Hoc Evaluation—An alternative or supplemental approach to evaluating the effectiveness of the EMS is based on the problem solving element of the generic EMS corrective action loop (see Section 3.2). Identification of the contributing and root causes of management and compliance problems may reveal deficiencies in the management system itself and thus suggest potential areas for EMS improvement. For example, a recurring compliance deficiency may be caused by inappropriate training or failure by management to effectively communicate the installation's commitment to compliance. As installation planners develop corrective actions that implement

needed management system elements, the scope and effectiveness of the management framework are increased incrementally.

Review against an EMS Standard—Another approach to evaluating management effectiveness is to evaluate the installation's EMS against an accepted EMS standard, such as EPA's CEMP or ISO 14001. The Navy's preliminary guidance on ISO 14000 and EMS is included in Appendix H. Since most Navy installations have not implemented ISO 14000 (exceptions are installations participating in DoD's ISO 14000 pilot study and CINCUSNAVEUR theater activities that are currently undergoing EMS implementation), only a limited version of an ISO audit will be appropriate in most cases. However, instead of employing CEMP or ISO as the model, Navy installations may wish to consider the generic EMS framework presented in Table 2-1 and Chapter 3 of this guide. Evaluation of environmental management may be accomplished by identifying which of the components and elements of the generic EMS are in place at the installation, and assessing the effectiveness of each. This approach may add value to the environmental management evaluation process where OPNAVINST 5090.1B requirements fall short of the EMS model.

2.4 EMS Review Checklists

One approach to conducting an EMS review is through the use of a checklist. EMS Review checklists may be developed to assist and standardize the review at an installation, but are not a substitute for critical and independent judgment or decision-making. Checklists should only be used as a reference point to affirm that key criteria and evaluation areas have been examined.

The content and focus of the checklist should be developed by installation or Major Claimant personnel, as appropriate, and tailored to the maturity of the EMS in place at the installation. Although checklists are valuable tools to ensure that an assessment has adequately addressed all management issues that need to be examined, they are not static and should reflect the unique and changing considerations of the program or management system under review.

Checklists could be a series of questions to assist in determining whether the installation has successfully implemented management functions needed to achieve environmental objectives. To make this determination, evaluators should ask questions and make observations to determine if policies and procedures have been developed and implemented to:

- Identify and track regulatory, DoD, and DoN requirements;
- Identify and rank practices which can or do impact the environment or other vulnerable assets;
- Identify, prioritize, and document impacts of identified practices;
- Identify and implement P2 opportunities;
- Establish EMS goals and objectives;
- Implement initiatives to meet the EMS's goals and objectives;
- Establish an internal assessment plan that effectively identifies compliance deficiencies and EMS inconsistencies;
- Conduct appropriate "problem solving" that determines the underlying causes of deficiencies identified in both internal and external assessments; and

- Implement corrective actions that prevent reoccurrence of identified deficiencies.

Sources of information for development of an EMS Review checklist include management requirements of the OPNAVINST 5090.1B and installation-level policy documents as well as the EMS models described in this guide. Several references in Appendix B also offer EMS checklists (e.g., EPA's Generic Protocol for Conducting Environmental Audits at Federal Facilities, Volumes I and II).

The Automated Compliance Evaluation (ACE) software tool, described in Chapter 7 of this guide, can be used to incorporate EMS requirements in a checklist. Observations regarding any question can be documented in ACE by recording each observation in the "Comment" or "Deficiency Description" fields. The checklist can also be modified over time to accommodate changing requirements and applicability as the installation's EMS evolves.

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CHAPTER 3: A SYSTEMATIC APPROACH

This chapter presents a generic EMS framework that incorporates the three ongoing loops— planning, corrective action, and continuous improvement— introduced in Chapter 2. The principles embodied in existing models, such as EPA's Code of Environmental Management Principles (CEMP), ISO Standard 14001, and OPNAVINST 5090.1B serve as a basis for this generic framework, which may be used by Navy installations in a systematic approach to enhancing their EMS in support of the EQA program.

Many of the components and elements of this framework are in place at Navy installations, as prescribed in OPNAVINST 5090.1B (see Table 2-2). Full implementation of the generic EMS framework will enhance environmental performance and promote attainment and maintenance of compliance by 1) highlighting and encouraging essential activities and procedures and 2) focusing management attention and resources on priorities established by the installation.

Figure 3-1 depicts an overview of the EMS framework illustrating the three generic loops. Sections 3.1 through 3.3 describe each loop in detail.

3.1 The Planning Loop—Determining Environmental Impacts

The most effective EMS focuses resources where they are most needed. To understand where to apply resources, an installation will benefit from a current and comprehensive inventory of its regulatory requirements, business and management practices, and the relative impacts of its activities on the environment and other vulnerable assets. Since business and management practices at Navy installations are subject to the dynamic nature of mission, funding, personnel, and environmental requirements, the inventory should be reviewed and revised on a periodic basis. The planning process is thus described as a "loop"—it is done repeatedly and supports continuous improvement.

An effective planning loop addresses environmental impacts and responsibilities across functional boundaries at the installation and is critical in the development of a comprehensive, installation-wide EMS.

A mature EMS is characterized by identification of practices, vulnerable assets, and impacts *across the entire installation*, irrespective of functional lines. Thus, practices, vulnerable assets, and impacts identified during planning should be rigorously documented. In this respect (and as discussed in Chapters 4 and 5 on the design of internal and external assessments) inventory information developed during the planning process will contribute significantly to the success and continuous improvement of the EQA program.

Figure 3-2 illustrates the relationship between vulnerable assets, business and management practices, and associated impacts.

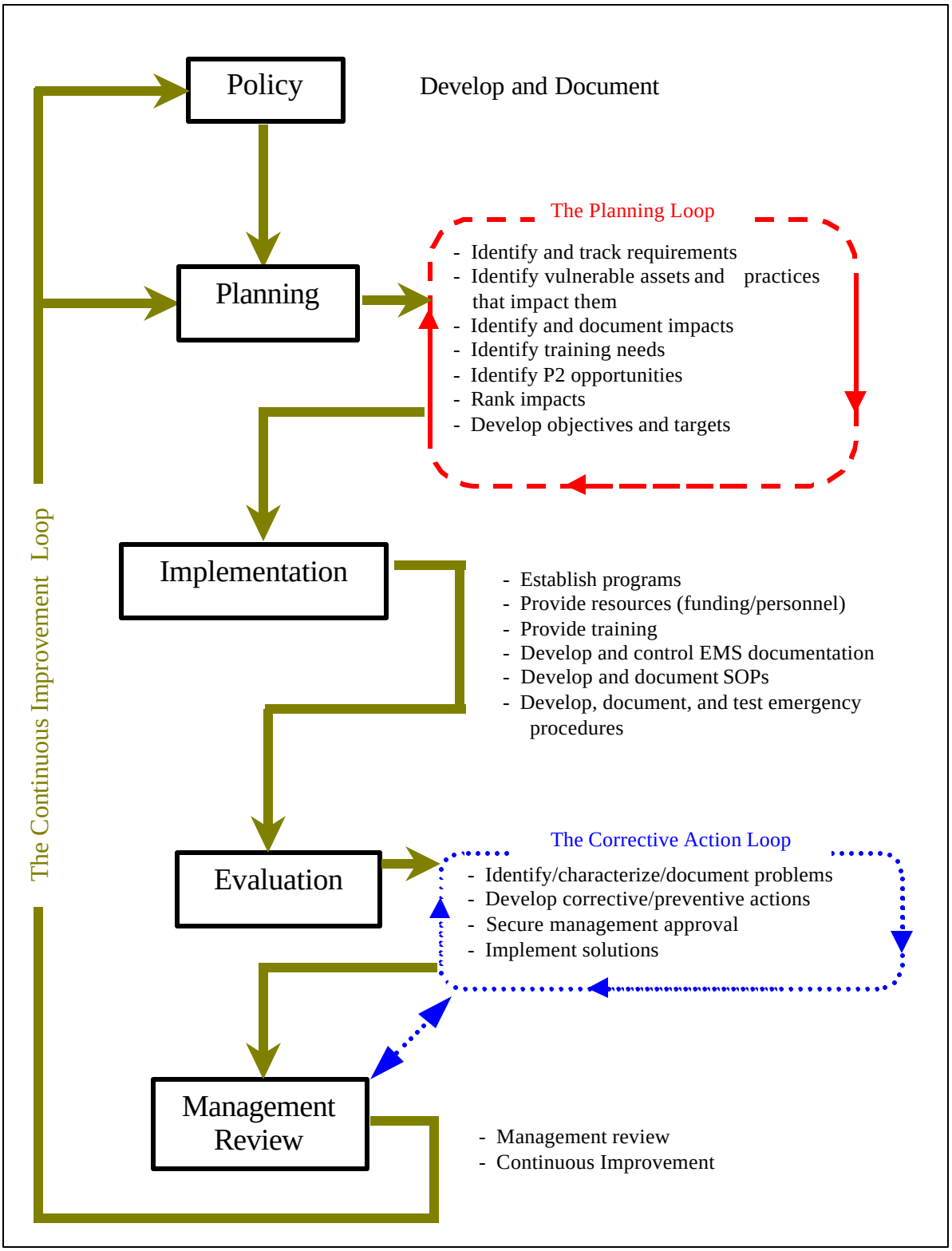

Figure 3-1: Generic EMS Process

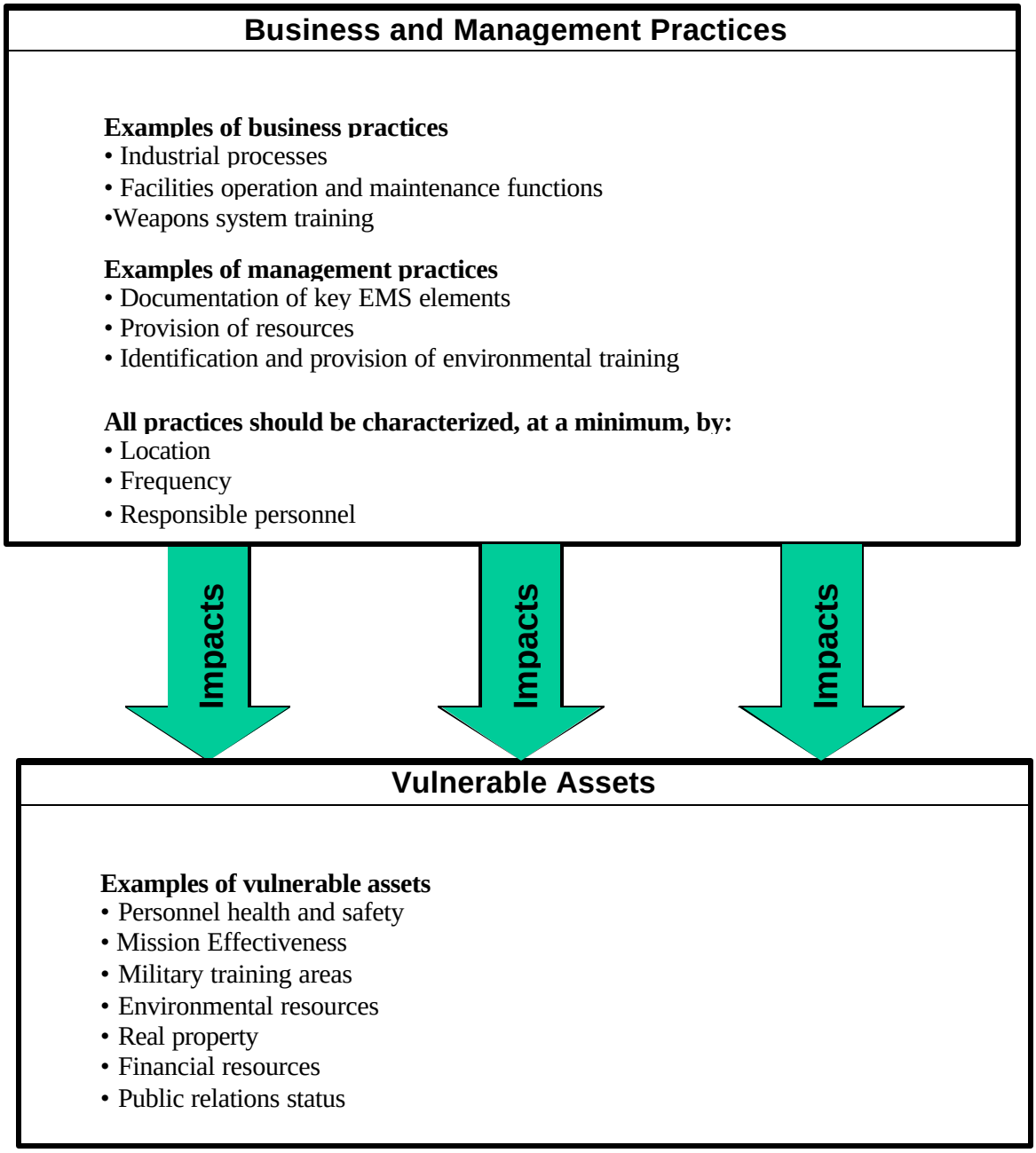

Figure 3-2: Relationships between Business and Management Practices, Impacts, and Vulnerable Assets

Components of the planning loop depicted in Figure 3-1 include:

1. *Identify and Track Legal, Regulatory, and Other Requirements*—Because regulatory compliance is the minimum goal of a performance-based EMS, identifying and tracking

legal, regulatory, DoD, DoN, Final Governing Standard, Status of Forces Agreements, and Overseas Environmental Baseline Guidance Document requirements remains key. Because new requirements are developed, and existing requirements change, tracking requirements must be done on a continuous basis.

2. *Identify Practices and Vulnerable Assets*—"Practices" are defined broadly to include everything that an installation does that has an actual or potential impact on its resources. At a minimum, practices include the following:

   - Business practices that have actual or potential environmental impacts including, but not limited to, operation and maintenance of industrial processes, pollution control equipment, mission-critical equipment, and facilities.
   - Management practices that have actual or potential environmental impacts including, but not limited to:
     - > Provision of environmental training for personnel;
     - > Documentation of EMS-related activities;
     - > Execution of the environmental project funding process; and
     - > Implementation of management plans and procedures.

     While conducting its inventory of practices, the installation should also identify where each practice takes place, the frequency of its occurrence, and responsible personnel. As a starting point, this information is compiled from existing sources including plans, permits, inventories, program managers' knowledge, practice owners' knowledge, etc. Subsequently, any gaps are filled in.

   "Vulnerable Assets" are also defined broadly to include:

   - Personnel health and safety;
   - Mission effectiveness;
   - Military training areas;
   - Sensitive environmental, historical, and cultural resources;
   - Real property;
   - Financial resources; and
   - Public relations status.

3. *Determine and Document Impacts*—"Impacts" are the effects of conducting business and management practices on the installation's vulnerable assets. Determination of impacts is based on the identification of practices and sensitive assets described above. Note that each practice may impact one or several assets in multiple ways. Impacts should be documented as they are identified. Examples include:

   - The operation of an oil/water separator may impact the quality of waters (an environmental asset) receiving the separator's discharge.
   - Air emissions from a large, highly visible power plant impact local and regional air quality and may also impact the installation's public relations status.

- Failure to provide effective environmental training to operators at the power plant could impact air, water, and other environmental media. In this example, internal and external assessments (and problem solving techniques) might identify a training deficiency in the management system as a root cause of identified non-compliance events.
- Operation of a solvent-based industrial parts washer generates hazardous wastes (HW) that must be disposed of. Transportation and disposal of HW create potential environmental impacts and real financial impacts. Operation of the parts washer also potentially impacts worker health and safety.

4. *Identify P2 Opportunities*—Identifying P2 opportunities follows naturally from a comprehensive identification of impacts. The identification, selection, and implementation of P2 technologies can not only reduce compliance liabilities, but can also improve operational and fiscal efficiency. While operational and financial efficiencies are important, however, the primary benefit of a P2 approach in an EMS is its ability to provide optimal control over certain environmental impacts by eliminating the impacts (and associated compliance requirements) entirely.

   When total costs are considered, the elimination of a compliance requirement altogether may provide stronger control over a practice and its impacts than will improved management of the requirement. This is the basic approach of several initiatives underway among the DoD components (e.g., U.S. Navy's AIMM to Score program, U. S. Marine Corp's P2 Approach to Compliance Efforts (PACE) program, and Air Combat Command's Compliance through Pollution Prevention (CTP2) initiative), which seek to eliminate "compliance sites" through the use of P2 solutions.

5. *Rank Impacts*— Prioritizing impacts is crucial to the EMS process and should be based on development and use of a ranking scheme that assesses the relative significance of (or risks associated with) each impact. Significance is determined per criteria developed by the installation. Examples of possible criteria for consideration include:

   - How frequently does the impact occur?
   - Is the impact currently under control?
   - Is the impact a recurring, continuous, or discrete event?
   - What is the probability of occurrence?
   - Does the impact affect more than one asset?
   - What is the importance/sensitivity of the affected asset?
   - Is the associated practice subject to regulatory requirements?
   - What is the potential for regulatory agency involvement?
   - What is the potential to impact sensitive assets?
   - How likely is negative (or positive) public (or other stakeholder) attention?
   - What is the potential to endanger employee health?

   Practices and impacts subject to regulatory requirements or scrutiny should automatically be given high priority. Otherwise, it is up to installation-level EMS planners to determine how to prioritize impacts. It is important to include practice owners—those personnel or units

who directly control a business practice—as well as environmental managers in the identification and ranking of impacts. The impact ranking process should consider the interests of as broad a spectrum of stakeholders as is feasible.

In order to communicate the results of the impact ranking process, installations may want to consider a model such as NAVOSH's Risk Assessment Code (RAC) described in OPNAVINST 5100.23E, Chapter 12, "Hazard Abatement Program." The RAC is an expression of risk assigned by a matrix which combines the elements of hazard severity and mishap probability.

6. *Develop Objectives and Targets*— A fundamental goal of an EMS is to continuously improve environmental performance. Performance is measured with respect to the installation's status in meeting internally-developed objectives and targets. Objectives and targets should reflect priorities based on the installation's inventory of business and management practices and associated impacts on vulnerable assets.

   Objectives must also support compliance and must be measurable, i.e., EMS planners should develop metrics to facilitate measurement of performance improvement attributable to the EMS. Table 3-1 presents examples of objectives and targets derived from an organization's planning inventory.

Table 3-1: Examples of Impacts, Objectives, and Targets

Priority Impact	Affected Asset(s)	Objective	Target
High cost of hazardous waste disposal	Financial resources	1) Reduce costs of HW disposal 2) Implement P2 solutions	1) 30% cost reduction by FY2002 2) Five P2 projects in next budget request
Wastewater treatment plant discharge	Water quality	Reduce NPDES permit exceedances	50% reduction by FY2000
Shop floor worker safety	Personnel health and safety, financial resources, mission effectiveness	Reduce accidents and spills	50% reduction in days lost to accident-related injuries by FY2000
Power plant stack emissions extensively degrade public image	Public relations	Reduce public disfavor	Participate in community environmental planning committee

Once the six steps of the planning process are completed, installation personnel should collate all documentation developed during each of the steps. Other data, such as responsible personnel, applicable requirements, reporting responsibilities, etc., can be included in the inventory, at the installation's discretion. A comprehensive inventory becomes an integral tool for conducting the internal and external assessments, as discussed in Chapters 4 and 5 respectively. The inventory also supports continuous improvement by providing a baseline for revisiting the planning loop as the installation's EMS matures. Table 3-2 presents a summary of types of information that may be developed and documented during EMS planning.

Table 3-2: Information Developed and Documented in the EMS Planning Process	
Critical Information	List all vulnerable assets. List all business practices with actual or potential impacts. List management practices that influence actual or potential impacts. List regulatory requirements that apply to each practice and asset. Describe the location and "owner" of each practice and asset, as applicable. Identify business and management practices subject to compliance requirements. Describe impacts to assets associated with each practice. Prioritize impacts per criteria developed by installation and Major Claimant.
Supporting Information	Identify key personnel and points of contact associated with each practice and asset. Identify key documents maintained for each practice and asset. Describe training requirements for each practice and asset. Maintain training records for all personnel in jobs requiring environmental training. Describe practice. Describe P2 solutions in place or applicable to each practice. Describe environmental projects underway for each practice and asset. Describe the regulatory history associated with each practice and asset.

3.2 The Corrective Action Loop

Effective implementation of the corrective action loop enables an installation's environmental programs or EMS to become "self-correcting" and promotes evolution beyond a reactive, compliance-focused stance. An effective corrective action process also allows installations to document their ability to identify non-compliance issues and to develop and implement appropriate solutions. The corrective action loop consists of several steps:

1. *Identify Deficiencies/Problems*— The EQA Program's internal and external assessments identify compliance deficiencies and associated opportunities for improvement within the installation's environmental programs or EMS. The installation and/or Major Claimant set evaluation criteria depending on the maturity of the installation's environmental programs, and evaluators collect objective information based on document reviews, inspections, and interviews with appropriate personnel.
2. *Characterize Deficiencies/Problems*— Characterization of identified deficiencies is a continuation of the fact-finding initially conducted to identify problems. Characterization consists of collecting additional information to support a more complete understanding of the deficiency and its underlying causes. Systemic causes of environmental management and compliance problems may be identified through root cause analysis[2] and problem solving techniques (see Chapter 6 of this guide).

   All information about identified EMS or compliance problems should be documented to support the development of corrective and preventive actions and management review of recommended solutions.

[2] Root cause analysis within the internal assessment is a component of the "problem solving" techniques discussed in Sections 4.3, 5.3, and Chapter 6 of this guide. Root cause analysis exceeds DoD's requirements for "root cause categorization" outlined in the DUSD(ES) memorandum, *Root Cause Analysis Methodology and Implementation*, 23 April 1997.

3. *Develop Corrective/Preventive Actions*—The installation should develop corrective or preventive actions that address the causes of problems and seek to prevent the recurrence of compliance or management system deficiencies. Root causes may often indicate shortcomings in the underlying management system; management system-related causes of non-compliance indicate opportunities for improvement of the EMS.
4. *Management Approval*—In addition to responsibilities for periodic review of the entire EMS (discussed in Section 3.3 below), top management personnel are also responsible under the EMS framework for approving corrective/ preventive actions developed to solve identified problems or deficiencies. Management review and approval of recommended solutions constitutes "buy-in" and significantly enhances the effectiveness of solutions that are implemented.
5. *Implement Solutions*—After preventive and corrective actions have been developed and approved, they must be implemented to support continuous improvement. Solutions designed to solve the causes rather than the symptoms of compliance or management system deficiencies contribute to long term enhancement of the EMS. Measurement of improvements attributable to implemented solutions is critical to documentation of continuous improvement, and should begin shortly after implementation is initiated. For a discussion of review and revision of the entire EMS by senior management personnel, see Section 3.3.

3.3 The Continuous Improvement Loop

Continuous improvement in environmental performance is a fundamental goal of the EMS approach. The continuous improvement loop encompasses the entire EMS process, including the planning loop (Section 3.1), the corrective action loop (Section 3.2), and several other supporting elements. This section discusses each part of the continuous improvement loop (the entire EMS framework).

1. *Develop and Document Environmental Policy*—Senior management is responsible for defining an environmental policy appropriate to the installation's mission. This policy must provide vision or direction for the EMS, typically articulated through basic performance goals. The policy should indicate the installation's commitment to continual improvement, pollution prevention, and compliance with regulations. It should also provide a framework for setting and reviewing goals, objectives, and targets. Additionally, management should ensure that the policy is maintained, documented, and communicated to all employees.
2. *The Planning Loop*— Section 3.1 above discusses the periodic planning process. EMS planning should support the installation's environmental policy and lead to the development of initiatives or programs in the implementation component. EMS planners should also seek the input of various functional organizations across the installation who "own" business practices that have environmental impacts. Cross-functional coordination facilitates the integration of environmental planning with planning among other functional areas at the installation.
3. *Implementation*— Senior management is responsible for developing the capabilities and support system required to achieve the installation's environmental policy. Implementation includes appointing personnel with defined roles, responsibilities, and authority for establishing the EMS and ensuring it is implemented and sustained. Implementing the EMS

also includes providing resources to address the financial, technical, training, and material requirements. Other important elements of EMS implementation address the need for documenting key aspects of the EMS, as well as maintaining environmental records. Documentation should include written procedures and operating criteria for all practices and impacts identified in the EMS planning process.

4. *The Corrective Action Loop*—Section 3.2 above discusses the corrective action process that identifies instances of non-compliance and their root causes and that develops solutions appropriate to those causes. Since effective compliance management is a component of overall environmental management, an understanding of the effectiveness of the corrective action process is critical to management's evaluation of the EMS.

5. *Periodic Management Review of EMS*— Chapter 2 discusses the EMS Review, which evaluates the management system's ability to enhance environmental performance (including the ability to attain and maintain compliance). Both the compliance assessment and the EMS Review are key to the continual improvement process. The results of evaluation and measurement should be provided to management personnel to support their review of the EMS. Management's actions in response to the results of compliance and management evaluations, in particular the revision of policy, programs, and procedures, enable continual improvement.

   Using the results of EMS evaluations, management personnel review the performance of the EMS with respect to its objectives. Essentially, management considers whether the EMS is achieving what it was established to achieve. If objectives have been met, new objectives may be established, or new targets may be developed for existing objectives. If objectives have not been met, management personnel should determine how EMS performance could be improved. At a Navy installation, appropriate management personnel to participate in a Management Review include the Commanding Officer, Public Works Officer, and other department heads. In a regional complex, the Regional Commander's Regional Advisory Board would be appropriate reviewers.

6. *EMS Improvement*— Improvements to the EMS are achieved through revision to policy, plans, procedures, and/or objectives and targets by management personnel based on their review of performance measurement results. The EMS is thus cyclic, with continuous review and revision of elements of the management framework based on the periodic review of regular performance measurements.

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CHAPTER 4: INTERNAL ASSESSMENT

4.1 Overview

The Navy is committed to full and sustained compliance with all applicable environmental and natural resource laws and regulations. Internal assessments are one of the most effective tools for understanding regulatory requirements and achieving compliance.

As defined in Chapter 20 of OPNAVINST 5090.1B, Change 2, an internal assessment is:

> A systematic, documented, objective, and comprehensive environmental compliance review of installation processes, facilities, and practices to be completed within a 12-month period. Installation personnel or their designees conduct the assessment.

The related terms, "compliance evaluation" and "inspection" are used throughout this chapter and have specific meanings as defined in Section 1.4.

The internal assessment is conducted in accordance with an Internal Assessment Plan (IAP) developed by the installation's host activity, in coordination with its tenants. It documents how the activity plans to conduct an assessment within the "fenceline" over the course of a year. The IAP is a key element of the internal assessment. The IAP must address all applicable compliance requirements. The schedule is based on the identified environmental practices, assets, and impacts. Information is compiled from existing sources including plans, permits, inventories, program area managers' knowledge, and practice owners' knowledge. The information is organized and analyzed in a planning process to create the IAP. The planning process is described in Section 4.2 and the IAP format is described in Section 4.4.1.

Federal, state, and local compliance checklists are also essential ingredients of the internal assessment. The ACE software described in Chapter 7 provides checklists that can be tailored to incorporate the requirements applicable to the installation. ACE can create tailored checklists to support specific portions of the installation, remote sites, specific facilities, specific business and management practices, or media managers' areas of responsibility. The checklists, used in conjunction with the inventory practices, assets, and impacts described in Chapter 3, should provide for a complete assessment of the environmental program.

The internal assessment process should provide for:

- Development and annual update of an IAP;
- Compliance evaluations by environmental professionals to identify, characterize, and document compliance deficiencies related to individual practices and environmental programs;
- Inspections of practices and associated environmental control measures by practice owners;
- Problem solving to define compliance problems; analyze their causes; and then select, implement, monitor and modify corrective and preventive actions to achieve specified results;
- Annual preparation of an Environmental Quality Assessment Report; and
- Management review of problem solving results, the IAP, and the EQA Report.

The personnel resources required to accomplish internal assessments should be assigned from both the installation's environmental offices and from those units owning practices to be assessed. Most installations have environmental specialists to manage environmental program and media areas. Their technical training, familiarity with the installation's practices, assets, and impacts, and knowledge of applicable compliance requirements prepare them to plan and oversee the routine inspections of practices. Environmental specialists and their supervisors are also the people best prepared to conduct compliance evaluations of media and environmental program requirements.

Practice owners have the greatest stake in ensuring environmental compliance because their missions depend on continued availability of their business practices. The owners' expertise and knowledge of their own practices should be a resource applied to monitoring adherence with environmental requirements. Performing internal assessments as a team with the installation's environmental specialists should promote performance from both perspectives.

Naval Environmental Protection Support Services (NEPSS) are not intended to perform internal assessments for installations. However, support regarding applicability and how to address specific environmental requirements, as well as how to correct environmental deficiencies, is available to installations as Environmental Consultation/Project assistance, as described in Chapter 7.

4.2 Planning Internal Assessments

To design and implement an IAP, installations can follow a ten-step process:

Step 1—Determine the approach to conducting internal assessments;

Step 2—Identify business and management practices, assets, and locations to be assessed;

Step 3—Identify management requirements for specific media program areas;

Step 4—Identify required inspections/monitoring;

Step 5—Identify inspection priorities;

Step 6—Determine frequency of internal assessments;

Step 7—Assign personnel responsible for conducting internal assessments;

Step 8—Schedule assessments;

Step 9—Implement the IAP; and

Step 10—Maintain the IAP.

4.2.1 Step 1— Determine Approach to Conducting Internal Assessments

The heart of the internal assessment is the identification, characterization, and documentation of compliance and management system deficiencies. There are various approaches that may be used to accomplish this key part of the process. For example, a one- or two-week stand-down annually or semi-annually to assess all program areas may be efficient and cost-effective for assessing smaller, less industrial installations. Another approach is to assess the hazardous waste program one month, the air program the next month, the wastewater program the next month, and so on, until all media programs are evaluated at least once per year. This "one a month approach" could also be applied to assessing tenants, particular types of facilities, or distinct

areas or zones of an installation. On the other hand, a large industrial complex with numerous practices that have environmental impacts, or with multiple tenants may decide to implement continuous compliance evaluations and inspections throughout the year.

Table 4-1 summarizes a few possible approaches for conducting compliance evaluations. These approaches, combinations of these approaches, or techniques developed by individual installations or claimants can be applied under the flexibility inherent in the EQA program. After proceeding with Steps 2 through 5, below, or later after gaining experience with their IAP, installations may want to revisit this step. The Major Claimant is responsible for evaluating the installation's approach to compliance evaluations and inspections for appropriateness, effectiveness, and efficiency.

Table 4-1: Various Approaches to Conducting Internal Assessments

Approach	Schedule
Assessment stand-down	1-2 weeks, once or twice a year
Once a year, scheduled by month (i.e., by media, facility, tenant, zone or area)	1-5 days per month for assigned media, facility, tenant, zone, or area
Multiple times a year, scheduled by month (i.e., by media, facility, tenant, or area)	Multiple days per month
Once a year, year-round	Part of day-to-day business
Multiple times a year, year-round	Part of day-to-day business

This chapter illustrates the continuous compliance evaluation approach that conducts the internal assessment throughout the entire year.

At this point, the installation, in coordination with their Major Claimant, may decide whether to incorporate EMS Reviews within the internal assessment and may plan for implementation of the EMS Review and problem solving, as discussed in Section 4.3.

4.2.2 Step 2—Develop an Inventory of Business and Management Practices, Assets, and Locations to be Assessed

After determining the overall internal assessment approach, the next step in internal assessment planning is to develop an inventory of practices, assets, and locations to be assessed—a concept introduced in Section 3.1, the EMS planning loop. This inventory will provide the foundation for other internal assessment planning efforts and for developing an IAP. Possible techniques to ensure a comprehensive inventory include reviewing an installation's practices by building, area, activity or tenant, or media program. In addition, information may be available from existing sources including management plans, permits, inventories, program area/media managers, and practice owners. The inventory data and other information associated with the internal assessment planning effort (as discussed below) should be entered on an inventory form similar to the one presented as Table 4-2. The data gathered during this step should be entered in the "Program/Media Area," "Type of Practice, Asset, and Impact," and "Location" columns of the internal assessment planning summary form.

Planning would be facilitated by marking/identifying the location of each facility, practice, or asset on an installation map. In particular, installations that maintain Geographical Information

Systems may consider entering locations of practices and assets that require compliance evaluations or inspections along with pertinent information such as practice owner, practice type, point of contact, etc. to aid in planning. This will also help ensure that all practices, assets, and locations have been identified or reviewed.

4.2.3 Step 3—Identify Management Requirements for Specific Media Program Areas

In contrast to developing an inventory of practices and assets (described in Section 4.2.2), the many regulatory or policy requirements associated with the management of media program areas cannot usually be assigned to a specific location. However, the review of these management functions during internal assessments can not be overlooked. Therefore, specific reviews of management functions required to ensure regulatory or policy compliance should be added to the inventory developed in Step 2 (and listed in the "Type of Practice" column of Table 4-2).

Examples of such management requirements include record keeping, training, management plan development, submitting notifications and permit applications, and developing and submitting funding requests to Major Claimants.

Although the primary focus of internal assessment efforts is to determine if an installation is in compliance with regulatory requirements, the scope of the internal assessment may also include an evaluation of the effectiveness of the installation's EMS. The minimum requirements for Navy installations' existing EMSs are the management responsibilities stated throughout OPNAVINST 5090.1B, Change 2. If an EMS review is to be included within the scope of the installation's internal assessment, it should be included on the inventory (Table 4-2) and addressed when developing the IAP and internal assessment schedule (discussed below). Section 4.3.2 further discusses evaluation of management effectiveness.

4.2.4 Step 4—Identify Required Inspections/Monitoring

With appropriate training provided by the installation's environmental office, practice owners and other units could provide much of the inspection and monitoring effort. When these duties are fulfilled by others, the environmental office may plan to provide oversight, for example, by accompanying the owners on some inspections or reviewing inspection and monitoring results. Regardless of who performs the actual field work, the inspections and monitoring activities need to be identified and scheduled.

Many inspections and monitoring procedures and their frequencies are mandated by regulations, permits, or operating procedure. Specific examples include weekly inspections of hazardous waste storage areas, monthly monitoring of NPDES discharges, and annual testing of back-flow preventers. This information should be documented in the "Inspection Frequency" column of Table 4-2. Required inspection frequencies are shown in parentheses in Table 4-2 so that they may be readily compared with the frequencies selected by the installation in Step 6.

Table 4-2: Sample Internal Assessment Planning Summary

Program/ Media Area	Type of Practice	Location (Building number)	Inspection Frequency [1] planned/ (required)	Inspection Responsibility	Local Priority	Compliance Evaluation Frequency	Compliance Evaluation Responsibility	Notes
Hazardous waste	Permitted HW storage facility	51	Weekly (Weekly)	Owner	High	Weekly	EMD HW manager	State inspector scrutiny
	Satellite accumulation points (Host)	56, 57, 58	Weekly (Weekly)	Owner	High	Weekly	EMD HW manager	Compliance problems
		54, 55, 59	Weekly (Weekly)	Owner	Medium	Monthly	EMD HW manager	
		9, 10, 13, 19, 21, 28	Weekly (Weekly)	Owner	Low	Quarterly	EMD HW manager	
	Satellite accumulation points (Tenant)	34, 35, 42, 52, 53, 64, 68, 69	Weekly (Weekly)	Owner	Low	Quarterly	EMD HW manager	
	RCRA-C program management	1	None	None	High	Quarterly	EMD Director	Reduce HW disposal costs 30% by FY02
Air	Asbestos removals	22 (school)	Daily (Daily)	Owner	High	Daily (1/11-1/22)	Safety Dept.	Asbestos removal-Principal's office
	Asbestos surveillance	22 (school)	Semi-annual	Owner	High	Quarterly	Safety Dept.	
	Air emission sources	22, 33, 44, 77, 88	Monthly (Annually)	Owner	Low	Annually	EMD air manager	
	CAA program management	1	None	None	Low	Annually	EMD Director	
Waste-water	NPDES outfalls	61, 62, 63,	Quarterly	Owner	Low	Quarterly	EMD wastewater manager	NPDES permit requirement
	Wastewater treatment plants	12, 37	Weekly	Plant operators	Medium	Quarterly	Facilities Dept	

Table 4-2: Sample Internal Assessment Planning Summary (Continued)

Program/ Media Area	Type of Practice	Location (Building number)	Inspection Frequency [1] planned/ (required)	Inspection Responsibility	Local Priority	Compliance Evaluation Frequency	Compliance Evaluation Responsibility	Notes
Waste-water (cont.)	CWA program management	1	None	None	Medium	Annually	EMD Director	Reduce permit exceedances by 50%
ASTs	Fuel off-loading facility	Pier 1	Daily (Monthly)	Owner	High	Weekly	EMD tank manager	High spill potential
	Fuel farm	32 (tanks 32-1, 32-2, 32-3, 32-4)	Monthly (Annually)	Owner	Medium	Monthly	EMD tank manager	Large quantity of POL stored
	ASTs	3, 11, 17, 25, 31, 40, 48, 65, 78, 80, 84, 85	Monthly (Annually)	Owner	Low	Bi-annually	EMD tank manager	
USTs	USTs (Host)	15 (tanks 15-1, 15-2, 15-3), 30 (tanks 30-1, 30-2, 30-3)	Monthly (Monthly)	Owner	Low	Annually	EMD tank manager	New USTs just installed
	USTs (Tenant)	72 (tanks 72-1, 72-2, 72-3, 72-4)	Monthly (Monthly)	Owner	Low	Quarterly	EMD tank manager	Older tanks due for replacement
	AST/UST program management	1	None	None	Low	Annually	EMD Director	
Pollution Prevention	Recycling Center	14	None	None	Medium	Monthly	EMD P2 manager	
	Recycling drop-off points	36, 38, 45, 60, 82	None	None	High	Weekly	EMD P2 manager	Determine usage
	P2 initiatives	75, 76, 81, 89, 90	None	None	Medium	Monthly	EMD P2 manager	Evaluate success
	P2 program management	1	None	None	High	Quarterly	EMD Director	Implement 5 P2 projects in FY99

Table 4-2: Sample Internal Assessment Planning Summary (Continued)

Program/ Media Area	Type of Practice	Location (Building number)	Inspection Frequency [1] planned/ (required)	Inspection Responsibility	Local Priority	Compliance Evaluation Frequency	Compliance Evaluation Responsibility	Notes
PCBs	PCB storage facility	67	Weekly	Owner	Medium	Quarterly	EMD PCB manager	
	PCB Transformers (Host)	43, 46	Quarterly	Owner	Medium	Quarterly	EMD PCB manager	Eliminate PCB use by FY99
	PCB Transformers (Tenant)	47, 49	Quarterly	Owner	Medium	Quarterly	EMD PCB manager	Eliminate PCB use by FY99
Potable water	Back-flow preventors (Host)	4, 16, 24, 73, 74	Annually	Owner	Low	Annually	EMD wastewater manager	
	Sanitary survey	Base-wide	Annually	Owner	Low	Annually	Facilities Dept.	
Other	Infectious waste locations (Tenant)	29, 79	None	None	Medium	Monthly	EMD Director	Compliance problems
	Culturally significant buildings	1,2, 7, 26	None	None	Low	Semi-annually	EMD Director	
	Natural resources areas	Training areas, Lake Steinberg, McVey Creek, Silva wetlands	None	None	Medium	Monthly	EMD Director	
	Pesticide storage facility	66	None	None	Low	Annually	EMD Director	
	EMS Review	1	None	None	High	Semi-annually	EMD Director	

[1] Inspections required by Federal, State, or local regulations or permits; DoD or DoN policy are shown in parentheses.

4.2.5 Step 5—Identify Inspection Priorities

The following factors could be considered in focusing resources on practices, assets, and locations that should receive the greatest attention during inspections:

Significance of Impacts—The impacts identified as part of the planning loop described in Section 3.2 that were ranked higher (i.e., have been determined to pose a higher risk for the installation) may need to be inspected/evaluated more frequently, while those that pose a lower risk may require less frequent scrutiny. The priority assigned by the installation to each practice and asset should be documented in the "Local Priority" column of Table 4-2.

Previous Compliance Status—If previous inspections, assessments, or ECEs have revealed compliance deficiencies or difficulties in achieving established goals and objectives, the installation may decide to increase the frequency of compliance evaluations for that site until personnel have corrected the deficiencies, improved their compliance status, or met EMS requirements. Conversely, those sites with a proven record of excellent compliance or adherence to EMS procedures may require fewer compliance evaluations and/or inspections.

Frequency of Regulatory Inspections—If particular media or areas are subject to increased scrutiny by state or local regulatory authorities, the installation may also choose to increase the frequency of compliance evaluation and/or inspections to ensure that staff maintain a high level of compliance awareness.

Funding—Installations may decide to increase assessments to ensure new funding is being applied in a most advantageous manner or to ensure a program that did not receive requested funding maintains compliance until funding is procured.

4.2.6 Step 6—Determine Frequency of Internal Assessments

Installation staff determine the frequency of compliance evaluations and inspections based on the required inspections documented in Step 4 and installation priorities established in Step 5. The roles of practice owners and units on the installation other than the environmental office may also be considered.

The frequencies of compliance evaluations and inspections should be entered into the respective columns of the internal assessment planning summary form (see Table 4-2). Information supporting these decisions can be entered in the "Notes" column.

4.2.7 Step 7—Assign Personnel Responsible for Conducting Internal Assessments

After completing Steps 1 through 6, installation managers should designate the personnel responsible for conducting the installation's compliance evaluations and inspections. As with other portions of the EQA program, there is an inherent flexibility that allows the installation a variety of options in assigning personnel to conduct the compliance evaluations and inspections.

As indicated in the discussion of Step 4 above, a significant amount of the inspection responsibility may be assumed by practice owners. This is encouraged since the effort required to train the individuals who use the practices to inspect them will pay off twice: once in providing those individuals with an environmental perspective on their job performance, and again in decreasing the inspection effort required by the environmental office.

Compliance evaluations (including inspections that are not provided by practice owners) can be assigned in various ways. Some options include:

- Having either individuals or teams complete the compliance evaluations;
- Performing the evaluations by either individual media area or across all media; and
- Having evaluators work only within their media of principle expertise or expand into other media.

Candidates for evaluations or evaluation teams include, but are not limited to:

- Environmental staff;
- Practice owners;
- Quality assurance, safety, facilities, medical or other installation staff.

All of these positions may not be present at every Navy installation. Each installation should define inspection and evaluation responsibilities appropriate to the scope of its EMS, its compliance requirements, its organizational structure, and its available resources. These responsibilities are documented in the "Inspection Responsibility" and "Compliance Evaluation Responsibility" columns of the form presented as Table 4-2.

Any staff members that have the knowledge, training, and expertise to identify and document instances of both regulatory non-compliance and deviation from the installation's EMS (see Chapter 2) are eligible to conduct compliance evaluations. The evaluators may be program managers or dedicated inspectors, subject matter experts (e.g., hazardous waste or air) who conduct inspections only at sites under their purview or multi-media experts who conduct assessments across all areas. Specific courses on conducting internal assessments and EMS Reviews are under development and are described in Chapter 7.

4.2.8 Step 8—Schedule Assessments

To facilitate scheduling of inspections and compliance evaluations, the information developed during the internal assessment planning process and entered into Table 4-2 should be transferred to a calendar format, which will help both evaluators and practice owners plan their time and efforts properly and ensure that appropriate staff are available.

The data presented in Table 4-3 represents the data contained in Table 4-2 associated with the hazardous waste management program. Installation personnel can schedule their work to meet their individual needs. Table 4-3 demonstrates how the hazardous waste program manager could schedule assessments to be conducted in January 2000.

Table 4-3 reflects the following hypothetical installation-specific information:

- The permitted hazardous waste storage facility (Building 51) will be assessed on a weekly basis because of increased scrutiny by state regulators.
- Hazardous waste satellite accumulation points at Buildings 56, 57, and 58 will be assessed weekly due to continuing compliance deficiencies.
- Hazardous waste satellite accumulation points at Buildings 54, 55, and 59 will be assessed monthly due to the difficulty these sites are having in achieving EMS objectives.

- Buildings 9, 10, 13, and 19 will be assessed during January in accordance with the scheduled quarterly inspection of satellite accumulation points that have demonstrated excellent regulatory compliance.
- The hazardous waste management program (located in Building 1) will be evaluated during January in accordance with the scheduled quarterly assessments of environmental media management programs.

Table 4-3: Sample Internal Assessment Plan Schedule to be Conducted by Hazardous Waste Program Manager

January 2000

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
3	**4** 54, 55, 59*	**5**	**6** **51, 56, 57, 58**	**7**
10	**11**	**12** 1	**13** **51, 56, 57, 58**	**14**
17	**18** *9, 10, 13, 19*	**19**	**20** **51, 56, 57, 58**	**21**
24	**25** *1*	**26**	**27** **51, 56, 57, 58**	**28**

Weekly assessments are in bold.

Monthly assessments are underlined.

Quarterly assessments are in italics.

* Numbers presented in Table 4-3 indicate building numbers where internal assessments will occur.

4.2.9 Step 9—Implement the IAP

Implementation of the IAP is discussed in Section 4.3.

4.2.10 Step 10: Maintain the IAP

Chapter 20 of OPNAVINST 5090.1B requires that the IAP be reviewed annually and updated as necessary. Changes to the plan may be required due to a number of factors:

- Practices have been shut down/closed, moved, added, or changed significantly;
- Additional practices have been "discovered" during the previous year's assessments that must be included in future efforts;
- Experience with the internal assessment program has resulted in reconsideration of previously assigned priorities and frequencies;
- New regulatory or policy requirements;
- Environmental performance improved at particular practices or assets indicating that these locations may require less frequent inspections or compliance evaluations; and
- Environmental performance deteriorated at particular practices or assets indicating that these locations may require more frequent inspections or compliance evaluations.

4.3 Conducting Internal Assessments

4.3.1 Compliance Evaluations

The techniques and methodologies used to conduct compliance evaluations are the same used in any environmental audit. Commonly used tools and techniques to determine compliance include:

- Knowledge of and adherence to applicable environmental laws and implementing regulations;
- Review of and compliance with applicable permits and their monitoring and other conditions of compliance;
- Use of checklists of requirements as a guide and to document inspections and assessments;
- Interviews with shop personnel who participate in or manage a particular practice to determine both their knowledge or awareness of potential impacts and the procedures required to meet regulatory requirements;
- Reviews of required documentation such as inspection forms, training certificates, waste turn-in forms, monitoring/analytical results, required management plans, and notifications; and
- Search for evidence of compliance such as proper labeling on drums, location of spill control materials, signs of spills or leaks, proper secondary containment, condition of storage containers/tanks, inspection tags on back-flow preventors, proper landfill cover, and properly functioning oil/water separators.

The Navy has adopted the ACE software as a tool to support its EQA Program. ACE provides checklists of Federal, state, local, and DoN requirements and can be used to document

assessment findings, root cause/problem solving decisions and assigned categories, recommended corrective/preventive actions, and a POA&M for implementing approved corrective/preventive actions. Further discussion of the ACE software is presented in Chapter 7.

4.3.2 Evaluation of Management Effectiveness

An installation may opt to evaluate the effectiveness of its EMS as part of its internal assessment and in preparation for an external assessment, and will therefore be concerned with evaluating its conformance, at a minimum, with the OPNAVINST and applicable local policy. Installations with mature EMSs in place may also elect to evaluate management system effectiveness against appropriate standards such as CEMP, ISO Standard 14001, or the Malcolm Baldrige quality criteria. Several management system evaluation techniques are discussed in Chapter 2, EMS Review. The installation's environmental managers should select method(s) appropriate for their installation based on the maturity of the installation's EMS, as discussed in Chapters 2 and 3 and Appendix H of this guide.

4.3.3 Determining and Implementing Corrective/Preventive Actions – Problem Solving

As discussed in Chapter 1, a primary difference between the ECE program and the EQA program is the shift of responsibilities for identifying compliance deficiencies from the external auditors once every three years to the installation's staff on a continuous basis. Another important difference is increased emphasis on the installation identifying, implementing, and monitoring corrective or preventive actions for recognized problems. The responsibility to implement corrective and preventive actions has always rested with the installation commander, and this has not changed under the EQA program. However, as discussed in Chapters 5 and 6, external auditors will rely more on installations to identify deficiencies, and will now be reviewing where, how, and to what effect installations permanently solve the problems they discover during internal assessments.

"Problem solving," as used here, begins with the recognition that deficiencies observed during internal or external assessments do in fact constitute problems that require analysis and decision making to prevent recurrence. In other words, a problem is more than a symptom that can be immediately fixed. Problem solving ends with the intended results, i.e., continuing compliance with regulations or permit requirements, and conformance with the existing EMS.

Chapter 6 discusses various steps and approaches to problem solving that installation personnel could implement.

4.4 Documenting Internal Assessments

Chapter 20 of OPNAVINST 5090.1B requires installations to prepare an IAP, internal assessment documentation, and an EQA Report. Each of these elements is discussed below.

4.4.1 Internal Assessment Plan

Chapter 20 of OPNAVINST 5090.1B, Change 2 defines an IAP as "the host activity's plan, coordinated with tenants, that describes how a comprehensive internal assessment will be accomplished within the 'fenceline' over the course of a year."

The information presented in the IAP and the EQA Report (discussed below) is reviewed by the Major Claimant and used to determine the scope and frequency of future external assessments

they will conduct at an installation. Therefore, installations should provide Major Claimants with information demonstrating that they have initiated an active internal assessment program, which may result in reduced future Major Claimant oversight. To document the successful design and implementation of an internal assessment program, the IAP should contain the following:

- Description of the general approach to scheduling inspections and compliance evaluations (Section 4.2.1).
- Roles and responsibilities for implementing the inspections and compliance evaluations (Section 4.2.7); problem solving (Chapter 6); and EMS Review if performed by the installation (Chapter 2).
- Summary of the planned inspections and compliance evaluations (Table 4-2).

These elements of the IAP are developed through the internal assessment planning process described in Sections 4.1 through 4.3. Appendix F contains a sample IAP.

4.4.2 Internal Assessment Documentation

Documentation of the results of an installation's internal assessments includes:

- A brief summary of each program/media area (e.g., major facilities, permits, any special arrangements with regulators);
- A description of identified deficiencies;
- Assigned root cause categories;
- Recommended corrective actions; and
- Plans of Action and Milestones (POA&M) for corrective actions.

Suggested distribution of the internal assessment documentation includes the Commanding Officer, Legal, Public Affairs, Public Works, and major tenants, as appropriate.

To assist activities in developing internal assessment documentation, the U.S. Navy has adopted ACE, a computer program developed by the U.S. Marine Corps to document both their benchmark ECEs and their self- ECEs. ACE provides a number of data fields in which auditors can enter all the required documentation listed above. Chapter 7 of this guide presents a more detailed description of the program and its capabilities.

Two important reasons for documenting corrective actions are: 1) to provide a record of evidence considered and decisions made during problem solving, and 2) to enable external assessors to verify that the installation's EMS is functioning effectively. Documenting the problem solving process is critical in case later reexamination becomes necessary. Documentation should be completed whether a deficiency is minor and warrants only an on-the-spot fix or is the focus of a structured problem solving exercise.

The extent of the documentation should be directly proportional to the seriousness of the problem. For instance, for deficiencies that are not repeats, that could have only minor consequences, and that are therefore not considered to constitute a "problem," an on-the-spot fix recorded in the "Recommended Corrective Action" field of ACE may be sufficient.

For deficiencies that do indicate "problems," any on-the-spot fixes and recommendations for subsequent actions should be documented in the recommended corrective action field of ACE, and the situation should be analyzed sufficiently to select a root cause category in ACE. Root cause categories and problem solving are described in Chapter 6. Concurrence on the selected root cause category should be obtained from the owning unit, the appropriate manager in the environmental office, and any other interested parties aboard the installation.

If intuitive problem solving is judged sufficient to achieve permanent corrective or preventive actions, key assumptions and intuitive conclusions for each of the seven problem solving steps (see Section 6.3) should be recorded in the POA&M module of ACE. Inspection personnel could also prepare a separate report and provide a reference to it in ACE.

For problems that warrant structured problem solving (see Section 6.3), the above measures should be developed and the seven problem solving steps should be documented in the POA&M module of ACE. Separate documentation may also be prepared and referenced in ACE. If the root cause category or the recommended corrective actions change as a result of proceeding through the steps, annotations to the POA&M fields in ACE should be made to document the suggested changes.

4.4.3 EQA Report

Once a year, the installation prepares the EQA Report. It is a summary of the health of the installation's environmental program as of the end of a specified reporting period. The report includes information on the critical issues that the Major Claimant should be aware of and that may require Major Claimant attention and/or resources.

The EQA Report is provided to the host activity's Major Claimant and to claimants of the tenants whose business practices have significant environmental aspects. Those tenants should be involved in the development of the report and should also receive copies.

The EQA Report contains four items:

- Program Area Status Summary Chart;
- Summary of Problem Solving Efforts and Corrective Actions;
- Status of Top 5 Environmental Issues/Concerns; and
- Updated IAP.

Appendix F contains a sample EQA Report.

4.4.3.1 Program Area Status Summary

For each program area listed in Table 4-5, the installation indicates whether the program, at the end of the reporting period, is:

● Inadequate

◗ Needs Improvement

◯ Excellent

N/A Not Applicable

NOTE: The symbols used here can be accessed in Microsoft Word by clicking on "Insert" in the main menu bar at the top of the screen, then on "Symbol" in the drop-down menu, and then choosing the "Zapf Dingbats" font. Click on the desired symbol, and then click on the "Insert" button at the bottom of the dialog box. Font size can be adjusted as desired after the symbol has been inserted.

The ratings are based on three criteria:

1. Whether problems were discovered by installation personnel during internal assessments or by external auditors,
2. Whether problem solving efforts were conducted and corrective actions implemented or the problem has not yet been solved, and
3. The priorities assigned to a media's impacts during the prioritization efforts described in Section 4.2.5.

By examining these factors a media area could be rated "inadequate" if the following sequence of events occurs:

- External auditors (i.e., Major Claimant's representatives, or state or federal regulators) discover a problem that the installation had not identified during internal assessments;
- The installation is unable to solve the problem and implement a viable corrective action during the reporting period; and
- The media area has been assigned a high local priority.

In another example, a media area would be rated as "needs improvement" if:

- The installation's internal assessments efforts identified the problem;
- The installation is unable to solve the problem and implement a viable corrective action during the reporting period; and
- The media area has been assigned a low local priority.

By contrast, a program could be rated "excellent" even if there have been problems requiring attention during the reporting period as long as the problems were discovered by the installation and their causes were corrected as of the end of the reporting period. The intent of the EQA program is, after all, not to make installations problem-free, but to establish and maintain the ability to be self-correcting.

Other combinations of the three rating criteria are presented in Table 4-4, which can be used in completing the Program Area Status Summary Chart.

Table 4-4: Program Area Rating Criteria

	High Local Priority		Medium-Low Local Priority	
	Problem Corrected	**Problem Not Corrected**	**Problem Corrected**	**Problem Not Corrected**
Problem Discovered by External Auditors	◗	●	◗	◗

Problem Discovered during Internal Assessments	❍	●	❍	◗
NOTE: The symbols used in this chart can be accessed in Microsoft Word by clicking on "Insert" in the main menu bar at the top of the screen, then on "Symbol" in the drop-down menu, and then choosing the "Zapf Dingbats" font. Click on the desired symbol, and then click on the "Insert" button at the bottom of the dialog box. Font size can be adjusted as desired after the symbol has been inserted.				

For each program area marked as "Inadequate," the installation should include a brief explanation for the rating, in particular answering the questions:

- What are the major deficiencies?
- What corrective actions have been taken or are planned?
- When are deficiencies expected to be resolved?

4.4.3.2 Summary of Problem Solving Efforts/Corrective Actions

The installation should list the problems that were defined during the reporting period (see Chapter 6.2 for a discussion of what constitutes a "problem"), and for each problem, briefly describe the current status of the problem solving exercise (if still in progress) or corrective action(s) taken.

4.4.3.3 Status of Top Five Environmental Issues/Concerns

Considering the entire environmental program, the installation should alert its Major Claimant and tenants' Major Claimants to issues of greatest importance or issues requiring Major Claimant support. To accomplish these objectives, the installation should describe the top five issues and concerns it faces. Measures taken by the installation and support requested from the Major Claimant or tenants' Major Claimants should be discussed, as appropriate.

4.4.3.4 Updated IAP

OPNAVINST 5090.1B, Change 2, Chapter 20 requires the installation to review the IAP at least annually and update it as necessary. The installation should include in the report a summary of the changes and a copy of the updated IAP.

Table 4-5: EQA Report: Program Area Status Summary

OPNAVINST 5090 Chapter	Program/ Media Area	Rating	Explanation for "Inadequate" Rating	Initiatives to Correct
1	Program Management			
2	NEPA			
3	Pollution Prevention			
4	EPCRA			
5	Air			
6	ODS			
7	Wastewater			
8	Drinking Water			
9/10	SPCC/ Spill Response			
11	PCB			
12	Hazardous Waste			
12	Infectious Waste			
13	Pesticide			
14	Solid Waste			
15	Installation Restoration			
16	Underground Storage Tanks			
17	Noise			
18	Compliance Overseas			
20	EQA Program			
22	Natural Resources			
23	Cultural Resources			
24	Training			
25	Sampling and Lab Testing			
26	Radon			

❍ = Excellent
◗ = Needs Improvement
● = Inadequate
na = Not Applicable

NOTE: The symbols used in this chart can be accessed in Microsoft Word by clicking on "Insert" in the main menu bar at the top of the screen, then on "Symbol" in the drop-down menu, and then choosing the "Zapf Dingbats" font. Click on the desired symbol, and then click on the "Insert" button at the bottom of the dialog box. Font size can be adjusted as desired after the symbol has been inserted.

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CHAPTER 5: EXTERNAL ASSESSMENT

5.1 Overview

The Major Claimant of the host installation, in coordination with Major Claimants of tenant organizations, is responsible for external assessments.

An external assessment has two main parts, as established in Chapter 20 of OPNAVINST 5090.1B, Change 2:

- An annual document review of the installation's IAP and EQA Report, plus any other information available on the installation's performance (see Chapter 4).
- A site visit with a schedule and scope determined by the Major Claimant, based on the annual document review.

The schedule and scope of the site visit are flexible and should be tailored to meet the installation's needs. This allows for varied degrees of compliance or oversight assessments. Based on the annual document review, the Major Claimant may elect to visit the installation immediately, once a year, once every two years, or less often, if appropriate, depending on the installation's condition and circumstances. At a minimum, during the site visit, the Claimant will evaluate the installation's EMS and internal assessment program to determine if the installation is effectively evaluating its compliance status. A site visit may also include compliance evaluations of all environmental program areas or may target particular program areas, as appropriate. The external assessment site visit may be accomplished through the traditional command inspection or as a separate assessment/assistance visit.

Major Claimants are required to document their decisions regarding the scope and frequency of the site visits in an External Assessment Plan (EAP) that must be submitted annually to CNO/N45.

This chapter provides:

- A description of factors that Major Claimants may consider when determining the level of oversight for the external assessment site visits;
- A sample format for the EAP; and
- Guidance for implementing the EAP.

5.2 External Assessment Planning

When determining the scope and frequency of the external assessments, the Major Claimant will review and analyze the submitted IAPs, EQA Reports, and any other available data for each installation under its claimancy. Analysis of available documentation should provide the Major Claimant with an indication of the performance of each installation's internal assessment program and its EMS. Appendix D covers the topic of maturity in environmental programs and EMSs. Table 5-1 outlines factors the Major Claimant may consider when reviewing each installation's environmental performance documentation.

Table 5-1: Factors to be Considered in Planning External Assessments

Information Source	Considerations	Influence on External Assessment Scope and Frequency
Review of IAP	▪ Does the IAP address all applicable media-specific program areas? ▪ Does the IAP identify practices, assets, and impacts of which the Major Claimant is aware? ▪ Does the IAP include assessments of all tenants aboard the installation? ▪ Does the IAP identify required inspections already conducted? ▪ Does the IAP address media management assessments? ▪ Is the installation's local prioritization of practices and impacts reasonable and clearly described? ▪ Do inspection and compliance evaluation frequencies accurately reflect local prioritization of impacts (are higher priority items assessed more frequently)? ▪ Which media-specific program areas are receiving the most/least internal oversight? Does this seem appropriate?	Comprehensive IAPs that are consistent with the Major Claimant's knowledge of the installation's environmental programs will tend to reduce the intensity and frequency of the external assessment, and should focus on EMS Review rather than compliance validation. Incomplete IAPs may indicate inadequate participation in the EQA Program. The scope of external assessments should continue to focus on compliance validation in addition to EMS Review.
Review of EQA Reports	▪ Does the EQA Report indicate that the internal assessment is conducted according to the IAP? ▪ Is the IAP comprehensive? (See Review of IAP, above.) ▪ Does the summary of internal assessment findings, problem solving efforts, and associated corrective actions suggest that sound management decisions are being made on a continuous basis? ▪ Does the EQA Report suggest that the installation's compliance and management programs are "self-correcting"? ▪ Does the status summary of the installation's overall environmental program indicate program areas that are inadequate or need improvement, and are efforts being taken to address areas needing improvement? ▪ Are results presented in the status summary consistent with information available on environmental performance? ▪ Has the installation conducted an EMS Review under its internal assessment program? ▪ Do the results of the EMS Review suggest that an effective EMS is in place? ▪ Does the EQA Report indicate that the installation is pursuing a continuous improvement goal?	Installations that are able to document strong corrective action programs are likely to have, at least, rudimentary EMS elements in place. As the effectiveness of installation EMSs increases, the scope and frequency of the Major Claimant external assessments should decrease. Installations unable to document strong corrective action programs should require increased scrutiny of their EMSs until these programs are established.

Table 5-1: Factors to be Considered in Planning External Assessments (Continued)

Information Source	Considerations	Influence on External Assessment Scope and Frequency
Maturity of Installation EMS	▪ Based on all available data, can the Major Claimant characterize the installation's EMS as "reactive," "progressive," or "proactive": – Reactive: compliance-driven; focused on meeting requirements; organized around media programs; limited planning; – Progressive: beginning to address management frameworks; compliance-focused with enhanced corrective action process (i.e., problem solving with root cause analysis and feedback/management review) – Proactive: Comprehensive management framework; enhanced planning and corrective action processes; environmental impact-focused; environmental performance goal. ▪ Has the installation internally characterized its EMS in any of its EQA documentation?	▪ Reactive programs should be subject to comprehensive compliance program evaluations and EMS Reviews. ▪ Progressive programs should require EMS Reviews and limited compliance validation. ▪ Proactive programs should require EMS Reviews only.
Other Considerations	▪ Results from previous ECEs or EQA external assessment site visits (including deficiency descriptions and POA&M submissions). ▪ The interval since the last ECE or external assessment. ▪ Input to semi-annual DoD Environmental Quality Report In-Progress Review (Measures of Merit). ▪ Notices of Violation (NOVs) or other enforcement actions and associated fines and penalties received by the installation. ▪ New or changing Federal, State, local, DoD, and/or DoD regulations or policy requirements applicable at the installation. ▪ Records of communication between the installation and the Regional Environmental Coordinator (including requests for assistance). ▪ Any additional knowledge of the installation's compliance status, problem solving efforts, or EMS performance.	Data that document an effective, self-correcting compliance and management program at the installation should serve to reduce the scope, intensity, and frequency of external assessments. Data that indicate continuing compliance difficulties suggest internal assessment and corrective action programs are not functioning; therefore, increased scope, intensity, and frequency of external assessments should be warranted.

5.3 Developing the External Assessment Plan (EAP)

Once available data from each installation have been reviewed and analyzed, Major Claimants should determine their oversight plans (external assessment scope and frequency) for each installation within their claimancy. The EAP is intended to be a short, concise document that identifies the schedule and the scope of the site visits planned by the Major Claimant for each of its installations and provides a brief description of the basis for these decisions. The EAP should address all activities in the claimancy including those installations that conduct only administrative functions or activities with minimal environmental requirements that are exempt from the EQA program requirements as described in Chapter 20 of OPNAVINST 5090.1B, Change 2.

Table 5-2 presents a sample format for the EAP. Data in Table 5-2 indicate the flexibility inherent in external assessment planning and show how analyses of IAPs, EQA Reports, and other available data support Major Claimant decisions regarding the level of oversight to be provided. In the examples provided in the table, the Claimant has decided to conduct another external assessment with full compliance evaluation at Installation 5 only two years after its last external assessment due to their unsatisfactory IAP, EQA Report, and assessment results. Installations 6 and 7, however, have successfully demonstrated the performance of their internal assessment program and EMSs through their IAPs, EQA Reports, and excellent results on their last assessment results. The Major Claimant has recognized their efforts by scheduling a four-year interval until their next external assessments.

As required by Chapter 20 of OPNAVINST 5090.1B, Change 2, each Major Claimant will update its EAP annually and submit it to CNO/N45. This update should reflect the review and analyses of the annual updates to IAPs and EQA Reports submitted by the installations as well as changes made by the Claimant as result of external assessments completed during the year.

5.4 Implementing the External Assessment Plan

5.4.1 Preparing for the External Assessment

In planning external assessments, Major Claimants are required to coordinate not only with the installation that will be visited, but also with the Major Claimant(s) of tenant activities that have environmentally significant practices. As the scheduled site visit approaches, the Major Claimant needs to assemble and prepare an external assessment team.

The Major Claimant of the host activity notifies the installation's Commanding Officer (CO) of an upcoming external assessment. Like the former ECE program, the notification is likely to be in the form of a memorandum that identifies the tentative schedule and the purpose of the visit. It should also address access to the appropriate personnel, documentation at the installation, and any other requirements the external assessment team may have.

Table 5-2: Sample Major Claimant External Assessment Plan

Installation/ Tenant	If a Tenant, Host and Major Claimant	Date of Last ECE or External Assessment	Scope[1] of Last ECE or External Assessment	Planned Date of Next External Assessment	Scope[1] of Next External Assessment	Media[2] for Compliance Assessment	Rationale[3] for Scope of Next External Assessment
Installation 1		01/96	E	02/99	B	All but IR	3, 4
Installation 2		06/96	E	04/99	C		3, 4, 7
Installation 3		03/97	D	11/99	B	Air, WW	3,
Installation 4		09/97	D	06/00	B	HW	3, 4
Installation 5		02/98	C	02/00	C		6, 8
Installation 6		03/98	B	03/02	A		1, 2, 4
Installation 7		10/98	A	10/02	A		1, 2, 4
Installation 8		03/96	D	04/00	D	NEPA, CR	7
Installation 9		02/97	D	11/02	D	All but PEST	7
Installation 10		01/97	E	02/00	B	All but HW	3, 4
Installation 11		06/97	E	04/00	C		3, 4
Installation 12		03/98	D	11/01	B	NR,CR,NEPA	3, 5
Installation 13		09/97	D	06/00	B	Oil, HW, WW	3, 4
Tenant 14	[Names]	07/98	C	12/01	B	WW, DW, Oil	3, 4, 5
Tenant 15	[Names]	12/95	E	04/99	A		2, 3, 4
Tenant 16	[Names]	08/96	D	04/99	B	HW, NEPA	3, 4
Tenant 17	[Names]	05/97	C	11/99	A		3, 4
Exempt Activities							
Activity 18	[Names]	04/95	E	None	X		X
Activity 19	[Names]	06/96	E	None	X		X
Activity 20	[Names]	12/96	E	None	X		X

Notes for Table 5-2	
[1] Scope codes: A = EMS Review only B = EMS Review and compliance assessment of selected media (indicate media) C = EMS Review and compliance assessment of ALL media D = Compliance assessment of selected media (indicate media) E = Compliance assessment of ALL media X = Exempt [2] Media codes: PM = Program Management NEPA = National Environmental Policy Act P2 = Pollution Prevention EPCRA = Emergency Planning and Community Right to Know Act Air = Clean Air Act ODS = Ozone Depleting Substances WW = Clean Water Act (wastewater) DW = Drinking Water Oil = Oil Management and Contingency Planning PCB = Polychlorinated Biphenyls HW = Hazardous Waste Management PEST = Pesticides SW = Solid Waste Management IR = Installation Restoration ST = Underground and Above Ground Storage Tanks Noise = Noise Prevention EQA = Environmental Quality Assessment NR = Natural Resource Management CR = Cultural Resource Management TR = Environmental and Natural Resources Training RAD = Radon Assessment and Mitigation	[3] Rationale codes: 1 = Comprehensive Internal Assessment Plan and EQA Report 2 = Excellent results on last ECE or external assessment 3 = Initial external assessment 4 = Interval since last site visit 5 = Average Internal Assessment Plan and EQA Report 6 = Unsatisfactory Internal Assessment Plan and EQA Report 7 = Known or suspected compliance/EMS issues 8 = Unsatisfactory results from last ECE or external assessment X = Exempt (Administrative or explain)

5.4.2 Conducting the External Assessment

While external assessors may also verify or validate compliance under the EQA, the primary focus of external assessment efforts is to determine whether the installation has successfully implemented management functions needed to achieve environmental objectives. Since installation personnel perform comprehensive inspections and/or compliance evaluations during the internal assessment, the Major Claimant can concentrate on management systems to determine the extent to which an installation has developed and implemented specific environmental protection programs and plans that, if properly managed, should ensure compliance and progress toward environmental excellence. The external assessment is an EMS review to focus on the quality and/or implementation of the program, not on actual compliance requirements. EMS Reviews are addressed in Chapter 2.

As with ECEs, assessors should review available documentation (e.g., IAPs, EQA Reports, internal assessment documentation, problem solving efforts, POA&Ms, P2 opportunity reports, EMS guidance) and interview appropriate personnel to determine if the EMS is functioning and individual responsibilities are being met. External assessors may also elect to inspect operations conducted at the installation to validate internal assessment inspections and other EMS functions.

5.5 Documenting the External Assessment

5.5.1 External Assessment Plan (EAP)

The format for the EAP is presented in Section 5.3.

5.5.2 External Assessment Report

The External Assessment Report should present the results of the Major Claimant's EMS Review and, if conducted, the results of any compliance evaluations. The organization of the External Assessment Report is at the discretion of the Major Claimant.

As suggested in Section 2.1, the External Assessment Report may address the following topics:

- Strengths and weaknesses of individual media programs or the EMS as a whole;
- Underlying causal factors (root causes) that may contribute to the occurrence of observed compliance deficiencies;
- The ability of the installation's compliance programs to be self-correcting;
- Strengths and weaknesses of each of the individual components/elements of an EMS; and
- The effectiveness of the system and identification of opportunities for improvement.

Alternatively, the report might address the installation's effectiveness in accomplishing each of the individual efforts within the planning loop, the evaluation loop, and the continuous improvement loop identified in Chapter 3.

A third approach is to document the installation's success in accomplishing each EMS activity listed in Section 2.4:

- Identify and track regulatory, DoD, and DoN requirements;
- Identify and rank practices which can or do impact the environment or other vulnerable assets;

- Identify, prioritize, and document impacts of identified practices;
- Identify and implement P2 opportunities;
- Establish EMS goals and objectives;
- Implement initiatives to meet the EMS's goals and objectives;
- Establish an internal assessment that effectively identifies compliance deficiencies and EMS inconsistencies;
- Conduct appropriate "problem solving" that determines the underlying causes of deficiencies identified in both internal and external assessments; and
- Implement corrective actions that prevent reoccurrence of identified deficiencies.

If the Major Claimant conducts compliance evaluations as part of the external assessment, the results can be documented efficiently in the installation's ACE database. Findings and problem solving recommendations shall be included in the written External Assessment Report.

Regardless of the report's organization, suggested improvements in the installation's EMS should be clearly identified and explained. The scope of the external assessment, the installation/region assessed, the individuals conducting the assessment, and the Major Claimant's point of contact should also be documented.

Before leaving, external assessors should present an outbrief to the CO of the installation. The draft of the External Assessment Report should be distributed to the Commanding Officer of the installation, the Major Claimant, Major Claimants of any tenants, and installation staff responsible for the development or implementation of the EMS. The Major Claimant should release the final external assessment report to the installation within 60 days of the completion of the site visit.

The installation is responsible for following up on deficiencies identified in the external assessment and for documenting corrective actions in its internal assessment documentation. Internal assessment documentation is addressed in Section 4.4.2.

5.5.3 Claimant EQA Summary

Once a year, the Major Claimant prepares the Claimant EQA Summary, which reports on the health of the environmental programs at all installations and activities in the claimancy. The summary includes information on the critical issues that CNO/N45 should be aware of and that may require top level attention and/or resources.

The Claimant EQA Summary contains three items:

- Program Area Status Summary by Installation/Activity (chart);
- Status of Top 10 Environmental Issues/Concerns; and
- EAP Update.

Program Area Status Summary by Installation/Activity (chart). This chart is a compilation of the Program Area Status Summary Charts developed by the installations and provided in their EQA Reports. See Section 4.4.3 for rating criteria. For each program area marked as inadequate, a brief explanation for the rating should be included in the footnotes.

Status of Top 10 Environmental Issues/Concerns. Considering the issues and concerns expressed by installations throughout the claimancy and its observations from external assessments, the Major Claimant lists the top 10 issues and concerns it faces and what is being done to resolve each issue/concern.

EAP Update. OPNAVINST 5090.1B, Change 2, Chapter 20 requires the Major Claimant to review the EAP at least annually and update it as necessary. The Major Claimant includes the updated EAP in the Claimant EQA Summary. The update should reflect site visits completed and any changes to the scope and schedule of future site visits.

Suggested formats for the Program Area Status Summary and the External Assessment Plan and its updates are provided in Appendix F.

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CHAPTER 6: PROBLEM SOLVING—ROOT CAUSE ANALYSIS AND CORRECTIVE ACTIONS

This chapter describes the problem solving process to address compliance issues and to develop long term compliance solutions. Both structured and intuitive methods are presented. Three case studies are presented in Appendix E to illustrate documentation of the seven-step problem solving process.

6.1 The Need for Problem Solving

Over the past ten years, although three and sometimes four external environmental compliance evaluations have been completed for most Navy installations, repeat deficiencies are common. That is, despite the success of audits in identifying compliance problems, corrective actions have not been implemented to permanently prevent recurrence of the deficiencies. Total deficiencies have been reduced as a result of audits, but a minimum number persist. This has been referred to as the "compliance plateau" (Roig and Schneider, 1995).

This section addresses measures that Navy installations should consider to reduce the compliance plateau.

The measures discussed below involve:

- Defining each compliance problem;
- Analyzing its contributing and root causes; and
- Selecting, implementing, monitoring, and, if indicated, modifying corrective or preventive actions to achieve specified results.

Business management literature refers to the full sequence of steps as "problem solving." Problem solving can be as formal or as informal as is needed to achieve the intended results. The term "problem" is defined in Section 6.2.

Formal problem solving has been referred to as "structured problem solving." Structured problem solving, described in detail in Section 6.3, begins and ends with results: a description of the desired results that are not being achieved at the beginning of the process, and verification that the desired results are being achieved at the end. Structured problem solving improves the odds of achieving the desired results by the use of formal steps clearly separated to ensure each is completed effectively before proceeding. Other key aspects of structured problem solving, besides a focus on results, are analysis of causes, consideration of alternative corrective actions, and follow-up on the selected corrective actions to ensure they work as intended. Structured problem solving relies on evidence to validate decisions made at each step.

Informal or intuitive approaches to correcting deficiencies have a role in compliance programs. Where problems pose limited risks to military missions, environmental resources, human health, or budgets, less rigorous problem solving may save time and resources. Intuitive problem solving is addressed here to indicate that some problem solving steps can be abbreviated, not to justify skipping steps or avoiding work or tough decisions. Intuitive approaches that focus on root cause categorization and statistical analysis are discussed in Sections 6.4 through 6.6 below.

In the long term, the cost of repeatedly applying ineffective fixes often will be higher than the cost of solving problems permanently. Achieving a practical minimum of deficiencies at the

least cost and impact depends on good judgment regarding when and how to use structured and intuitive problem solving. Section 6.5 presents guidelines for when to use structured problem solving. Section 6.6 illustrates how root cause categories may be analyzed to reveal problems that otherwise may not be apparent. Section 6.7 makes the case that environmental management offices should not always be the sole decision makers in problem solving. Section 6.8 addresses the role of judgment in problem solving.

6.2 What is a "Problem"?

The word "problem" should be used carefully to avoid ambiguity and confusion.

"Problem" is used here to mean "a situation where there is deviation from expected results, and the causes for the deviation are not known" (Kepner and Tragoe, 1981). Note that this definition specifies that causes are not known. Kepner and Tragoe hold that, if the causes are known, then what is left is not a problem, but a "decision" as to which corrective action to take. This distinction is significant because it helps to prevent "jumping the gun" on identifying causes.

The expected results from internal and external assessments are compliance with regulatory standards, achieving permit requirements, and conformance with policy and environmental management system standards. Although they continue to be modified, regulatory standards and permit requirements are well-defined. Environmental management system standards are less well-defined and are in an early stage of development. Management requirements in OPNAVINST 5090.1B and any Major Claimant or installation orders that address elements of environmental management constitute the minimum relevant standards. Failure to meet requirements or standards is referred to as a "deficiency."

A deficiency is not necessarily the same as a problem. A deficiency should be corrected, but may represent a single instance of a "deviation from expected results." Assessments, particularly external assessments, are limited in time and effort and may not establish whether the deficiency's frequency of occurrence is significant enough to warrant structured or even intuitive problem solving. The installation or owning unit may want to monitor such a situation over time or examine other locations where the deficiency could occur. If the deficiency is an isolated event and does not in itself represent a high risk, "fixing the symptom" may suffice.

Problems may be identified by means other than external and internal assessments. Unpermitted and accidental releases to the environment and regulatory agency inspections can also reveal problems that require concerted problem solving efforts.

6.3 Structured Problem Solving—Step by Step

The references by authors on problem solving listed for this section (see Appendix B) address several useful methodologies that may be helpful in particular cases. They characterize from four to seven steps in these methodologies. The seven-step problem solving process outlined in Figure 6-1 and described below is an amalgamation of the referenced authors' methodologies.

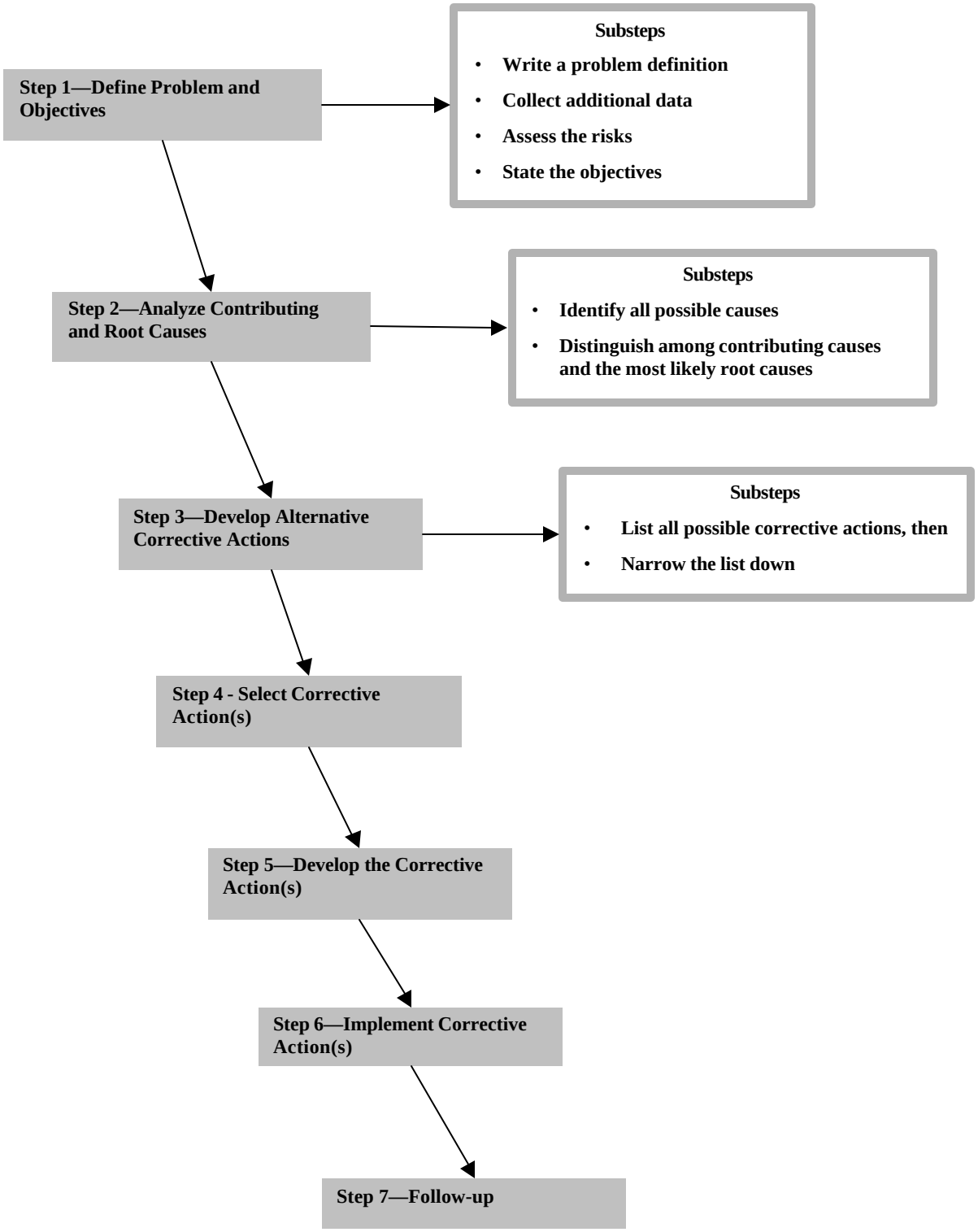

Figure 6-1: The Seven-Step Problem Solving Process

The steps, recommendations, and tools discussed in this chapter are not presented as cookbook recipes to be applied in every situation. Problem solving is a creative process and is, therefore, subject to judgment as will be discussed in Section 6.8.

Appendix E contains three case studies to illustrate the problem solving process and the documentation that might be developed while solving a high-risk compliance problem. Such documentation may be maintained within ACE software's POA&M module or it may be created and updated in traditional paper format.

6.3.1 Step 1—Define Problem and Objectives

Step 1: Process—Problem solving begins with discovery of evidence that requirements or accepted standards — the numerous regulatory and policy requirements— are not being met. Standards for the installation's environmental management system are the relevant policies and procedures documented in OPNAVINST 5090.1B and implementing base orders. Deficiencies revealed during internal or external assessments provide evidence that these standards are not being met.

Step 1 substeps are as follows:

1. Using evidence from the assessment or obtained from other sources, write a problem definition—a concise statement of the results that are not being achieved and how the situation varies from the desired results. The problem definition is a statement of facts. Do not include any assumptions about the causes or the solutions in the problem definition.
2. Collect additional data on the locations, timing, and/or magnitude of similar deficiencies, if needed, in order to adequately characterize the problem and to lay the foundation for cause analysis (see Kepner and Tregoe, 1981). Since at any one time compliance evaluations can only examine a fraction of the practices at an installation, a deficiency may only be the tip of an iceberg. Conversely, a single deficiency may be an isolated, low risk event that does not warrant problem solving.
3. Assess the risks and likely consequences of not correcting the problem permanently. Is the problem likely to lead to mission impairment or intense public scrutiny? Are significant impacts on worker health or natural resources possible, but unlikely? Assessing risks and consequences is particularly important if a number of problems are identified concurrently, so that the installation may prioritize which ones need to be addressed first.
4. Lastly, state the objectives of the problem solving exercise—the desired status after the problem is resolved. Describe the objectives quantitatively, if possible.

Step 1: Tools—An installation-wide inventory of practices with their locations and characteristics would facilitate assessment of the extent of problems.

Step 1: Recommendations—Ensure that all parties involved agree on the problem definition and objectives before proceeding.

6.3.2 Step 2—Analyze Contributing and Root Causes

Step 2: Process—Step 2 may be broken down into two sub-steps:

1. Identifying all possible causes. This sub-step deserves significant effort when previous attempts to solve a problem have been unsuccessful. Using tools mentioned below and

contributions from as many people as reasonable, this sub-step should reach beyond traditions and conventional understanding to develop new perspectives on the problem. Buried within the most unlikely causes may be the wisdom required to permanently resolve obstinate problems.

2. Distinguish among contributing causes and the most likely root causes. Root causes are those that, once corrected, will prevent recurrence of the problem. Other causes may be operating that shape or modify the frequency, location, or magnitude of the problem's symptoms. These are contributing causes. Since the root causes are the ones that guide subsequent steps, it may be easiest to classify causes that are the most readily corrected as the root causes. However, this course may not lead to the effective corrective actions. It is important, therefore, that the selection of root causes be as objective and as well informed as possible. Developing concurrence among involved parties that the root causes are clearly based on the evidence for the problem defined in Step 1 would help ensure objectivity and incorporation of relevant facts.

Step 2: Tools—

Cause and Effect Diagrams—Cause and effect diagrams, also called "Ishikawa diagrams" after the author who described them or "fishbone diagrams" because of their appearance, are a good device for identifying possible causes. As illustrated in Figure 6-2, the diagram is begun by writing out the effect, or short version of the problem, in a box. (Tables 6-1 A-D supplement Figure 6-2 by listing the root cause codes referenced in the fishbone diagram along with their associated root cause categories. The U.S. Army developed the codes and categories used in Tables 6-1 A-D.) Then identify the major categories of factors that influence the problem or effect. The branching links between major categories and the effect statement are the backbone of the fish.

The major categories of factors (or major "bones") shown in Figure 6-2 are:

- Plans and procedures;
- Training;
- Resources; and
- Management.

These categories are compatible with the Tier 1 root cause categories from the Deputy Under Secretary of Defense (Environmental Security) 23 April 1997 memorandum on Root Cause Analysis Methodology and Implementation, which could also be used for the major categories:

- Plans and Implementation;
- Training and General Awareness;
- Command Emphasis/Oversight;
- Resources; and
- Other (External Phenomena).

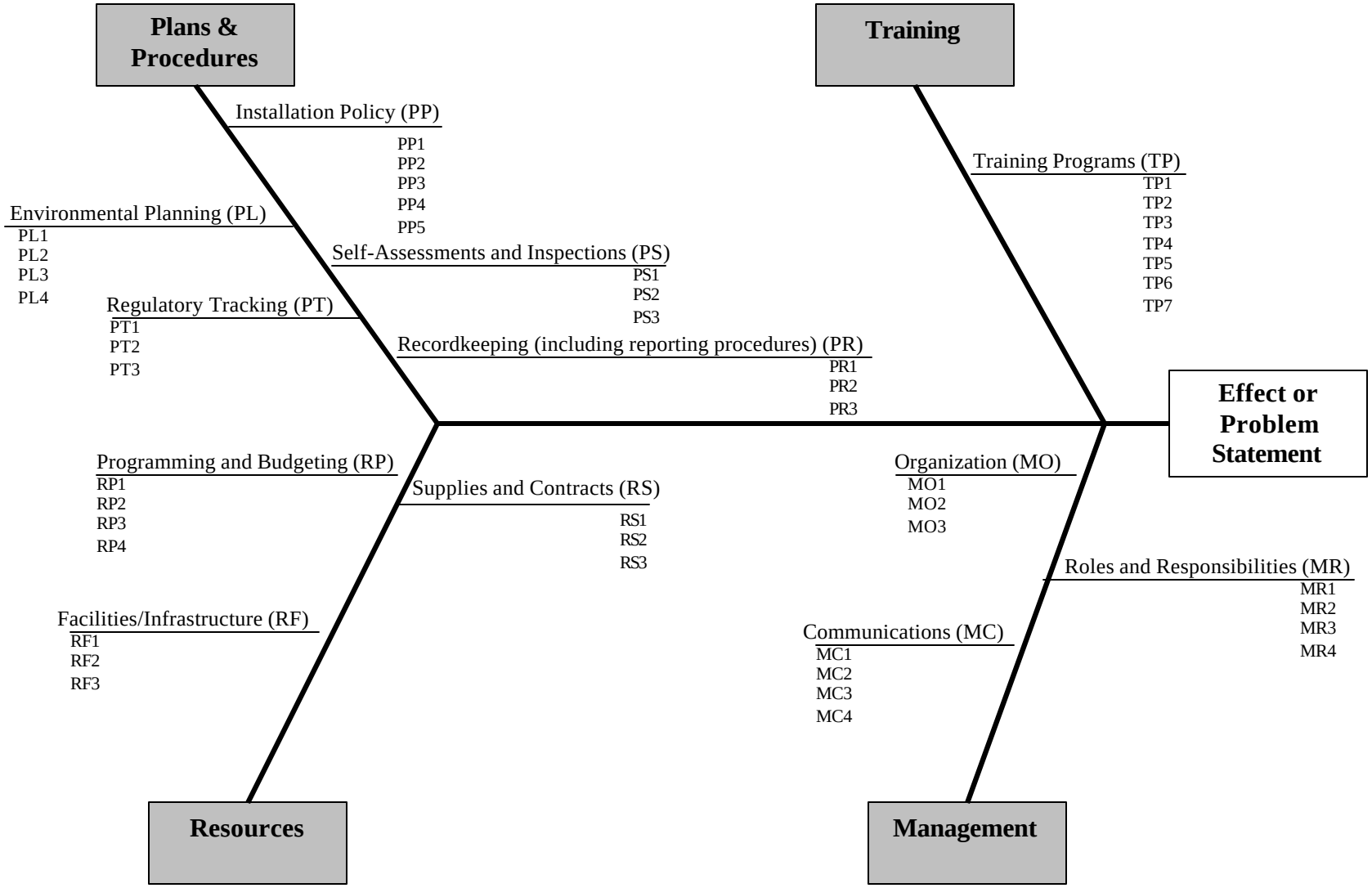

Figure 6-2: Cause and Effect Diagram Showing Possible Root Cause Categories

TABLES 6-1 A–D: ROOT CAUSE CODES DEVELOPED BY U.S. ARMY

Table 6-1a: Root Cause Codes: PLANS AND PROCEDURES (P)	
	Installation Policy (PP)
PP1	Formal policies are not issued from the appropriate level.
PP2	Existing policies conflict with environmental protection initiatives.
PP3	Formal statements of environmental goals and objectives do not exist or are inadequate.
PP4	Environmental requirements are not adequately considered when developing policies.
PP5	Environmental considerations are not adequately integrated into accomplishments of military missions.
	Environmental Planning (PL)
PL1	Environmental management plans and/or procedures are not established (e.g., HW management plans, spill plans, pesticide management plans).
PL2	Environmental management plans and/or procedures are inadequate.
PL3	System is not in place to properly coordinate the review and acceptance of new and/or updated plans and/or procedures with appropriate agencies.
PL4	Plans and/or procedures are not effective and/or properly implemented.
	Regulatory Tracking (PT)
PT1	System is not in place to track new or changing regulations.
PT2	New regulatory requirements are not being incorporated into standard operating procedures (SOPs).
PT3	Regulatory policy is misinterpreted.
	Recordkeeping (including reporting procedures) (PR)
PR1	A tracking system for key regulatory compliance deadlines (e.g.. permit renewals) does not exist or is inadequate.
PR2	Document control system and record retention procedures do not exist or are inadequate.
PR3	No formal mechanism exists to investigate, report, correct, track, or monitor environmental problems or incidents.
	Self-Assessments and Inspections (PS)
PS1	Trained or qualified professionals do not conduct assessments or inspections.
PS2	Inadequate or conflicting guidance exists for conducting internal assessments/inspections
PS3	Appropriate review and follow-up of self-assessment/inspection, execution, and results is not conducted

Table 6-1b: Root Cause Codes: RESOURCES (R)	
	Programming and Budgeting (RP)
RP1	Environmental planning does not include both short-term and long-term programming for resources (i.e., EPR).
RP2	Funds for environmentally related activities are not sufficient.
RP3	Staffing levels are not sufficient to achieve performance goals.
RP4	Strategic and long-term planning of projects with environmental impacts are inadequate or do not exist (i.e., timely awarding of contracts, NEPA documentation, etc.)
	Facilities/Infrastructure (RF)
RF1	Design is inadequate.
RF2	Error occurred in equipment or material selection.
RF3	Systems, facility, equipment, or part failure.
	Supplies and Contracts (RS)
RS1	Supplies have been ordered but have not been received.
RS2	Contract deliverables are not properly identified and/or delivered.
RS3	Control and oversight do not exist over purchased materials, equipment, and services supporting the day-to-day operations and maintenance activities.

Table 6-1c: Root Cause Codes: TRAINING (T)	
	Training Programs (TP)
TP1	Environmental Awareness Training is not provided
TP2	Personnel do not have the technical background and training to perform assigned job tasks.
TP3	Inadequate training needs analysis.
TP4	The training program is not effective.
TP5	Training activities are not documented (i.e., not on file, incomplete, or not current).
TP6	Periodic evaluations of the effectiveness of training programs are not conducted nor formally documented.
TP7	Personnel are not trained on new regulations or policies.

Table 6-1d: Root Cause Codes: MANAGEMENT EMPHASIS (M)	
	Organization (MO)
MOl	Environmental management lacks sufficient organizational stature, independence, and authority (i.e., levels within organization)
MO2	Environmental planning is not afforded the same priority as other organizational functions.
MO3	Environmental management does not participate at key strategic and operations planning meetings.
	Communications (MC)
MC1	Working relationships are ineffective within the organization.
MC2	Personnel concerns are not solicited, addressed, or documented.
MC3	The organization does not have a good working relationship with tenant organizations.
MC4	The organization does not have a good working relationship with external agencies (e.g., regulatory agencies, Major Claimant, community).
	Roles and Responsibilities (MR)
MR1	Environmental responsibilities are not clearly defined for all activities and personnel.
MR2	Environmental responsibilities are not clearly defined in the job description.
MR3	Performance standards are not included in environmental responsibilities.
MR4	Personnel activities are not held accountable for environmental performance

If most problems are traceable to the environmental management system, then the major categories might be based on the four phases of the Deming or Shewhart cycle with an initial category for organization-wide policy and commitment:

- Policy and Commitment
- Plan
- Do (Implement and Operate)
- Check (Measure and Evaluate)
- Act (Review and Improvement)

Still other categories, such as the “4 M’s” (methods/ manpower/ material/ machinery) or the “4 P’s” (policies/ procedures/ people/ plant), could be useful. Figure 6-3 illustrates these various schemes for fishbone analysis.

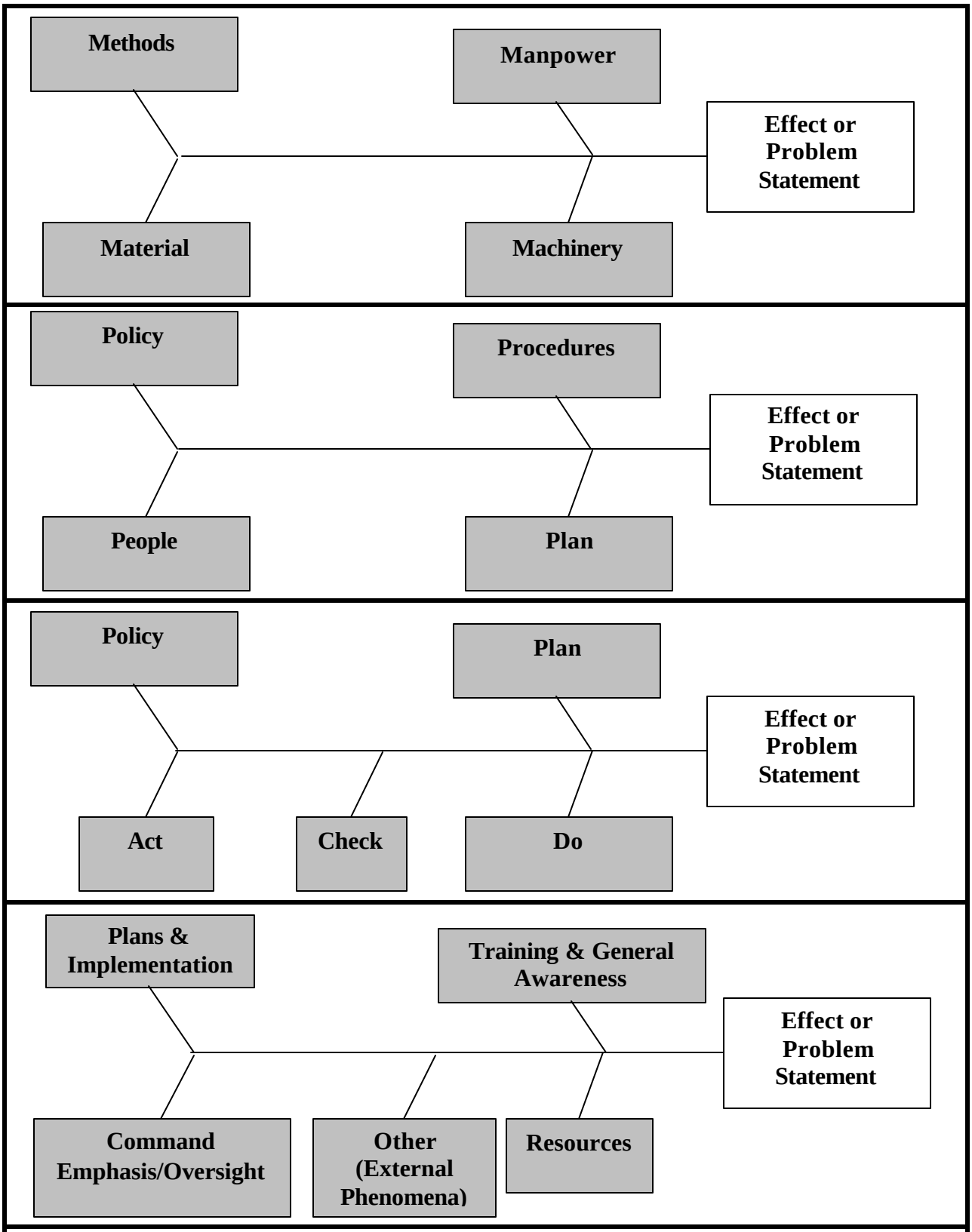

Figure 6-3: Additional Schemes for Fishbone Analysis

The problem solver then fleshes out each category with factors and sub-factors that could contribute to the observed problem. The factors and subfactors illustrated in Figure 6-2 and listed in Tables 6-1 A-D are presented for use during Navy internal and external assessments. A pre-constructed cause and effect diagram such as those in Figures 6-2 and 6-3 could be useful during assessments for guiding discussions among interested parties about possible causes, and for picking a root cause category for each deficiency.

However, a fixed list inevitably suggests causes that, although easy to identify and accept, may not accurately encompass the specific situation at hand. Therefore, constructing a cause and effect diagram should be a creative process when used as a tool during structured problem solving to determine real root and contributing causes. Start with the actual problem statement defined in Step 1 and a list of major categories such as those presented above (or any other that works). Then add factors and sub-factors that are supported by the facts at hand and that emerge from discussions with interested parties.

Brainstorming. If the permanent corrective action must be agreed to or implemented by multiple interested parties, this is a good way to get them working together. Bring all parties together and write the problem definition on a board. Ask for all ideas on what may be causing the problem, and write down all responses before beginning to analyze the validity of any response. Discussion of various brainstorming techniques may be found in any text or training materials on Total Quality Management.

The Five "WHYs?" Once a long list of possible causes has been identified, begin with the problem definition, then repeatedly ask "Why?" to pare the list down and to differentiate between root causes and contributing causes. Debate the answers until they are accepted. Like the cause and effect diagram, this tool leads the problem solver along a path defined by causality, not by tradition and intuition. Typically, asking "Why?" no more than five times will reveal the root cause.

What IS/IS NOT? Often, a deficiency could occur at numerous locations on the installation, but in fact occurs sporadically. Additional data on factors that differentiate between locations where a deficiency does and does not occur may provide ideas for causes as well as corrective actions.

Process Flow Chart. At times, cause and effect relationships that are obvious to some participants will be incomprehensible to others. To clarify and illustrate the situation where such a problem exists, construct a flow chart of the processes or activities. Building a flow chart is an excellent tool when the permanent corrective action may be a modification of parts or all of the process.

Accident/Release Investigation Tools. If the problem to be analyzed is an accident or a release of pollutants to the environment, root cause analysis methods developed by the U.S. Department of Energy (DOE) for nuclear safety may be useful. These methods include:

- Events and Causal Factor Analysis,
- Change Analysis,
- Barrier Analysis,
- Management Oversight and Risk Tree, and

- Human Performance Evaluation

These methods are described, and references for each method are listed, in DOE's *Root Cause Analysis Guidance Document*. (See reference list in Appendix B.) Each method has particular strengths depending on the specifics of the events being analyzed and the conditions at the time the events occurred. Also, cause categories, checklists, and examples provided in DOE's guidance are specific to nuclear reactor safety. However, the theories and practices on which these methods are based could be applicable to a variety of environmental compliance problems.

DOE's root cause guidance also addresses "Kepner-Tregoe Problem Solving and Decision Making" as a root cause analysis method. However, root cause analysis is but one element of Kepner and Tregoe's approach. Their theories provide the basis for the entire problem solving approach that is elaborated in this chapter.

Step 2: Recommendations—Identification of all possible causes may reveal the potential for additional problems that were not occurring or not recognized at the time of the assessment. Responsible decision makers should weigh the potential risks of not taking preventive measures to deal with the new problems. They may also want to initiate a separate problem solving exercise or deal with the issue in tandem with ongoing problem solving.

Attempts to distinguish among irrelevant, contributing, and root causes often broadens participants' perspectives on the problem; in such cases, it may be productive to redefine the problem to correspond to the improved perspective.

Trying to find one, absolute root cause is not always productive; several actions may be required to permanently correct complex compliance and management problems. In a similar vein, a contributing cause for one problem may be the root cause for another.

6.3.3 Step 3—Develop Alternative Corrective Actions

Step 3: Process—The approach for developing alternative corrective actions is similar to that for resolving causes: list all possible corrective actions, then narrow the list down.

Step 3: Tools—

Brainstorming. Use brainstorming to identify as many potential ways to correct the identified causes as possible. If brainstorming was successful in identifying the contributing and root causes, try it again, but try to keep cause analysis separate from alternative development.

Support from Others. Seek advice from the technical services available to Navy installations such as those available through the Navy Environmental Protection Support Service (NEPSS), as discussed in Section 7.2.

Step 3: Recommendations—Priority should be given to modifying or replacing the tangible components of the problem (processes, facilities, and operations) so that the mission they support might be accomplished with less cost or environmental impact. Installations' Pollution Prevention plans may provide some ideas for generating such alternatives.

Capital intensive projects requiring budget submissions are not the only solutions for most compliance deficiencies. Consider measures that deal with procedures, management systems, and people, as appropriate.

Depending on the scope of the alternatives, data collection and analysis may be needed to form a basis for comparison among the short list of alternatives.

The more obstinate or complex a problem and its causes, the more creativity should be encouraged in identifying alternatives. Include people in this step who are most familiar with the operations and facilities involved. Also, consider including people who may have a fresh perspective or have dealt with similar problems before.

6.3.4 Step 4—Select Corrective Action(s)

Step 4: Process—By the time this step is reached, the optimum, permanent solution will be obvious for all but the most complex or obstinate problems. If significant funds are involved, tradeoffs between alternatives are difficult, or other factors complicate the selection, consider applying one of the decision-making tools below.

Step 4: Tools—

Multidisciplinary Assessment. Prepare a thorough comparison of costs, benefits, environmental impacts, implementation considerations, and other significant criteria.

Benchmarking. Query other installations or Navy technical support organizations that may have dealt with similar decisions.

Group Techniques. Some problems will be permanently solved only when all parties involved agree to the solution and accept their roles in implementing and monitoring it. If several alternatives are considered feasible, but no one stands out as the best, consider group techniques such as:

- Nominal group technique—Ask each member of the group to prioritize the feasible alternatives, assign a rank to each with the highest number assigned to the most favored alternative, and use no number twice. Add all numbers for each alternative and select the one with the highest total.
- Pair-wise ranking—Pair each alternative with each of the other alternatives and, with the entire group contributing, pick the preferred one from each pair. The alternative chosen most frequently is selected.
- Multi-voting—If many alternatives remain, reduce the number by giving each member of the group half as many votes as there are alternatives. Count the votes cast for each alternative and devote continuing efforts to the alternatives with the most votes.

Step 4: Recommendations—Consensus among the parties responsible for implementation may be more important than ensuring that the perfect corrective action is selected.

If time or resources are limited and the effectiveness of available alternatives is uncertain, it may be preferable to select whatever action seems best, but agree to reexamine the problem solving record and modify the corrective action should it not work as hoped.

Consider possible unintended consequences of the preferred corrective actions. Many problems are the result of prior solutions and decisions. If you have reached this point and have considered only the problem as stated, ask, for example, whether the leading alternative is going to require more manpower than will be available or if any delay in receiving funds for a

constructed solution would impact the mission. At a minimum, ask the interested parties if they can foresee any unintended consequences of the preferred actions.

An optional verification step following the selection may be needed if consensus among the interested parties is not achieved or uncertainty about the effectiveness of the selected actions remains. Implement one or more of the corrective actions on a trial basis and test the results.

6.3.5 Step 5—Develop the Corrective Action(s)

Step 5: Process—Many corrective actions require the participation of several parties. Success of such corrective actions depends on clear definitions of tasks, responsibilities, resource requirements, and schedules. Prepare a plan for both implementation and follow-up to ensure communication and to maximize cooperation. The plan should address contingencies if the results of the overall solution or of specific tasks are uncertain. If the structured problem solving process has been followed and documented, it should be easy to identify contingencies.

Also consider the need for information collection and following corrective action implementation.

6.3.6 Step 6—Implement Corrective Action(s)

Ensure that all parties understand the desired results and their responsibilities in obtaining them.

Carry out the corrective actions.

6.3.7 Step 7—Follow-Up

Corrective actions are seldom entirely foolproof. Measures to monitor the effectiveness of corrective actions and responsibilities for doing so should have been specified in Step 5. Do the results meet the objectives set in Step 1 of the problem solving process?

The installation should modify its Internal Assessment Plan to incorporate any new or revised inspections or other monitoring methods specified in the corrective action plan.

Implement contingency plans or revisit the problem solving record if necessary.

6.4 The Role of Intuitive Methods

Not every deficiency discovered during internal or external assessments justifies the full, structured problem solving process.

Certainly, some deficiencies are isolated events or have so little risk associated with them that “fixing the symptom” immediately, and devoting the time that would be otherwise used in problem solving to monitor the situation, is the best use of resources.

The causes and corrective actions for some other deficiencies are so obvious that, even if each of the problem solving steps are considered, the entire process requires very little time or discussion. In such cases, an intuitive approach to problem solving may be applicable. For example, the first two steps of the problem solving process may be condensed to the point of just guessing the deficiencies’ most likely causes. This is something that evaluators might accomplish on site using a generic fishbone diagram to prompt cause and effect discussions with the representatives of owning units and/or environmental management offices. Similarly,

corrective action selection, implementation, and follow-up are still required, but might be similarly abbreviated, depending on the judgment of the parties involved.

6.5 Application of Structured and Intuitive Problem Solving

Structured problem solving, including documentation of each step and coordination among all interested parties at each step, should be applied in at least the following cases:

- If the deficiency would expose the installation to fines or other penalties if observed by a regulatory agency;
- If releases to the environment that are not allowed or that exceed permit limits could occur as a result of the deficiency;
- If adverse environmental or human health impacts could occur as a result of the deficiency;
- If similar deficiencies were observed at multiple locations aboard the installation or are suspected of occurring repeatedly;
- If the deficiency was found in a previous compliance evaluation; or
- If statistical analysis of root cause categories or an EMS assessment reveals a systemic management problem.

Where the above conditions do not apply, intuitive problem solving may be appropriate. Each of the seven problem solving steps should be considered. However, depth of analysis, the amount of coordination among the interested parties, and the volume of documentation could be less than for more serious problems. Individual steps may be designated for more formal analysis, documentation, or coordination if needed to permanently resolve the problem.

For all deficiencies, evaluators should make the best root cause categorization possible within the time constraints of the evaluation, then propose the categorization to the environmental management office and, if applicable, the owning unit. If there is agreement on the cause, then everyone involved should discuss the corrective action to be recommended by the evaluator in the POA&M.

Documentation of all problem solving exercises, whether structured or intuitive, is essential to the goal of achieving permanent solutions. In the event that a corrective action is not effective, documentation will permit a review of what was tried previously and on what basis it was selected. The POA&M function in the ACE software provides text fields that may be used for documentation of all problem solving facts and decisions. These fields are useful for both external and internal evaluators. Establishing and maintaining traditional paper documentation of problem solving decisions is also an option. In either case, the record should be initiated as soon as a problem is defined, and it should be updated as progress is made in solving the problem.

6.6 Statistical Analysis of Causes

Evaluators and installation personnel can increase the value of root cause categorizations by statistical analysis. Categories that are identified repeatedly, even for low-risk deficiencies, may deserve special attention for problem solving.

Complex mathematical techniques are not required for such an analysis. What is needed is the complete list of all root cause categories that have been identified over some defined period of time—for instance, a year's worth of self-audit inspections or the results of an intensive, installation-wide external compliance assessment. Do not bias the list by excluding either poorly substantiated or highly documented causes. It may even be appropriate to include causes that were judged to be contributing, but not root, causes. Count the number of deficiencies associated with each root cause category, then concentrate on the categories that were identified most frequently. Review of the most frequently assigned categories could indicate systemic problems that may not be revealed by structured problem solving of individual, high-risk deficiencies. Once revealed by this statistical form of root cause analysis, significant problems should be subjected to structured problem solving.

Figure 6-4 illustrates how root cause categorizations may be graphically portrayed to facilitate interpretation of the root cause statistics. In this hypothetical example, categories represented most frequently were related to management of the environmental program. Some causes in this group might result in high-risk deficiencies that may have been related only to minor deficiencies at the time they were observed.

Statistical analysis of causes benefits from standardized, clearly defined lists of causes. Standardization improves consistency of categorization and comparability of results. However, as noted in Section 6.3, structured problem solving depends on detailed, situation-specific analysis of causes. Standardized lists of causes, presented in fishbone diagrams or tiers, can be a useful starting point to foster discussion. Strict adherence to a predefined list of causes, however, should remain in the realm of intuitive problem solving and statistical analysis of causes.

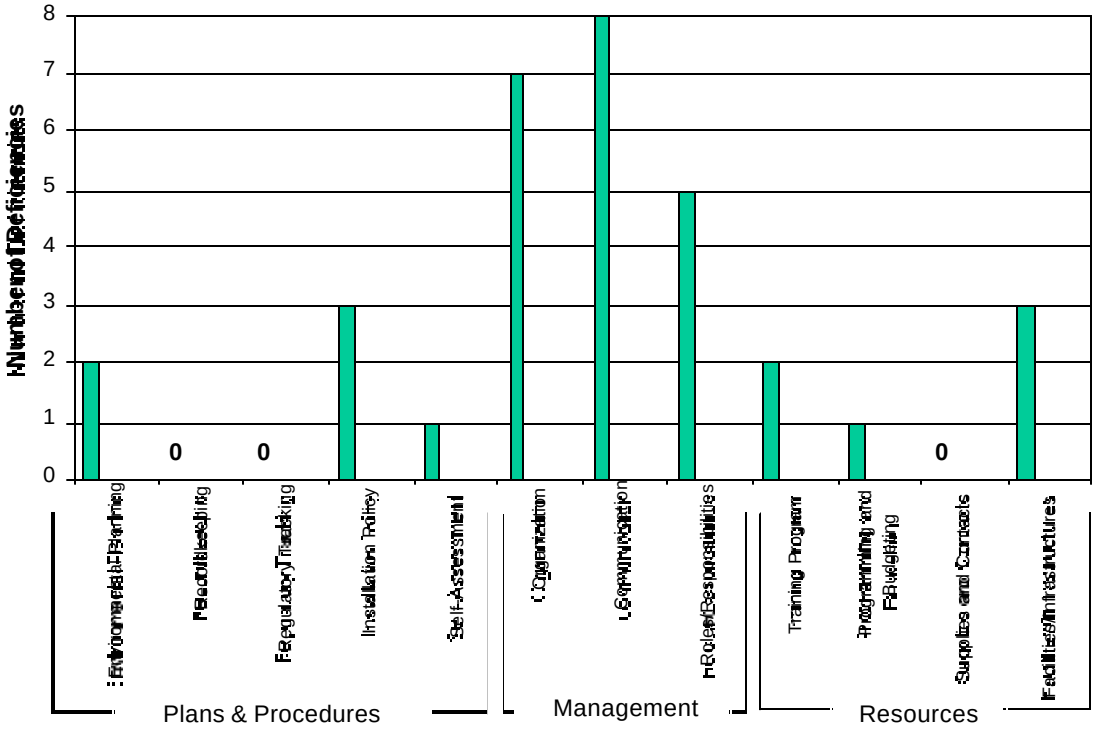

Figure 6-4: Histogram of Hypothetical Audit Findings Illustrating Statistical Root Cause Analysis

6.7 Roles and Responsibilities

A characteristic of many environmental problems on military installations is that several offices or units have an interest. The unit that "owns" the process, facility, or operation that is the source of a problem has an interest in continuing to fulfill its mission. The environmental management office has an interest in maintaining compliance with requirements. The installation's or owning unit's financial and manpower offices have an interest in corrective actions that require additional resources. The installation's Public Affairs office and the Installation Commander have an interest if the problem could impact off-installation environmental media or citizens.

To the extent that multiple interests in an environmental problem are not identified and considered during problem solving, solutions that otherwise appear to be permanent may come undone. Providing interested parties with opportunities to comment or participate in problem solving may avoid later interference.

At a minimum, the installation's environmental management office will be involved. This office, which provides environmental services to all other units, may be directly responsible for some facilities and operations such as hazardous waste tracking, storage, and disposal; and cultural and natural resource management. The environmental management office typically conducts compliance evaluations and hosts external assessments, and in most cases is the logical choice to provide the technical, coordination, and documentation functions required for problem solving.

Many other practices are not "owned" by the environmental management office, but are the immediate responsibility of other units, including tenants. Problem solving must be the ultimate responsibility of the unit owning the practice that is the source or location of a compliance deficiency. Practice owners should, at a minimum, be party to all decisions made during the problem solving process.

External evaluators, by definition, are independent of the parties responsible for the problem. They may have an oversight role, but will seldom have sufficient time on site to be responsible for problem solving. External evaluators can provide a service in identifying deficiencies, defining problems, and picking presumptive root cause categories, but should not be responsible for the effectiveness of corrective actions or decisions leading up to their implementation.

6.8 Use of Judgment

Even the most rigorous application of structured problem solving relies to some degree on the judgment exercised by the involved parties. The keener the judgment and the sounder the evidence developed at each step, the more likely that the selected corrective action will be the expected permanent solution. Structured problem solving can be seen as a means of organizing judgments, validating them with evidence, and communicating them among responsible parties.

By contrast, intuitive problem solving relies mostly or entirely on judgment. At the extreme, individuals jumping to conclusions with little evidence and no experience in structured problem solving run the greatest risk of wasting time and resources on ineffective corrective actions.

The key to using judgment is deciding when and how much to bolster it with:

- An organized approach;
- Additional evidence for validating decisions at particular steps;
- Input from additional people who have an interest in the final results; and
- A commitment to follow up on corrective actions.

One of the benefits of structuring the problem solving process is gaining a new perspective so that past, unsuccessful solutions are not repeated. If problem solvers limit problem solving exercises to comfortable, traditional approaches, then this new perspective, and opportunities to discover permanent solutions, may be lost.

6.9 Resources

The reader who may be tasked to implement the suggestions made in this section should seek additional sources of information and insight. Appendix B lists selected sources with brief comments on their content.

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CHAPTER 7: EQA TOOLS

This chapter covers the various tools and resources available to assist Navy activities in the implementation of the EQA Program:

- EQA Roll-out and Lessons Learned
- EQA Training
- Navy Environmental Protection Support Services (NEPSS)
- Automated Compliance Evaluation (ACE) Software

7.1 EQA Roll-Out and Lessons Learned

Many of the concepts and methods addressed in this Guide are new to Navy environmental personnel. Comments received on the draft Guide from early reviewers indicate support for the EQA program and interest in contributing to its development and implementation. As a result, CNO (N45) intends to play an active roll in involving EQA program participants in program improvement. CNO (N45) plans to collect lessons learned by Major Claimants and installations during program implementation and to subsequently incorporate those lessons into a revised EQA Guide or supplement to the Guide.

In order to introduce the new EQA Program and obtain effective feedback on the Guide from Major Claimants and installations, and to begin planning for EQA program implementation, CNO (N45) plans to conduct several one-day meetings throughout CONUS and in Hawaii after the EQA Guide is distributed.

Comments on the initial draft versions of the Guide suggested a model for EQA program implementation based on the formation of EQA Implementation Teams by Major Claimants. Each EQA Implementation Team, in the concept under development, would include personnel from several offices that have interests in the Major Claimants' EQA programs. Each Team would select one or more installations where Internal Assessment Plans would be developed and implemented. After a period of implementation, lessons learned would be shared among Teams and would be applied in internal assessment planning and implementation at all other installations. CNO (N45) will work with the Major Claimants to organize EQA Implementation Teams and to coordinate sharing of lessons learned. Lessons learned will be documented in a revised EQA Guide or supplement.

7.2 EQA Training Courses

7.2.1 Environmental Compliance Assessment

The Air Force Institute of Technology (AFIT) has developed the course, "Environmental Compliance Assessment, ENV-020." It is an Interservice Environmental Education Review Board (ISEERB) approved course. This means that the course has been reviewed by subject matter experts from the DOD Components and found to have a common content suitable for use by more than one Component. Navy personnel participated in a Technical Course Review in January 1999 and offered specific comments to AFIT, which is working to address our needs in a revised course to be offered beginning in Fiscal Year 2000. This course will be broadcast from Dayton, Ohio by satellite to reach DOD training classrooms CONUS and OCONUS.

The objective of this course is for each student to comprehend the objectives, principles, and mechanics of an environmental assessment. The course offers the student case studies and practical exercises to develop skills in planning a compliance assessment, interviewing, problem solving including root cause analysis, and writing good finding and recommended corrective action statements. At the end of the course, the student should have the knowledge to successfully plan and execute a comprehensive compliance assessment.

AFIT recently announced the course schedule for Fiscal Year 2000. The course dates are:

- 29 Nov–2 Dec 99
- 10–13 Apr 00
- 7–10 Aug 00

The Naval School, Civil Engineer Corps Officers (CECOS) is working to reserve satellite classrooms in Navy concentration areas. Information on these offerings will be available in the Navy Environmental Training Catalog and at the CECOS web page: http://www.cnet.navy.mil/cecos/cecos.htm.

7.2.2 Conducting Environmental Management System Reviews

The CECOS is developing a new course, "Conducting Environmental Management Systems Reviews" and is working towards delivering the first offering in early Spring 2000. Information on the course schedule will be available in the Navy Environmental Training Catalog and at the CECOS web page: http://www.cnet.navy.mil/cecos/cecos.htm.

This course will train Navy civilian and military personnel representing shore installations, major claimants, and Naval Facilities Engineering Command Engineering Field Divisions/Activities to conduct EMS reviews at Navy shore installations. EMS Reviews are one aspect of the Environmental Quality Assessment (EQA) Program established in OPNAVINST 5090.1 (series) and described in this Guide.

In this course, students will learn to:

- Identify strengths and weaknesses of environmental management systems and programs;
- Identify underlying causal factors that may contribute to the occurrence of observed compliance deficiencies; and
- Evaluate each of the individual components of an EMS and provide feedback on the effectiveness of the system and identify opportunities for improvement.

The curriculum will cover:

- Planning and Preparing
- Gathering Information
- Analyzing Information Gathered- Problem Solving Techniques
- Documenting and Communicating Results

This course is intended for personnel from Navy shore installations, regional complexes, Major Claimants, Regional Environmental Coordinators offices, Naval Facilities Engineering

Command Engineering Field Divisions/Activities, and specialty officers who serve on Navy Environmental Quality Assessment internal and external assessment teams.

7.3 NEPSS Support

The Navy Environmental Protection Support Services (NEPSS) is a network of organizations established to provide environmental support to all the claimants and installations in the Navy. The NEPSS includes offices in various commands designated to provide environmental technical, legal, data management, and information exchange support to Navy organizations. The NEPSS organizations are NAVFACENGCOM Headquarters, the Engineering Field Divisions, NAVFACENGCOM Field Production Units, the Naval Facilities Engineering Service Center (NFESC), the Ordnance Environmental Support Office (OESO), the Aircraft Environmental Support Office (AESO), the Ships Environmental Support Office (SESO) and the Marine Environmental Support Office (MESO). NEPSS is centrally funded through NAVFACENGCOM. Because NEPSS is a limited resource, priorities may need to be negotiated to meet the requirements of the many different customers that NEPSS serves. NEPSS supports the claimants, installations, and Regional Environmental Coordinators as follows:

7.3.1 Technical/Legal Consultation

Upon request, provide Navy customers correct, timely, cost-effective responses to inquiries and requests for environmental engineering assistance. Research, as necessary, to fully understand the compliance problem and provide the assistance required to develop a workable solution. Communicate results in a timely manner via appropriate media. Perform appropriate reporting of results (phone, fax, email, letter, personal briefing, etc). Resources are available to respond to near term, quick answer situations and longer term project-oriented solutions. Longer-term project assistance is described in Section 7.3.2 below. Technical/Legal Consultation means:

1. Review activity operations, processes and procedures for conformance with environmental requirements, recommend appropriate solutions and course of action, and assist with project definition and development as needed.
2. Conduct site visits and meetings with activity, claimant, regional commander, and/or REC personnel to acquire technical information and discuss alternate ways of defining and solving compliance problems.
3. Provide legal assistance; review proposed and enacted laws, regulations, and policy; and provide an analysis of what needs to be done to comply.
4. Provide consultation or guidance to customers in the preparation of forms, permits, reports, etc.
5. Assist customers in working with regulatory agencies, including responding to and resolving Notices of Violation, Notices of Non-Compliance, and other enforcement actions.

7.3.2 Environmental Quality Project Assistance

Follow-up on Technical/Legal Consultation described above; longer-term project assistance may be needed. Environmental Quality Project Assistance means:

1. Support project preparation, develop the scope and government estimate, and assist the activity by providing technical information needed for budget and programming documentation. (Note: Project management and after statement of work contract administration effort are not covered by NEPSS).
2. Conduct acquisition planning and provide appropriate contracting vehicles to ensure ability and capacity to execute obligation of environmental projects. The goal of obligation of funding for properly planned project request(s) within 180 days of receipt from the Claimant or Regional Commander or by the end of second quarter of the fiscal year, whichever comes later.

7.3.3 Long Range Planning

NEPSS supports Claimant's development and implementation of comprehensive planning and budgeting process that ensures early analysis of compliance requirements and supports cost-effective long-range compliance strategies. Upon request, NEPSS resources provide support in predicting future compliance requirements, and in developing the documentation required for the programming and budgeting process. Specifically:

1. Maintain knowledge of new and proposed laws and regulations and their impact on compliance at Navy facilities.
2. Assess future requirements and identify solutions to address those requirements, including the cost of conventional or proven innovative technologies.
3. Coordinate the update and review of the Environmental Requirements Cookbook to maintain current guidance for activities in planning their environmental compliance program budgets.
4. As requested, participate in the evaluation of an activity's environmental program Baseline Assessment Memorandum (BAM), including but not limited to reviewing existing Environmental Program Requirements (EPR) exhibits and providing pertinent data for the EPR exhibit development.
5. As requested, evaluate activities' environmental quality program for pollution prevention opportunities. Provide research and technical assistance implementing pollution prevention opportunities.
6. Identify cost saving alternatives for environmental quality projects or requirements.

7.3.4 Environmental Quality Assessment (EQA) Program Assistance

NEPSS generally does not cover internal assessments. However, support regarding applicability and how to address specific environmental requirements, as well as how to correct environmental deficiencies, is available to activities as Environmental Consultation/Project Assistance described in 1) and 2) above. NEPSS support for the EQA Program is available to:

1. Provide support to claimants and activities in the use of the ACE software.
2. Provide instructors to support CECOS in providing Claimant, Regional Commander, REC, and activity personnel with training on the EQA Program, including internal and external assessment, root cause analysis, corrective actions, identification of process improvements and pollution prevention opportunities, EMS reviews, program management reviews, reporting, and available tools.

3. Assist Claimants, as requested, in conducting and preparing reports on external assessments that are primarily program management analysis and process reviews to identify and correct root causes and implement program improvements.
4. At CNO's direction, prepare and update guidance documents and training materials for conducting internal and external assessments, including root cause analyses.

7.3.5 Technical/Regulatory Information Transfer

Disseminate technical and regulatory information to Navy customers and establish mechanisms and procedures that assist customers. For example:

1. Provide assistance in development and conduct of environmental training courses.
2. Advise customers on new or emerging technologies (including lessons learned).

7.3.6 Support to the REC

Support the Navy and DoD REC in meeting the environmental coordination requirements of OPNAVINST 5090.1B and DoD Instruction 4715.2.

7.4 Automated Compliance Evaluation Software

The Department of the Navy Automated Compliance Evaluation (ACE) software was developed by the U.S. Marine Corps to document their ECEs and to provide their installations a convenient automated process to submit required Plans of Action and Milestones (POA&Ms) to higher headquarters for review and comment. The U.S. Navy recently adopted ACE as the preferred software to document both internal and external assessments conducted under the EQA program.

ACE provides Federal, state, and regional compliance requirements, Navy policy requirements, requirements under the Final Governing Standards (FGS), and requirements of Status of Forces Agreements and the Overseas Environmental Baseline Guidance Document. Table 7-1 is a list of ACE state, regional, and overseas checklists available:

Table 7-1: State, Regional, and Overseas ACE Checklists as of August 1999

STATES, TERRITORIES		CA AIR DISTRICTS	FGSs
Alabama	Missouri	CA Kern	Greece
Arizona	New Hampshire	CA Great Basin/Mono County	Iceland
California	New Jersey	CA South Coast/Orange County	Italy
Connecticut	Nevada	CA Mojave/San Bernadino County	Japan
District of Columbia	New York	CA San Diego	United Kingdom
Florida	North Carolina		
Georgia	Ohio		
Guam	Puerto Rico		
Hawaii	Rhode Island		
Illinois	South Carolina		
Indiana	Tennessee		
Louisiana	Texas		
Massachusetts	Virginia		
Maryland	Washington		
Maine	West Virginia		
Mississippi			

Table 7-2 is the list of ACE checklist program/media areas that are available:

Table 7-2: ACE Checklist Program/Media Areas

Program/Media	Checklist Code
Air Pollution—General	AIR-GEN
Asbestos	AIR-ASB
Radon	AIR-RAD
Oil and Hazardous Substance Spill Contingency Plan	EPR-SCP
OPA 90 Facility Response Plan	EPR-FRP
RCRA Contingency Plan	EPR-RCP
EPCRA/SARA Title III/E.O. 12856	EPR-ESE
Air Risk Management Plan	EPR-ARM
Spill Prevention, Control and Countermeasures (SPCC) Plan	EPR-SPC
Historical Resources	CUL-HIS
Archeological Resources	CUL-ARC
Native American Graves Protection and Repatriation Act (NAGPRA)	CUL-NAG
Hazardous Materials Management	HZM-HMM
Hazardous Waste—General	HZW-GEN
Hazardous Waste Generator	HZW-HWG
Hazardous Waste TSDF	HZW-TSD
Hazardous Materials/Waste Transporter	HZW-TRA
Hazardous Waste Munitions	HZW-MUN
Installation Restoration CERCLA	INS-GEN
Natural Resources Management—General	NAT-GEN
Multi Land Use Management	NAT-MLU
NEPA	NEP-GEN
Noise Management	NOI-GEN
Pesticide Management	PES-GEN
Pollution Prevention—General	POL-GEN
E.O. 12856/EPCRA TRI Reporting	POL-EOP
Recycling	POL-REC
Used Oil Management	POL-OIL
Potable Water Treatment	POT-GEN
Solid Waste Management	SOL-GEN
Medical/Infectious Waste	SOL-INF
Underground Storage Tanks (USTs)	STO-UST
Aboveground Storage Tanks (ASTs)	STO-AST
PCB and Lead Paint Management/TSCA	PCB-GEN
Wastewater Management	WAT-GEN

7.4.1 ACE Features

The Evaluation module of ACE contains a series of user-friendly screens that allow activity personnel to answer checklist questions about selected environmental program areas (e.g., asbestos, hazardous waste, solid waste, etc.). Checklist questions can be answered “yes” to indicate compliance with the requirements described by the checklist question, “no” to indicate noncompliance, “not applicable,” or “not reviewed.” A comment field allows notes to be entered for each “yes,” “not applicable,” or “not reviewed” response.

When a question is answered "no," a separate series of screens is used to identify the non-compliant command/tenant and to document site-specific deficiency information, recommended corrective actions, and root cause categories.

The POA&M module allows users to indicate the status of their implementation of a recommended corrective action and to document their problem solving efforts and corrective actions. This module also allows Major Claimants or other higher headquarters to review and comment on the installation's POA&M entries.

ACE provides the options of either selecting individual questions or groups of applicable questions from detailed, ECE-type checklists for Federal, State, and Navy requirements or of entering installation-specific checklists into the program to be used during the assessment.

Other features of ACE include:

- Providing a brief statistical summary of the questions answered during an assessment;
- Performing trend analysis across multiple assessments to identify questions that have been assigned multiple deficiencies;
- Sorting and printing numerous output reports using multiple data fields as sort criteria; and
- Allowing the export and import of data to facilitate the consolidation of information generated by multiple staff using laptop computers during assessments.

7.4.2 ACE System Requirements

ACE Version 4.0 requires a Pentium computer running Windows 95, 98, or NT with approximately 25 MB of free hard disk space.

7.4.3 ACE Training and Support

CNO/N45 maintains contract support from Potomac-Hudson Engineering, Inc. (PHE), developers of ACE, to maintain ACE for Navy uses and to train Navy personnel in the use of ACE. PHE can provide initial and refresher training at Navy facilities in the use of ACE. Request training through CNO/N45, Crystal Plaza 5, 2211 South Clark Place Room 680, Arlington, VA 22202-3735 or mcvey.tami@hq.navy.mil.

PHE also maintains a help desk to support Navy users of ACE over the phone at (888) 834-7732 or via e-mail at ace@ phe.com. PHE's staff has extensive experience performing compliance assessments as well as developing software and is thus prepared to address the entire range of issues that may arise during the Navy's use of ACE.

7.4.4 How to Obtain a Copy of ACE Software

Submit requests for the ACE software to ace@phe.com.

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APPENDIX A: ACRONYMS AND ABBREVIATIONS

Term	Definition
ACE	Automated Compliance Evaluation software
AESO	Aircraft Environmental Support Office
AIMM	Assess, Implement, Manage, and Measure
AST	Aboveground Storage Tank
BAM	Baseline Assessment Memorandum
BUMED	U.S. Navy Bureau of Medicine and Surgery
CEMP	U.S. EPA Code of Environmental Management Principles
CMAR	Commander, Mid-Atlantic Region
CNET	Chief of Naval Education and Training
CNO	Chief of Naval Operations
CO	Commanding Officer
CTP2	U.S. Air Force Compliance through Pollution Prevention Initiative
DoD	Department of Defense
DoDI	DoD Instruction
DoE	Department of Energy
DoN	Department of Navy
DRMO	Defense Reutilization and Marketing Office
DUSD(ES)	Deputy Undersecretary of Defense (Environmental Security)
ECE	Environmental Compliance Evaluation
EFA	Engineering Field Activity
EFD	Engineering Field Division
EMS	Environmental Management Systems
EO	Executive Order
EAP	External Assessment Plan
EMD	Environmental Management Division
EPA	U.S. Environmental Protection Agency
EPR	Environmental Program Requirements
EQA	Environmental Quality Assessment
FSA	Field Support Activity

Term	Definition
FY	Fiscal Year
HM	Hazardous Material
HQ	Headquarters
HW	Hazardous Waste
IAP	Internal Assessment Plan
ISO	International Organization for Standardization
MESO	Marine Environmental Support Office
NAVAIR	Naval Air Systems Command
NAVBASE	Naval Base
NAVFAC	Naval Facilities Engineering Command
NAVFACENGCOM	see NAVFAC
NAVSEA	Naval Sea Systems Command
NEIT	Navy Environmental Inspection Team
NEPA	National Environmental Policy Act
NEPSS	Naval Environmental Protection Support Service
NFESC	Naval Facilities Engineering Services Center
NON	Notice of Noncompliance
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
OESO	Ordnance Environmental Support Office
OPNAVINST	Office of the Chief of Naval Operations Instruction
P2	Pollution Prevention
PACE	Pollution Prevention Approach to Compliance Efforts
PAT	Process Action Team
PCB	Polychlorinated Biphenyls
POA&M	Plan of Actions and Milestones
POL	Petroleum-Oil-Lubricant
PWC	Public Works Center
RAC	Risk Assessment Code
REC	Regional Environmental Coordinator
RESFOR	U.S. Navy Reserve Forces

Term	Definition
SCORE(E)	Sustained Compliance + Operational Readiness = Environmental Excellence
SECGRU	Naval Security Group
SESO	Ships Environmental Support Office
SOP	Standard Operating Procedure
USMC	United States Marine Corps
USNA	United States Naval Academy
UST	Underground Storage Tank
WPNSTA	Weapons Station
WWTP	Wastewater Treatment Plant

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APPENDIX B: REFERENCES

This appendix provides references for further information on compliance auditing and management system reviews; EMSs; and root cause analysis, problem solving, and corrective action.

B.1 Compliance Auditing and Management System Review

Office of the President, *Executive Order (EO) 12088, Federal Compliance and Pollution Control Standards*, 13 October 1978.

Department of Defense Instruction (DoDI) 4715.6, *Environmental Compliance*, 24 April 1996.

DoD Office of the Inspector General, *Strategies for Improving DoD Environmental Compliance Assessment Programs*, 28 October 1996.

DoN, OPNAVINST 5090.1B change 2, Chapter 20, *Environmental Quality Assessment Ashore*.

DoN, OPNAVIST 5100.23E, Chapter 12, *Hazard Abatement Program*.

Department of Energy (DoE), *Protocols for Conducting Environmental Management Assessments at DoE Organizations*, December 1993.

DoE, *Performance Objectives and Criteria for Conducting DoE Environmental Audits*, January 1994.

U.S. Environmental Protection Agency (EPA), *Generic Protocol for Conducting Environmental Audits at Federal Facilities, Volumes I and II*, (EPA 300-B-96-012A&B), December 1996.

EPA, *Environmental Auditing Policy Statement*, (51FR25004), 9 July 1986.

EPA, *Environmental Policy Statement on Incentives for Self-Policing, Discovery, Disclosure, Correction and Prevention of Violations*, (60FR6607), 22 December 1995.

EPA, *Environmental Audit Program Design Guidelines for Federal Agencies*, (EPA 300-B-96-011).

EPA, *Interim Final Policy and Technical Guidance of Environmental Management Reviews at Federal Agencies*, 31 May 1996.

B.2 Environmental Management Systems

DoD Office of the Inspector General, *Strategies for Improving Environmental Management Systems in the DoD*, 13 January 1997.

EPA, *Code of Environmental Management Principles (CEMP) for Federal Agencies*, (61FR54062), 16 October 1996.

EPA, *Implementation Guide for the Code of Environmental Principles (CEMP)*, (EPA-315-B-96-12A&B), March 1997.

International Organization for Standardization, *International Standard ISO 14001, Environmental Management Systems—Specifications with Guidance for Use*, (ANSI/ISO 14001-1996), 1 September 1996.

B.3 Root Cause Analysis, Problem Solving, and Corrective Action

Deputy Under Secretary of Defense for Environmental Security (DUSD(ES)) memorandum, *Root Cause Analysis Methodology and Implementation*, 23 April 1997.

Bowling, Curtis, Acting Assistant Deputy Under Secretary of Defense (Environmental Security). Memo to DoD secretariats, *Root Cause Analysis Methodology and Implementation*, 23 April 1997.

DUSD(ES) response to the DoD Inspector General's October 1996 report recommending use of root cause analysis.

Chang, Richard and Keith Kelly, *Step-by-Step Problem Solving—A Practical Guide to Ensure Problems Get (and Stay) Solved*, Richard Chang Associates, Inc., Irvine, CA, 1993.

An easy reading guide to problem solving. Clearly describes and gives examples for the most common tools and points out seven common problem solving pitfalls.

Conger & Elsea, Inc., Mishap Analysis and Prevention System (MAPS) software.

Marketing literature indicates that MAPS supports several root cause analysis methodologies, including change analysis, hazard-target-barrier analysis, events and causal factors analysis, flowcharting, and fault tree analysis. Based on Management Oversight and Risk Tree Analysis (MORT) theories, MAPS was apparently developed for nuclear system safety purposes.

Conger & Elsea, Inc., Management Evaluation and Risk Identification Tree (MERIT) software.

This proprietary software "is the application of MORT technology to evaluate a system before an accident/mishap happens. MERIT is used to find holes in the management system."

Decision Systems, Inc., REASON software.

Proprietary software for "computerized root cause analysis, problem solving, investigation and modeling". (Not evaluated for this report)

Faust, Gerald, Richard Lyles, and Will Phillips, *Responsible Managers Get Results*, AMACOM, New York, NY, 1998.

The overall theme of this book is that successful organizations are run by managers "…responsible enough to do what it takes to produce the necessary results and to do what it takes to achieve success with the hand one has been dealt." Within that context, five chapters address how the responsible manager solves problems, including one chapter on the role of judgment. Different from the typical approaches described in this Guide, but thought-provoking.

Hedstrom, Gilbert and Roger Voeller, "Evaluating Your Environmental Audit—Moving beyond Band-Aids in Developing Corrective Actions" in *Auditing for Environmental Quality Leadership*, John Willig, ed., John Wiley & Sons, Inc., 1995.

Addresses how the role of environmental audits change within maturing EMSs. Finds that audit program effectiveness can be improved by integrating it with the organization's corrective action program. "...an environmental audit program is only as good as the

company's success in identifying the root cause of each audit finding and then taking the 'right' corrective action."

Hicks, Michael, *Problem Solving in Business and Management: Hard, Soft and Creative Approaches*, Chapman & Hall, 1991.

Reviews alternative problem solving strategies beginning with Kepner-Tregoe and including more recent Synectics, brainstorming, and Soft Systems Methodology. For readers who are interested in problem solving theory.

Holmes, MSgt Susan, and Judy Balance, *The Quality Approach and Process Improvement Guide*, Air Force Quality Institute, Maxwell Air Force Base, AL, 2nd ed., September 1994.

This two-volume set is billed as a "hands-on guide to Quality Air Force." Many of the tools used in problem solving are discussed in *Process Improvement Guide*.

Kepner, Charles and Benjamin Tregoe, *The New Rational Manager*, Princeton Research Press, Princeton, NJ, 1981.

Widely regarded as the originators of structured problem solving, Kepner and Tregoe's goal was to find ways to improve organizational effectiveness. The original version of this work, *The Rational Manager* (1965), focused on the steps involved in problem solving. The newer version adds advice on achieving teamwork in the process.

Newman, Victor, *Problem Solving for Results*, Gower Publishing, 1995.

A recently published conventional approach to problem solving. Provides many helpful suggestions in an accessible format.

Roig, Randy and Peter Schneider, "Audits and Root Cause Analysis" in *Auditing for Environmental Quality Leadership*, John Willig, ed., John Wiley & Sons, Inc., 1995.

Obviously written from an auditor's point of view, this paper does not look beyond cause analysis to selecting or implementing corrective actions. However, it does provide a useful discussion on statistical analysis of causes. Suggests that findings are rarely explained by a single root cause.

Straker, David, *Toolbook for Quality Improvements and Problem Solving*, Prentice-Hall, New York, NY, 1995.

Heavy on industrial quality control methods, this book addresses all of the quantitative and diagrammatic tools for problem solving in considerable detail.

System Improvements, "TapRooT" software, not dated.

Proprietary software used in conjunction with System Improvements' course on root cause analysis and investigation. Events and causal analysis, change analysis, barrier analysis, developing corrective actions, and incident reporting are mentioned in the course description and are supposedly supported by the software.

U.S. Department of Defense, Office of the Inspector General, *Strategies for Improving DoD Environmental Compliance Assessment Programs*, Report No. 97-009, Arlington, VA, October 28, 1996.

This report documented that the most frequently occurring deficiencies are often repetitions from earlier audits, indicating that corrective actions were not taken or were ineffective.

U.S. Department of Energy, Office of Nuclear Safety Policy and Standards, *Root Cause Analysis Guidance Document, DoE Guideline,* DoE-NE-STD-1004-92, Washington, DC, February 1992.

Primarily concerned with nuclear safety, this guidance presents terminology and theory of root cause analysis.

APPENDIX C: STANDARD EMS MODELS

Many voluntary environmental standards and codes have emerged since the mid-1980s out of increased public concern over environmental issues, and are fueled by corporate concerns with the increasing number of environmental regulations and associated compliance costs. Although the most notable is the ISO 14000 family of standards, many others are used by manufacturing firms and industrial organizations throughout the world.

These codes typically require organizations to adopt new types of environmental behavior that are systematic in approach and broad in scope. with many of the steps required(similar to goals of the EQA program) going beyond compliance to include setting environmental goals and then assessing progress toward achieving those goals. While each of these standards has particular strengths and focuses, they also have much in common. Each requires an organization to:

- Establish an EMS;
- Audit the EMS to determine if they are achieving the goals they set for themselves;
- Evaluate their products' impacts on the environment based on life cycle management; and
- Involve outside groups in their environmental efforts. These groups can include the local community, but typically focus on the customer and suppliers to the organization).

None of the voluntary standards contain performance-related "compliance" requirements that an organization must meet. Laws, regulations, and DoD policy specify compliance requirements. Voluntary standards help organizations become proactive and move beyond compliance by developing a systematic approach to reducing their impact on the environment. Voluntary codes can help organizations:

- Reduce the costs of doing business;
- Distinguish themselves as environmental leaders;
- Create consistency across various facilities and with various regulatory agencies; and
- Enhance public relations.

This appendix discusses ISO 14000 and EPA's Code of Environmental Management Principles (CEMP). The references listed in Appendix B provide more detail.

C.1 ISO 14000

ISO 14000 consists of six separate standards that fall into two broad categories: organizational evaluation and product development evaluation. The organizational evaluation standards address environmental and business management systems and include the EMS, Environmental Performance Evaluation, and the Environmental Auditing Standards. These standards all relate to concepts addressed by the EQA program and are discussed briefly below. The product development standards do not apply to DoD activities.

Environmental Management Systems—The EMS standard enables an organization to establish an effective management system as a foundation of environmental performance. The EMS provides the foundation for the entire environmental program and is the cornerstone of the continuous improvement program. The generic model, discussed in Chapter 3 of this guide, provides a framework for developing and implementing the EMS by identifying the basic steps that must

take place to implement, operate, and maintain an effectively managed environmental program. Table C-1 discusses the five components in this model: policy, planning, implementation, evaluation, and improvement.

Table C-1: Components of ISO 14001

Component	Discussion
Environmental Policy	Senior management is responsible for defining an environmental policy that is appropriate for the organization's activities, services, and products. The environmental policy must provide the vision or direction, typically articulated through basic performance goals, for the EMS. The policy should indicate the organization's commitment to continual improvement, prevention of pollution, and compliance with regulations. It should also provide a framework for setting and reviewing goals, targets, and objectives. Additionally, management must ensure that the policy is maintained, documented, and communicated to all employees, and that it is made available to the public.
Planning	The purpose of environmental planning is to develop a roadmap of actions necessary to meet the policy developed in the policy component. Key planning elements include identification of environmental aspects of activities conducted by the organization. For each aspect, related impacts are identified and prioritized to provide a basis for the development of environmental goals and objectives consistent with policy. The planning component comprises four elements: environmental aspects and impacts, legal and other considerations, objectives and targets, and environmental management programs.
Implementation	Implementation is essentially the process of executing the roadmap or plan developed in the planning component, and includes such tasks as defining roles, responsibilities, and authority for establishing the EMS requirements and ensuring they are implemented and maintained. Implementation also includes providing required financial and other resources. The basic elements are structure and responsibility; training, awareness, and competence; EMS documentation; document control; operational control; and emergency response.
Evaluation	The evaluation component includes procedures to measure, monitor, and evaluate those activities that impact the environment. EMS internal audits should be carried out at defined intervals to evaluate conformance to policy. The use of problem solving techniques will identify and remedy the root causes of compliance and management system deficiencies. The basic areas of this component include monitoring and measurement, nonconformance, corrective and preventive action, keeping records, and external EMS audits.
Improvement	Senior management should review the EMS to assure its continuing suitability, adequacy, and effectiveness. The review should occur continuously to improve the performance of the EMS. The EMS should address possible need for changes in policy in light of audit findings, changing circumstances, and a commitment to continuous improvement. The review and changes shall be documented.

Environmental Performance Evaluation— The Environmental Performance Evaluation (EPE) Standard supplements the EMS standard and defines the impacts an organization has on the environment. The organization should conduct an inventory of those impacts (examples include solid waste generation, air emissions, or hazardous waste disposal). Once impacts are inventoried, the organization can then establish performance targets. The EPE is an ongoing evaluation by line employees responsible for the organization's environmental performance, as opposed to an independent audit by personnel outside the organization. This is very much like the EQA concept.

Environmental Auditing—The ISO 14000 standards rely on auditing to ensure that the organization is in "conformance" with the standard. The EMS audit evaluates the organization's environmental processes over their lifecycles—from inputs (including raw materials), through

the process, to outputs (products and wastes). The purpose of the EMS audit is to determine how well the organization is implementing the EMS; it is not a compliance audit, although a compliance audit and an EMS audit can occur simultaneously.

C.2 EPA's Code of Environmental Management Principles

The EPA met the requirements of Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention (P2) Requirements*, by developing a CEMP for Federal agencies that mirrors many of the principles underlying EMS standards. The CEMP contains organizational principles, infrastructures, and practices for a state-of-the-art EMS. As defined in the CEMP, a state-of-the-art EMS is one that ensures environmental performance will be considered world-class or best-in-class by peers and stakeholders and that will comply with the principles of the National Performance Review. Table C-2 presents the CEMP principles.

Table C-2: CEMP Principles

Principle	Description
Management Commitment	The agency's management makes a written commitment to improve environmental performance by establishing policies that emphasize P2 and the need to ensure compliance with environmental requirements. Performance objectives include: ▪ Obtain Management Support ▪ Policy Development ▪ Systems Integration ▪ Environmental Stewardship ▪ Sustainable Development
Compliance Assurance and Pollution Prevention	The agency implements proactive programs that aggressively identify and address potential compliance problem areas and utilize P2 approaches to correct deficiencies and improve environmental performance. Performance objectives include: ▪ Compliance Assurance ▪ Emergency Preparedness ▪ P2 ▪ Resources Conservation Identifying and addressing potential compliance problem areas corresponds to the generic planning loop discussed in Section 3.1 of this guide.
Enabling Systems	The agency develops and implements the measures needed for personnel to perform their functions consistently with regulatory requirements, the agency's environmental policies, and its overall mission. Performance objectives include: ▪ Training ▪ Structural Supports ▪ Information Management, Communication, and Documentation
Performance Accountability	The agency develops measures to address employee environmental performance and to ensure full accountability of environmental functions. Performance objectives include: ▪ Responsibility, Authority, and Accountability* ▪ Performance Standards
Measurement and Improvement	The agency develops and implements a program to assess progress toward meeting its environmental goals. Results of the assessment programs are used to improve environmental performance. Performance objectives include: ▪ Evaluate Performance ▪ Gather and Analyze Data ▪ Institute Benchmarking ▪ Continuous Improvement The measurement and improvement principle corresponds to the corrective action loop discussed in Section 3.2 of this guide and to the continuous improvement loop discussed in Section 3.3.

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APPENDIX D: CONTINUOUS IMPROVEMENT—MATURITY IN ENVIRONMENTAL PROGRAMS

Chapter 20 of OPNAVINST 5090.1B, Change 2 stresses environmental excellence and continuous improvement in environmental programs. The emphasis on continuous improvement compels environmental program managers at all levels to seek enhanced effectiveness in the Navy's environmental programs, with respect to both compliance and management performance. This section discusses levels of environmental program maturity and the process by which programs mature.

In the *Generic Protocol for Conducting Environmental Audits of Federal Facilities* (EPA 300-B-96-012A, December 1996), the Environmental Protection Agency (EPA) recognizes that the focus of audit programs needs to shift as overall environmental management systems (EMS) mature. The *Generic Protocol* defines three phases of environmental auditing:

- Phase 1—Auditing for compliance,
- Phase 2—Auditing for management effectiveness of media-specific environmental programs, and
- Phase 3—Auditing for management effectiveness of the installation's comprehensive EMS.

A brief analysis of the three audit phases suggests corresponding levels of maturity in the environmental programs under evaluation. Throughout this guide, the three levels of maturity will be described as "reactive," "progressive," and "proactive." Table D-1 presents key characteristics of the three levels, and Figure D-1 graphically illustrates the evolution through increasingly effective program types. Subsections D.1 through D.3 discuss each level of environmental program maturity in turn.

Characterizing environmental program maturity in three levels is an arbitrary approach adopted for discussion purposes. In reality, the lines between one level and the next will not be as well defined. Maturation in environmental programs is a continuous process, not a series of discrete events.

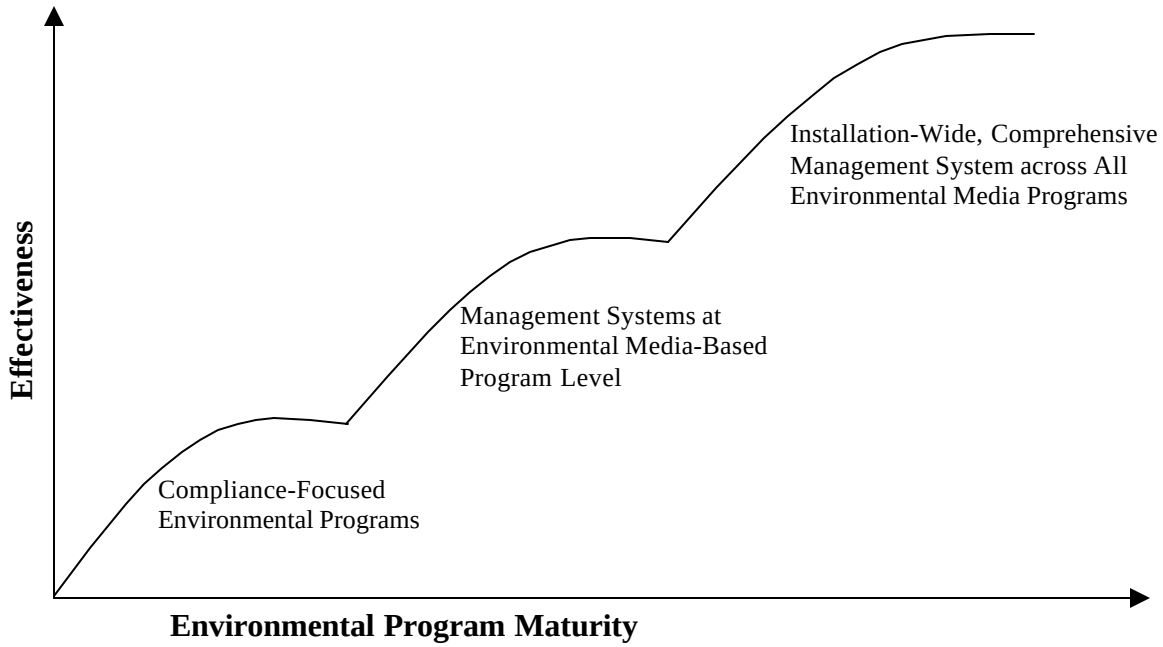
Even an installation with an effective, proactive environmental program is not relieved of the responsibility to continuously improve. Program and management effectiveness should be continually reviewed to identify additional opportunities to promote environmental excellence.

D.1 Reactive Environmental Programs

Reactive, or compliance-driven, programs are characterized by a focus on meeting requirements, with divisions in program structure defined according to environmental media. Reactive programs are thus managed and funded through media-specific program areas, e.g., air, water, hazardous waste, natural resources, etc.

Table D-1: Characteristics of Environmental Program Types

	Reactive Program	Progressive Program	Proactive Program
Focus	Compliance	Compliance and management system causes of non-compliance	Environmental performance (including compliance)
Structure	Environmental media-specific programs	Environmental media-specific programs with management focus	Comprehensive, installation-wide environmental management system
Problem Identification & Resolution	Find and fix symptoms	Enhanced self-correction process	Enhanced self-correction process and enhanced planning process
Scope/ Responsibilities	Activities under direct control of the Environmental Management Department (EMD)	Activities under direct control of the EMD	All activities installation-wide with environmental impacts



Source: Modified from EPA Generic Protocol for Conducting Environmental Audits at Federal Facilities, December 1996

Figure D-1: Maturation of Scope and Effectiveness of Environmental Programs

D.2 Progressive Environmental Programs

Progressive environmental programs are similar to reactive programs in their compliance focus, but they begin to address the management frameworks underlying each media-specific area. Environmental program managers may recognize that non-compliance is often caused by

shortfalls in the management of media programs. For example, insufficient training or poor communication procedures may contribute to non-compliant labeling or handling of a hazardous waste container.

After identifying management-related causes of non-compliance, a progressive environmental program implements corrective or preventive actions designed to develop management-oriented solutions. Continuing with the example presented above, rather than simply applying a correct label to a waste container, the solution should focus on ensuring that appropriate training and/or communication procedures are in place. In this way, progressive programs seek to prevent reoccurrence of non-compliance events. Progressive programs, when implemented properly, are thus said to be "self-correcting." Section 3.1 of this guide discusses the corrective action process in detail. Chapter 7 discusses identification of root causes of non-compliance events and problem solving.

A limitation of progressive programs is that they are typically managed strictly within the environmental department. Practices "owned" by other units on the installation may contribute significantly to environmental issues, but may not be under direct control of the environmental program. When environmental responsibilities and accountability are not distributed or coordinated across functional lines, progressive programs may miss important opportunities to improve compliance and management performance.

D.3 Proactive Environmental Programs

Proactive environmental programs have evolved beyond the media-specific focus of progressive programs to an installation-wide comprehensive EMS. Environmental planning activities are incorporated into installation-level planning by considering the environmental impacts of all installation practices, regardless of which unit "owns" them.

Proactive programs, like progressive programs, are self-correcting. The effective corrective action process, when coupled with integrated planning procedures, promotes additional improvements in environmental performance by focusing resources where they are needed, often before non-compliance issues require immediate (and often poorly planned) responses. An implied requirement in proactive programs is the ability to track, analyze, and communicate the implications of new or changing regulations.

Management of proactive programs is cross-functional. The EMD may be responsible for environmental program design, implementation, and day-to-day management; but accountability, cooperation, communication, and coordination with managers in all functional areas across the installation are critical to optimizing performance.

Figure D-2 illustrates the evolution of environmental programs through the three levels described above, and describes key characteristics of each level.

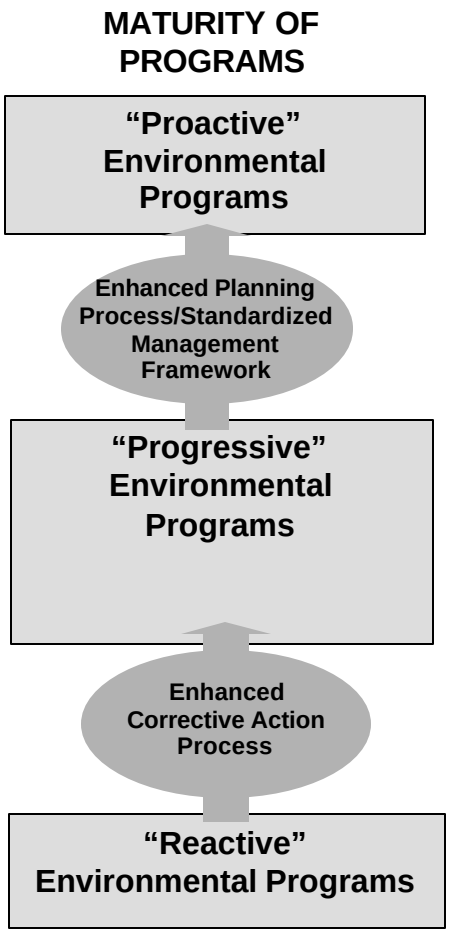


Figure D-2: Maturity of Environmental Programs

D.4 Distribution of Responsibilities under EQA Program

As an environmental program matures, the corresponding assessment broadens to consider, first, management systems of particular media programs and, then, the EMS as a whole. The EQA program allows Navy installations to determine the extent and pace of environmental program maturation, but encourages a shift in management and assessment responsibilities. The evolution of environmental programs and the general division of responsibilities as environmental programs mature are described below:

- In a media-specific, compliance-based ("reactive") environmental program, the installation is primarily responsible for program management, while auditing responsibilities rest with the Major Claimant. This was the situation under the former ECE Program.
- As programs mature, the specific media programs' EMSs are evaluated and improved as necessary ("progressive" environmental programs). The installation's internal assessment role—evaluating its compliance with requirements and, as appropriate, the effectiveness of program management—becomes critical. The ability for compliance programs to be self-correcting, and documentation of this ability, are emphasized.

- With better internal assessments conducted by the installation, the Major Claimant's oversight role shifts to examine the effectiveness of the internal assessment program by looking at internal assessment plans and reports and conducting EMS Reviews and limited on-site inspections.
- Ultimately, as installations implement comprehensive, installation-wide EMSs based on an identification of environmental impacts and can demonstrate that their compliance programs are self-correcting ("proactive" programs), the external assessment responsibilities of the Major Claimant become oversight and support to the installation's continuous improvement efforts.

Figure D-3 depicts the changing responsibilities of installations and Major Claimants as environmental programs at the installations mature.

D.5 Distribution of Installation-Level Responsibilities

The maturation of environmental programs at Navy installations is also marked by another shift in responsibilities. This shift distributes environmental awareness and responsibilities formerly concentrated within the EMD to all personnel across functional lines whose work may contribute to environmental impacts. This shift is reflected in internal assessments by training practice owners to conduct routine inspections of their practices, and to assist EMD staff with compliance evaluations.

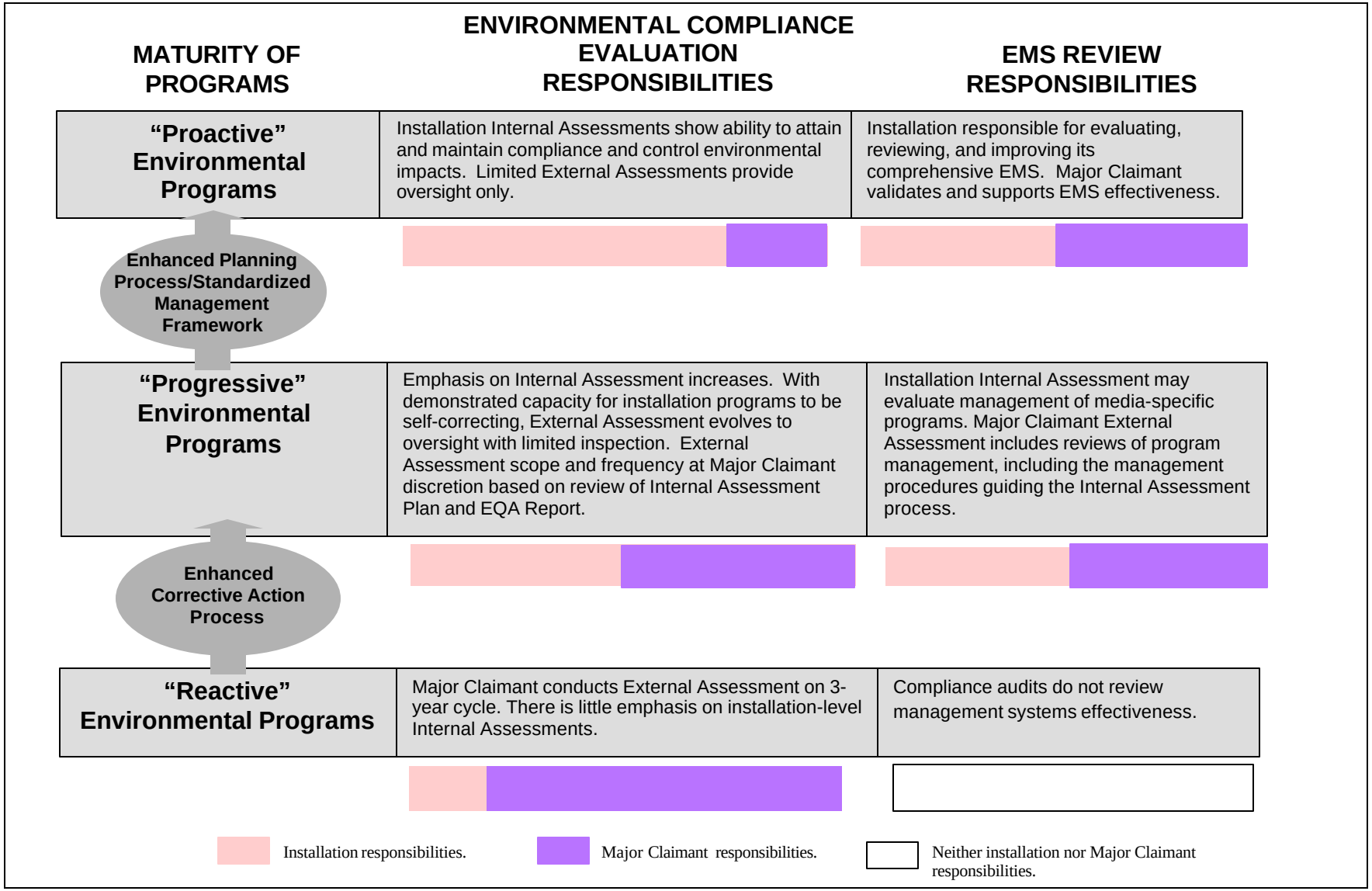


Figure D-3: Shift in Evaluation Responsibilities as Environmental Programs Mature

APPENDIX E: PROBLEM SOLVING CASE STUDIES

The following three case studies were written principally to illustrate documentation of the seven-step problem solving process discussed in Chapter 6. But the three case studies together tell a story of how multiple errors and oversights, which individually may not seem too serious, can lead to significant impacts. They also make some important points about the process.

While Case Study # 1 incorporates the seven recommended steps, it suggests that inadequate effort or understanding will lead to inappropriate results (see what happens in the following case studies). Why, for instance, is the problem definition couched only in terms of penalties, without addressing the fact that unknown hazardous wastes were being generated and improperly handled? Why, in the cause analysis step, did the writer avoid any analysis and appear to take the (poorly framed) problem personally?

Case Study #2 is clearly more fully developed. It was prepared to illustrate how scrutiny of an apparently simple audit discrepancy could reveal a complex and potentially serious problem that has multiple causes. It also reveals a second problem (Case Study #3) that might have been recognized and solved before significant impacts occurred if the related label problem had been dealt with effectively.

Case Study # 3 highlights the reality that many environmental compliance problems are not under the sole jurisdiction or control of an installation's environmental management division (EMD). In Case Study # 3, the problem solving documentation is terminated when responsibility for the problem is transferred to another unit or division. However, the logic and utility of documenting a structured problem solving process are valid not only with environmental problems. It is up to the installation to decide whether this process should be implemented cross-functionally.

E.1 Case Study #1: Labels on HW Drums (Initial)

During a scheduled external assessment on 9 July, an auditor inspecting satellite hazardous waste accumulation sites documented in ACE that two out of four 55-gallon drums at one site had no hazardous waste labels attached. One of the two drums had a manufacturer's label indicating that mineral spirits were the original contents of the drum. The other drum had no label at all. A finding was assigned by the auditor. In addition to recommending that the mislabeling of the observed drums be corrected, the recommended corrective action entered in ACE included inspection of all other satellite accumulation sites.

Step 1 – Problem Definition: I inspected all 20 of this installation's satellite accumulation sites between 15 July and 3 August specifically for the presence of appropriate labels on containers of waste. Out of 44 drums at these sites, four had no labels at all and two had essential information written on the drums with grease pencil but not on the label. This situation could put the installation in violation of Federal and state laws and could subject the installation's Commanding Officer to a Notice of Violation and penalties.

Step 2 – Contributing and Root Causes: Time and time again I have told the sailors who are responsible for each accumulation site that labels are required.

Step 3: - Alternatives: Since the people at the satellite sites cannot use verbal information, they must need written information.

Step 4 – Corrective Action: Copies of 40 CFR 264 Subpart I were made and sent 6 August to the Officer in Charge of each unit that uses satellite accumulation sites.

Step 5 – Development of Corrective Action: Not relevant.

Step 6 – Implementation of Corrective Action: Completed.

Step 7 – Follow-up: (See Case Study #2.)

E.2 Case Study #2: Labels on HW Drums (Revisited)

On 29 August, the installation's hazardous waste manager received a call from his waste disposal contractor notifying him that a drum of PCB-contaminated mineral spirits had been received and tested by the contractor's designated TSD facility, and was being shipped back to the installation. The TSD facility charged $1,200 for the testing and special handling of this drum. The waste disposal contractor charged an additional $800 for making a special trip to ship the drum back and for liquidated damages resulting from misidentification of wastes as stipulated by contract. In addition, the TSD facility has refused to accept future wastes from the installation since it accepts only petroleum-based wastes for reuse as fuel in boilers, and this was the third time in a year that chlorinated compounds were detected in the installation's wastes. The waste disposal contractor insists that its contract price for disposing of waste petroleum products be renegotiated. The contractor states that no other TSD within a reasonable travel distance of the installation has a permit to reuse the waste oils as fuel. TSDs that are within a reasonable travel distance would dispose of these wastes by incineration, charging $350 more per drum.

The installation received the returned drum on 2 September. The hazardous waste manager recognized it as the same drum located in the Helicopter Maintenance Group's satellite accumulation site that was the subject of a finding during an external assessment in July.

Step 1—Problem Definition: The installation saved $35,000 per year by sending an average of 100 drums per year of waste oils and other petroleum products to the TSD, which reused them for fuel. Those savings have been lost.

At a meeting called by the chief of the EMD, the ensign in charge of the Helicopter Maintenance Group accepted responsibility for the drum's having been mislabeled and for the PCB contamination. He also promised an analysis of how these faults occurred. His 14 September letter cited the following facts:

- On 2 July, a sailor pierced a transformer located near the Group's hangar when he lost control of his fork lift. Some of the transformer fluid ran onto the ground, but he managed to capture most of the spillage in a nearby bucket. With the help of co-workers, he disconnected the power to the transformer, drained the remaining fluid into the bucket, scrounged and installed a replacement transformer, and poured the fluid into a nearly empty drum of mineral spirits.
- The sailor moved the partially full drum to the satellite accumulation site where others saw the manufacturer's mineral spirits label on the drum and continued pouring waste mineral spirits from parts cleaning into it until full.
- Following the 9 July external assessment, the Group's manager for the satellite accumulation site, not knowing about the PCB spill, applied labels to both unlabeled drums. For the PCB-contaminated drum, he used the manufacturer's label and knowledge about the parts cleaning

operation in the Group to characterize the contents. His labeling of the other drum and its disposition are still being investigated.

Following review of this letter, the chief of the EMD called in his emergency response contractor to sample and clean up the PCB spill site. The cost of this effort was $7,900. The Facilities Department was alerted to the possibility of an improperly sized and installed transformer in the hangar. The EMD chief also tasked his hazardous waste manager and pollution prevention specialist to thoroughly investigate the six drums that had no labels or were incompletely labeled during the hazardous waste manager's 15 July - 3 August inspections.

The investigation was carried out between 15 September and 2 October. The results are summarized:

- The six drums had been located at three satellite accumulation sites. All three sites are utilized by units of the 3rd Light Strike Battalion, including the Helicopter Maintenance Group.
- Two of the drums had been filled, closed, and labeled as Mixed Hazardous Waste since no information on their contents was available. The installation paid top price of $750 per drum for disposal of these drums. There were a total of four drums currently in the satellite accumulation site despite the fact that the units close to the site generate only three types of hazardous wastes. Wastes are not segregated.
- One of the drums was about one-quarter full of oily rags and absorbent. Although it was not in the satellite accumulation site used by the Helicopter Maintenance Group, it was suspected to be the clean-up wastes from the PCB spill. The emergency response contractor was called in to investigate. The cost of sampling and disposing of the PCB wastes was $5,400.
- The three other drums cannot be accounted for. The individuals assigned to manage the two satellite accumulation sites where they had been seen earlier claimed no knowledge of their existence. These individuals had heard of the results of the external assessment, the hazardous waste managers' subsequent inspection, and the PCB spill. These missing drums represent a substantial potential liability to the government until they are accounted for.
- At each accumulation site, an individual responsible for managing the site was located. Quizzed about their understanding of hazardous waste management, they demonstrated rudimentary knowledge of their day-to-day responsibilities, but have not devoted any effort to enforcing good waste management practice among the sailors and civilians taking wastes to the drums in the accumulation sites. Also, these individuals demonstrate little awareness of their responsibilities in the event of a spill or other emergency.
- Training received by the accumulation site managers has been limited to that provided by the installation's hazardous waste manager. This has been in the form of brochures and copies of hazardous waste management regulations. The Commander of the 3rd Light Strike Battalion has not authorized his sailors to attend the hazardous waste management training sponsored twice yearly by the EMD.

Based on their investigation, EMD's pollution prevention specialist and the hazardous waste manager offered a list of causes of the inadequate waste management practices within the 3rd Light Strike Battalion. They are included in Step 2, below.

On 18 September the local civilian newspaper published an article under the headline, "Military Exposes Pollution Company to Toxics." Apparently based on poorly informed sources in the 3rd Light Strike Battalion, the article recounted the PCB spill and the subsequent rejection of "an unknown mixture of toxic chemicals" by the TSD. Details were confused and erroneous, but the basic sequence of events was recognizable. At least ten residents of the local municipality have called Public Affairs and two members of the Ladies Midnight Knitting and Macramé Society have called the installation's Commanding Officer's wife about the article.

Due to the complex sequence of events, two separate problems have been defined: one having to do with poor management of satellite accumulation sites and the other related to the PCB spill. See separate problem solving documentation for the PCB spill.

Step 2—Contributing and Root Causes: The causes for poor management of satellite accumulation sites serving the 3rd Light Strike Battalion were initially identified as:

- Lack of command support by the Commander of the 3rd Light Strike Battalion for environmental training.
- Inadequate training of hazardous material users and satellite accumulation site managers.
- Absence of site specific procedures for utilizing and managing satellite accumulation sites.
- Absence of communication between the EMD and commanders of operating units.
- Ineffective communication between EMD staff and personnel in operating units.
- Failure to properly implement problem solving procedures following the ECE.
- Failure to follow installation policy requiring segregation of hazardous wastes.
- Failure to follow installation policy and Federal and state regulations regarding labeling of drums intended to accumulate hazardous wastes.

The root cause was identified as absence of communication between the EMD chief and the Commander of the 3rd Light Strike Battalion. All the other causes contributed to the problems, but probably would not have been consequential if this communication had been occurring effectively.

Step 3:—Alternatives: None developed at this time. The corrective actions specified by the installation's Commanding Officer will be implemented immediately and monitored carefully. If the corrective actions are not completely successful, alternatives will be considered.

Step 4—Corrective Action: The EMD chief and the installation's Commanding Officer met on 7 October with the Commander of the 3rd Light Strike Battalion to resolve the situation. The installation's Commanding Officer ordered the following:

The Commander of the 3rd Light Strike Battalion will:

- Designate a staff officer to act as his permanent liaison with the EMD.
- Make all personnel who are currently assigned as satellite accumulation site managers available for HW managers training within the next two weeks on a schedule to be developed in coordination with the EMD.
- Make all other personnel who handle hazardous wastes in performing their jobs available for HW awareness training within the next four weeks on a schedule to be developed in

coordination with the EMD. Ensure that all new personnel receive this training before they are allowed to handle hazardous wastes.

- Prepare procedures for managing satellite accumulation sites designated for use by his command. Request review by the EMD and revise per recommendations. Make these procedures available at all times to personnel who handle hazardous materials or hazardous wastes. Ensure that each satellite accumulation site manager understands these procedures.
- Prepare site specific procedures for hazardous waste handling for each unit where hazardous wastes are generated or handled. Request review by the EMD and revise per recommendations. Make these procedures available at all times to personnel who handle hazardous materials or hazardous wastes in these units. Ensure that each person understands these procedures before they are allowed to handle hazardous materials or hazardous wastes.

The chief of the EMD will:

- Ensure that the liaison with the 3rd Light Strike Battalion receives copies of all correspondence sent by EMD to units of the Battalion and is verbally informed of any significant events or conversations relevant to the Battalion.
- Arrange to provide hazardous waste awareness training to all personnel in the command who generate or handle hazardous wastes.
- Arrange to provide hazardous waste management training to all satellite accumulation site managers in the command.
- Review satellite accumulation site procedures for consistency with all applicable regulations and best management practices.
- Inspect each satellite accumulation site utilized by the Battalion weekly until all specified training has been provided and, on a site-by-site basis, they meet all expectations for three weeks in a row. After four weeks, report any remaining deficiencies to the installation's Commanding Officer with a copy to the Commander of the 3rd Light Strike Battalion.
- Inspect all shops/hangars within the 3rd Light Strike Battalion where hazardous materials are used within the next four weeks. Identify any processes, activities, facilities, or entire shops/hangars for which site-specific hazardous waste handling procedures would ensure compliance with environmental regulations, prevention of waste, or protection of health and safety.
- Train EMD employees in problem solving techniques.

Step 5 – Development of Corrective Action: Definitions of tasks, responsibilities and schedules for the corrective action in the installation's Commanding Officer's instructions are sufficiently specific for implementation of the corrective action. In addition, the 3rd Light Strike Battalion will maintain training records as required by 40 CFR 262.34 and installation policy.

Battalion resource requirements for the corrective actions include line personnel time for training and management of training records, liaison officer's time for preparing procedures, and liaison officer's time for coordinating with EMD. Most of these resources will be provided during the next four weeks. Units will have to adjust work schedules accordingly. The EMD will minimize the liaison officer's time for preparing site-specific procedures by providing examples from other commands on the installation. If, during implementation of the corrective action, requirements

for capital expenditures for equipment or facilities are recognized, they should be handled according to established protocol.

EMD resource requirements include contract support for hazardous waste training, and staff time for inspections, reviewing procedures, coordinating training, and developing expertise in problem solving techniques. Contract support will be provided under an existing contract for training services. The additional training will be arranged by accelerating the contractor's existing schedule so that no new funds will be required (but other commands may have to delay some training until next fiscal year). EMD's pollution prevention specialist will provide examples of existing procedures to the Battalion's liaison, review site procedures, and develop expertise in problem solving techniques. EMD's hazardous waste manager will coordinate training and inspect the satellite accumulation sites, shops, and hangars.

Step 6 – Implementation of Corrective Action: Copies of this document and the installation Commanding Officer's order have been provided to all parties.

Step 7 – Follow-up: The results achieved by the 3rd Light Strike Battalion will be reviewed on 6 November at which time the chief of the EMD and the Commander of the 3rd Light Strike will report to the installation's Commanding Officer on compliance with his order. The resulting communication will be synopsized for this record.

E.3 Case Study #3: PCB Spill

Reference the Evidence reported in Case Study #2.

Step 1 – Problem Definition: See the Problem Definition described in Case Study #2.

In addition to the EMD inspections of satellite accumulation sites, a member of the Fire Department's HAZMAT crew and a Master Electrician from Facilities Division investigated the unreported PCB spill. They interviewed the sailor who drove his fork lift into the transformer, other personnel who were present at the time, the ensign in charge of the Helicopter Maintenance Group, and the sailor who was responsible for managing the satellite accumulation site.

They learned that the transformer containing PCB fluids was installed by Group mechanics when the previous transformer developed leaks. The mechanic undertook the replacement when Facilities Division could not respond to a job order immediately. The Facilities Division had a backlog of electrical job orders that resulted in a two-month delay. Units that have the skills available to perform their own electrical work are, therefore, not censured for doing so. Since the transformer that was ruptured came from an unknown source and other self-installed transformers on the installation could also contain PCBs, Facilities Division and the Fire Department immediately initiated electrical equipment inspections at all units which had requested repairs at some time during the past year but had to wait at least one week for the repair. This problem is being managed by the Facilities Division, and is not addressed further here.

All employees of the Helicopter Maintenance Group were asked about their emergency response training. All had received basic emergency response training at some time in their careers with the Navy, but none had received such training in the previous three years or since working in the Group. No site-specific training had ever been conducted for this Group. No employee could say where the installation SPCC plan was located. As noted in Case Study # 2, the Commander

of the 3rd Light Strike Battalion has not authorized his employees to attend the hazardous waste awareness training sponsored twice yearly by the EMD.

The driver of the fork lift that punctured the transformer was suitably trained to operate that equipment and had substantial experience doing so with no record of such accidents. He and co-workers stated that he was not impaired in any way at the time of the accident.

Step 2 – Contributing and Root Causes: The immediate cause of the PCB spill was the improper spill response implemented by the Helicopter Maintenance Group. Related causes included:

- Fear among employees of the Helicopter Maintenance Group that their covert transformer repair would be found out and they would be punished.
- Insufficient training of all employees regarding emergency response procedures for hazardous material and petroleum product spills.
- Recurring backlogs of equipment repair requests submitted to the Facilities Division.
- Tolerance of unsupervised equipment repairs.
- An ethic within the Helicopter Maintenance Group that their mission, maintaining at least 90% flight readiness, justifies taking shortcuts in established procedures and requirements.

The rupture of the transformer by fork lift was judged to be an accident.

It is determined that the EMD has no capability to correct the causes identified except for emergency response training which will be addressed in the training already required by the installation's Commanding Officer as discussed in Case Study #2. This record is, therefore, closed unless and until any additional equipment containing or potentially containing PCB fluids may be discovered during the Facilities Division's electrical equipment inspections.

Step 3—Alternatives:

Step 4—Corrective Action:

Step 5—Development of Corrective Action:

Step 6—Implementation of Corrective Action:

Step 7—Follow-up: Copies of this record have been provided to all interested units with the direction that any discoveries of undocumented transformers (see Installation PCB Equipment List, attached) be immediately reported to the chief of the EMD. The EMD will incorporate any such discoveries in its inventory of PCB-containing equipment.

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APPENDIX F: INTERNAL ASSESSMENT DOCUMENTATION

This appendix provides examples of two types of installation EQA program documentation:

- EQA report that will be submitted to the Major Claimant
- Internal assessment documentation the installation should maintain

The examples are suggestions for how the documentation might be structured. It should be noted that the report formats presented in this Appendix are for illustration purposes only. The EQA program permits installations to develop, or Major Claimants to require, alternative formats.

For the sake of brevity, only the hazardous waste program at the unnamed installation is profiled in some of the examples.

Installation XYZ
FY 00 IAP/EQA Report

30 September 1999

Submitted to: [Major Claimant]

Submitted by: [Environmental Management Office]
[Activity Name]

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EQA Report: Program Area Status Summary				
OPNAVINST 5090 Chapter	**Program/ Media Area**	**Rating**	**Explanation for "Inadequate" Rating**	**Initiatives to Correct**
1	Program Management	◗		
2	NEPA	❍		
3	Pollution Prevention	◗		
4	EPCRA	❍		
5	Air	◗		
6	ODS	◗		
7	Wastewater	❍		
8	Drinking Water	❍		
9/10	SPCC/ Spill Response	◗		
11	PCB	◗		
12	Hazardous Waste	●	Marked increase in deficiencies due to personnel turnover.	Increase training frequency, review/update course.
12	Infectious Waste	◗		
13	Pesticide	na		
14	Solid Waste	❍		
15	Installation Restoration	na		
16	Underground Storage Tanks	◗		
17	Noise	❍		
20	EQA Program	◗		
22	Natural Resources	◗		
23	Cultural Resources	na		
24	Training	●	See Hazardous Waste	See Hazardous Waste
25	Sampling and Lab Testing	❍		
26	Radon	❍		

❍ = Excellent
◗ = Needs Improvement
● = Inadequate
na = Not Applicable

NOTE: The symbols used in this chart can be accessed in Microsoft Word by clicking on "Insert" in the main menu bar at the top of the screen, then on "Symbol" in the drop-down menu, and then choosing the "Zapf Dingbats" font. Click on the desired symbol, and then click on the "Insert" button at the bottom of the dialog box. Font size can be adjusted as desired after the symbol has been inserted.

Summary of Problem Solving Efforts and Corrective Actions

The following problems were recognized during the period of 1 September 1998 through 1 September 1999 that were judged to require structured problem solving:

Problem Description	Status
Marked increase in deficiencies in the hazardous waste program (i.e., no accumulation start dates on drums, open bungs on drums, weekly inspections not being conducted, drums mislabeled).	Problem caused by an usually large turnover of personnel. Therefore, initial hazardous waste training will be offered twice a month for the next three months to ensure all new personnel are properly trained. Course content and presentation is also being reviewed to determine if updated materials or presentations are warranted. Course length may also be increased to ensure thorough understanding of the subject. Frequency of joint compliance evaluations/inspections will be increased to monitor improvements and provide any site-specific training needed.
Two EMD staff reported POL spills from their own automobiles.	Facilities Department will inspect automobiles in designated parking lots daily when temperatures exceed 90 degrees F in order to determine extent of problem. Until the problem is adequately defined, Facilities Department has sent staff to advise gasoline vendors to avoid overfilling tanks.
[Major Claimant] found that few vehicle maintenance shops on the installation maintain written procedures for handling hazardous wastes.	Written procedures for waste generators to follow have been available from the EMD but have not been requested. EMD has revised the written procedures into four versions appropriate for different types of waste generators and will distribute them during initial hazardous waste training (see first problem, above) and during joint compliance evaluations/inspections.
[Major Claimant] determined that few practice owners know that they should contact EMD for technical assistance when modifying or adding new practices.	The FY 00 EMS Review will focus on communication of environmental responsibilities among installation personnel.

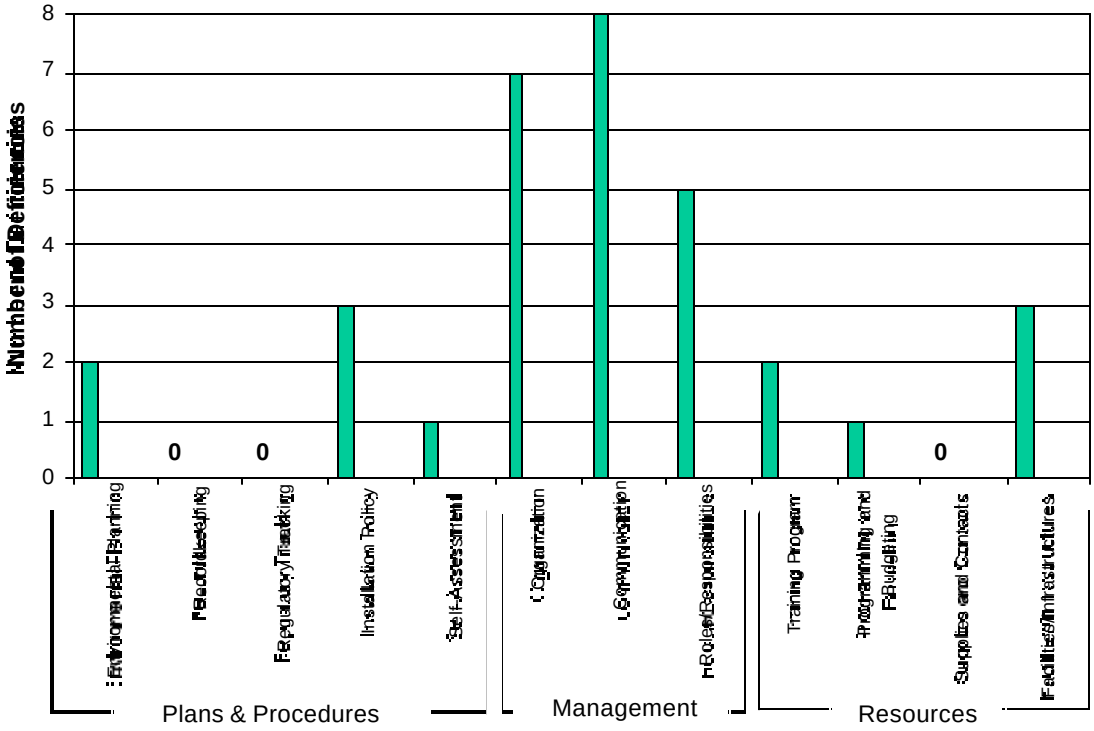
During this period, a total of 33 deficiencies and other events were recorded that required fixes or solutions by this installation or its tenants. The sources of these findings and events break down as:

- 17 deficiencies were reported to EMD by practice owners.

- 10 deficiencies were revealed by scheduled EMD compliance evaluations.
- 2 minor POL spills were reported.
- 3 recommendations were offered by [Major Claimant] for improvement of the EMS based on their External Assessment during July 1999.
- 1 deficiency was discovered by state officials during an unannounced inspection.

The assigned causes of the 33 deficiencies and other events indicated that the installation's EMS required improvement in the areas of Organization, Communications, and Roles/Responsibilities as indicated in the following frequency diagram. This result confirms the findings of the External Assessment.

With the exceptions of the problems noted above, all deficiencies have been corrected and management recommendations have been acted upon as of 1 September. Documentation for all problem solving exercises is available for review.



Histogram of Hypothetical Audit Findings Illustrating Statistical Root Cause Analysis

Status of Top 5 Environmental Issues/Concerns

- Deterioration of 10,000-gallon waste oil AST located near Building 25 jeopardizes integrity of tank.
- Failure of pump at lift station and collapse of adjacent iron pipe resulted in release of raw sewage to local creek
- P2 equipment installed in Building 51 is exceeding expectations to reduce air emissions from process XYZ. Please advise us of policies and procedures to procure and install additional similar equipment.

IAP Update

Changes in the IAP (Hazardous Waste program only) effective 30 September 1999 will be as follows:

- Environmental Department staff will inspect the permitted hazardous waste storage facility on a weekly basis because of increased scrutiny by state regulators.
- Hazardous waste satellite accumulation points at Buildings 56, 57, and 58 will be inspected weekly due to continuing compliance deficiencies.
- Hazardous waste satellite accumulation points at Buildings 54, 55, and 59 will be inspected monthly due to the difficulty these sites are having in achieving the EMS requirements.
- P2 initiatives implemented in Buildings 75, 76, 81, 89, 90 will be reviewed monthly to determine if the recently installed equipment is meeting anticipated effectiveness.

Approach to Scheduling Inspections and Compliance Evaluations

Installation XYZ has instituted a three-tiered approach to performing its internal assessment:

- EMD Director will review each environmental program's status annually, semi-annually, or quarterly as indicated in the Internal Assessment Planning Summary. Program reviews are staggered throughout the year.
- EMD program/media or their designated staff will review inspection results submitted by practice owners as submitted and will verify compliance status of each practice by means of on-site compliance evaluations on a variable frequency determined by risk and past compliance status. Minimum frequencies for on-site evaluations are indicated in the Internal Assessment Planning Summary. During FY 00 EMD staff will routinely schedule their on-site evaluations concurrently with practice owners' inspections in order to provide training on inspection techniques and documentation to practice owners' designated staff.
- Except where EMD is responsible (P2, culturally significant buildings, natural resource areas, and pesticide storage), inspections will be performed by practice owners at least as frequently as required by regulation and more frequently as indicated in the Internal Assessment Planning Summary.

Roles and Responsibilities

Inspections

Inspections will be conducted by staff designated by each practice owner. These designated staff will be tasked with reporting any discrepancies to EMD and with providing inspection results to EMD in a format and with a frequency determined by EMD's program/media manager.

Compliance Evaluations

With the exceptions of the potable water sanitary survey (Facilities Department) and asbestos program (Safety Department), compliance evaluations will be conducted by the EMD program/media managers as indicated in the Internal Assessment Planning Summary. EMD, Facilities, and Safety staff will work with the staff designated by practice owners, where applicable, to establish inspection procedures.

Problem Solving

The EMD P2 Manager will coordinate and document all problem solving exercises. Any disagreements over the procedures to be followed or the actions to be selected for implementation will be resolved by the EMD Director in coordination with practice owners, as appropriate.

EMS Review

The EMD Director will review the status of the Hazardous Waste and P2 programs quarterly, and the Clean Air and AST/UST programs annually.

Annually, the EMD Director will lead an in-house project to assess selected management components of the installations entire environmental effort. In FY 00, the assessment will focus on environmental job performance training for non-environmental specialists and communication of environmental responsibilities among installation personnel.

Sample Internal Assessment Planning Summary

Program/ Media Area	Type of Practice	Location (Building number)	Inspection Frequency [1] planned/ (required)	Inspection Responsibility	Local Priority	Compliance Evaluation Frequency	Compliance Evaluation Responsibility	Notes
Hazardous waste	Permitted HW storage facility	51	Weekly (Weekly)	Owner	High	Weekly	EMD HW manager	State inspector scrutiny
	Satellite accumulation points (Host)	56, 57, 58	Weekly (Weekly)	Owner	High	Weekly	EMD HW manager	Compliance problems
		54, 55, 59	Weekly (Weekly)	Owner	Medium	Monthly	EMD HW manager	
		9, 10, 13, 19, 21, 28	Weekly (Weekly)	Owner	Low	Quarterly	EMD HW manager	
	Satellite accumulation points (Tenant)	34, 35, 42, 52, 53, 64, 68, 69	Weekly (Weekly)	Owner	Low	Quarterly	EMD HW manager	
	RCRA-C program management	1	None	None	High	Quarterly	EMD Director	Reduce HW disposal costs 30% by FY02
Air	Asbestos removals	22 (school)	Daily (Daily)	Owner	High	Daily (1/11-1/22)	Safety Dept.	Asbestos removal-Principal's office
	Asbestos surveillance	22 (school)	Semi-annual	Owner	High	Quarterly	Safety Dept.	
	Air emission sources	22, 33, 44, 77, 88	Monthly (Annually)	Owner	Low	Annually	EMD air manager	
	CAA program management	1	None	None	Low	Annually	EMD Director	

Sample Internal Assessment Planning Summary (continued)

Program/ Media Area	Type of Practice	Location (Building number)	Inspection Frequency [1] planned/ (required)	Inspection Responsibility	Local Priority	Compliance Evaluation Frequency	Compliance Evaluation Responsibility	Notes
Waste-water	NPDES outfalls	61, 62, 63,	Quarterly	Owner	Low	Quarterly	EMD wastewater manager	NPDES permit requirement
	Wastewater treatment plants	12, 37	Weekly	Plant operators	Medium	Quarterly	Facilities Dept	
	CWA program management	1	None	None	Medium	Annually	EMD Director	Reduce permit exceedances by 50%
ASTs	Fuel off-loading facility	Pier 1	Daily (Monthly)	Owner	High	Weekly	EMD tank manager	High spill potential
	Fuel farm	32 (tanks 32-1, 32-2, 32-3, 32-4)	Monthly (Annually)	Owner	Medium	Monthly	EMD tank manager	Large quantity of POL stored
	ASTs	3, 11, 17, 25, 31, 40, 48, 65, 78, 80, 84, 85	Monthly (Annually)	Owner	Low	Bi-annually	EMD tank manager	
USTs	USTs (Host)	15 (tanks 15-1, 15-2, 15-3), 30 (tanks 30-1, 30-2, 30-3)	Monthly (Monthly)	Owner	Low	Annually	EMD tank manager	New USTs just installed
	USTs (Tenant)	72 (tanks 72-1, 72-2, 72-3, 72-4)	Monthly (Monthly)	Owner	Low	Quarterly	EMD tank manager	Older tanks due for replacement
	AST/UST program management	1	None	None	Low	Annually	EMD Director	
Pollution Prevention	Recycling Center	14	None	None	Medium	Monthly	EMD P2 manager	
	Recycling drop-off points	36, 38, 45, 60, 82	None	None	High	Weekly	EMD P2 manager	Determine usage
	P2 initiatives	75, 76, 81, 89, 90	None	None	Medium	Monthly	EMD P2 manager	Evaluate success
	P2 program management	1	None	None	High	Quarterly	EMD Director	Implement 5 P2 projects in FY99

Sample Internal Assessment Planning Summary (continued)

Program/ Media Area	Type of Practice	Location (Building number)	Inspection Frequency [1] planned/ (required)	Inspection Responsibility	Local Priority	Compliance Evaluation Frequency	Compliance Evaluation Responsibility	Notes
PCBs	PCB storage facility	67	Weekly	Owner	Medium	Quarterly	EMD PCB manager	
	PCB Transformers (Host)	43, 46	Quarterly	Owner	Medium	Quarterly	EMD PCB manager	Eliminate PCB use by FY99
	PCB Transformers (Tenant)	47, 49	Quarterly	Owner	Medium	Quarterly	EMD PCB manager	Eliminate PCB use by FY99
Potable water	Back-flow preventors (Host)	4, 16, 24, 73, 74	Annually	Owner	Low	Annually	EMD wastewater manager	
	Sanitary survey	Base-wide	Annually	Owner	Low	Annually	Facilities Dept.	
Other	Infectious waste locations (Tenant)	29, 79	None	None	Medium	Monthly	EMD Director	Compliance problems
	Culturally significant buildings	1,2, 7, 26	None	None	Low	Semi-annually	EMD Director	
	Natural resources areas	Training areas, Lake Steinberg, McVey Creek, Silva wetlands	None	None	Medium	Monthly	EMD Director	
	Pesticide storage facility	66	None	None	Low	Annually	EMD Director	
	EMS Review	1	None	None	High	Semi-annually	EMD Director	

Examples of Internal Assessment Documentation

- Internal Assessment Plan Schedule
- ACE Screens for an Individual Finding

HW Manager's Compliance Evaluation Schedule (first quarter CY 1999)				
JANUARY 1999				
MONDAY	**TUESDAY**	**WEDNESDAY**	**THURSDAY**	**FRIDAY**
4	**5** 36, 38, 45, 60, 82 14 22	**6** 9, 10, 13 61 66	**7** 51, 56, 57, 58 Pier 1 54, 55, 59	**8**
11	**12** 36, 38, 45, 60, 82 67 12, 37	**13** 6, 18, 27 29, 79	**14** 51, 56, 57, 58 Pier 1	**15**
18	**19** 36, 38, 45, 60, 82 22 15	**20** 19, 21, 28 22	**21** 51, 56, 57, 58 Pier 1 22	**22** 22
25	**26** 36, 38, 45, 60, 82 32	**27** 83, 86 5, 8, 20, 23	**28** 51, 56, 57, 58 Pier 1	**29**

Displayed schedule depicts data presented in the Sample Internal Planning Summary

Numbers represent building numbers on installation

HW Manager's Compliance Evaluation Schedule (first quarter CY 1999, continued)				
FEBRUARY 1999				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1	**2** 36, 38, 45, 60, 82 14 33, 44	**3** 34, 35, 42 62 66	**4** 51, 56, 57, 58 Pier 1 54, 55, 59	**5**
8	**9** 36, 38, 45, 60, 82 12, 37	**10** 6, 18, 27 29, 79	**11** 51, 56, 57, 58 Pier 1	**12**
15	**16** 36, 38, 45, 60, 82 30	**17** 52, 53, 64 3, 11, 17	**18** 51, 56, 57, 58 Pier 1	**19**
22	**23** 36, 38, 45, 60, 82 32	**24** 83, 86 39, 41, 50	**25** 51, 56, 57, 58 Pier 1	**26**

Displayed schedule depicts data presented in the Sample Internal Planning Summary

Numbers represent building numbers on installation

HW Manager's Compliance Evaluation Schedule (first quarter CY 1999, continued)				
MARCH 1999				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
1	**2** 36, 38, 45, 60, 82 14 77, 78	**3** 68, 69, 75 63 66	**4** 51, 56, 57, 58 Pier 1 54, 55, 59	**5**
8	**9** 36, 38, 45, 60, 82 12, 37	**10** 6, 18, 27 29, 79	**11** 51, 56, 57, 58 Pier 1 1, 2, 7, 26	**12**
15	**16** 36, 38, 45, 60, 82 72	**17** 76, 81, 89, 90 43, 46, 47, 49	**18** 51, 56, 57, 58 Pier 1	**19**
22	**23** 36, 38, 45, 60, 82 32	**24** 83, 86 70, 71, 87	**25** 51, 56, 57, 58 Pier 1 25, 31, 40	**26**

Displayed schedule depicts data presented in the Sample Internal Planning Summary

Numbers represent building numbers on installation

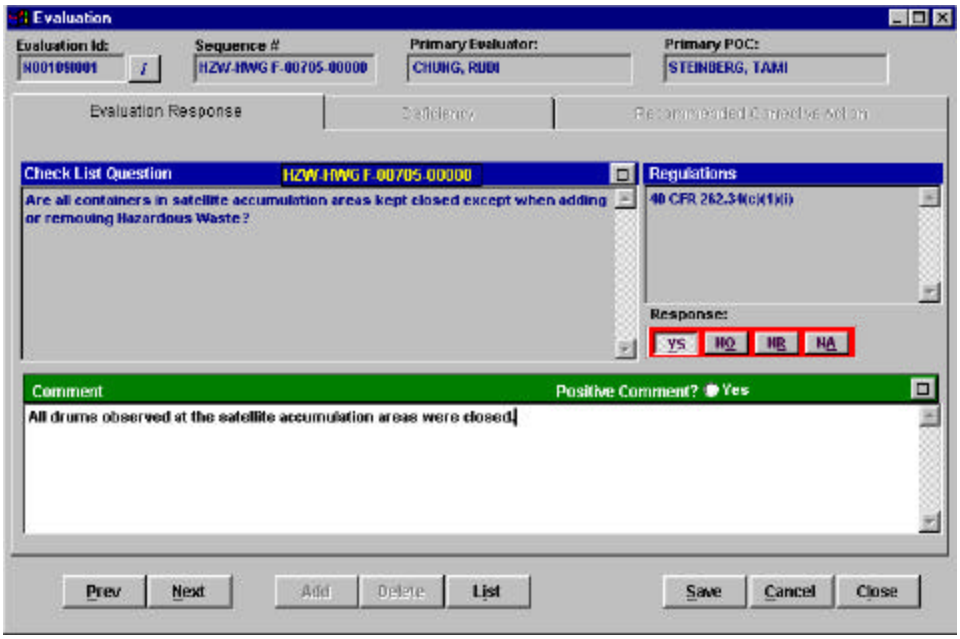


Figure F-1: Evaluation Module of ACE—Evaluation Response Tab Showing "Yes" Response with Comment

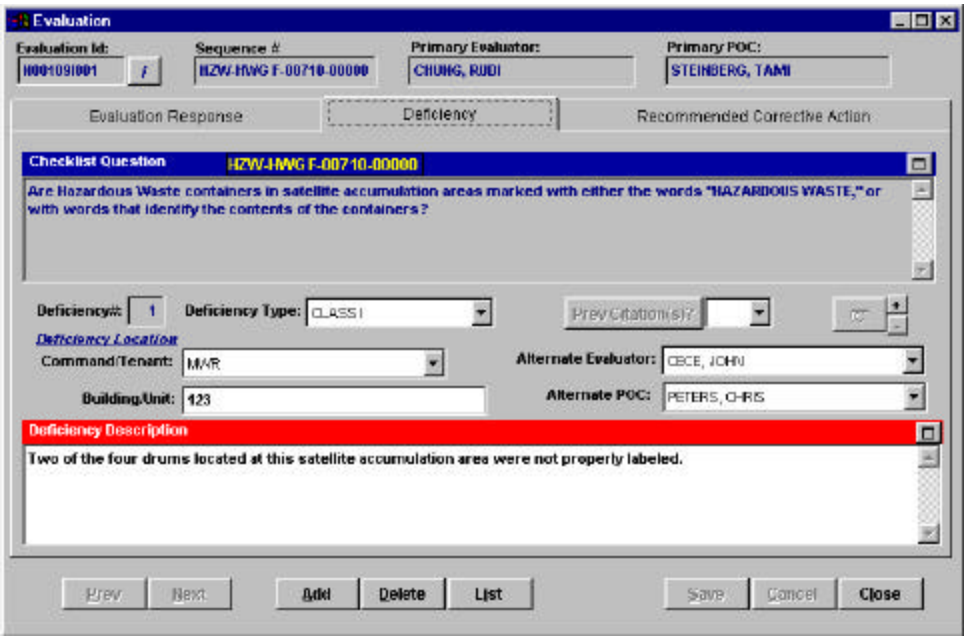


Figure F-2: Evaluation Module of ACE—Deficiency Tab

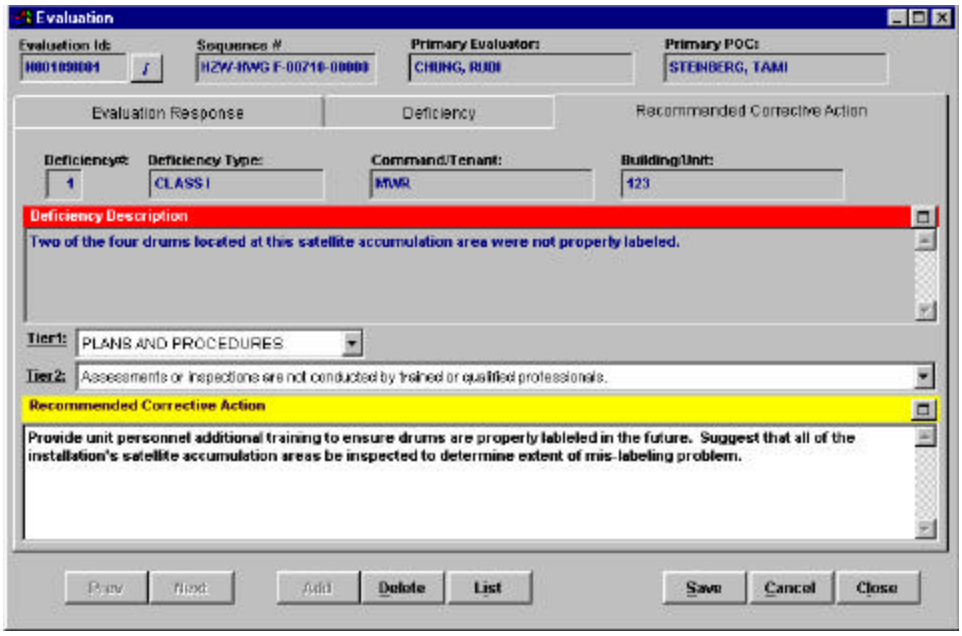


Figure F-3: Evaluation Module of ACE—Recommended Corrective Action Tab

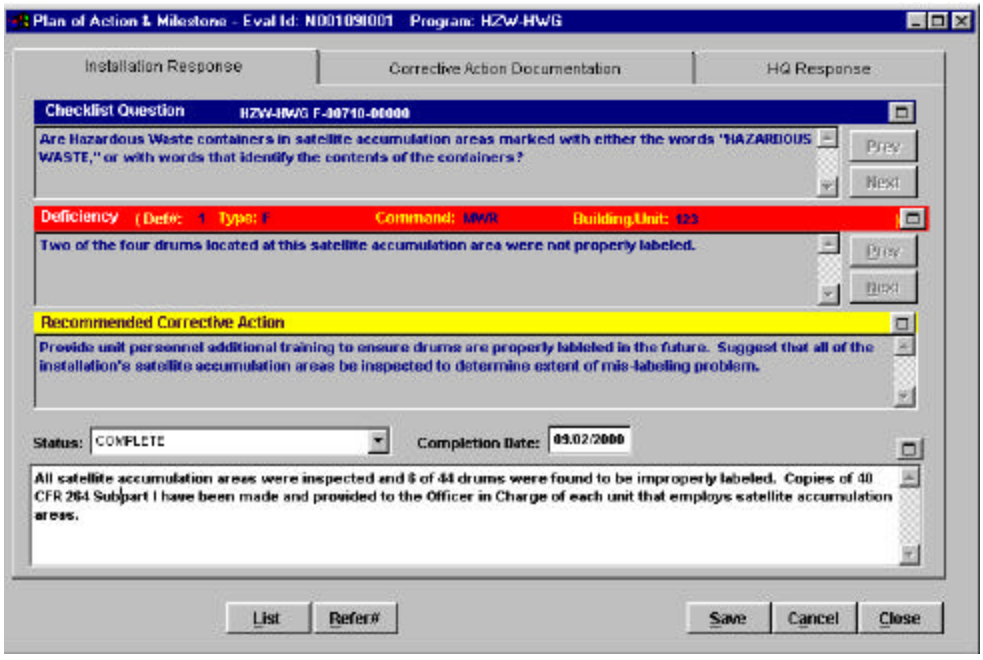


Figure F-4: POA&M Module of ACE—Installation Response Tab

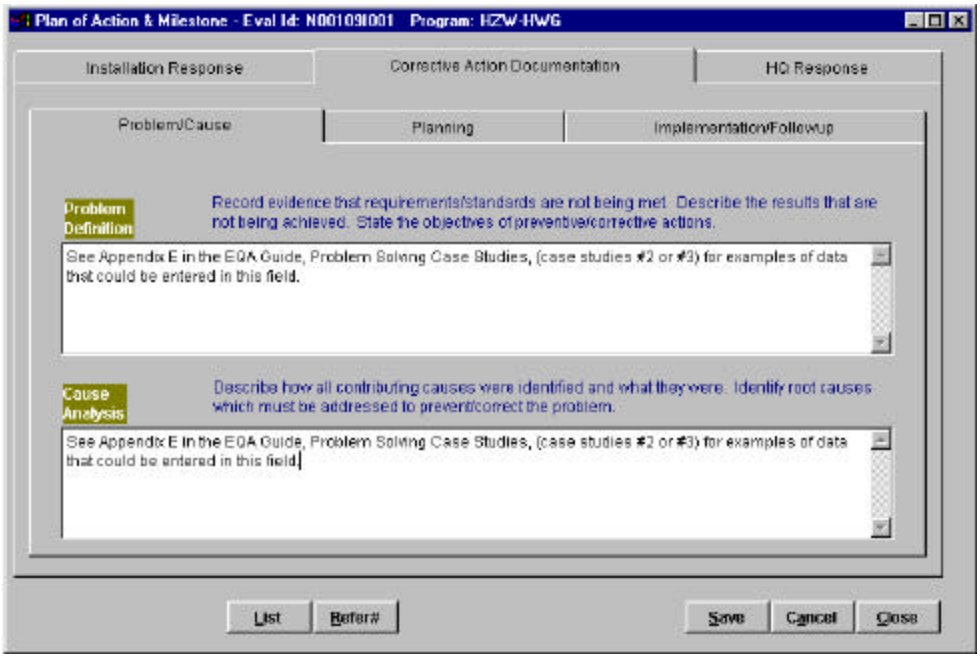


Figure F-5: POA&M Module in ACE—"Problem/Cause" Fields on Corrective Action Documentation Tab

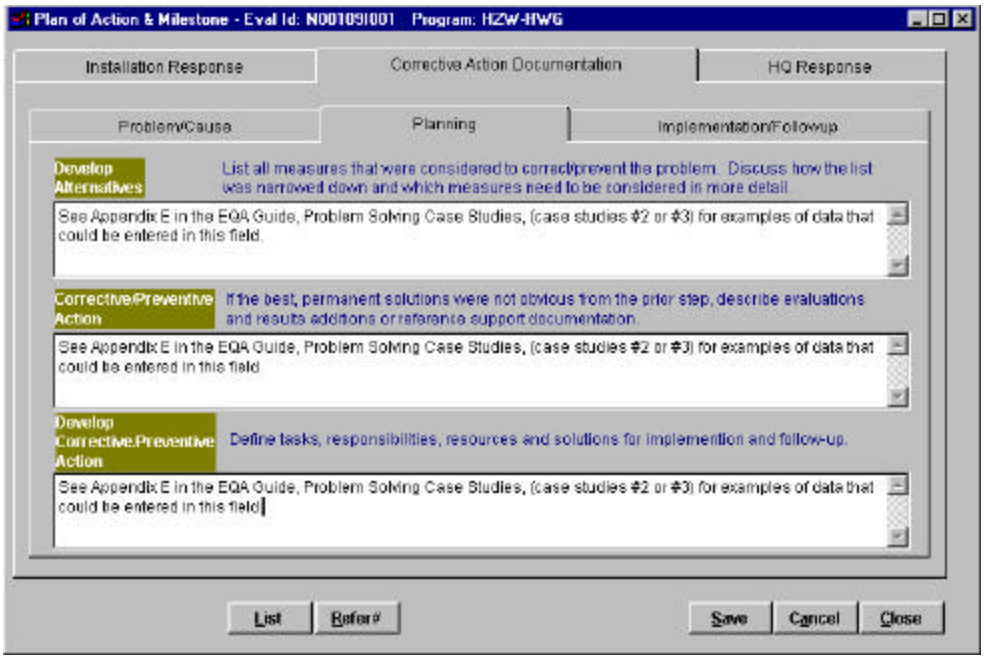


Figure F-6: POA&M Module of ACE—"Planning" Fields on Corrective Action Documentation Tab

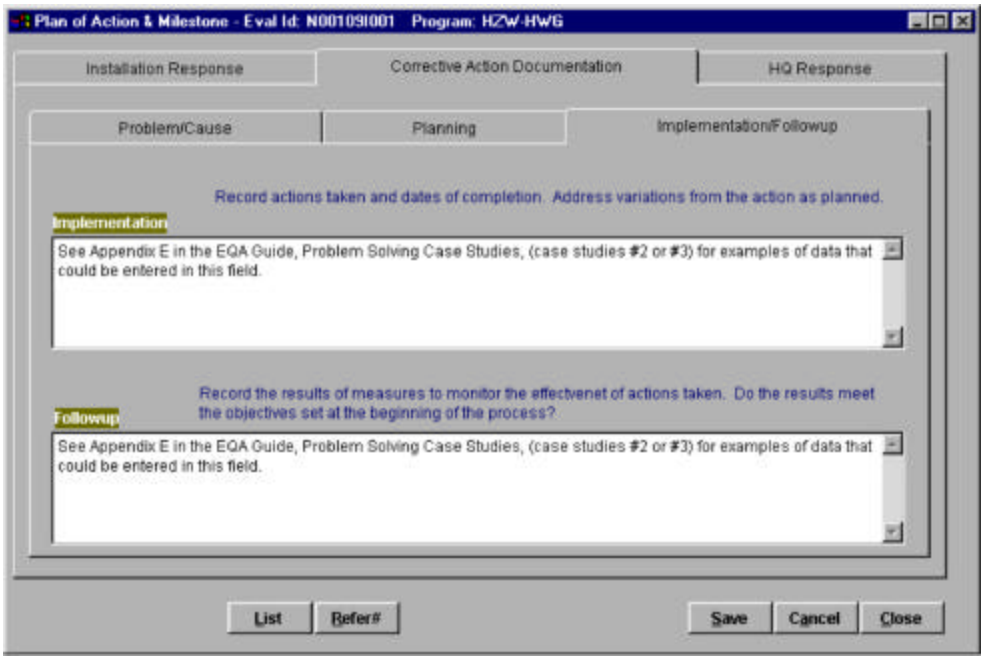


Figure F-7: POA&M Module of ACE—"Implementation/Followup" Fields on Corrective Action Documentation Tab

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APPENDIX G: SAMPLE EXTERNAL ASSESSMENT PLAN

Sample Major Claimant External Assessment Plan							
Installation/ Tenant	**If a Tenant, Host and Major Claimant**	**Date of Last ECE or External Assessment**	**Scope[1] of Last ECE or External Assessment**	**Planned Date of Next External Assessment**	**Scope[1] of Next External Assessment**	**Media[2] for Compliance Assessment**	**Rationale[3] for Scope of Next External Assessment**
Installation 1		01/96	E	02/99	B	All but IR	3, 4
Installation 2		06/96	E	04/99	C		3, 4, 7
Installation 3		03/97	D	11/99	B	Air, WW	3,
Installation 4		09/97	D	06/00	B	HW	3, 4
Installation 5		02/98	C	02/00	C		6, 8
Installation 6		03/98	B	03/02	A		1, 2, 4
Installation 7		10/98	A	10/02	A		1, 2, 4
Installation 8		03/96	D	04/00	D	NEPA, CR	7
Installation 9		02/97	D	11/02	D	All but PEST	7
Installation 10		01/97	E	02/00	B	All but HW	3, 4
Installation 11		06/97	E	04/00	C		3, 4
Installation 12		03/98	D	11/01	B	NR,CR,NEPA	3, 5
Installation 13		09/97	D	06/00	B	Oil, HW, WW	3, 4
Tenant 14	[Names]	07/98	C	12/01	B	WW, DW, Oil	3, 4, 5
Tenant 15	[Names]	12/95	E	04/99	A		2, 3, 4
Tenant 16	[Names]	08/96	D	04/99	B	HW, NEPA	3, 4
Tenant 17	[Names]	05/97	C	11/99	A		3, 4
Exempt Activities							
Activity 18	[Names]	04/95	E	None	X		X
Activity 19	[Names]	06/96	E	None	X		X
Activity 20	[Names]	12/96	E	None	X		X

Sample Major Claimant External Assessment Plan: Notes

[1] Scope codes:
A = EMS Review only
B = EMS Review and compliance assessment of selected media (indicate media)
C = EMS Review and compliance assessment of ALL media
D = Compliance assessment of selected media (indicate media)
E = Compliance assessment of ALL media
X = Exempt

[2] Media codes:
PM = Program Management
NEPA = National Environmental Policy Act
P2 = Pollution Prevention
EPCRA = Emergency Planning and Community Right to Know Act
Air = Clean Air Act
ODS = Ozone Depleting Substances
WW = Clean Water Act (wastewater)
DW = Drinking Water
Oil = Oil Management and Contingency Planning
PCB = Polychlorinated Biphenyls
HW = Hazardous Waste Management
PEST = Pesticides
SW = Solid Waste Management
IR = Installation Restoration
ST = Underground and Above Ground Storage Tanks
Noise = Noise Prevention
EQA = Environmental Quality Assessment
NR = Natural Resource Management
CR = Cultural Resource Management
TR = Environmental and Natural Resources Training
RAD = Radon Assessment and Mitigation

[3] Rationale codes:
1 = Comprehensive Internal Assessment Plan and EQA Report
2 = Excellent results on last ECE or external assessment
3 = Initial external assessment
4 = Interval since last site visit
5 = Average Internal Assessment Plan and EQA Report
6 = Unsatisfactory Internal Assessment Plan and EQA Report
7 = Known or suspected compliance/EMS issues
8 = Unsatisfactory results from last ECE or external assessment
X = Exempt (Administrative or explain)

Status Summary of Environmental Programs at Major Claimant ABC Installations

	INSTALLATION	1	2	3	4	5	6	7	8	9
	PROGRAM HEALTH	●	O	O	◗	O	●	●	●	●
COMPLIANCE	Program Management	◗	O	◗	O	O	O	◗	◗	◗
	NEPA	◗	◗	O	O	◗	●	O	◗	O
	Pollution Prevention	◗	O	●	●	◗	O	●	●	O
	EPCRA	O	O	O	O	O	O	O	O	◗
	Air	◗	◗	O	●	O	O	◗	◗	◗
	ODS	O	O	O	O	O	O	O	O	na
	Wastewater	◗	O	O	O	O	O	O	O	◗
	Drinking Water	◗	O	O	●	O	●	●	●	◗
	SPCC/ Spill Response	O	O	O	●	◗	●	O	◗	◗
	PCB	◗	◗	◗	O	O	●	◗	◗	na
	Hazardous Waste	O	◗	O	O	O	O	◗	◗	◗
	Infectious Waste	◗	◗	◗	●	na	●	◗	◗	◗
	Pesticide	◗	◗	O	◗	O	◗	◗	◗	◗
	Solid Waste	◗	O	O	◗	O	◗	●	◗	O
	Installation Restoration	●	●	O	O	●	O	◗	◗	◗
	Underground Storage Tanks	◗	◗	O	O	●	O	◗	●	O
	Noise	◗	◗	na	O	O	◗	●	●	na
	EQA Program	O	O	O	O	O	O	O	O	◗
	Natural Resources	◗	◗	O	●	O	O	◗	◗	◗
	Cultural Resources	O	O	O	O	O	O	O	O	na
	Training	◗	O	O	O	O	O	O	O	◗
	Sampling and Lab Testing	◗	O	O	●	O	●	●	●	◗
	Radon	O	O	O	●	◗	●	O	◗	◗

O = EXCELLENT ◗ = NEEDS IMPROVEMENT ● = INADEQUATE LAST UPDATED:_____

NOTE: The symbols used in this chart can be accessed in Microsoft Word by clicking on “Insert” in the main menu bar at the top of the screen, then on “Symbol” in the drop-down menu, and then choosing the “Zapf Dingbats” font. Click on the desired symbol, and then click on the “Insert” button at the bottom of the dialog box. Font size can be adjusted as desired after the symbol has been inserted.

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APPENDIX H: SELECTED OPNAVINST 5090.1B CHANGE 2, CHAPTER 20 REFERENCES

- OPNAVINST 50901B-CH2 Chapter 20, Environmental Quality Assessment
- CNO Memorandum N451I/6U598760 of 14 January 1997 on Navy Preliminary Guidance on ISO 14000 and Environmental Management Systems
- DUSD(ES) Memorandum of 23 April 1997 on Root Cause Analysis Methodology and Implementation
- DUSD(ES) Memorandum of 3 February 1997 on Invocation of State Audit Privilege Laws

CHAPTER 20

ENVIRONMENTAL QUALITY ASSESSMENT ASHORE

20-1 Scope

This chapter provides policy and outlines procedures and responsibilities for the assessment and oversight of Navy shore installations' environmental quality.

20-1.1 References

a. DODINST 4715.6 of 24 April 1996, Environmental Compliance

b. Environmental Protection Agency (EPA) Environmental Auditing Policy Statement of 9 July 1986

c. EPA Environmental Policy Statement on Incentives for Self-Policing: Discovery, Disclosure, Correction and Prevention of Violations of 22 December 1995

d. DODINST 4715.5 of 22 April 1996, Management of Environmental Compliance at Overseas Installations; (NOTAL)

e. DUSD (ES) Memorandum of 23 April 1997, Root Cause Analysis Methodology and Implementation; (NOTAL)

f. NAVOP 004/97 of 23 June 1997, Regionalization

g. NAVOP 015/97 of 19 December 1997, Streamlining Shore Installation Management

h. SECNAVINST 5720.42F; Department of the Navy Freedom of Information Act (FOIA) Program; (NOTAL)

i. DOD Directive 5405.2 of 23 July 1985, Release of Official Information in Litigation and Testimony by DOD Personnel as Witnesses; (NOTAL)

j. SECNAVINST 5820.8A; Release of Official Information for Litigation Purposes and Testimony by DON Personnel; (NOTAL)

k. DUSD (ES) Memorandum of 3 February 1997, Invocation of State Audit Privilege Laws; (NOTAL)

l. ASN Memorandum of 24 March 1997, Invocation of State Audit Privilege Laws; (NOTAL)

20-2 Legislation

20-2.1 Freedom of Information Act (FOIA). This act provides for release of government documents to the public upon request, unless the government specifically exempts them from release.

20-3 Terms and Definitions

20-3.1 Environmental Management System. That part of the overall management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental program, and achieving environmental goals.

20-3.2 Environmental Quality. That level of environmental excellence that has a baseline of consistent regulatory compliance, adding continuous process improvement with a concerted focus on pollution prevention.

20-3.3 Environmental Quality Assessment (EQA) Guide. A guidance document to assist activities and Major Claimants in the implementation of the policy for Environmental Quality Assessments (EQA) ashore.

20-3.4 Environmental Requirements. Federal, State, regional, local, Navy, Final Governing Standards, Status of Forces Agreements, Overseas Environmental Baseline Guidance Document and environmental and natural resources requirements.

20-3.5 External Assessment. A systematic, documented, objective and periodic review of the installation's environmental management system that may include compliance reviews of selected program areas. Designated persons from outside the organization of the inspected installation conduct the assessment. Those designated persons may be members of the Major Claimant, Naval Inspector General, Naval Audit Service and/or others. In terms of the EQA program, regulatory inspections are not considered external assessments.

20-3.6 External Assessment Plan. The Major Claimant's plan depicting the schedule and scope of the external assessments planned for each of the activities within its claimancy.

20-3.7 "Fenceline." The boundary of the contiguous Navy property and satellite areas under the direct control of the host activity. In Navy Concentration Areas, "fenceline" refers to all properties under direct control of the Regional Commander.

20-3.8 Installation. The term used in this chapter to refer collectively to the host and tenant activities within the 'fenceline" as defined in 20-3.7.

20-3.9 Internal Assessment. A systematic, documented, objective, and comprehensive environmental compliance review of installation processes, facilities and practices completed within a 12-month period. Installation personnel or their designees conduct the assessment.

20-3.10 Internal Assessment Plan. The host activity's plan, coordinated with tenants, that describes how a comprehensive internal assessment will be accomplished within the "fenceline" over the course of the year. The plan addresses assessment of all applicable compliance requirements on a schedule based on the environmental aspects, vulnerabilities, and risk to the environment and may include the environmental management system.

20-3.11 Root Cause. The cause of an occurrence that, if corrected, would prevent recurrence of that and similar occurrences. There may be a series of identifiable causes, one leading to another. Activities should pursue that series of causes until identifying the fundamental, correctable cause.

20-4 Requirements

Reference (a) requires and Federal regulations and EPA policy, including reference (b) and (c), recommend environmental assessments as a tool to help achieve and maintain compliance with environmental laws and regulations. Reference (d), as implemented by the Overseas Environmental Baseline Guidance Document (OEBGD), requires an ongoing program to evaluate environmental compliance at overseas installations. Reference (e) requires DOD Components to incorporate root cause analysis in their environmental compliance assessment programs.

References (f) and (g) directed all commands to support infrastructure cost reduction by regionalizing installation management functions, including environmental services, in shore concentration areas and reducing the number of

claimants in the installation management business. In shore concentration areas, the Navy is undergoing regionalization to determine better and more economical ways to deliver services at shore installations, by streamlining services and merging similar functions under one commander. Commands must implement the EQA Program in light of regionalization and its guiding principles presented in reference (f).

20-5 Navy Policy

20-5.1 Policy. Navy policy is to: monitor compliance with environmental requirements; identify problems, their root causes, process improvements, and pollution prevention opportunities; and, ensure appropriate corrective actions and process improvements are completed.

20-5.2 Program Structure

a. **Internal Assessment.** The host activity, in coordination with tenant activities, will conduct an internal assessment annually. The internal assessment is a comprehensive environmental compliance review of installation processes, facilities and practices, completed within a 12-month period. The internal assessment addresses all applicable compliance requirements on a schedule based on the environmental aspects, vulnerabilities, and risk to the environment and may include the environmental management system.

b. **External Assessment.** The Major Claimant of the host activity, in coordination with Major Claimants of tenant activities with significant environmental aspects, will conduct an external assessment that consists of two parts: (1) an annual document review of the installation's Internal Assessment Plan and the annual EQA Report plus any other information available on the installation's environmental performance; and (2) a site visit on a schedule determined by the Major Claimant. The schedule and scope of the site visit are flexible and should be tailored to meet the installation's needs, which allows for varied degrees of compliance or oversight inspections.

(1) **Schedule**. Based on the results of the annual document review, the Major Claimant may elect to visit the installation immediately, once a year, once every 2 years, or less often, if appropriate, depending on the installation's condition and circumstances. At a minimum, the Major Claimant will accomplish the external assessment site visit during the traditional Command Inspection Process.

(2) **Scope**. At a minimum during the site visit, the Major Claimant will evaluate the environmental management system and Internal Assessment Program. A site visit may also include compliance reviews of all environmental program areas or more narrow reviews of particular problem areas.

20-5.3 EQA Integration and Coordination

a. **At Navy installations.** The host activity shall establish a means to communicate and coordinate with Navy and non-Navy tenants with significant environmental aspects located within the "fenceline" for the purpose of planning and implementing the EQA Program. Arrangements for EQA Program support will be documented in interservice and intragovernmental support agreements as appropriate. Examples include such forums as Environmental Compliance Boards and Commanding Officer's Executive Management Boards. Environmental compliance boards of host and tenant management personnel, are required where appropriate by chapter 1 (1-2.14), and are in place within many organizations. These boards function effectively to integrate environmental, natural resources and cultural resources considerations into all aspects of operations.

b. **Where a Navy activity is a tenant on a non-Navy installation.** The Navy activity will

participate in the host's environmental compliance assessment program in accordance with the interservice or intragovernmental support agreement. Where the non-Navy host's environmental compliance assessments are not consistent with Navy or claimant objectives, Navy activities must develop internal assessment plans and conduct assessments that fulfill the objectives established in the Claimant's External Assessment Plan.

20-5.4 Root Cause Analysis. Root cause analysis is a problem solving process to identify root causes and best prevention solutions to compliance deficiencies. Additional information on root cause analysis is available in the EQA Guide.

20-5.5 Checklists of Compliance Requirements. The Department of the Navy Automated Compliance Evaluation (ACE) Software is a tool available to installations, Major Claimants, and NAVFACENGCOM Environmental Field Divisions/Activities (EFD/EFA). The ACE Software provides checklists of Federal, State, and regional compliance requirements, Navy policy requirements, requirements under the Final Governing Standards (FGS) and requirements of Status of Forces Agreements (SOFA), and the Overseas Environmental Baseline Guidance Document (OEBGD). The software allows for tailoring of the checklists to include those requirements applicable to a particular installation. For example, an activity can add local requirements such as permit conditions and operating procedures and delete non-applicable requirements. The ACE software also provides for tracking follow-up actions in the plan of action and milestones (POA&M). Other environmental compliance checklists are available through various public forums or through the commercial market.

20-5. 6 Plans and Reports. Additional information on formats for the following plans and reports is available in the EQA Guide.

a. **Installation Level**

(1) **Internal Assessment Plan.** The Internal Assessment Plan describes how the comprehensive internal assessment will be accomplished within the "fenceline" over the course of the year. The plan addresses assessment of all applicable compliance requirements on a schedule based on the environmental aspects, vulnerabilities, and risk to the environment. The plan may also include an environmental management system review. Activities shall review the Internal Assessment Plan annually and update it as necessary. The host activity will provide the Internal Assessment Plan to its Major Claimant annually.

(2) **Internal Assessment Documentation.** Internal Assessment documentation provides the results of assessments and includes identified deficiencies, assigned root cause(s), and POA&Ms for corrective actions and process improvements. The documentation contains deficiencies identified in internal and external assessments conducted during the assessment period as well as those that remain open from previous assessment periods. The POA&M provides proposed corrective actions, process improvements and schedules to address the deficiency and its root cause(s). The documentation also serves as a record of completed corrective actions and to verify problems are resolved. The Major Claimant may request the host activity to submit POA&Ms or, at a minimum, the Major Claimant will review the POA&Ms during the external assessment site visit.

(3) **EQA Report.** The EQA Report provides a summary of the health of the installation's environmental program and information on issues requiring Major Claimant attention and/or resources. The host activity will provide the EQA Report to its Major Claimant and

the appropriate Navy Regional Environmental Coordinator annually.

b. **Major Claimant Level**

(1) **External Assessment Plan.** The External Assessment Plan describes the schedule and scope of oversight planned for the external assessment site visit at each of the Major Claimant's installations and the basis for the decisions. The Major Claimant of the host activity, in coordination with Major Claimants of tenant activities with significant environmental aspects, determines the schedule and scope of oversight based on the document review of the Internal Assessment Plan and EQA Report provided by each host activity and any additional information available on each installation's environmental performance. The plan will also indicate those installations that serve only administrative functions with minimal environmental requirements where exemptions are justifiable. The Major Claimant shall review the plan annually and update it as necessary. The Major Claimant will provide the updated External Assessment Plan to CNO (N45) annually.

(2) **External Assessment Report.** The External Assessment Report provides the results of the external assessment conducted during a site visit and includes identified deficiencies and recommendations for corrective actions and process improvements. The Major Claimant shall give a working draft report to the host activity commanding officer/executive officer at the end of the site visit. The Major Claimant shall present an out brief to the host activity commanding officer/executive officer. The Major Claimant should release the final report to the host activity within 60 days of the site visit completion. The Major Claimant legal counsel should review the External Assessment Report before releasing it.

(3) **Claimant EQA Summary.** The Claimant EQA Summary is a report summarizing the health of the environmental program at the installations in the claimancy. It also provides information on issues requiring CNO attention and/or resources. The Major Claimant will provide the Claimant EQA Summary to CNO (N45) annually.

c. **Report Releasability.** The activities will consult legal counsel for advice on the releasability and exemptions under the Freedom of Information Act (FOIA). Reference (h) applies to all FOIA requests. If the request is made by a third party involved in litigation, reference (i) and reference (j) also apply.

20-5.7 State Audit Privilege Laws. Installations must not invoke the protections of any of the various State Audit privilege or immunity laws without proper consultation with and approvals by the chain of command. References (k) and (l) provide the procedures for required consultation with the Office of the Deputy Assistant Secretary of the Navy (Environment and Safety) and the Office of the Deputy Under Secretary of Defense (Environmental Security).

20-5.8 EQA at Closing and Closed Bases. All EQA Program requirements apply to closing and closed bases, including those bases that have already undergone operational closure and are assigned to the COMNAVFACENGCOM claimancy for caretaking until transfer of ownership.

20-5.9 Exemptions. The Navy has numerous shore activities that serve only administrative functions. Those shore activities typically have minimal environmental requirements and therefore pose little risk to the environment. Major Claimants with activities that serve only administrative functions may elect to exempt them from EQA Program requirements. The Major Claimant's External Assessment Plan shall reflect exemptions.

20-5.10 Training and Awareness. Every person conducting, reviewing, or approving internal and external assessments shall receive general environmental awareness training specified in chapter 24 and specific comprehensive training in assigned subject matter or environmental media. Every person so assigned shall familiarize himself or herself with the provisions of this chapter.

20-6 Responsibilities

20-6.1 Commanding Officers of Host Activities shall

a. In coordination with the affected commands, develop and execute a plan to implement an internal assessment to cover all processes, facilities and practices with environmental aspects within the "fenceline." Review the Internal Assessment Plan annually and update as necessary. On an annual basis, provide the updated Internal Assessment Plan or a summary of significant amendments to the Major Claimant.

b. Perform annual internal assessments, identify deficiencies and their root causes, develop POA&Ms with corrective actions and process improvements to address the root causes of deficiencies and document corrective actions and process improvements.

c. For pertinent deficiencies identified in external assessments, identify root causes, develop POA&Ms with corrective actions and process improvements to address the root causes of deficiencies and document corrective actions and process improvements.

d. Coordinate identification and funding of corrective actions and process improvements to address deficiencies and their root causes and fund as appropriate. If necessary and appropriate, submit to the Major Claimant funding requests to support projects required to correct the deficiencies and root causes identified.

e. In coordination with the affected commands, prepare an annual EQA Report and provide to the Major Claimant and the appropriate Navy Regional Environmental Coordinator.

f. Document arrangements for providing EQA Program support in interservice and intragovernmental support agreements as appropriate.

g. Advise the Navy Regional Environmental Coordinator and the Major Claimant, as soon as possible, if a deficiency or problem identified may result in significant adverse public relations and/or require regional coordination to solve.

h. Ensure environmental compliance is a factor in the performance evaluations of appropriate personnel.

20-6.2 Commanding officers or senior managers of tenants with significant environmental aspects shall

a. Support and participate with the host activity in developing and executing a plan to implement an internal assessment to cover all processes, facilities and practices with environmental aspects within the "fenceline."

b. For pertinent deficiencies identified in internal and external assessments, identify root causes, develop POA&Ms with corrective actions and process improvements to address the root causes of deficiencies, and document corrective actions and process improvements.

c. Coordinate identification and funding of corrective actions and process improvements to address deficiencies and their root causes and fund as appropriate. If necessary and appropriate, submit to the Major Claimant funding requests to support projects required to correct the identified

deficiencies and root causes identified.

d. Support and participate with the host activity in preparing an annual EQA Report and provide to the Major Claimant.

e. Advise the host activity and the Major Claimant, as soon as possible, if a deficiency or problem identified may result in significant adverse public relations and/or require regional coordination to solve.

h. Ensure environmental compliance is a factor in the performance evaluations of appropriate personnel.

20-6.3 Major claimants of host activities shall

a. Implement the EQA Program. Major Claimants may delegate implementation responsibility to lower echelon claimants or Regional Commanders.

b. On an annual basis, review the host activities' Internal Assessment Plans and annual EQA Reports to ensure they conduct internal assessments and identify deficiencies for correction.

c. In coordination with other affected Major Claimants of tenant activities with significant environmental aspects, to accommodate host-tenant relationships, develop and execute an External Assessment Plan addressing all shore installations in the claimancy. Review the External Assessment Plan annually and update as appropriate. On an annual basis, provide the updated External Assessment Plan to CNO (N45).

d. Issue notification of an upcoming external assessment site visit and the external assessment report to the host activity.

e. Prepare an annual Claimant EQA Summary based on input from the claimancy's host activities and provide to CNO (N45).

f. Assist in identification and programming for funding of corrective actions and process improvements to address deficiencies and their root causes and fund as appropriate. If necessary, submit funding requests as part of a midyear review to address emergent requirements.

g. Advise CNO (N45), as soon as possible, if a deficiency or problem identified may result in significant adverse public relations and/or require national coordination to solve.

20-6.4 Major Claimants of tenant activities with significant environmental aspects shall

a. Implement the EQA Program. Ensure the claimancy's tenant activities support and participate with the host activity in developing and executing a plan to implement an internal assessment to cover all processes, facilities and practices with environmental aspects within the "fenceline."

b. Coordinate with the Major Claimant of the host activity in developing and executing a plan to implement an external assessment site visit as appropriate.

c. For pertinent deficiencies identified in internal and external assessments, assist in identification and programming for funding of corrective actions and process improvements to address deficiencies and their root causes and fund as appropriate. If necessary, submit funding requests as part of a midyear review to address emergent requirements.

d. Advise CNO (N45), as soon as possible, if a deficiency or problem identified may result in significant adverse public relations and/or require national coordination to solve.

20-6.5 Regional Environmental Coordinator shall

a. Review the annual EQA Reports from all host activities within the region and take any required coordinating actions, consistent with chapter 1.

b. Advise the Area Environmental Coordinator, as soon as possible, if a deficiency or problem identified may result in significant adverse public relations and/or require broader coordination to solve.

20-6.6 Area Environmental Coordinator shall:

a. Advise CNO (N45), as soon as possible, if a deficiency or problem identified may result in significant adverse public relations and/or require broader coordination to solve.

20-6.7 COMNAVFACENGCOM shall

a. Provide support to Major Claimants and shore activities in the use of the ACE Software that provides automated checklists of Federal and State regulations, final governing standards, overseas requirements, and Navy policy requirements and ensure ACE Software checklists are maintained and available.

b. Upon request, assist Major Claimants in conducting and preparing reports on external assessments.

c. Prepare and update guidance documents and training materials for conducting internal and external assessments including root cause analyses.

d. Support the Chief of Naval Education and Training (CNET) in developing and providing training in conducting internal and external assessments for personnel at shore activities, Major Claimants, EFDs, EFAs, and other commands.

20-6.8 CNET shall

a. Through the Naval School, Civil Engineers Corps Officers School (CECOS), and in coordination with COMNAVFACENGCOM and the Interservice Environmental Education Review Board (ISEERB), provide training courses and materials on internal and external assessments including root cause analysis and environmental management system reviews.

20-6.9 Chief of Naval Operations shall

a. Ensure the implementation of the EQA Program by reviewing External Assessment Plans and claimant EQA Summaries that cover results of internal and external assessments.

b. Support resource requirements, as appropriate.

c. Act on those issues requiring broad coordination, as identified by the Major Claimant or Area Environmental Coordinator.

d. Provide comments and guidance on common problems and innovative solutions identified in the EQA process.

DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO

5090
N451I/6U598760
14 January 1997

From: Chief of Naval Operations
To: Distribution

Subj: NAVY PRELIMINARY GUIDANCE ON ISO 14000 AND ENVIRONMENTAL MANAGEMENT SYSTEMS

Encl: (1) Code of Environmental Management Principles

1. This letter provides interim guidance on ISO 14000 for Navy installations. ISO 14000 is an international standard for environmental management systems (EMS) issued by the International Organization for Standardization. In response to the numerous inquiries and questions posed by Navy activities on ISO 14000 and its applicability to the Navy, the Office of the Chief of Naval Operations (OPNAV) (N45) is issuing the following interim guidance on ISO 14000 for Navy installations.

2. As part of a Department of Defense Working Group on EMS, the Navy is currently evaluating different EMS and ISO 14000 as they pertain to Navy operations. The DoD group has performed a qualitative analysis of the impact of EMS on current DoD programs and is working on a cost-benefit analysis. No decisions have been reached to date.

3. Until complete Navy policy is issued on this topic, Navy installations should follow these guidelines when evaluating or investigating ISO 14000 and EMS:

a. No appropriated funds shall be spent on third-party certification.

b. No Navy activities shall seek to become registered by the American National Standards Institute as third party certifiers for ISO 14000.

c. Installations are encouraged to evaluate their environmental programs in terms of the five principles of the Code of Environmental Management Principles, included as enclosure (1). Training on ISO 14000 principles and concepts can be used in this evaluation process.

d. Any installations already completing work in this area or considering ISO 14000 implementation should contact their claimant for guidance. Claimants should inform N45 of activities involved in ISO 14000 and provide information as available for incorporation into the DoD Working Group.

e. ISO 14000 and EMS are installation-level programs. Engineering Field Divisions and Regional Environmental Coordinators should not anticipate becoming implementation vehicles for the Navy.

Subj: NAVY PRELIMINARY GUIDANCE ON ISO 14000 AND ENVIRONMENTAL MANAGEMENT SYSTEMS

4. In evaluating ISO 14000 and its role in the Navy Environmental Program, N45 is focusing on quantitative cost-benefit analysis. A decision to adopt ISO 14000 would involve a significant commitment of resources, time, and manpower. Navy installations should be aware that there are no deadlines related to ISO 14000, and the Navy will not be making a commitment to adopt ISO 14000 until a meaningful cost-benefit analysis is performed.

5. Please forward this letter to your activities as soon as possible. My points of contact on this issue are Catharine Cyr, N451I, (703)602-5335, cyrc@N4.opnav.navy.mil and Terry Bowers, N457C1, (703)602-4769, bowerst@N4.opnav.navy.mil.

L. F. SCHRIEFER
By direction

Distribution:
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5 MAJOR ELEMENTS OF THE CODE OF ENVIRONMENTAL MANAGEMENT PRINCIPLES

1. Identify purpose and overall environmental objectives, review policies, develop strategic plans and management systems.

2. Implement programs that aggressively identify and address potential problem areas and emphasize a proactive approach to environmental issues where prevention rather than reaction is the foundation of environmental strategy.

3. Develop and implement systems to enable personnel to perform their functions consistent with environmental policy and agency mission.

4. Develop measures to address and improve employee performance in meeting environmental objectives

5. Develop and implement program to evaluate progress toward meeting environmental goals. Use evaluation results to correct deficiencies and improve environmental performance.

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND
TECHNOLOGY

23 APR 1997

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE ARMY
(ENVIRONMENT SAFETY & OCCUPATIONAL HEALTH)
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT & SAFETY)
DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE
(ENVIRONMENT SAFETY & OCCUPATIONAL HEALTH)
DIRECTOR, DEFENSE LOGISTICS AGENCY (DLA-CAAE)
ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: Root Cause Analysis Methodology and Implementation

Root cause analysis identifies the basic cause of compliance deficiencies or notices of violation and, if corrected, enables an organization to prevent recurrence of the violation or similar occurrences. By incorporating root cause analysis into our internal environmental audit programs, DoD Components can experience improved management efficiency and effectiveness, help prioritize actions for correcting deficiencies, justify deficiency-related management decisions, and reduce or avoid future compliance costs.

The Office of the Inspector General submitted its final Root Cause Analysis Report on October 28, 1996. Three recommendations for the Office of the Deputy Under Secretary of Defense (Environmental Security) (ODUSD(ES)) were indicated:

1) Establish a working group to select a standard root cause analysis methodology
2) Require working group to consider the methodologies described in the report appendices, and
3) Incorporate the selected methodology into DoD guidance.

ODUSD(ES) established the Root Cause Analysis Workgroup (RCAW) in January 1997. The RCAW met several times and developed a general, top-level methodology agreeable to all. The methodology centers around a multi-tier system of root cause analysis categories and requires the environmental auditor to complete a few simple steps. These four basic root cause analysis steps should be incorporated into each DoD Component's audit program: 1) define the root cause, 2) classify the findings by root cause category, 3) address the root cause in audit recommendations, and 4) discuss the root cause analysis results with the team leader at the end of the audit.

Each DoD Component should have at least two tiers, if not more, in their root cause analysis system. In terms of the root cause categories, the RCAW defined five standard top-tier categories which will be used by the DoD Components when implementing root cause analysis into their internal environmental auditing programs. You will find a depiction of a tier-system methodology in Attachment 1 with the recommended five standardized, top-tier categories and

examples of the second tier categories. The second tier examples are given to increase your understanding of the five top-tier categories and should not be taken as a standard or prescribed list of second-tier categories to be used in your environmental auditing program.

Please review the standard methodology (the four steps to be incorporated into your environmental audit program) and the attached top-tier categories and provide your comments and concurrence to my office by COB June 13, 1997. ODUSD(ES) will incorporate these standards into DoD guidance once we receive concurrence by each of the Components.

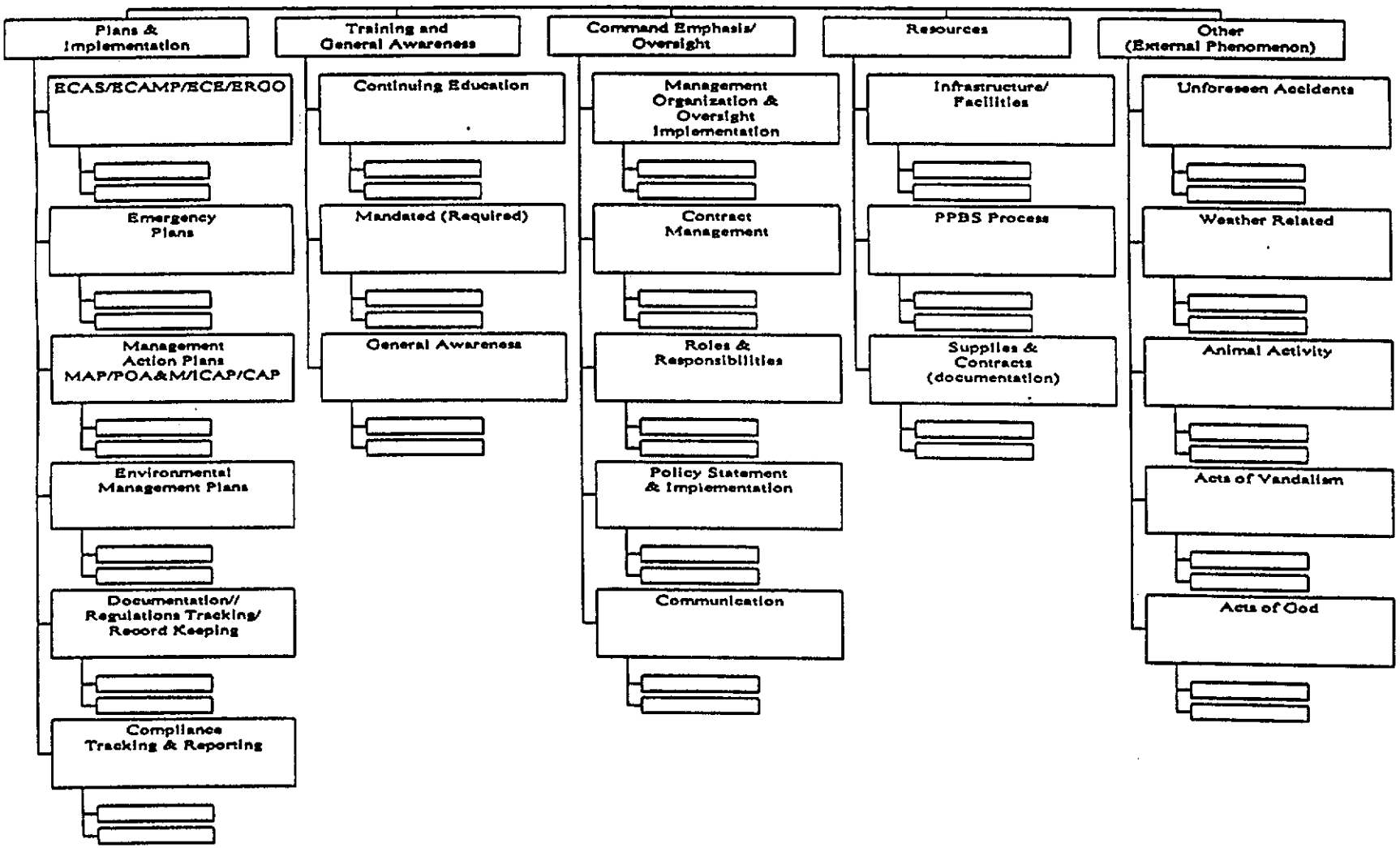
Thank you for your cooperation in this effort. My points of contact for the root cause analysis methodology and implementation are Ms. Lindabeth Doby (703-604-1724, email: dobylb@acq.osd.mil) and Mr. Jim Kennedy (703-604-1766, email: kennedjl@acq.osd.mil, fax: 703\607-4237).

Curtis Bowling
Acting Assistant Deputy Under Secretary
of Defense (Environmental Security)

Attachment

Attachment 1

Root Cause Analysis
Tier Structure and Standardized Top-Tier Categories



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

03 FEB 1997

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE ARMY
(ENVIRONMENT, SAFETY & OCCUPATIONAL HEALTH)
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT & SAFETY)
DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE
(ENVIRONMENT, SAFETY & OCCUPATIONAL HEALTH)
DIRECTOR, DEFENSE LOGISTICS AGENCY, DLA-CAAE

SUBJECT: Invocation of State Audit Privilege Laws

Approximately eighteen States have enacted various forms of audit privilege or immunity laws over the last several years. These laws differ markedly, one from the other, making it extremely difficult to generalize. In addition, the laws of many of the States are or may be in flux due to changes in statutory language, development of administrative interpretations, and the issuance of judicial decisions construing such laws. Further, as you are aware, the Department of Justice and the Environmental Protection Agency (EPA) have serious concerns about the impact of several of these laws on the ability of the States to continue to fulfill the requirements for delegation of certain Federal environmental programs to the States, such as the National Pollution Discharge Elimination System permit program and the Clean Air Act Title V permit program. Finally, there any many Federal environmental programs where EPA retains concurrent enforcement authority along with a delegated State, and in such cases it is questionable whether EPA would be limited by the provisions of a State audit privilege or immunity law.

For these reasons, I direct that no Department of Defense (DoD) Component invoke the protections of any of the various State audit privilege or immunity laws prior to consulting with my office, through the Director of Compliance. Consultation with my office should be commenced as soon as practicable, but in no event less than 30 days before the date on which the DoD Component plans to seek the protection of the State law. My office will complete the consultation with Office of the Assistant Attorney General for Environment and Natural Resources and the Office of the Assistant Administrator of EPA for Enforcement and Compliance Assurance, as soon as possible, but no later than two weeks after receipt of notice from the DoD Component. In addition, I direct that my office be informed at least two weeks prior to the submission pursuant to any State audit privilege or immunity law of any notification of planned audits. The General Counsel of the Department of Defense shares my view that any invocation of the protections of these statutes by a DoD Component should not take place without the consultation called for in this memorandum.

I look forward to working with you and your staffs to ensure that the integrity and effectiveness of your audit programs are maintained. The audit

programs have proved to be of enormous value in ensuring that the environmental practices at each installation are in full compliance with all applicable legal requirements, and that any shortcomings -- whether or not legally proscribed -- are detected and remedied as appropriate.

Please assure that this policy is communicated to each of the installations within your Department or Agency.

///SIGNED///
Sherri W. Goodman
Deputy Under Secretary of Defense
(Environmental Security)

cc:
The General Counsel
The General Counsel of the Army
The General Counsel of the Navy
The General Counsel of the Air Force
The General Counsel of the Defense Logistics Agency
Ms. Lois Schiffer, Department of Justice
Mr. Steve Herman, U.S. Environmental Protection Agency

State Audit Privilege and Immunity Legislation Update

The following states have enacted environmental audit privilege and/or penalty immunity laws:

Privilege Only	Privilege and Immunity	Immunity Only
1. Arkansas (2/95)	5. Colorado (6/95)	19. New Jersey (12/95)
2. Illinois (1/94)	6. Idaho (7/95)	20. South Dakota (3/96)
3. Indiana (7/94)	7. Kansas (7/95)	
4. Oregon (10/93)	8. Kentucky (7/94)	
	9. Michigan (3/96)	
	10. Minnesota (1/95)	
	11. Mississippi (7/95)	
	12. New Hampshire (7/96)	
	13. Ohio (12/96)	
	14. South Carolina (6/96)	
	15. Texas (5/95)	
	16. Utah (3/95)	
	17. Virginia (7/95)	
	18. Wyoming (2/95)	

DEPARTMENT OF THE NAVY
OFFICE OF THE ASSISTANT SECRETARY
(INSTALLATIONS AND ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON, D.C. 20350-1000

MAR 24 1997

MEMORANDUM FOR THE DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS AND LOGISTICS)/CMC-L

Subj: INVOCATION OF STATE AUDIT PRIVILEGE LAWS

Encl: (1) DUSD(ES) memo of 3 Feb 1997

By enclosure (1), the Deputy Under Secretary of Defense (Environmental Security) (DUSD(ES)) directed that all Department of Defense (DoD) Components comply with certain policies regarding state laws that provide either an evidentiary privilege against disclosure of the results of environmental audits or immunity from penalties for environmental violations discovered during such audits. Enclosure (1) contains two restrictions that shall be implemented within the Department of the Navy as follows:

- Before any Department of the Navy command invokes the protections of any of the various State environmental audit privilege/immunity laws (i.e., seeks to exert the evidentiary privilege against use of audit results or to bar imposition of a penalty for a violation discovered during an audit), it must consult with DUSD(ES). Such consultation shall be conducted by forwarding a request through the chain of command to this office, which will complete the consultation with DUSD(ES). Consultation should begin as soon as possible, but not less than 45 days before the date on which the protection must be invoked.

- Some state audit privilege/immunity laws require notice to the State <u>before the audit</u> if the results of the audit will later be eligible for invocation of privilege or immunity. For example, Texas law will not provide immunity for violations discovered during an audit unless the state was provided notice of the audit before it was conducted. Before any Department of the Navy command notifies a State of its intent to conduct an environmental audit so that the results are eligible for application of the State's privilege/immunity law, it must consult with DUSD(ES). Such consultation shall be conducted by forwarding a request through the chain of command to this office, which will complete the consultation with DUSD(ES). Consultation should begin as soon as possible, but not less than three weeks before the date on which notice is to be provided. If subsequently the command decides to invoke the protection of the statute with respect to the results of the audit, it must also comply with the first subparagraph above.

My point of contact on this matter is Mr. Paul Yaroschak, who can be reached at (703) 614-1282.

Elsie L. Munsell

ELSIE L. MUNSELL
Deputy Assistant Secretary of the Navy
(Environment and Safety)

Copy to:
CNO (N45)
HQMC (CMC-LFL)
CINCLANTFLT (N465)
CINCPACFLT (N465)
COMNAVRESFOR(N01E)
COMNAVSEASYSCOM (00T)
COMNAVFACENGCOM(40)
COMNAVAIRSYSCOM (AIR-8.0Y3)
COMNAVSUPSYSCOM (42)
BUMED(NEHC-EPWR)
SPAWAR(071B)
CNET(N441)