
Hazardous Materials and Terrorist Incident Prevention

Curriculum Guidelines

Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	-----------------------	--------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------



**Hazardous Materials
Prevention Training Guidelines**

**Prevention
Training
Issues**

INTRODUCTION

Since most hazardous materials accidents are caused by human activities, communities and employers can influence the probability of incidents and the magnitude of their effects by emphasizing **prevention** in hazardous materials emergency management. As defined here, prevention is a “*proactive attitude, effort, and process for eliminating or reducing the effects of hazardous materials events in advance of occurrence.*” In other words, prevention focuses on helping communities and citizens avoid becoming disaster victims in the first place, and reducing the impact of incidents when they occur.

Hazardous materials prevention includes efforts to eliminate or reduce risk due to either accidental releases of hazardous materials or exposure to toxic substances. Basic prevention strategies can be broadly summarized as follows:

- Improve methods and procedures for storing, transporting, handling, and processing hazardous materials.
- Promote compliance with safety codes, regulations, and statutes.
- Develop and enforce land use plans that regulate the location of sites with hazardous chemicals.
- Increase public and community awareness and support for prevention.

Well-designed prevention programs have been shown to reduce loss of life, property, and environmental damage from disasters. The Occupational Safety and Health Administration (OSHA) concludes that “a strong correlation (exists) between the application of sound management practices in the operation of safety and health programs and a low incidence of occupational injuries and illnesses. Where effective safety and health management is practiced, injury and illness rates are significantly less than rates at comparable worksites where safety and health management is weak or non-existent” (*Safety and Health Program Management Guidelines; Issuance of Voluntary Guidelines*).

As noted by the Federal Emergency Management Agency (FEMA), “experience has shown again and again that lives can be saved, damage to property can be reduced significantly, and economic recovery can be accelerated by consistently building safer and stronger buildings, strengthening existing infrastructures, enforcing building codes, and making the proper preparations BEFORE a disaster occurs. More important, mitigation investments by...businesses and citizens...will enhance and strengthen the economic structure, stability, and future of (the) community regardless of when a disaster may strike” (*Project Impact Guidebook*).

In recent years, both government and industry have made significant strides in hazardous materials prevention. However, more must be done to encourage a change from the traditional focus on disaster preparedness and response to a new emphasis on accident prevention. This shift in perspective by business leaders and emergency management professionals will require adjustments in corporate and community attitudes about prevention, improvements in safety management methods and technologies, better access to information and research, and a strengthened cooperation between government agencies and hazardous materials end users.

One of the most effective ways of promoting this transition is through prevention training and education programs. Training helps employees understand the nature and causes of potential safety problems, apply safe work practices and procedures, and participate in the design of effective prevention programs. For this reason, federal and state agencies have consistently identified training as a critical component in all prevention activities.

This document identifies training requirements for public and private sector personnel who have a role in hazardous materials prevention. The information is organized into three sections:

- A narrative overview describing the nature of hazardous materials prevention, related programs, and training activities.
- A description of prevention training audience categories and training requirements presented in the form of detailed instructional objectives.
- Appendices that summarize prevention laws, regulations, programs, and other information helpful to training managers.

HAZARDOUS MATERIALS PREVENTION

The Philosophy of Prevention

Hazardous materials prevention is based on the concept that the majority of accidents don't just happen—they are caused. While the use of chemicals may involve risk, the factors that precipitate most accidents are at some point under an organization's or an individual's control. Therefore, most chemical accidents and the damage they cause are by definition preventable.

Hazardous materials prevention is not new. For many years, federal and state governments have issued regulations governing workplace safety, transportation safety, and environmental safety. Communities have assessed local hazards, managed land use, enforced safety codes, and conducted public education activities. Businesses have implemented safety programs to protect worker health and minimize the potential for accidental releases of and exposures to toxic substances.

The benefits to communities and employers of well-designed prevention programs have proven to be significant. These benefits include reductions in hazardous materials incidents and accidents; fewer deaths and injuries to workers and citizens; improvements in employee skills, productivity, and morale; lower insurance and operating costs; decreased damage and cleanup costs; elimination of regulatory penalties; and protection against litigation. As FEMA notes in its Strategic Plan (FY 1998-2007), "no other approach is as effective over the long term."

Although the concept of prevention is well established, the practice of making safety a primary focus of production and emergency management may be new to some organizations. Prevention requires identifying safety as a basic goal and priority of hazardous materials operations. The objective is accomplished through formal programs that incorporate a systematic analysis of potential hazards, a comprehensive effort to eliminate or minimize risk, and activities that foster a safety culture among workers and the public.

A key element of this new emphasis on prevention is the concept of a **public/private sector partnership** to promote hazardous materials safety. Increasingly, communities, businesses, and professional associations recognize the mutual benefits of cooperation and coordination in prevention program planning and development. For example, FEMA's concept of **Disaster Resistant Communities** aims to bring together private industry, insurance providers, mortgage lenders, the real estate industry, homebuilding associations, citizens, and others to create model communities in high-risk areas. Other federal initiatives strive to promote understanding and cooperation between government and industry, and to simplify unnecessarily burdensome and confusing regulations.

Everyone who can affect hazardous materials prevention has a role in this partnership. The federal government establishes minimum safety standards, provides incentives and guidelines for compliance, conducts inspection and enforcement activities, and supplies assistance and resources, including training. State governments serve as a conduit for federal programs, and provide supplementary programs, regulations, and assistance. Local jurisdictions identify and assess hazards, develop prevention strategies and plans that address community needs, and implement programs to enforce safety standards and protect the public health.

Prevention

General Training Issues

Although government plays a key role in prevention, organizations that process, store, handle, and transport hazardous materials are in the best position to actually eliminate or mitigate against accidents. Employers in both the public and private sectors are ultimately responsible for the safety of chemical operations and for coordinating prevention activities within the community. They accomplish these goals through programs and activities that are appropriate to the hazards involved and in full compliance with legal requirements.

The general public also has a role in hazardous materials prevention. With adequate information, community groups, professional associations, and individual citizens can provide valuable support and resources to government prevention programs and initiatives. They also contribute to hazardous materials prevention by preparing individual and family preparedness plans that address household chemicals, and by maintaining safe homes and workplaces.

In addition to the concept of a public/private partnership, other aspects of this new philosophy on prevention include the following:

- A focus on safety must be evident during the complete life cycle of hazardous materials, from design and testing to production, storage, transportation, use, treatment, and disposal. This approach implies methods to systematically evaluate entire operations, as well as comprehensive programs that address all phases of production and transportation operations.
- Organizations that use hazardous materials should first attempt to eliminate the *possibility* of accidents or exposures by substituting inherently safer technologies or less hazardous substances in existing operations. If this approach is not feasible, other measures should be considered to reduce the *probability* or *severity* of accidents.
- Communities and employers should recognize that costs for prevention may not be extensive, and many measures will pay for themselves over time. Costs and benefits should be established early in the planning process, even though it may be difficult to estimate savings that accrue by avoiding accidents and exposures.
- Safety management techniques and technologies are continually evolving. When possible, communities and professional associations should promote activities that foster research, information sharing, technology transfer, and the development of a supportive regulatory and economic environment for organizational innovation.

Prevention Legal Authorities

Hazardous materials safety efforts have expanded over the last two decades with the addition of numerous laws, regulations, and standards. These legal authorities address separate pieces of the hazardous materials problem, and are administered by different agencies at all levels of government.

On the community level, planning for prevention is often considered a natural extension of state and local governments' responsibility for developing emergency operations plans. In effect, planning team members "piggyback" and expand on the hazards analysis conducted for response planning to prepare prevention strategies and plans. These materials are often incorporated as an annex to the community's emergency operations plan. A number of federal laws, regulations, and guidelines apply to this process. (For more information, see the *Hazardous Materials Planning Curriculum Guidelines*.)

- Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA)
- OSHA Hazardous Waste Operations and Emergency Response (29 CFR 1910.120)
- Resource Conservation and Recovery Act (RCRA)
- FEMA Emergency Operations Plan Requirements (44 CFR Part 302)
- Guide for All-Hazard Emergency Operations Planning (FEMA SLG 101)
- Hazardous Materials Emergency Planning Guide (NRT-1)
- Technical Guidance for Hazards Analysis (EPA/FEMA/DOT)
- Handbook of Chemical Hazard Analysis Procedures (FEMA/DOT/EPA)

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Public and private sector facilities that store, handle, or transport certain types and quantities of hazardous materials are also subject to federal contingency planning regulations. Although different requirements may apply to different facilities and operations, the National Response Team’s Integrated Contingency Plan (ICP) Guidance provides a format for complying with the various planning regulations in one functional emergency response plan. Annex 7 of the ICP addresses prevention-based requirements that are specified in the regulations or that may impact response activities. (For more information, see the *Hazardous Materials Planning Curriculum Guidelines*.)

Federal statutes, regulations, and national codes that specifically address hazardous materials prevention safety are listed below and described further in Appendix A:

- Hazardous Materials Transportation Act
- Hazardous Materials Transportation Uniform Safety Act
- Hazardous Materials Regulations (49 CFR Parts 171-180)
- The Occupational Safety and Health Act of 1970
- OSHA Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119)
- OSHA Hazard Communication Standard (29 CFR 1910.1200/1926.59)
- OSHA Safety and Health Program Management Guidelines (Federal Register 54(18):3908-3916, January 26, 1989)
- The Clean Air Act Amendments of 1990 (Public Law 101-549)
- EPA Accidental Release Prevention Requirements: Risk Management Programs Under Clean Air Act, Section 112(r)(7) (40 CFR Part 68)

In addition to these authorities, the *Occupational Safety and Health Act of 1970* encourages states to develop and operate their own job safety and health plans. States with plans approved under section 18(b) of the law must adopt standards and enforce requirements that are at least as effective as federal requirements. Many local jurisdictions also adopt specific policies, regulations, and codes that affect hazardous materials prevention requirements. As a result, agencies and facilities with a role in hazardous materials prevention are encouraged to thoroughly research state and local authorities during program analysis and planning.

Finally, jurisdictions adopt and enforce standards and codes that define safe practices and procedures in the use of hazardous materials. These codes may govern design and construction of buildings, fire prevention, land use planning (zoning and occupancy), employee safety, accident prevention, public health, environmental quality, and related areas. Several important national codes developed by cognizant professional associations are described in Appendix A.

Prevention Programs

The key to prevention programs is improving the safety of methods used to store, transport, handle, and process hazardous materials. This is true whether the requirement exists in business and industrial operations or in government managed facilities (water treatment plants, sewer systems, utilities, etc.). Broad strategies and methods for accomplishing this goal include:

1. Use of less hazardous alternatives. Examples of this approach include the use of inherently safer technologies, substitution of non-toxic or less toxic materials, reassessment of plant layout to isolate hazardous substances, and reduction of chemical stockpiles through efficient management of inventory.
2. Engineering controls. Examples of engineering controls commonly used in hazardous materials operations include ventilation systems, containment systems, detection and monitoring systems, robotic controls, physical barriers, isolation controls, electrical protection, sprinklers, and pollution control technologies.
3. Safety information. Accurate safety information must be accessible by all end users, including secondary processors, distributors, transporters, contractors, and workers. Tactics used to

Prevention

General Training Issues

accomplish this objective include employee training, labeling and placarding, and process safety information management systems. Establishing an effective labor-management dialogue on safety is also important.

4. Standard operating guidelines (SOGs). These guidelines distill the analysis conducted during the hazard assessment, systems design, and safety planning phases into job-specific procedures and worker performance standards and expectations. Development and enforcement of SOGs define and implement safe working practices for each hazardous materials application.
5. Administrative actions. Personnel management systems and procedures often have great potential for enhancing prevention, often at little cost. Examples include reducing employee shift length, cross-training, or rotating employees to keep them alert; improving security and access control systems; modifying maintenance and housekeeping schedules and procedures; identifying safety as a factor in organizational goals and objectives, worker performance reviews, and management incentives; and integrating planning with the community and local health care facilities.
6. Personal protective equipment. When exposure is less controllable, adequate personal protective equipment (PPE) and related training must be made available. Examples of PPE include chemical resistant gloves, aprons, face shields, respiratory protection, etc.

Although prevention is first and foremost a responsibility of hazardous materials users, government oversight agencies, insurance companies, professional associations, community groups, and others can do much to promote safety. Examples of activities used to motivate and support facilities and transporters in prevention include:

- Legislation, regulations, and standards that clarify prevention requirements and programmatic guidelines
- Community right-to-know policies and information management systems
- Land use planning and zoning (set back, density, relocation, land acquisition, etc.)
- Plans review and permitting programs for building and operational systems designs
- Inspections and enforcement of hazardous materials and other safety codes
- Environmental and hazard monitoring systems
- Public education and information activities
- Disaster insurance (premium reductions, criteria for coverage, etc.)
- Tax incentives/disincentives and financial resources
- Methods to foster improved public/private sector coordination and cooperation
- Research and information dissemination

Obviously, the concept of prevention covers a broad spectrum of strategies and tactics conducted by many different types of organizations. The nature of prevention programs is equally diverse, depending on such factors as the mission of the organization, the types and quantities of chemicals involved, financial and personnel resources, legal requirements, etc. However, all prevention programs should be based on a thorough hazard assessment, and include a comprehensive and systematic program planning process appropriate to the organization's needs.

Exhibit 1, *Prevention Program Model*, identifies common functional elements of prevention programs. These elements are derived from a review of federal regulations and guidelines (see Appendix A), with emphasis on OSHA's *Process Safety Management Standard*. Although each organization will tailor this program model to its own needs, the exhibit demonstrates the potential scope of prevention activities. The model also is useful as a conceptual framework for program planning and for identifying training audiences and instructional requirements.

Exhibit 1
PREVENTION PROGRAM MODEL

1.0 Prevention Program Analysis and Planning

- 1.1 Review of Authorities and Statutory Mandates
- 1.2 Hazards Analysis
- 1.3 Program Planning
- 1.4 Program Implementation, Evaluation, and Maintenance
- 1.5 Interagency Coordination and Cooperation

2.0 Employee Participation, Education, and Training

- 2.1 Employee Participation
- 2.2 Employee Education and Training

3.0 Process Design, Plans Review, and Construction

- 3.1 Facility and Systems/Process Design and Construction
- 3.2 Transportation and Storage Design and Construction
- 3.3 Plans Review and Permitting

4.0 Safety Systems

- 4.1 Pre-Startup Safety Reviews
- 4.2 Maintenance/Mechanical Integrity
- 4.3 Management of Change

5.0 Process Operations

- 5.1 Systems/Process Safety Information
- 5.2 Operating Guidelines and Practices
- 5.3 Contractor Safety

6.0 Compliance

- 6.1 Safety Inspections, Investigations, and Enforcement
- 6.2 Compliance and Safety Audits
- 6.3 Recordkeeping and Reporting

7.0 Public Information and Education

- 7.1 Public Awareness/Prevention Communication
- 7.2 Family and Individual Preparedness

General Training Issues

PREVENTION TRAINING AND EDUCATION

Rationale for Prevention Training and Education

Of all prevention strategies, training and education programs may be the most effective. Well-designed training programs significantly reduce the number and severity of incidents arising from process operations, and help prevent small problems from leading to a catastrophic release. The Department of Transportation notes simply that “training is the best means of preventing hazardous materials accidents” (*Training For the Safe Transportation of Hazardous Materials*, RSPA, 1997).

Why is training so effective? Studies have identified as among the barriers to effective prevention programs:

- Inadequate information about chemical hazards, the causes of accidents, safer technologies, and related costs.
- A lack of managerial awareness and expertise about preventive measures and regulatory requirements.
- Organizational obstacles based on corporate attitudes.
- Limited communications among public officials, employers, and workers.
- Inadequate employee and citizen knowledge about safety and prevention.

An effective method for addressing all of these problems is training and education programs targeted to the various groups with a role in prevention. Training programs increase employee awareness of hazards and help workers understand the nature and causes of potential problems. They provide opportunities for individuals to learn and practice safety systems and procedures in a risk-free environment. And they contribute to the development of a safety culture within the organization that motivates worker participation in hazard identification, program planning, safety audits, incident reviews, and other prevention activities.

Training is also critical for public officials, executives, managers, and others not directly involved in hazardous materials operations. Promoting change within organizations is most effective when the process starts at the top. Shifting the traditional focus from productivity and emergency preparedness to prevention requires changing the mindset of decision-makers in government, business, and industry. The same is true for design professionals and technical experts—architects, engineers, consultants, etc.—that plan operational systems and contribute to policy development.

Recognizing the importance and benefits of prevention training, OSHA, DOT, EPA, and other federal agencies have identified training requirements and guidelines for hazardous materials employers. General requirements are summarized in Appendix B; training managers may need to research more specific mandates for different industrial sectors and employer types.

Prevention Training Challenges

Although hazardous materials prevention training is mandated by law, and the potential benefits are well established, too few organizations place an adequate emphasis on this safety strategy. Several reasons exist for this state of affairs:

1. The benefits of prevention are often poorly understood and difficult to quantify. As a result, some organizations place a low priority on prevention initiatives, including training. This is especially true in smaller commercial operations, where safety information is limited and resources are tight.
2. Traditionally, employee training has focused on improving productivity, with prevention viewed as an adjunct to workers' primary job responsibilities. Thus, prevention training is not usually identified as a separate requirement or curriculum area, with the attention and resources it deserves.

3. Workplace safety is not identified as a separate competency in many professional schools of business management, architecture, engineering, public administration, etc. Opportunities to deliver prevention training to these key audiences may be limited.
4. An emphasis on hazardous materials safety as a primary objective of training is relatively new. Few course materials exist, and instructional guidelines for training managers, course developers, and instructors may be lacking or inadequate.
5. Prevention covers a very broad range of possible subject areas and audiences. The resulting scope of training program requirements can be overwhelming for some communities and facilities.
6. Prevention training is often highly technical and complex. Opportunities should be provided for students to practice key skills in a realistic but safe environment. As a result, training delivery often benefits by the use of specialized facilities and equipment that are beyond the resources of some organizations.
7. Recruitment for training activities can be difficult because organizations and audience members may place a low priority on prevention, or view prevention as an ancillary duty to primary work responsibilities.

How individual training managers deal with these challenges will depend on the organizational situation they face—management priorities, training requirements, safety concerns, resources, etc. However, three general principles can be stated: (1) educational activities designed to heighten the awareness of decision-makers about the organizational benefits of prevention should be considered early in program planning; (2) a comprehensive prevention training needs assessment should be prepared to identify priorities, appropriate training methodologies, and techniques for demonstrating competence; and (3) whenever possible, employee participation should be encouraged in the training development process.

THE PREVENTION CURRICULUM GUIDELINES

Organization of the Curriculum

The ultimate goal of the Prevention Curriculum is to improve safety in hazardous materials operations, thereby reducing the probability and severity of accidents and exposures. This goal is accomplished by enhancing participants' motivation and ability to develop and implement effective prevention programs and activities within their organizations. Instruction is intended to supplement, not replace, other job-specific education and training that audience members receive in their primary work functions.

The Prevention Curriculum addresses the training needs of two broad audience groups: persons who conduct hazardous materials operations, whether in the public or private sectors; and persons responsible for government and other oversight and enforcement programs to protect worker and citizen health. At this time, the general public is not identified as a curriculum audience, although personnel responsible for public information and education activities are included.

The Prevention Curriculum is organized into seven audience categories based on commonalities in knowledge and skill requirements. These categories are briefly described below; more detailed information on each is presented in the following sections.

Prevention Awareness describes the introductory training requirements of all audiences in the Hazardous Materials Prevention Curriculum. Instruction is intended to give participants general knowledge about prevention that can serve as a foundation for subsequent job-specific training. The audience includes anyone who has responsibilities in hazardous materials prevention or could influence prevention

Prevention Training Issues

Prevention Awareness

Prevention Policy Development

Community Prevention Program Management

Prevention in Operations

Design & Plans Review

Inspection & Enforcement

Appendix A: Prevention Authorities

Appendix B: Training Mandates

Appendix C: Federal Programs

Appendix D: OSHA 1910.119

Prevention

General Training Issues

efforts at state and local levels. Participants are provided with 1) an introduction to basic prevention terminology and concepts, 2) an explanation of individual and organizational roles in prevention, and 3) an overview of common prevention methods and activities.

Prevention Policy Development describes the training requirements of persons who direct, manage, or own organizations that use hazardous materials—chief executives and senior managers from a broad spectrum of government, private sector, and non-profit organizations. In this role, audience members oversee the development and maintenance of the prevention program, and direct staff and others who implement the program on a day-to-day basis. They have the organizational authority to develop and enforce prevention program policies and to budget and expend related funds.

Prevention Program Management describes the training requirements of persons who develop or manage prevention programs and related activities for organizations that use hazardous materials. Individuals in this category are responsible for ensuring worker and public safety in hazardous materials operations, and for implementing the organizational policy and direction established by senior managers. The training audience consists of supervisory-level personnel in hazardous materials facilities and transport operations, both public and private. Since training requirements will depend on the size and nature of the operations, the audience is further subdivided as follows:

- Smaller/Less Complex Operations describes the training needs of persons that manage smaller and/or less complex hazardous materials operations, such as retail outlets, small energy distributors, trucking firms, and so forth.
- Larger/More Complex Operations describes the training needs of persons that manage prevention programs for larger producers, processors, and distributors of hazardous materials, including those subject to OSHA's *Process Safety Management (PSM) Standard*.

Community Prevention Program Management describes the training needs of persons who develop and manage state and local government hazardous materials prevention programs and activities (community hazards analysis, prevention planning, land use planning, construction plans review, inspection and codes enforcement, public education, etc.). The training audience includes government officials and others with supervisory-level responsibilities in community hazardous materials prevention—state environmental agency prevention managers, HMEP program managers, local response agency (fire, law enforcement, emergency medical services) prevention managers, hazardous materials planners, zoning board members, codes enforcement managers, emergency management program directors, and other community representatives.

Prevention in Operations describes the training requirements of persons who regulate, respond to, supervise or operate systems or processes that involve the use of hazardous materials. These employees are responsible for ensuring that hazardous materials prevention activities and safety requirements defined in safety management plans and SOGs are properly implemented and enforced. The training audience includes employees of public, private, and non-profit facilities, including large and small operations at industrial plants, commercial establishments, trucking and other transport companies, government agencies, health care operations, utilities, and many other types of organizations.

Design and Plans Review describes the training needs of persons who oversee and participate in the design, planning, approval, and construction of hazardous materials operations (plants, buildings, processing systems, equipment, etc.). Individuals performing this function are responsible for incorporating the requirements and recommended practices contained in prevention codes and standards into detailed plans, specifications, instructions, and other documents. The training audience includes members of the design team and community officials who oversee the process. A secondary audience includes persons that implement the approved design (procurement personnel, contractors, vendor representatives, production operators, etc.)

Inspection and Enforcement describes the training needs of persons who monitor, inspect, and evaluate safety in hazardous materials operations. In this role, audience members 1) identify risks and prevention opportunities associated with specific operations, and 2) assess and enforce compliance with established authorities and codes. The audience includes inspectors and enforcement officials from community agencies (fire service, police, health agency, etc.), and individuals with similar roles in public, private, and non-profit organizations (safety officers, production managers, shift supervisors, insurance company representatives, consultants, etc.).

Use of the Guidelines

The following section of the *Prevention Curriculum Guidelines* identifies training requirements for each audience category defined above. This analysis is presented in the form of detailed terminal and enabling instructional objectives that define basic competencies audience members need to successfully perform their prevention responsibilities. Narrative information describing each curriculum area—purpose of training, target audiences, subject matter content, and recommended training methodologies—is included.

The training requirements identified here are compatible with the prevention philosophies and strategies contained in federal regulations and guidelines (see Appendix A) and other respected studies. However, the curriculum model is necessarily general in nature. State and local training managers will have to match the unique roles and responsibilities of their personnel with the categories in the model, or tailor the model to meet their specific needs. Assistance in this process will be addressed in the *Guidelines for Training Program Management* section of subsequent editions of this manual.

To minimize confusion, some important terminology is clarified below.

- “Accidental releases,” “accidents,” “incidents,” and “events” are used interchangeably to define emergency situations that have the potential for adverse effects on human health, property, and the environment.
- The terms “operations” and “system/process” are broadly defined to mean any activity involving a hazardous chemical, including the storage, manufacturing, processing, handling, on-site movement, or transportation of such materials.
- “Hazards assessment” and “hazards analysis” are used interchangeably to describe the general process of identifying, categorizing, and assessing the risk of hazardous materials accidents and exposures. The specific approach used for this process will depend upon organizational needs, resources, and preferences.
- “Risk” means the potential losses associated with a hazard and is defined in terms of expected probability, frequency, magnitude, severity, exposure, and consequences.
- “Facility” is broadly defined to include the buildings, containers, and equipment that house a hazardous materials operation or system/process .

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119



**Hazardous Materials
Prevention Training Guidelines**

Prevention Awareness

Prevention Awareness

General Training Considerations

Introduction

Prevention Awareness describes the introductory training requirements of all audiences in the Hazardous Materials Prevention Curriculum. Instruction in this area is intended to give participants a general knowledge base about prevention that can serve as a foundation for subsequent job-specific training.

The goal of Prevention Awareness training is to enhance participants' understanding of the importance and benefits of prevention, and to motivate them to seek additional information and assistance as needed. This goal is accomplished by providing students with 1) an introduction to basic prevention terminology and concepts, 2) an explanation of individual and organizational roles in prevention, and 3) an overview of common prevention methods and activities.

(Note: As defined here, Prevention Awareness is a common training requirement for all audiences, not a unique audience category. This material would typically be included in training delivered to each of the audiences described in the following sections. It is presented as a separate category to minimize redundancy and to facilitate use for mixed audiences, non-hazmat workers, and the general public.)

Audience

The training audience for Prevention Awareness includes everyone that has responsibilities in hazardous materials prevention or could influence prevention efforts at the state and local levels. Specifically included are employees of hazardous materials facilities, transportation workers, and personnel in agencies and organizations that implement the community's prevention policies and plans. Other workers and the general public will also benefit by awareness training in prevention. Potential audiences include union members, employee groups, civic organizations, volunteer agencies, activist groups, etc.

Training Requirement

Prevention Awareness training includes generic information about prevention and the community's prevention system. Also included is a general orientation to the student's work requirements and expectations. More specific knowledge and skills are defined for different audience groups in subsequent sections of these *Guidelines*.

At the conclusion of training, participants should be able to describe the hazardous materials prevention system as it applies to them, their responsibilities in that system, and ways to get further assistance. Possible content areas include:

- Relevant technological hazards
- Applicable laws, regulations, and codes
- Common prevention strategies and activities
- Community and organizational plans, roles, and activities
- Sources of prevention information and training

Methodology Recommendations

Prevention Awareness training can usually be delivered in one to three hours of classroom instruction. Content is typically presented as an introductory module in a broader training program for a specific audience group, although stand-alone training is possible. This type of awareness-level training can also be presented through the use of written materials and instructional media, a strategy that is particularly cost-effective for large and dispersed audiences. Other recommendations and considerations include the following:

- Training should emphasize the jurisdiction's strategies and methods for creating a disaster resistant community, and encourage the coordination and cooperation of government agencies and private sector organizations in hazardous materials prevention.

General Training Considerations

- Heterogenous audiences for Prevention Awareness training provide the opportunity for cross-disciplinary information sharing and networking among participants.
- Appropriate instructional methodologies include case studies, discussions, and small group activities to promote participant interaction and individual action planning.
- Although the bulk of Prevention Awareness training is by definition generic, some tailoring of course materials to specific audiences may be beneficial to account for differences in community hazards, prevention strategies and systems, job requirements, etc.
- The use of instructional media (videotapes, slides, graphics, etc.) to enhance the impact and efficiency of training is particularly appropriate for this audience.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Prevention Awareness

Recommended Training

Recommended Training

Prevention Awareness

Two types of statements are used to describe training requirements recommended for Prevention Awareness. Terminal objectives identify broad job competencies. Enabling objectives describe instructional accomplishments intended for a training (generally a classroom) environment. Together, these statements define generic training needs for all audience members. Hazardous materials training managers are encouraged to expand upon and refine this material to clarify the training requirements of specific audience groups.

The training objectives presented in the next section are consistent with federal requirements and national standards established for hazardous materials prevention. Included are FEMA and NRT prevention program planning guidelines for communities and facilities, DOT Transportation Regulations, various OSHA worker safety guidelines, EPA Accidental Release Prevention Requirements, and guidance disseminated by the chemical industry.

Objective Identification Legend

PAWR-1

This is the identification of the objective used in this document. It matches the identification code used in course assessment references. (See the Training Program Management section of this document.) Decimal numbers (such as PAWR-1.1) indicate enabling objectives supporting the primary objective.

Identification

Recommended Training Objectives

PAWR-1	Given the hazards in a specific jurisdiction, describe the purpose and benefits of hazardous materials prevention.
PAWR-1.1	Define hazardous materials prevention, and describe the benefits of hazardous materials prevention programs.
PAWR-1.2	Define Comprehensive Emergency Management (CEM) and the integrated approach to hazardous materials prevention.
PAWR-1.3	Describe the nature of technological hazards facing the community.
PAWR-1.4	Describe the concept of disaster resistant communities.
PAWR-2	Describe relevant aspects of a hazardous materials prevention system.
PAWR-2.1	Identify key legislation, regulations, and policies governing hazardous materials prevention.

Prevention Awareness
Recommended Training

PAWR-2.2	Identify the roles and general responsibilities of federal, state, and local government agencies and private sector organizations in hazardous materials prevention.	Prevention Training Issues		
PAWR-2.3	Describe the prevention planning process and participants.		Prevention Awareness	
PAWR-2.4	Identify the roles and general responsibilities of workers and citizens in hazardous materials prevention.			
PAWR-2.5	Describe major prevention strategies, activities, and how these should be developed in the emergency operations plan and prevention plans.			Prevention Policy Development
PAWR-3	Given this model hazardous materials prevention program, describe common prevention activities.			Community Prevention Program Management
PAWR-3.1	Describe activities associated with Prevention Program Analysis and Planning: Review of authorities and statutory mandates Hazard analysis Program planning Program implementation, evaluation, and maintenance Interagency coordination and cooperation	Prevention in Operations		
PAWR-3.2	Describe prevention activities associated with Employee Participation, Education, and Training: Employee participation Employee education and training	Design & Plans Review		
PAWR-3.3	Describe prevention activities associated with Design, Plans Review, and Construction: Facility and systems/process design and construction Transportation and storage design and construction Plans review and permitting	Inspection & Enforcement		
PAWR-3.4	Describe prevention activities associated with Safety Systems: Pre-startup safety reviews Maintenance/mechanical integrity Management of change	Appendix A: Prevention Authorities		
PAWR-3.5	Describe prevention activities associated with Operations: System/Process safety information Operating guidelines and practices Contractor safety	Appendix B: Training Mandates		
PAWR-3.6	Describe prevention activities associated with Compliance and Enforcement: Safety inspections, investigations, and enforcement Compliance and safety audits Record keeping and reporting	Appendix C: Federal Programs		
PAWR-3.7	Describe prevention activities associated with Public Information and Education: Public awareness/prevention communication Family and individual preparedness	Appendix D: OSHA 1910.119		



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	--------------------------------------	---	--------------------------	-----------------------	--------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Prevention Policy Development

Prevention Policy Development

General Training Considerations

Introduction

Prevention Policy Development describes the training requirements of persons who direct or manage organizations that have defined responsibilities in hazardous materials prevention. In this role, audience members initiate and oversee the development and maintenance of the prevention program's mission statement, policies, strategies, goals, objectives, plans, activities, and administrative systems.

In their jobs, audience members direct staff and others who manage and implement prevention programs and activities. Tasks include initiating and directing the development of prevention programs, setting related policy, establishing priorities based on cost/benefit analyses and other information, allocating staff and resources, approving and monitoring plans, supporting program implementation and evaluation, and ensuring interagency liaison and coordination.

Training Audience

The training audience for Prevention Policy Development consists of chief executives and senior managers from a broad spectrum of public, private, and nonprofit organizations. Potential audience members include city and county elected and appointed officials, SERC and LEPC members, facility owners and managers, police and fire chiefs, planning commissioners, school boards, managers of financial institutions, hospital administrators, media executives and station managers, and officers of professional groups, fraternal organizations, and unions.

The training audience should reflect persons who have the organizational authority to develop and enforce prevention program policy and to budget and expend related funds. Some students, especially in smaller jurisdictions and organizations, will also have responsibility for supervising and implementing specific prevention programs and activities. Individuals with dual responsibilities may need additional training, described under Prevention Program Management, below.

Training Requirement

Persons responsible for Prevention Policy Development represent a broad range of organizations, with very different prevention program needs and resources. Thus, the job requirements of individual audience members may differ, sometimes dramatically. However, all students will benefit by awareness-level training in hazardous materials prevention concepts, techniques, and applications. Many also need training that is specific to their unique organizational and prevention program responsibilities (e.g., type of operations, legal and regulatory requirements, management systems, etc.).

As a prerequisite for training, students are assumed to already possess the management skills, technical support, and resources they need to carry out their assigned organizational responsibilities. Thus, the goal of training is to motivate effective prevention program leadership, promote prevention program excellence, and contribute to the development of a disaster resistant community by providing students with a heightened awareness of:

- The risks posed by hazardous materials to the community and the organization.
- The benefits of prevention programs and activities.
- Strategies and options for hazardous materials prevention.
- Organizational and individual roles and responsibilities in hazardous materials prevention.
- Related administrative and resource requirements.

Training Methodology Recommendations

Generic training that is appropriate for all audience members can usually be accomplished in one to three hours. Content should emphasize 1) the jurisdiction's strategy for developing and implementing prevention programs that contribute to the development of a disaster resistant community, and 2) the organization's and student's role in that system. Audiences should be heterogeneous whenever possible, reflecting the contribution of different types of organizations to the community's hazardous materials prevention system.

Prevention Policy Development
General Training Considerations

More training may be necessary to address the unique needs of different audience members, covering, for example, specific organizational hazards, regulatory requirements, prevention program activities, etc. If so, training managers should group students and tailor training accordingly. Instruction must be presented in such a way that nonspecialists can acquire the information they need to make informed management-level decisions.

Other training methodology recommendations and considerations include the following:

- Training should emphasize the jurisdiction’s strategies and methods for developing a disaster resistant community, and encourage the coordination and cooperation of government agencies and private sector organizations in hazardous materials prevention.
- Instructional methodologies should include discussions and small group activities that promote participant interaction and support the resolution of conflicts.
- Course materials for heterogeneous audiences should include examples of prevention activities from various types of organizations, e.g., government agencies, public utilities, chemical transporters, industrial production facilities, hospitals, sewage treatment facilities, truck stops, and pipelines.
- The use of instructional media (videotapes, slides, overhead transparencies, etc.) to enhance the impact and efficiency of training is particularly appropriate for this audience.
- Special efforts may be needed to recruit students due to the nature of their organizational positions and the low priority sometimes afforded prevention programs and training.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Recommended Training

Prevention Policy Development

Two types of statements are used to describe training requirements recommended for Prevention Policy Development. Terminal objectives identify broad job competencies. Enabling objectives describe instructional competencies that lead to proficiency in the terminal objective. Together, these statements identify generic training needs for all audience members. Hazardous materials training managers are encouraged to refine this material as necessary to clarify the training requirements of different audience groups (e.g., large chemical facility executives, LEPC members, hospital administrators, etc.).

The training objectives presented in the next section are consistent with federal requirements and national standards. Included are FEMA and NRT planning guidelines for communities and facilities, DOT Transportation Regulations, various OSHA worker safety guidelines, EPA requirements, and guidance disseminated by the chemical industry.

Objective Identification Legend

PLCY-1

This is the identification of the objective used in this document. It matches the identification code used in course assessment references. (See the Training Program Management section of this document.) Decimal numbers (such as PLCY-1.1) indicate enabling objectives supporting the primary objective.

Identification

Recommended Training Objectives

PLCY-1	Given an over view of prevention concepts and activities (see <i>Prevention Awareness</i>), analyze the organization's prevention program mission, policies, goals, objectives, strategies, activities, and plans.
PLCY-1.1	Describe guidelines for researching and assessing hazardous materials prevention authorities and statutory mandates.
PLCY-1.2	Describe guidelines for identifying and analyzing technological hazards, vulnerabilities, and risks.
PLCY-1.3	Describe guidelines for developing or refining the organization's hazardous materials prevention program mission statement and policies.
PLCY-1.4	Describe guidelines for developing or refining the prevention program's short- and long-term goals, measurable objectives, and evaluation criteria.
PLCY-1.5	Describe guidelines for identifying and analyzing prevention program strategies and activities.
PLCY-1.6	Describe guidelines for preparing and coordinating short- and long-range prevention program plans.

Prevention Policy Development
Recommended Training

PLCY-1.7	Describe common prevention program implementation shortfalls and opportunities.	Prevention Training Issues
PLCY-2	Given the program strategy and plans, identify administrative systems and resources needed to implement the program.	
PLCY-2.1	Describe guidelines for determining the scope of the prevention program's administrative and resource requirements.	Prevention Policy Development
PLCY-2.2	Describe guidelines for assessing existing personnel, available resources, organizational capabilities, competing requirements, and staffing alternatives.	
PLCY-2.3	Describe possible funding resources and alternatives.	
PLCY-2.4	Describe methods to assess organizational impacts (economic, legal, public relations, etc.) resulting from different resource allocation strategies and program outcomes.	Community Prevention Program Management
PLCY-3	Given implementation of the organization's prevention program, support and sustain evaluation and maintenance of the program.	Prevention in Operations
PLCY-3.1	Describe guidelines for monitoring program activities and measuring progress in implementing prevention strategies.	
PLCY-3.2	Describe guidelines for evaluating and refining program systems, strategies, plans, budgets, procedures, etc. to enhance prevention.	
PLCY-3.3	Describe guidelines for ensuring long-term compliance with legal requirements and maintaining interagency liaison and coordination.	
PLCY-4	Given a review of prevention program needs, identify additional sources of information, assistance, and training.	Design & Plans Review
PLCY-4.1	Assess individual and organizational needs for additional information, assistance, and training.	
PLCY-4.2	Identify and describe methods to research and evaluate information, assistance, and training available through government and private sector sources.	Inspection & Enforcement
		Appendix A: Prevention Authorities
		Appendix B: Training Mandates
		Appendix C: Federal Programs
		Appendix D: OSHA 1910.119



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	--	--------------------------	-----------------------	--------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Community Prevention Program Management

Community Prevention Program Management

General Training Considerations

Introduction

Community Prevention Program Management describes the training requirements of persons who develop and manage state and local government hazardous materials prevention programs and activities. These activities include community hazard analysis, prevention planning, land use planning, construction plans review, inspection and codes enforcement, public education, and other efforts designed to enhance worker and public safety and contribute to the development of a disaster resistant community. (Note: Governmental entities may also be involved in hazardous materials operations—the processing, storage, handling, or transport of regulated chemicals—for example in waste water treatment plants, utilities, medical care facilities, military applications, etc. Training requirements for managers of these types of operations is covered under *Prevention Program Management*.)

Persons performing Community Prevention Program Management are responsible for implementing the organizational policy and direction established by senior managers (see *Prevention Policy Development*). Tasks include conducting and/or supervising staff and consultants (e.g., architects, engineers, and other technical specialists) in the following types of prevention activities:

- Assisting senior managers in writing prevention policy, establishing prevention goals, designing related administrative systems, assessing budgets, promoting interagency coordination, developing evaluation criteria, and so forth.
- Researching and assessing prevention legal requirements, technological hazards, potential incident impacts, and organizational capabilities.
- Analyzing prevention strategies and options (i.e., activities designed to prevent and mitigate hazardous materials incidents).
- Determining prevention training needs, developing course materials, managing training programs, and delivering instruction.
- Developing prevention program staff plans and schedules, negotiating subcontractor arrangements, assigning personnel, monitoring and evaluating performance, and tracking expenditures.
- Implementing specific prevention activities, monitoring progress, evaluating outcomes, and recommending changes to improve safety and program effectiveness.

Training Audience

The training audience for Community Prevention Program Management consists primarily of government officials and others with supervisory-level responsibilities in community hazardous materials prevention. Potential audience members include state environmental agency prevention managers, Hazardous Materials Emergency Preparedness (HMEP) program managers, local response agency (fire, law enforcement, emergency medical services) prevention program managers, hazardous materials planners, zoning board members, codes enforcement managers, emergency management program directors, and other representatives of community organizations that have a defined role in hazardous materials prevention.

Training Requirement

Candidates for instruction in this curriculum area are assumed to already possess basic management skills and expertise in their areas of responsibility (fire prevention, code enforcement, plans review, etc.). Thus, the goal of training is to improve leadership and enhance safety programs by providing students with supplementary knowledge and skills in hazardous materials incident prevention and related activities.

The job and training requirements of individual audience members will vary depending on their roles and responsibilities. For example, the needs of agency officials in large metropolitan areas and rapidly growing

Community Prevention Program Management

General Training Considerations

jurisdictions may exceed those in smaller, rural, and established communities. However, all audience members will benefit by generic training in hazardous materials prevention concepts, techniques, and applications. Possible content areas include:

- The prevention program manager's role and responsibilities.
- The organization's prevention mission and policies.
- State-of-the-art prevention program strategies, concepts, and techniques.
- Methodologies to enhance program planning, implementation, monitoring, and evaluation.
- Problem solving methods and techniques.

For instruction to be most effective, audience members should be grouped to the extent possible by prevention program type and the technical requirements of the job. Training can then address any specialized knowledge and skills needed by different groups. Possible content areas for advanced training include legislative and regulatory requirements, hazard analysis techniques, planning strategies, and prevention applications.

Training Methodology Recommendations

General training in Community Prevention Program Management can usually be accomplished in one to three days of instruction. More time may be appropriate for audiences with greater needs. Instructional methodologies should emphasize case studies and examples relevant to the audience. Participant activities should highlight innovative approaches to prevention and practical solutions to common problems. Other training methodology recommendations and considerations include the following:

- Training should emphasize the jurisdiction's strategies and methods for creating a disaster resistant community, and encourage the coordination and cooperation of government agencies and private sector organizations in hazardous materials prevention.
- Student activities should encourage participant interaction and provide ample opportunities for practice and application of acquired skills. Checklists, job aids, and other practical tools should be included in the course materials.
- Activities should focus on the development of useful work products (e.g., hazards analyses, work plans, program strategies, etc.) under classroom conditions that are as realistic as possible. Methods to transfer learning back to the job should be emphasized.
- Instructors need significant practical experience and technical expertise in prevention programs relevant to the audience's needs. Familiarity with state and local program requirements and systems is also important.

Prevention Training Issues

Prevention Awareness

Prevention Policy Development

Community Prevention Program Management

Prevention in Operations

Design & Plans Review

Inspection & Enforcement

Appendix A: Prevention Authorities

Appendix B: Training Mandates

Appendix C: Federal Programs

Appendix D: OSHA 1910.119

Community Prevention Program Management

Recommended Training

Recommended Training

Community Prevention Program Management

Two types of statements are used to describe training requirements recommended for Prevention Program Management. Terminal objectives identify broad job competencies. Enabling objectives describe instructional competencies that lead to proficiency in the terminal objective. Together, these statements identify generic training needs for all audience members. Hazardous materials training managers are encouraged to refine this material as necessary to clarify the training requirements of different audience groups (e.g., retail operations, health care facilities, etc.).

The training objectives presented in the next section are consistent with federal requirements and national standards. Included are FEMA and NRT planning guidelines for communities and facilities, DOT Transportation Regulations, various OSHA worker safety guidelines, EPA requirements, and guidance disseminated by the chemical industry.

Objective Identification Legend

COMM-1

This is the identification of the objective used in this document. It matches the identification code used in course assessment references. (See the Training Program Management section of this document.) Decimal numbers (such as COMM-1.1) indicate enabling objectives supporting the primary objective.

Identification

Recommended Training Objectives

COMM-1

Given an overview of prevention concepts and activities (see *Prevention Awareness*) and a specific state or local jurisdiction, describe the community's hazardous materials prevention system.

COMM-1.1

Describe general prevention planning guidelines and roles for state and local jurisdictions contained in the following authorities (see *Hazardous Materials Planning Curriculum Guidelines* for more information):

- Robert T. Stafford Disaster Relief and Emergency Assistance Act
- Title III of the Superfund Amendments Reauthorization Act (SARA)
- Guide for All-Hazard Emergency Operations Planning (SLG-101)
- Hazardous Materials Emergency Planning Guide (NRT-1)
- OSHA 29 CFR 1910.120 and EPA 40 CFR
- State and local laws and regulations

COMM-1.2

Describe general prevention guidelines and roles contained in:

- State and local legislation, regulations, and policies
- State and local emergency operations and prevention plans
- State and local planning and zoning ordinances
- State and local building, fire, hazardous materials, health, and other codes

COMM-2

Given the community's hazards analysis, identify related prevention program considerations and priorities. (See *Hazardous Materials Planning Curriculum Guidelines* for more information.)

Community Prevention Program Management Recommended Training

COMM-2.1	Describe the hazards identified in the community's hazards analysis.	Prevention Training Issues
COMM-2.2	Describe guidelines and methods for evaluating and refining the community's hazards analysis, if appropriate.	Prevention Awareness
COMM-2.3	Describe guidelines and methods for identifying planning considerations and prioritizing prevention activities to reflect the community's hazard analysis.	Prevention Policy Development
COMM-3	Given a community's hazards analysis, identify and assess options for promoting prevention through plans review and permitting programs.	Prevention Policy Development
COMM-3.1	Describe community systems and roles for promoting prevention through plans review and permitting programs.	Community Prevention Program Management
COMM-3.2	Identify hazardous materials regulations, codes, and standards applicable to various design scenarios.	Community Prevention Program Management
COMM-3.3	Describe guidelines, methods, and procedures for conducting hazardous materials prevention plans reviews and permitting activities, addressing such factors as: <ul style="list-style-type: none"> • Consultation with facility management and design team members • Review of design specifications, plans, and supporting documents • Construction permitting and licensing (approval) • Construction monitoring and consultation • Inspection of new or modified facilities and operations • Operational permits 	Prevention in Operations
COMM-3.4	Describe the essential elements and management requirements of hazardous materials prevention plans review and permitting programs.	Design & Plans Review
COMM-3.5	Describe staffing strategies and recommended personnel qualifications for hazardous materials prevention plans review and permitting programs.	Inspection & Enforcement
COMM-3.6	Describe guidelines and methods for determining administrative and resource requirements for hazardous materials prevention plans review and permitting programs.	Inspection & Enforcement
COMM-4	Given a community's hazards analysis, identify and assess options for promoting prevention through inspections and enforcement activities.	Appendix A: Prevention Authorities
COMM-4.1	Describe community systems and roles for conducting hazardous materials inspections and enforcement activities.	Appendix A: Prevention Authorities
COMM-4.2	Describe key authorities governing the processing, storage, handling, and transport of hazardous materials, including: <ul style="list-style-type: none"> • OSHA's General Safety and Health Provisions (29 CFR 1910.20) • OSHA's Process Safety Management Standard (29 CFR 1910.119) • The Clean Air Act Amendments (1990) • EPA's Accidental Release Prevention Requirements (40 CFR Part 68) • OSHA's Hazard Communication Standard (29 CFR 1910.1200) • DOT's Hazardous Materials Regulations (49 CFR Parts 171-179) • NRT's Integrated Contingency Plan Guidance 	Appendix B: Training Mandates
		Appendix C: Federal Programs
		Appendix D: OSHA 1910.119

Community Prevention Program Management

Recommended Training

COMM-4.3 Describe guidelines, methods, and information sources for gathering hazardous materials data on facilities and operations, categorizing risks, and establishing priorities among inspection and enforcement requirements.

COMM-4.4 Describe guidelines, methods, and procedures for conducting hazardous materials inspections, addressing such factors as:

- Developing required forms, checklists, questionnaires, etc.
- Scheduling and planning site visits
- Briefing management and operating personnel
- Gathering inspection data
- Assessing the adequacy of plans, permits, process safety information, operating procedures, training, safety systems, etc.
- Identifying deficiencies and concerns
- Documenting and reporting results

COMM-4.5 Describe guidelines, methods, and procedures for enforcing compliance with hazardous materials inspection results (consultation, violation notices, citations, personnel actions, audits, legal actions, etc.).

COMM-4.6 Describe the essential elements and management requirements of hazardous materials inspection and enforcement programs.

COMM-4.7 Describe staffing strategies and recommended personnel qualifications for hazardous materials inspection and enforcement programs.

COMM-4.8 Describe guidelines and methods for determining administrative and resource requirements for hazardous materials inspection and enforcement programs.

COMM-5 Given a community's hazards analysis, identify and assess options for promoting prevention through incident record keeping, reporting, and investigations.

COMM-5.1 Describe community systems and roles for promoting prevention through incident record keeping, reporting, and investigations.

COMM-5.2 Describe appropriate data gathering forms and procedures for promoting incident reporting and record keeping.

COMM-5.3 Describe staffing strategies and recommended personnel qualifications for the hazardous materials incident investigation team, including requirements for training.

COMM-5.4 Describe strategies to ensure that hazardous materials prevention concepts and techniques are adequately considered during incident investigations.

COMM-5.5 Describe strategies for ensuring that hazardous materials incident investigation findings and recommendations are addressed, that corrective measures are adequately documented, and that results are considered in prevention program planning.

COMM-5.6 Describe guidelines and methods for determining administrative and resource requirements for hazardous materials investigations.

COMM-6 Given a community's hazards analysis, identify and assess options for promoting public information and education on hazardous materials prevention.

COMM-6.1 Describe community systems and roles for conducting hazardous materials public awareness/risk communication activities.

Community Prevention Program Management Recommended Training

COMM-6.2	Describe community systems and roles for conducting individual and family preparedness public education activities in hazardous materials prevention.	Prevention Training Issues
COMM-6.3	Describe guidelines and methods for determining audience needs for hazardous materials public information and education activities.	Prevention Awareness
COMM-6.4	Identify and assess communication strategies (media, participants, etc.) for hazardous materials public information and education programs.	Prevention Policy Development
COMM-6.5	Identify and assess existing materials and sources of assistance for hazardous materials public information and education programs.	Community Prevention Program Management
COMM-6.6	Describe the essential elements and management requirements of hazardous materials public information and education programs.	
COMM-6.7	Describe staffing strategies and recommended personnel qualifications for hazardous materials public information and education programs.	
COMM-6.8	Describe guidelines and methods for determining administrative and resource requirements for public information and education programs and activities.	
COMM-7	Given an analysis of prevention program risks, authorities, and activity options, prepare a hazardous materials prevention program management plan. (See <i>Hazardous Materials Planning Curriculum Guidelines</i> for more information.)	Prevention in Operations
COMM-7.1	Describe guidelines and methods for preparing and formatting a hazardous materials prevention program management plan.	Design & Plans Review
COMM-7.2	Describe guidelines for developing an organizational strategy for program activities that addresses: <ul style="list-style-type: none"> • Short- and long-term goals, measurable objectives, and evaluation criteria. • Analysis of program activities and options. • Resources and administrative support systems and procedures. • Staffing assignments and contractor requirements. 	Inspection & Enforcement
COMM-7.3	Describe guidelines and methods for coordinating the planning process and communicating results to community officials.	Appendix A: Prevention Authorities
COMM-8	Given a hazardous materials prevention program management plan, conduct and/or supervise the implementation, monitoring, evaluation, and continual refinement of the prevention program.	Appendix B: Training Mandates
COMM-8.1	Describe strategies and methods for implementing prevention program elements, activities, and procedures.	Appendix C: Federal Programs
COMM-8.2	Describe strategies and methods for monitoring, evaluating, and continually refining prevention program elements, activities, and procedures.	
COMM-8.3	Describe common shortfalls and opportunities in implementing, evaluating, and maintaining hazardous materials prevention programs.	
		Appendix D: OSHA 1910.119



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	---------------------------------	-----------------------	--------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Prevention in Operations

Prevention in Operations

General Training Considerations

Introduction

Prevention in Operations describes the training requirements of persons who supervise or operate processes that involve the storage, transport, handling, manufacture, or use hazardous materials. These employees are responsible for ensuring that hazardous materials prevention activities and safety requirements defined in system/process safety management plans and standard operating guidelines (SOGs) are properly implemented and enforced.

The job requirements and training needs of operations personnel will vary significantly, depending on the size and nature of the operation, the type of hazards involved, the prevention strategy adopted by the facility, and the duties of the employee. However, generic roles and responsibilities can be defined as follows:

- Assist the prevention program manager identify hazardous materials risks, prevention opportunities, and safe operating practices and procedures for specific processes/operations.
- Implement, monitor, and enforce safe working practices and procedures for specific operations.
- Participate in record keeping, reporting, safety reviews, compliance audits, incident investigations, inspections, evaluations, and other prevention program activities.

Training Audience

The training audience for Prevention in Operations consists of employees of public, private, and non-profit facilities. In this context, the terms “facility” and “process” are broadly defined, specifically to include large and small operations at industrial plants, commercial establishments, trucking and other transport companies, government agencies, health care operations, utilities, and many other types of organizations.

The training audience includes a broad spectrum of facility workers, from supervisors of huge chemical production systems to fork lift operators. Audience members include production managers, shift supervisors, line operators, general laborers, hazardous materials transport employees, and many process-specific job titles.

Training Requirement

As a prerequisite of training, students are assumed to already know how to carry out their basic work responsibilities. Thus, the goal of training is to promote hazardous materials incident prevention and employee safety by enhancing participants’ ability and motivation to 1) identify and apply safe working practices and procedures on the job, 2) ensure compliance with established prevention program requirements, and 3) contribute as assigned to related program activities (hazard analysis, planning, record keeping, incident critiques, audits, etc.).

A safety management plan and job-specific SOGs, prepared under the direction of the prevention program manager, should exist for all hazardous materials activities. Instruction in Prevention in Operations therefore emphasizes the knowledge and skills students need to apply these established systems and procedures under varying conditions and in a wide range of routine and non-routine work situations. Specifically included is the ability to implement SOGs that define the student’s prevention responsibilities, and to recognize and report potential safety problems.

Training must be highly specific to each student’s needs, which, in turn, depend on their unique job requirements (type of operations, work responsibilities, associated hazards, prevention strategies, etc.). Therefore, instruction emphasizes the transfer of **operations-specific** knowledge and skills that students need to implement the organization’s prevention program and avoid accidents. General training in prevention concepts and techniques is provided as necessary to support this primary goal.

Training Methodology Recommendations

All students will benefit by awareness-level training in hazardous materials prevention and an understanding of the organization’s prevention program. Audience members also need technical knowledge and skills that are specific to their jobs. For this latter type of training, audience members should be grouped to the extent possible by process, hazard, and job type. Training can then be more effectively tailored to the needs of different workers.

Participants should be given opportunities to apply and practice job-specific operating procedures and safety systems under different work conditions and situations. For classroom activities, case studies and scenarios can be used. However, hands-on use of equipment under realistic working conditions and on-the-job training are encouraged. Activities should highlight creative approaches to prevention program requirements and practical solutions to common problems. Drills or exercises under simulated emergency or non-routine situations are also useful.

The scope and duration of training will vary depending on the nature and complexity of related SOGs and safety systems. Checklists, job aids, and other practical tools that can be used at the work site should be included in course materials whenever possible.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Prevention in Operations

Recommended Training

Recommended Training

Prevention in Operations

Two types of statements are used to describe training requirements recommended for Prevention in Operations. Terminal objectives identify broad job competencies. Enabling objectives describe instructional competencies that lead to proficiency in the terminal objective. Together, these statements identify generic training needs for all audience members. Hazardous materials training managers are encouraged to refine this material as necessary to clarify the training requirements of different audience groups.

The training objectives presented in the next section are consistent with federal requirements and national standards. Included are FEMA and NRT planning guidelines for communities and facilities, DOT Transportation Regulations, various OSHA worker safety guidelines, EPA requirements, and guidance disseminated by the chemical industry.

Objective Identification Legend

PrOPS-1

This is the identification of the objective used in this document. It matches the identification code used in course assessment references. (See the Training Program Management section of this document.) Decimal numbers (such as PrOPS-1.1) indicate enabling objectives supporting the primary objective.

Identification

Recommended Training Objectives

PrOPS-1	Given an overview of prevention concepts and activities (see <i>Prevention Awareness</i>), describe employee safety requirements.
PrOPS-1.1	Describe general safety and health provisions protecting worker safety.
PrOPS-1.2	Describe general guidelines for employee participation in hazardous materials prevention activities.
PrOPS-1.3	Describe general guidelines for employee training in workplace safety and health.
PrOPS-1.4	Describe general guidelines for maintaining and accessing process safety information.
PrOPS-2	Given the organization's hazardous materials prevention program, describe elements of the program that affect operations.
PrOPS-2.1	Describe the organization's hazardous materials prevention mission and policies.

Prevention in Operations
Recommended Training

PrOPS-2.2	Describe the organization's hazardous materials emergency response capabilities and systems.	Prevention Training Issues
PrOPS-2.3	Describe components and relevant aspects (policies, activities, roles, etc.) of the organization's hazardous materials prevention program.	Prevention Awareness
PrOPS-3	Given an operation's hazards assessment and safety plan, describe prevention strategies.	Prevention Policy Development
PrOPS-3.1	Identify specific hazards and risks associated with the operation.	Community Prevention Program Management
PrOPS-3.2	Describe and demonstrate the ability to access and use process safety information to enhance prevention.	
PrOPS-3.3	Describe organizational strategies and safe work practices designed to address all identified hazards.	
PrOPS-4	Given an operation's work situation and scenarios, describe and apply standard operating guidelines (SOGs) that relate to safe working practices.	Prevention in Operations
PrOPS-4.1	Describe the role of SOGs in hazardous materials safety and prevention programs.	Design & Plans Review
PrOPS-4.2	Demonstrate the ability to apply SOGs that define safe operations (e.g., routine and non-routine operating procedures and practices, contractor safety).	
PrOPS-4.3	Demonstrate the ability to apply SOGs for safety systems (e.g., pre-startup safety reviews, maintenance/mechanical integrity, management of change).	
PrOPS-4.4	Demonstrate the ability to apply SOGs for compliance and enforcement activities (e.g., safety inspections and enforcement, compliance safety audits, incident record keeping, reporting, and investigations).	
PrOPS-5	Given the organization's hazardous materials prevention program, participate as assigned in various program activities.	Inspection & Enforcement
PrOPS-5.1	Demonstrate the ability to participate as assigned in prevention program analysis and planning activities.	Appendix A: Prevention Authorities
PrOPS-5.2	Demonstrate the ability to participate as assigned in prevention training activities.	Appendix B: Training Mandates
PrOPS-5.3	Demonstrate the ability to participate as assigned in the design of new or modified facilities, systems, or processes.	
PrOPS-5.4	Demonstrate the ability to participate as assigned in monitoring, evaluating, and continually refining prevention program activities.	Appendix C: Federal Programs
		Appendix D: OSHA 1910.119



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	----------------------------------	--------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Design and Plans Review

Design and Plans Review

General Training Considerations

Introduction

Design and Plans Review describes the training requirements of persons who oversee and participate in the design, planning, approval, or construction of operations that produce, use, store, or transport hazardous materials. Audience members are responsible for incorporating the requirements and recommended practices contained in applicable prevention codes and standards into detailed blueprints, drawings, plans, specifications, instructions, and other documents. In this role, they conduct and/or supervise staff, consultants, and subcontractors in the following types of activities:

- Clarifying the technical and prevention requirements of design projects, including associated hazardous materials risks.
- Conducting a search and analysis of applicable regulations, codes, and standards to identify prevention requirements, opportunities, and recommended practices.
- Briefing and/or training design staff, construction managers, vendor representatives, consultants, and others on prevention opportunities and initiatives.
- Preparing and reviewing design plans, specifications, and support documents that incorporate and clarify prevention requirements.
- Consulting and coordinating with community and facility representatives to enhance the hazardous materials operations plans review process.
- Monitoring procurement and construction to ensure that hazardous materials operations plan requirements are met and related problems are resolved.
- Identifying hazardous materials prevention requirements for management systems and standard operating procedures for planned operations.
- Advising prevention managers, operators, and others on ways to implement, evaluate, and maintain the new facilities, systems, and processes.

Training Audience

The training audience for Design and Plans Review is composed of persons in governmental, private, industry, or non-profit organizations that develop or review the technical content of hazardous materials design plans and operational specifications. This category includes members of the facility design team and community officials who oversee the process—design project managers, prevention program managers, production managers, construction managers, community plans reviewers, zoning and planning board members, architects, engineers (mechanical, structural, chemical, electrical, civil, etc.), draftsmen, safety experts, consultants, subcontractors, and other technical specialists.

A secondary audience includes persons that implement the approved design. This group will benefit by more limited training that focuses on the specific design project and is intended to heighten awareness of related prevention concepts and techniques. Included in this category are facility procurement personnel, construction contractors, vendor representatives, community and facility inspectors, codes enforcement officials, and production operators.

Training Requirement

As a prerequisite of training, audience members are assumed to already possess the basic knowledge and skills they need to carry out their primary job responsibilities (architecture, engineering, plans review, prevention program management, etc.). Thus, the goal of training is to promote safety in hazardous materials operations by enhancing the participant's ability and motivation to 1) identify opportunities to reduce accidents and recommended practices in proposed designs, and 2) ensure that requirements for hazardous materials incident prevention are incorporated in design plans and specifications.

Training should stress the importance of the design and plans review function in prevention, and provide students with a solid grounding in related codes and standards. Instruction should also give students advanced knowledge and skills in the following areas:

- Identifying, interpreting, and applying specific prevention code items, concepts, and techniques to varying design requirements and problems.
- Assessing hazardous materials risks and prevention opportunities associated with alternative design strategies.
- Preparing and/or evaluating design plans and other documents that contribute to hazardous materials prevention.
- Providing guidance and direction to community and facility representatives to encourage the safe and effective implementation of hazardous materials operational designs.

Training Methodology Recommendations

Design and Plans Review is a highly technical and complex process involving a wide variety of possible design requirements, parameters, and variables. Training managers and course developers are encouraged to limit the scope of training to the extent possible by grouping students according to the prevention requirements of their jobs and then focusing training accordingly. All students will benefit by some basic training in hazardous materials codes, standards, and design principles. More advanced training can then be classified into five categories:

- 1) General—the ability to apply the broad range of hazardous materials authorities and codes to any facility or operations design.
- 2) Project-specific—the ability to identify and apply only those prevention requirements that are relevant to a specific facility or operations design.
- 3) Operations-specific—the ability to apply the broad range of hazardous materials authorities and codes to a certain type of facility or operations design (e.g., refineries, retail outlets).
- 4) Code-specific—the ability to apply a specific prevention code (fire, building, health, etc.) to any facility or operations design.
- 5) Operations and code-specific—the ability to apply a specific prevention code to a certain type of facility or operations design.

The amount of time planned for instruction will depend on the needs of the audience and the scope of training. Participants will greatly benefit by opportunities to practice and apply skills acquired during training. For example, activities can be designed to permit students, organized in teams, to research and apply prevention codes to realistic design scenarios. Actual design problems from the participants' communities and organizations is preferable for this purpose. Training should also address management and political considerations in project planning.

Other training methodology recommendations and considerations include the following:

- Instructors need significant experience and technical expertise in design, plans review, prevention techniques, and state and local prevention authorities.
- Participant activities should emphasize the development of practical work products and methods to transfer learning back to the job, including checklists, job aids, and other design and planning tools.
- If possible, training should encourage interagency cooperation and information sharing among public and private sector participants.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Design and Plans Review

Recommended Training

Recommended Training

Design and Plans Review

Two types of statements are used to describe training requirements recommended for Design and Plans Review. Terminal objectives identify broad job competencies. Enabling objectives describe instructional competencies that lead to proficiency in the terminal objective. Together, these statements identify generic training needs for all audience members. Hazardous materials training managers are encouraged to refine this material as necessary to clarify the training requirements of different audience groups.

The training objectives presented in the next section are consistent with federal requirements and national standards. Included are FEMA and NRT planning guidelines for communities and facilities, DOT Transportation Regulations, various OSHA worker safety guidelines, EPA requirements, and guidance disseminated by the chemical industry.

Objective Identification Legend

D/PR-1

This is the identification of the objective used in this document. It matches the identification code used in course assessment references. (See the Training Program Management section of this document.) Decimal numbers (such as D/PR-1.1) indicate enabling objectives supporting the primary objective.

Identification

Recommended Training Objectives

D/PR-1	Given an overview of prevention concepts and activities (see <i>Prevention Awareness</i>), describe community and organizational prevention systems for design and plans review.
D/PR-1.1	Describe the purpose, structure, and content of state and authorities and codes that govern hazardous materials design and plans review, including those addressing: <ul style="list-style-type: none">• Buildings, construction, and fire prevention• Community planning, zoning, and occupancy• Employee safety and accident prevention• Health and environmental concerns
D/PR-1.2	Describe organizational prevention policies, strategies, and systems for hazardous materials design and construction.
D/PR-1.3	Describe community and organizational prevention policies, strategies, and systems for hazardous materials plans review and approval.
D/PR-2	Given a range of representative design scenarios, design and/or evaluate plans for proposed projects to ensure that prevention requirements are met.
D/PR-2.1	Demonstrate the ability to research and analyze state and local authorities that govern hazardous materials design.

Design and Plans Review
Recommended Training

D/PR-2.2	Describe information sources on state of the art prevention technologies and recommended practices in hazardous materials design.	Prevention Training Issues
D/PR-2.3	Assess strategies for briefing and educating design staff members, including ways to: <ul style="list-style-type: none"> Identify the knowledge requirements of design staff members. Train staff on standard and non-standard code items. Maintain current knowledge of prevention codes. 	Prevention Awareness
D/PR-2.4	Demonstrate the ability to identify and assess hazards associated with alternative design strategies.	Prevention Policy Development
D/PR-2.5	Demonstrate the ability to identify design strategies that optimize safety and prevention opportunities.	Community Prevention Program Management
D/PR-2.6	Demonstrate the ability to prepare and/or evaluate design plans, specifications, and supporting documents that incorporate and clarify prevention requirements.	Prevention in Operations
D/PR-2.7	Assess strategies for coordinating activities among facility, community, and design team representatives to enhance prevention.	Design & Plans Review
D/PR-3	Given an approved design, assist in promoting prevention through the effective implementation and maintenance of the project.	Inspection & Enforcement
D/PR-3.1	Assess strategies for preparing contractor and vendor documents that incorporate and clarify the prevention requirements of the design plan.	Appendix A: Prevention Authorities
D/PR-3.2	Assess strategies for assisting construction personnel and vendor representatives to interpret the project's prevention requirements.	Appendix B: Training Mandates
D/PR-3.3	Assess strategies for monitoring procurement and construction activities to ensure that prevention requirements are met.	Appendix C: Federal Programs
D/PR-3.4	Assess strategies for assisting prevention program managers and operators to develop and implement safe operational systems and employee work procedures.	Appendix D: OSHA 1910.119
D/PR-3.5	Assess strategies for assisting prevention program managers and operators to safely activate, integrate, evaluate, and maintain the new facility, system, or process.	



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	-----------------------	-------------------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Inspection and Enforcement

Inspection and Enforcement

General Training Considerations

Introduction

Inspection and Enforcement describes the training needs of persons who monitor, inspect, and enforce safety compliance in operations that produce, use, store, or transport hazardous materials. In this role, audience members 1) identify hazardous materials risks and prevention opportunities associated with specific facility and transportation operations, and 2) assess and enforce compliance with established prevention authorities and codes.

The specific job requirements of Inspection and Enforcement personnel will vary depending on the size and nature of operations involved, the prevention strategy of the organization, assigned responsibilities, etc. However, a generic list of job responsibilities would include the following:

- Assess the adequacy of hazardous material prevention plans and programs prepared by facilities and transport companies.
- Assess the adequacy of safety systems and response capabilities in facilities and transport companies.
- Ensure that equipment is properly installed and maintained.
- Ensure that operating procedures are safe and effectively implemented.
- Ensure that operations and maintenance personnel are adequately trained.
- Brief community and facility officials of safety deficiencies and opportunities, and promote cooperation and coordination among decision makers.
- Monitor efforts to resolve problems, and implement policies and procedures designed to enforce compliance with applicable authorities and codes.
- Participate in safety reviews, compliance audits, incident investigations, and other types of prevention activities.

Training Audience

The training audience for Inspection and Enforcement includes inspectors and officials from community agencies (e.g., fire service, police, health agency, etc.) that are responsible for prevention, enforcement, and compliance programs and activities in the jurisdiction. Included are representatives of agencies that develop and enforce codes in all related areas: buildings, transportation, employee safety, fire, health, and so on.

The training audience also includes inspectors and enforcement personnel from public, private, and non-profit facilities that store, handle, transport, or use hazardous materials. In business and industry, the role may be filled by prevention program managers, safety officers, production managers, shift supervisors, or others assigned the responsibility. Representatives of insurance companies, consultants, safety experts, and others also perform the function in certain situations.

Training Requirement

As a prerequisite of training, students are assumed to already possess basic knowledge and skills in inspection and enforcement. Therefore, the primary goal of training is to promote hazardous materials prevention and safety by enhancing the participant's ability and motivation to 1) identify safety deficiencies and opportunities associated with the hazardous materials operations, 2) assess compliance with applicable prevention authorities and codes, and 3) monitor and enforce compliance according to established policies and protocols.

Inspection and Enforcement is a technical and complex process, potentially involving the application of a broad range of prevention authorities and codes to many different types of hazardous materials operations. All students will benefit by basic training in hazardous materials prevention and related authorities and codes. Training managers and course developers are encouraged to limit the scope of more advanced instruction to the extent possible by grouping students according to their job requirements and then focusing training accordingly. More advanced technical training can be classified into five categories:

- 1) General—the ability to apply the broad range of hazardous materials authorities and codes to any facility/process or operations.
- 2) Project-specific—the ability to identify and apply only those prevention requirements that are relevant to a specific facility/process or operations.
- 3) Operations-specific—the ability to apply the broad range of hazardous materials authorities and codes to a certain type of facility/process or operations (e.g., refineries, retail outlets).
- 4) Code-specific—the ability to apply a specific prevention code (fire, building, health, etc.) to any facility/process or operations.
- 5) Process- and code-specific—the ability to apply a specific prevention code to a certain type of facility/process or operations.

However training is targeted, participants will benefit by generic instruction in hazardous materials prevention and an understanding of the organization’s prevention, inspection, and enforcement programs. Course content should then emphasize the knowledge and skills students need to apply established authorities, systems, and procedures in representative hazardous materials and transport operations.

Training Methodology Recommendations

As described above, training requirements for different audience members may vary significantly. Therefore, students should be grouped whenever possible by job categories that reflect their inspection and enforcement responsibilities. Training can then be more effectively tailored to the specialized needs of different employees.

Instructional methodologies should emphasize opportunities for students to interpret and practice applying prevention codes and program requirements to different types of operations and under different types of conditions. Participant activities should also address management and political considerations. Examples and realistic scenarios are appropriate for this purpose. Practice should highlight creative approaches and practical solutions to common problems.

The scope and duration of training will vary, depending on the nature and complexity of organizational inspection and enforcement procedures, hazardous materials operations, and related authorities and codes. Checklists, job aids, and other practical tools that can be used on site should be included in course materials whenever possible.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Inspection and Enforcement

Recommended Training

Recommended Training

Inspection and Enforcement

Two types of statements are used to describe training requirements recommended for Inspection and Enforcement. Terminal objectives identify broad job competencies. Enabling objectives describe instructional competencies that lead to proficiency in the terminal objective. Together, these statements identify generic training needs for all audience members. Hazardous materials training managers are encouraged to refine this material as necessary to clarify the training requirements of different audience groups.

The training objectives presented in the next section are consistent with federal requirements and national standards. Included are FEMA and NRT planning guidelines for communities and facilities, DOT Transportation Regulations, various OSHA worker safety guidelines, EPA requirements, and guidance disseminated by the chemical industry.

Objective Identification Legend

IN/ENF-1

This is the identification of the objective used in this document. It matches the identification code used in course assessment references. (See the Training Program Management section of this document.) Decimal numbers (such as IN/ENF-1.1) indicate enabling objectives supporting the primary objective.

Identification

Recommended Training Objectives

-
- | | |
|-------------------|--|
| IN/ENF-1 | Given an overview of prevention concepts and activities (see <i>Prevention Awareness</i>), describe aspects of the hazardous materials prevention system. |
| IN/ENF-1.1 | Describe state and local laws, regulations, and policies that govern hazardous materials inspections and enforcement. |
| IN/ENF-1.2 | Describe prevention strategies, activities, and roles specified in emergency operations and prevention plans. |
| IN/ENF-1.3 | Describe strategies and plans for conducting hazardous materials inspections and enforcement activities. |
| IN/ENF-1.4 | Describe administrative systems and roles for conducting hazardous materials inspections and enforcement activities. |
| IN/ENF-2 | Given key prevention authorities and a range of representative inspection scenarios, identify hazardous materials safety deficiencies and opportunities. |
-

IN/ENF-2.1	<p>Describe the purpose, structure, and content of key federal authorities governing the production, storage, handling, and transport of hazardous materials, including:</p> <ul style="list-style-type: none"> • OSHA's General Safety and Health Provisions (29 CFR 1926.20) • OSHA's Process Safety Management Standard (29 CFR 1910.119) • EPA's Accidental Release Prevention Requirements (40 CFR Part 68) • OSHA's Hazard Communication Standard (29 CFR 1910.1200) • DOT's Hazardous Materials Regulations (49 CFR) • NRT's Integrated Contingency Plan Guidance 	Prevention Training Issues
IN/ENF-2.2	<p>Describe the purpose, structure, and content of state and local hazardous materials prevention ordinances, codes, and standards addressing:</p> <ul style="list-style-type: none"> • Buildings, construction, and fire prevention • Community planning, zoning, and occupancy • Employee safety and accident prevention • Health and environmental concerns 	Prevention Awareness
IN/ENF-2.3	<p>Demonstrate the ability to 1) research and apply prevention authorities and codes to representative hazardous materials operations and situations, and 2) identify related safety deficiencies and opportunities.</p>	Prevention Policy Development
IN/ENF-3	<p>Given prevention strategies and plans, conduct hazardous materials inspections and enforcement activities as assigned.</p>	Community Prevention Program Management
IN/ENF-3.1	<p>Demonstrate the ability to gather data, categorize risks, identify violations, and establish priorities among inspection requirements.</p>	Prevention in Operations
IN/ENF-3.2	<p>Demonstrate the ability to implement hazardous materials inspection procedures, addressing such factors as:</p> <ul style="list-style-type: none"> • Forms, checklists, questionnaires, etc. • Scheduling and planning inspections • Briefing facility managers, operating personnel, transporters, etc. • Gathering inspection data and identifying violations • Identifying safety deficiencies and concerns • Documenting and reporting results 	Design & Plans Review
IN/ENF-3.3	<p>Demonstrate the ability to implement enforcement procedures (consultation, violation notices, citations, personnel actions, audits, legal actions, etc.) designed to ensure compliance with inspection results.</p>	Inspection & Enforcement
		Appendix A: Prevention Authorities
		Appendix B: Training Mandates
		Appendix C: Federal Programs
		Appendix D: OSHA 1910.119



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	-----------------------	--------------------------	---	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Appendix A: Hazardous Materials Prevention Authorities and Statutory Mandates



Haz Mat Prevention Authorities and Statutory Mandates

HAZARDOUS MATERIALS PREVENTION AUTHORITIES AND STATUTORY MANDATES

FEDERAL TRANSPORTATION AUTHORITIES

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act (Public Law 93-633 as amended) is the basic statute pertaining to the transportation of hazardous materials in the United States. The law strengthened regulatory and enforcement activities by providing the Secretary of Transportation with broad authority to set regulations for all modes of transportation. Specifically, the Act:

- Authorized DOT to issue regulations related to placarding, handling, packing, repacking, marking, routing, and labeling;
- Expanded the regulated community to include container manufacturers;
- Authorized establishment of a shipper registration program;
- Provided DOT with authority to conduct surveillance activities and assess penalties; and
- Defined the relationship between federal, state, and local government regulations.

HMTA requires the training of all hazardous materials employees in order to reduce incidents by improving safety awareness. It separated the National Transportation Safety Board from the DOT structure, making it an independent body reporting directly to Congress.

Hazardous Materials Transportation Uniform Safety Act

In 1990, Congress enacted the Hazardous Materials Transportation Uniform Safety Act (HMTUSA, Public Law 101-65 as amended). The statute required that DOT issue rules to:

- Regulate hazardous materials transport in intrastate commerce;
- Create shipping manifests;
- Regulate training for handlers of hazardous materials;
- Require certain hazardous materials carriers to hold safety permits;
- Issue procedures and waivers for preemptions;
- Develop and implement a grant program for local emergency planning and first responder training, and develop a national curriculum;
- Improve hazardous materials identification systems;
- Determine the costs and benefits of a continually monitored emergency response telephone system; and
- Require certain shipper and carrier registration fees.

HMTUSA also required DOT and other organizations to conduct certain studies related to hazardous materials transportation. The law amended HMTA to require the Secretary of Transportation to participate in international forums that establish or recommend mandatory standards and requirements for the transportation of hazardous materials in international commerce.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

Hazardous Materials Regulations

To ensure public safety and minimize risks posed by hazardous materials in transportation, Congress requires the Secretary of Transportation to prescribe regulations for safe transportation of hazardous materials. The *Hazardous Materials Regulations* (49 CFR Parts 171-180) govern the classification, shipper and carrier operations, hazard communication requirements, and packaging and container specifications for the various modes of transportation (air, water, rail, and highway). Related training and incident reporting requirements are also defined. In addition, the regulations explain DOT policies on hazardous materials inspections and enforcement, which focus on compliance with classification, description, marking, labeling, and packaging requirements.

The Hazardous Materials Regulations consist of the following Parts:

- Part 171: General Information, Regulations and Definitions
- Part 172: Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
- Part 173: Shippers—General Requirements for Shipment and Packagings
- Part 174: Carriage By Rail
- Part 175: Carriage By Aircraft
- Part 176: Carriage By Vessel
- Part 177: Carriage By Public Highway
- Part 178: Specifications For Packagings
- Part 179: Specifications For Tank Cars
- Part 180: Continuing Qualifications and Maintenance of Packagings

FEDERAL WORKER PROTECTION AUTHORITIES

Occupational Safety and Health Act of 1970

The *Occupational Safety and Health Act of 1970* (Public Law 91-596, as amended) was designed to assure safe and healthful employment conditions for all workers in the United States. The Act mandates that each employer provide a place of employment that is free from recognizable hazards which may cause death or physical harm. It establishes authority and procedures for the development, promulgation, and enforcement of occupational safety and health standards, including those dealing with toxic materials and harmful physical agents.

Among other purposes, the Act establishes conditions for:

- Encouraging employers and employees in their efforts to reduce occupational safety and health hazards, and to develop and refine related safety programs.
- Authorizing the Secretary of Labor to set mandatory occupational safety and health standards and guidelines for businesses.
- Establishing procedures for inspections, investigations, and enforcement of the standards, including variations, citations, penalties, etc.
- Providing for research in the field of occupational safety and health, and for the development of innovative methods, techniques, and approaches to reduce injuries and exposures on the job.
- Providing grants to encourage states to assume the fullest responsibility for the administration and enforcement of their occupational safety and health laws.
- Establishing medical criteria and reporting procedures to help achieve the objectives of the Act.

Haz Mat Prevention Authorities and Statutory Mandates

Standards promulgated under the Act are intended to address “the use of labels or other appropriate forms of warning as are necessary to insure that employees are apprised of all hazards to which they are exposed, relevant symptoms and appropriate emergency treatment, and proper conditions and precautions of safe use or exposure.” Where appropriate, standards should also prescribe suitable protective equipment, controls or technological procedures, methods for monitoring and measuring employee exposure, and the type and frequency of medical examinations or other tests for persons who may become exposed to hazards.

Process Safety Management

OSHA's *Process Safety Management of Highly Hazardous Chemicals* standard (29 CFR 1910.119) contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, fire, or explosion hazards. Its major objective is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards. The standard covers processes involving listed (highly hazardous) chemicals at specified quantities and flammable liquids or gases in quantities of 10,000 pounds or more (except products used solely for heating or fuel).

The Process Safety Management Standard addresses requirements and nonmandatory guidelines in the following areas, each of which is explained in more detail in Appendix D:

- Employee involvement
- Process safety information
- Process hazard analysis
- Operating procedures and practices
- Employee training
- Contractors
- Pre-startup safety reviews
- Mechanical integrity
- Nonroutine work authorizations
- Managing change
- Investigation of incidents
- Emergency Preparedness
- Compliance audits

Hazard Communication

OSHA's *Hazard Communication Standard* (29 CFR 1910.1200/1926.59) is designed to ensure that the hazards of all chemicals used in the workplace are properly evaluated, and that the resulting information is transmitted to employers and employees. This knowledge will help employers provide safer workplaces, and help employees protect themselves. The result should be a reduction in chemical source illnesses and injuries.

The standard's design is simple. Chemical manufacturers and importers must evaluate the hazards of the chemicals they produce or import. Using that information, they must then prepare labels for containers and material safety data sheets (MSDSs). Manufacturers, importers, and distributors of hazardous chemicals are then required to provide these labels and MSDSs to their customers. Employers that “use” the chemicals must obtain the information and provide it to their own employees through the following activities:

- Identify and list hazardous chemicals in the workplace.
- Obtain MSDSs and labels for each hazardous chemical.
- Develop and implement a written hazard communication program, including labels, MSDSs, and employee training.
- Communicate hazard information and appropriate protective measures to their employees through labels, MSDSs, and formal training programs.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

Safety and Health Program Management Guidelines

Effective management of worker safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their costs. To assist employers and employees in developing effective safety and health programs, OSHA published recommended *Safety and Health Program Management Guidelines* (Federal Register 54(18):3908-3916, January 26, 1989). These voluntary guidelines apply to all places of employment covered by OSHA. The guidelines recommend specific actions under each of four general elements that are critical to the development of a successful safety and health management program:

- Management commitment and employee involvement
- Worksite analysis
- Hazard prevention and control
- Safety and health training

FEDERAL ENVIRONMENTAL SAFETY AUTHORITIES

During the last three decades, general public awareness and concern resulting from major accidents have contributed to the enactment of new laws that establish current federal environmental policy. Hazardous materials prevention policy has been included in and derived from the statutory language of this legislation. Recent laws include:

- Water Quality Improvement Act of 1970
- 1972 Amendments to the Federal Water Pollution Control Act (Clean Water Act)
- Safe Drinking Water Act of 1974
- Toxic Substances Control Act of 1976
- Resource Conservation and Recovery Act of 1976
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Emergency Planning and Community Right-to-Know Act of 1986
- Oil Pollution Act of 1990

Of particular importance in this framework of federal environmental safety and hazardous materials prevention authorities are the Clean Air Act Amendments of 1990 and EPA's Accidental Release Prevention standard.

Clean Air Act Amendments

Section 112(r)(7) of the Clean Air Act Amendments of 1990 (CAAA; Public Law 101-549) mandated that EPA promulgate regulations and develop guidance to prevent and mitigate the consequences of accidental releases to the air of chemicals that pose a significant risk to the public and the environment. The law specified that the regulations cover "the use, operation, repair, replacement, and maintenance of equipment to monitor, detect, inspect, and control such releases, including training of persons in the use and maintenance of such equipment and in the conduct of periodic inspections." In addition to operations, regulations should also address emergency response, storage, recordkeeping, reporting, vapor recovery, and other requirements.

The law requires the owner or operator of a stationary source at which a regulated substance is present in specified quantities to prepare and implement a risk management plan to detect and prevent or minimize accidental releases. The plan must include a hazard assessment of any regulated substance, including an estimate of potential release quantities, possible population exposures, release histories, and an evaluation of worst-case incidents. The law also specifies that EPA describe requirements for employers to develop and implement safety and response programs.

Haz Mat Prevention Authorities and Statutory Mandates

Section 304 of the CAAA required OSHA to promulgate “a chemical process safety standard designed to protect employees from hazards associated with accidental release of highly hazardous chemicals in the workplace” and a “list of highly hazardous chemicals which includes toxic, flammable, highly reactive, and explosive substances.” Congress stressed that the standard should be developed in coordination with EPA, and address, at a minimum, employer requirements for safety information systems, workplace hazard assessments, employee participation, employee information and training, operating procedures, quality assurance programs, maintenance programs, pre-startup safety reviews, management of change, and incident investigations.

Accidental Release Prevention

The Clean Air Act Amendments of 1990 mandated that EPA promulgate regulations and develop guidance to prevent accidental releases to the air of regulated substances and mitigate the consequences of releases that do occur. The resulting rule, *Accidental Release Prevention Requirements: Risk Management Programs Under the Clean Air Act, Section 112(r)(7)* (40 CFR Part 68) focuses prevention measures on chemicals that pose the greatest risk to the public and the environment. Chemical processes are divided into three categories based on the potential for off-site consequences associated with a worst-case accidental release, accident history, and compliance with the requirements of OSHA’s Process Safety Management Standard.

In summary, the owner or operator of a covered process must (1) prepare and submit a risk management plan (RMP), including registration that covers all affected processes and chemicals; (2) conduct a worst-case release scenario analysis, review accident history, and ensure emergency response procedures are coordinated with community response organizations to determine eligibility for Program 1; (3) if eligible, document the worst case and complete a Program 1 certification for the RMP; (4) for Program 2 processes, conduct a hazard assessment, document a management system, implement a more extensive but still streamlined prevention program, and implement an emergency response program; and (5) for Program 3 processes, conduct a hazard assessment, document a management system, implement a prevention program that is fundamentally identical to the OSHA Process Safety Management Standard, and implement an emergency response program.

NATIONAL CODES AND STANDARDS

Uniform Fire Code Article 80—Hazardous Materials

Article 80 of the Uniform Fire Code defines requirements for the “prevention, control, and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials and information needed by emergency response personnel” (80001.1.1). The code applies to all hazardous materials (as defined in Article 2) except when specific requirements are provided in other articles.

General requirements addressed in Article 80 include permits; development of hazardous materials management plans and inventory statements; design, construction, and installation of equipment; handling and transport of hazardous materials; safety information (MSDS forms, identification signs, etc.); and general safety precautions. Storage requirements are then defined in detail for the various hazard categories (compressed gases, flammable solids and gases, organic peroxides, etc.). Finally, section 8004 describes requirements for use, dispensing, and handling of hazardous materials, both for indoor and outdoor applications.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

NFPA 1—Fire Prevention Code

The Fire Prevention Code developed by the National Fire Protection Association (NFPA) “prescribe(s) minimum requirements necessary to establish a reasonable level of fire safety and property protection from the hazards created by fire and explosion. The scope covers the construction, maintenance, and use of property to the extent that such is not covered by existing NFPA codes and standards.” The document is intended to provide jurisdictions with a guideline for the development of a local fire prevention code.

Parts I-IV of NFPA 1 describe general fire prevention requirements, which serve to reduce the risk of fire as a cause of or contributing factor in hazardous materials accidents. Areas addressed include the administration and enforcement of fire prevention programs (recordkeeping and reporting, owner/occupant responsibilities, permits and approvals, etc.); general fire safety requirements (construction, systems and equipment, automatic sprinklering, alarm systems, etc.); and occupancy fire safety requirements (day-care facilities, health care centers, hotels, etc.).

Part V—Special Processes and Material Handling—describes specific hazardous materials requirements, which have been organized by hazard category or application type. The following sections are of particular importance for hazardous materials prevention:

- Chapter 27—Hazardous Materials and Chemicals
- Chapter 28—Flammable and Combustible Liquids
- Chapter 30—Liquefied Petroleum Gases/Liquefied Natural Gases
- Chapter 33—Spray Application Using Flammable and Combustible Materials
- Chapter 35—Dust Explosion Prevention
- Chapter 39—Combustible Fibers

Haz Mat Prevention Authorities and Statutory Mandates

BUILDING CODES

Most jurisdictions base their building codes on “model” codes developed by the Building Officials and Code Administrators (BOCA), the Southern Building Code Congress International (SBCCI), or the International Conference of Building Officials (ICBO). For example, the BOCA National Building, Property Maintenance, and Fire Prevention Codes address safety issues and standards in the construction and operation of buildings, including the administration, organization, and enforcement of related regulations by state and local government units. The three organizations have formed a joint effort, the International Codes Council (ICC), and are working to develop a single International Code that will eventually replace the separate codes.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	-----------------------	--------------------------	------------------------------------	--------------------------------------	------------------------------	---------------------------

**Hazardous Materials
 Prevention Training Guidelines**

**Appendix B:
 Hazardous Materials
 Prevention Training
 Requirements**



Haz Mat Prevention Training Requirements

OSHA Training Requirements

Many standards promulgated by OSHA explicitly require employers to train employees in the safety and health aspects of their jobs. Other OSHA standards make it the employer's responsibility to limit certain job assignments to employees who are "certified," "competent," or "qualified," meaning that they have had special training in or out of the workplace. These requirements reflect OSHA's belief that training is an essential part of every employer's safety and health program for protecting workers from injuries and illnesses.

General industry training requirements related to hazardous materials prevention are contained throughout 29 CFR Part 1910, addressing, for example, personal protective equipment, employee emergency plans, and fire protection. Other hazardous materials training requirements can be found in standards developed for specific industrial sectors, e.g., maritime (Parts 1915, 1917, 1918), construction (Part 1926), and agriculture (Part 1928).

The Hazard Communication Standard (29 CFR 1910.1200) requires employers to establish training and information programs for employees exposed to hazardous chemicals in the workplace. Training, which must be conducted at the time employees are initially assigned and whenever a new hazard is introduced, should address the following elements:

- How the hazard communication program is implemented in the workplace, and how employees can obtain and use the available hazard information.
- How to read and interpret information on labels and MSDSs.
- The hazards of all chemicals in the work area, and measures employees can take to protect themselves.
- Specific procedures put into effect by the employer to provide protection, such as engineering controls, work practices, and personal protective equipment (PPE).
- Methods and observations—such as visual appearance or smell—that workers can use to detect the presence of hazardous chemicals to which they may be exposed.

Under this rule, an employer can provide employees information and training through whatever means are found to be appropriate and protective. Employee training may be satisfied in part by general training by, for example, trade associations, unions, colleges, and professional schools. In addition, previous training, education, and experience of workers may relieve the employer of some requirements under this regulation. Regardless of the method chosen, however, the employer is always ultimately responsible for ensuring that employees are adequately trained.

OSHA's *Process Safety Management of Highly Hazardous Chemicals* standard (29 CFR 1910.119) identifies additional training requirements for employers with large-scale chemical processes as defined in the regulation. The requirements cover subjects such as an overview of the process, safety and health hazards, operating procedures and safety work practices, emergency operations including shutdown, routine and nonroutine work authorization activities, and other areas pertinent to process safety and health. Refresher training should be provided at least every three years, and more often if necessary. Employers are further required to document that each covered employee has received and understood the training required under the standard. Separate but similar training requirements are specified for contract employees.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention
Operations
inDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

Haz Mat Prevention Training Requirements

In this standard, OSHA has adopted a performance-oriented approach to training. Employers can determine the amount of training and the content of the training program that best reflects the operation's complexity and the experience and necessary skill level of their employees. A minimum number of training hours is not specified, and previous training and experience can be recognized if the employer certifies in writing that employees have the required knowledge, skills, and abilities to safely carry out their duties and responsibilities. (Note: essentially similar training requirements are identified in EPA's *Accidental Release Prevention Requirements: Risk Management Programs* (40 CFR Part 68) for designated facilities.)

Transportation Training Requirements

Federal transportation law requires the training of all hazardous materials employees, defined as persons who directly affect hazardous materials transportation safety. The term includes employees and self-employed individuals who:

- Load, unload, or handle hazardous materials;
- Test, recondition, repair, modify, mark, or otherwise represent packagings as qualified for use in the transportation of hazardous materials;
- Prepare hazardous materials for transportation;
- Have responsibility for the safety of transporting hazardous materials; or
- Operate a vehicle used to transport hazardous materials.

Instruction should increase the employee's awareness of safety and ability to perform assigned functions, thereby reducing the number and severity of hazardous materials incidents. Training should include a systematic program that ensures that hazardous materials employees have familiarity with the general provisions of the Hazardous Materials Regulations (49 CFR Parts 171-180), are able to recognize and identify hazardous materials, have knowledge of specific regulatory requirements applicable to their job functions, and have knowledge of emergency response information, self-protection measures, and accident prevention methods and procedures.

Each hazardous materials employer is responsible for training and testing workers, certifying that they can perform their assigned duties, and developing and retaining records of current training. Instruction must include general awareness/familiarization, function-specific, and safety training. Driver training is also required for hazardous materials employees who will operate a motor vehicle. In addition, the regulations prescribe modal-specific training requirements for the individual modes of transportation (air, vessel, highway, etc.) in 49 CFR Parts 174-177.

The regulations define requirements and exceptions for initial training and recurrent or refresher training, required at least once every three years. Relevant training received from a previous employer or source may be used to satisfy the requirements, provided a current record of training is obtained from the previous employer or source. Employers are required to develop and retain training records for the preceding three years, to include at a minimum:

- Hazmat employee's name
- Completion date of most recent training
- Training materials (copy, description, or location)
- Name and address of hazmat trainer
- Certification that the employee has been trained and tested

Haz Mat Prevention Training Requirements

Environmental Safety Training Requirements

The Clean Air Act Amendments of 1990 (Public Law 101-549) authorized EPA to promulgate regulations that require the owner or operator of regulated facilities (stationary sources) to prepare a risk management plan which identifies employee training measures. At a minimum, the standard would require employers to:

- Provide written safety and operation information to employees and train employees in operating procedures, emphasizing hazards and safe practices;
- Train and educate employees and contractors in emergency response; and
- Establish maintenance systems for critical process-related equipment, including employee training to ensure ongoing mechanical integrity.

In response to this legislative mandate, EPA promulgated the *Accidental Release Prevention Requirements: Risk Management Programs Under the Clean Air Act, Section 112(r)(7)* (40 CFR Part 68). This rule identified training requirements for Program 3 processes (Section 68.71) that are identical to the OSHA Process Safety Management standard, with minor wording changes to address statutory differences. The requirements address initial training, refresher training, employer certification, and training documentation for larger and more complex hazardous materials operations.

Section 68.54 of the EPA standard describes a streamlined version of OSHA training requirements for Program 2 sources, which generally have more simple processes and fewer employees involved in hazardous materials operations. The primary difference is that training documentation requirements identified for Program 3 processes have been dropped. The rule specifically states that training conducted to comply with other federal or state regulations or industry codes, or training conducted by equipment vendors, may be used to demonstrate compliance if the training covers the standard operating procedures (SOPs) for the process. Workers must be retrained when SOPs are revised as a result of a major change in operations.

The EPA Accidental Release Prevention standard does not specify safety training requirements for Program 1 processes. Program 1 is available to any process that has not had an accidental release with offsite consequences in the five years prior to the submission of the risk management plan and has no public receptors within the distance to a specified toxic or flammable endpoint associated with a worst-case release scenario.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119



Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	-----------------------	--------------------------	------------------------------------	-------------------------------	-------------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

Appendix C: Organizational Structure for Hazardous Materials Prevention



Organizational Structure for Haz Mat Prevention

ORGANIZATIONAL STRUCTURE FOR HAZARDOUS MATERIALS PREVENTION

[Note: The following material, which summarizes government agency programs in hazardous materials prevention, is derived from "A Review of federal Authorities for Hazardous Materials Accident Safety: Report to Congress Section 112(r)(10) Clean Air Act As Amended," prepared in coordination with the National Response Team by the Chemical Emergency Preparedness and Prevention Office of EPA. The material will be reviewed and updated during the national review of these draft Curriculum Guidelines.]

Primary responsibility for the development and implementation of accident prevention measures at the federal level is within DOT, including the U.S. Coast Guard; OSHA within the Department of Labor and EPA. The NRC also maintains regulatory responsibilities for source, by-product, and special nuclear materials. Some of the statutes and regulations administered by NRC, in conjunction with FEMA, particularly in the areas of planning and response to significant radioactive materials emergencies, are discussed in this review. Other laws and regulations pertinent to the safety of commercial nuclear power plants were not considered within the scope of this analysis. Food and Drug Administration authorities for consumer-related hazardous materials safety were not considered within the scope of this review.

DOT/Research and Special Programs Administration (RSPA)

The administering body for hazardous materials safety within DOT is the Research and Special Programs Administration. The Hazardous Materials Transportation Act (HMTA) of 1975 gave DOT umbrella authority for developing hazardous materials transportation safety policy. It enabled the Office of Hazardous Materials Safety to develop policies pertinent to all modes of transportation. HMTA authorized the Secretary to issue regulations for the safe transportation in commerce of hazardous materials. The Hazardous Materials Transportation Uniform Safety Act (HMTUSA) of 1990 expanded DOT's hazardous materials safety responsibilities and clarified certain provisions contained in the original HMTA.

RSPA Prevention and Regulatory Programs. RSPA's Office of Hazardous Materials Safety has primary responsibility for regulating the transport of hazardous materials across all modes except pipelines. Because of the multiple points of exposure during transportation and the potential for exposure to hazardous material handlers and first responders, the primary goal of these regulations is to prevent accidents from occurring. A secondary goal is to ensure that response personnel can easily identify the materials, so that the appropriate actions and precautions can be taken if an accident does occur. The regulations address: criteria for classifying risks of materials being transported; identification through proper labeling and manifesting of what is being transported; containerization and packaging for transport; handling of hazardous materials in loading and unloading; and procedures for accident notification and follow-up reports.

Federal hazardous materials regulations (except for penalties and specific relief provisions) apply to all agencies of the Federal government with the exception of the U.S. Postal Service. They also apply to all contractors used by Federal government agencies.

RSPA's Office of Pipeline Safety oversees the safe transportation of natural gas to 55 million residential and commercial customers, and the environmentally sound transportation of 25 percent of the nation's intercity freight, more than 605 billion ton miles of petroleum and other hazardous materials by pipeline. This office has jurisdiction over more than 2,000 gas pipeline operators and 155,000 miles of pipeline that transport hazardous liquids, and is authorized under the Natural Gas Pipeline Safety Act of 1968 and the Hazardous Liquid Pipeline Safety Act of 1979 (HLPSA). Following enactment of the Oil Pollution Act of 1990, the Department delegated responsibility for spill prevention and containment of oil

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Organizational Structure for Haz Mat Prevention

and hazardous substances from pipelines to RSPA. These responsibilities, defined under the Federal Water Pollution Control Act, further expand the role of RSPA in environmental protection, and cover categories of pipelines currently excepted by the HLPESA or regulations adopted thereunder. Pipeline safety regulations cover criteria for pipe design, joining of materials, construction, customer meters, service regulators and service lines, corrosion control, testing, upgrading, operations, and maintenance. Enforcement of the regulations is shared by 244 State and 24 Federal inspectors.

RSPA Enforcement. RSPA has the primary federal responsibility for enforcing hazardous materials regulations for transportation. RSPA's enforcement process includes random inspections of packaging manufacturers, shipper and carrier facilities, and investigations of accidents and incidents involving hazardous materials. In addition to RSPA's enforcement program, the DOT modal administrations (Federal Highway Administration, Federal Aviation Administration, Federal Railway Administration, and U.S. Coast Guard) and the states also enforce the hazardous materials regulations.

RSPA Training. More recent initiatives, developed in response to HMTUSA, are focusing on providing grants for emergency preparedness planning to states and grants for emergency response training to states and Native American tribes. The Office of Hazardous Materials Safety is administering a planning and training grant program assisted by other federal agencies, including FEMA, EPA, DOE, OSHA, NIEHS and the Bureau of Indian Affairs. DOT also offers training through the Transportation Safety Institute and prepares and distributes training modules and other materials. In addition, the Federal Highway Administration provides funds for training to states.

DOT/U.S. Coast Guard

USCG Regulatory Programs. The Coast Guard maintains regulatory authority for bulk carriers by water transport. Because authority for transportation by navigable waters has historically been a federal responsibility, the Coast Guard exercises a unique and broad authority over the shipping industry. In general, its application of an "umbrella" regulatory structure controls vessel design, operations, pollution prevention, personnel qualification, and a number of other categories. Domestic and foreign vessels operating on the navigable waters of the United States are required to have proper licensing and documentation in order to operate, and in the case of commercial vessels, to take part in their trade. The Coast Guard is responsible for issuing these certificates and endorsing certificates issued by international organizations.

Among the provisions administered by the Coast Guard are regulations concerning:

- The boundaries for Coast Guard jurisdiction;
- Specific requirements for obtaining waivers to inspection laws and regulations;
- The transportation of hazardous materials in vessels, including the carriage of explosives, and port and waterway safety;
- The prevention of pollution from ships and the enforcement of waste reception facility requirements;
- The prevention of oil discharges into the navigable waters of the U.S.;
- The protection and security of vessels, harbors and waterfront facilities;
- Dry bulk waterfront facilities; and
- The oversight of and prevention of unlawful dumping or transportation of materials for dumping into the ocean (the EPA exercises most of the regulatory authority over this activity).

The Ports and Waterways Safety Act of 1972 provides for the establishment, operation, and maintenance of vessel traffic services, the control of vessel movement, among other matters, and the establishment of vessel operating requirements. The act allows for field level controls that, if not appropriately applied, would result in an unacceptable hazard to the environment or property. Orders regarding these matters can be issued only by the Captain on the Port or the cognizant District Commander.

Organizational Structure for Haz Mat Prevention

The Federal Water Pollution Control Act (FWPCA), as amended, delegates to the Coast Guard the enforcement authority and responsibility in cases where oil and hazardous substances are discharged in harmful quantities. The Coast Guard is also tasked with enforcement of the Act to Prevent Pollution From Ships, which is the implementation of the international MARPOL protocol. The Coast Guard also conducts surveillance of Ocean dumping as mandated in the Marine Protection, Research, and Sanctuaries Act of 1972.

USCG Enforcement. Inspection, compliance, and enforcement are cornerstones to the Coast Guard's prevention programs. The Officer in Charge of Marine Inspections exercises considerable power in his/her port and is responsible for:

- Inspection of vessels and facilities to determine compliance with applicable laws, rules and regulations related to construction, equipment, manning, and operation;
- Shipyard inspections;
- Factory inspections of materials and equipment;
- Licensing, certification, shipment and discharge of seamen;
- Investigation of marine casualties and accidents;
- Pollution prevention;
- Investigations of violations of the law;
- Negligence, misconduct, unskillfulness, incompetence of persons holding licenses, certificates or documents issued by the Coast Guard;
- Initiations of actions seeking suspension or revocation of licenses; and
- Presentation at hearings held by Administrative Law Judges concerning these cases.

New vessels, foreign vessels, waterfront transfer and storage facilities, tankers, and a variety of other vessels are all required to be inspected by the Coast Guard. Certificates of inspection are issued and grant specific rights to each ship. Each class of vessel has unique inspection regulations based on the type of vessel it is and the specific cargo that it carries.

If any equipment is found not to be in compliance with applicable regulations, a form is issued to the master, owner, or operator which details the problems and mandates the specific circumstances that the cited deficiencies must be corrected. Any vessel may be inspected/reinspected. Certificates of inspection may be revoked if the vessel is found not to comply with the terms of the vessel's certificate of inspection. A vessel or facility may be exempted from complying with any specific regulation by the Commandant.

Investigations are conducted after a marine casualty to determine cause and to determine appropriate proceedings to be taken against those responsible. Investigating officers have the power to administer oaths, subpoena witnesses, etc. At the conclusion of an investigation, recommendations are forwarded to Coast Guard Headquarters program managers for review and further action as appropriate. In investigations where criminal liability is alleged, the case is referred to the U.S. Attorney General for prosecution.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

Organizational Structure for Haz Mat Prevention

Administrative punishments are intended to be remedial, not penal, with the goal of maintaining competence and safety in the field. Initial recommendations to revoke licenses are set forth by the investigating officer. Investigations are initiated if it appears that the holder of the license was negligent in some manner. An investigating officer can accept voluntary surrender of a license. Upon completion of a case investigation, the case is forwarded to an Administrative Law Judge, who holds hearings and adjudicates the cases.

Prior to the Federal Water Pollution Control Act of 1972, the Coast Guard did not have the kind of authority it needed to enforce against discharges. The Ports and Tanker Safety Act of 1978 expanded many equipment and operating requirements for vessels, with emphasis on tank vessels to coincide with many international initiatives, such as agreements reached by the International Maritime Organization.

Coast Guard Organization. The Coast Guard maintains 47 Captain of the Port operations. The functions performed by the Coast Guard at each of these locations include: port security, port safety, facility inspections, personnel/merchant mariners documentation, vessel inspections and accident response and investigation.

Like other transportation modes, the Coast Guard's program is predicated upon prevention. However, unlike other transportation authorities, because of the history, mission, and unique resources of the Coast Guard, it maintains and is responsible for a total safety system including accident prevention, preparedness, and response.

Other Modal Administrations

Federal Aviation Administration (FAA). The FAA regulates air commerce, controls the use of airspace, and operates air navigation facilities and a common system of air traffic control and navigation for both civil and military air craft. The Administrator issues and enforces rules, regulations, and minimum standards relating to the manufacture, operation, and maintenance of aircraft, as well as the rating and certification of airmen and the certification of airports. The agency performs flight inspection of air navigation facilities in the U.S. and as required, abroad. It also enforces regulations under the Hazardous Materials Transportation Act applicable to shipments by air and investigates accidents involving air carrier.

Federal Highway Administration (FHWA). The FHWA seeks to coordinate highways with other modes of transportation to achieve the most effective balance of transportation systems and facilities. Under the authority of the motor carrier safety provisions, the agency exercises Federal regulatory jurisdiction over the safety performance of all commercial motor carriers engaged in interstate or foreign commerce. The FHWA has jurisdiction over the safe movement on U.S. highways of dangerous cargoes such as hazardous wastes, explosives, flammables, and other volatile materials, and deals with more than 185,000 carriers and approximately 25,000 shippers of hazardous materials.

The FHWA conducts safety reviews at carriers' facilities to determine their safety performance; all carriers must comply with Federal safety regulations specifying safe operating practices. Compliance reviews are conducted to follow up on problem areas identified during safety reviews. These reviews may lead to prosecution or other sanctions against violators of the Federal motor carrier safety regulations or the hazardous materials transportation regulations.

The FHWA works with states and local government enforcement officers to enforce regulations affecting interstate transportation. It provides grants to assist the states and local governments in enforcing those regulations and encourages states to adopt regulations compatible with federal standards.

Organizational Structure for Haz Mat Prevention

Federal Railroad Administration (FRA). The FRA promulgates and enforces rail safety regulations, administers railroad financial assistance programs, conducts research and development in support of improved railroad safety and national rail transportation policy, provides for the rehabilitation of Northeast Corridor rail passenger service, and consolidates government support of rail transportation activities. The FRA administers and enforces regulations resulting from the Railroad Safety Act and transportation of explosives and other hazardous materials under the Hazardous Materials Transportation Act, and the reporting and investigation of railroad accidents.

National Transportation safety Board (NTSB)

The National Transportation Safety Board is an independent agency that originated within the U.S. Department of Transportation (DOT). Congress passed an Act in 1975, giving the Board increased authority in accident investigation and severing its ties with DOT. The Board’s mission is to determine the “probable cause” of transportation accidents and to formulate safety recommendations to improve transportation safety.

DOL/Occupational Safety and Health Administration (OSHA)

Authority for worker protection and hazardous materials prevention programs is housed in the Occupational Safety and Health Administration (OSHA), established within the Department of Labor in 1970. The Occupational Safety and Health Act (OSH Act) gives OSHA authority to promulgate its hazardous materials regulations. In addition, SARA and the 1990 Clean Air Act Amendments included OSHA requirements. OSHA’s regulatory system is one which has developed requirements that apply to safety of all industries. OSHA promulgates regulations, inspects workplaces, enforces regulations, conducts workplace safety and health training, disseminates information, collects data, and investigates workplace accidents.

OSRA Regulatory Programs. The specific OSHA hazardous materials program includes standards for: the handling and storage of liquids that are flammable and combustible and of certain chemicals that are reactive and unstable; the design, installation, and use of storage tanks; fire protection within a facility; firefighting operations, including training and equipment; emergency preparedness and evacuation plans; permissible exposure limits for more than 600 air contaminants; employee access to medical records of their workplace exposures to toxic substances or harmful physical agents; medical services and first aid; protection of workers engaged in hazardous waste operations; respiratory protection; use of personal protective equipment; communication of information about hazardous chemicals, including the important requirement that employers train workers in the precautions needed to minimize the risk of potentially dangerous exposures; and, the control of hazardous energy sources, also known as lockout/tagout. OSHA recently issued its chemical process safety standard requiring employers to conduct hazard assessments of chemicals and chemical processes and to develop programs to manage these risks including the training of workers. For hazards not addressed by a particular standard, OSHA enforces the “General Duty Clause” of the OSH Act, which requires employers to provide a place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm to employees.

OSHA Organization, Accident Investigation and Enforcement. The OSH Act encourages States to develop and operate, under Federal OSHA guidance, State job safety and health plans, including plans for hazardous materials. Once a State plan is approved, OSHA funds up to 50 percent of the program’s operating costs, and the State’s programs must be at least as effective as the Federal OSHA program. Twenty-five States (including two territories) have OSHA-approved programs. Twenty-three state plans cover both private and public sector employees. Two state plans cover public sector only.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Organizational Structure for Haz Mat Prevention

OSHA investigates all serious workplace accidents involving chemical releases to determine whether there has been a violation of the OSH Act or of any regulations under that Act; and to determine whether changes are needed in the OSHA program.

Under the OSH Act, OSHA is authorized to conduct workplace inspections. OSHA inspections, in order of priority, include: imminent danger situations; to catastrophes and fatal accidents; employee complaints of violations of standards; and planned inspections of high of high-hazard or targeted industries, including the chemical industry. OSHA is also authorized to issue citations for violations of OSHA regulations and to assess penalties. In 1990 and 1991, OSHA issued unprecedented multimillion dollar penalties against several chemical companies which had willfully violated OSHA regulations. Section 4(b)(1) of the OSH Act is specifically designed to avoid duplication and overlap of federal safety and health regulations. Under section 4(b)(1), OSHA is preempted from applying its regulations to working conditions addressed by other federal agency regulations.

OSHA has placed increased emphasis on chemical accident prevention in the last two to three years. In 1990, OSHA initiated its Special Emphasis Program in the petrochemical industry (PetroSEP), by selecting 28 corporations for inspection. This program targeted corporations of more than 2,500 employers where most petrochemical facilities exist, within the three primary SIC Codes — 2821 (plastic materials), 2869 (industrial organic chemicals), and 2911 (petroleum refineries). In addition, OSHA has increased its coordination with other federal agencies, in particular, with EPA, which led to a Memorandum of Understanding governing coordination, sharing information and data, and cooperating in certain enforcement actions in the PetroSEP program. OSHA has supported public and worker training programs at its training facility in Illinois, and has provided materials to the public.

OSHA Training. Although the Occupational Safety and Health Act of 1970 does not address specifically the responsibility of employers to provide safety and health training to employees, Section 5(a)(2) does require that each employer "...shall comply with the ...standards promulgated under this Act." OSHA standards that contain training requirements for emergency prevention, preparedness, and response cooperations include the Process Safety Management Standard, mentioned above, the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER), and the Hazard Communication Standard.

Under the Hazard Communication Standard, employers must establish a training and information program for employees exposed to hazardous chemicals in their work area at the time of initial assignment and whenever a new hazard is introduced. OSHA's HAZWOPER standard covers workers employed in clean-up operations at uncontrolled hazardous waste sites and at waste treatment, storage and disposal facilities licensed by EPA under the Resource Conservation and Recovery Act (RCRA). The standard also covers workers responding to emergencies, including those involving hazardous materials (e.g., spills). State, county and municipal workers such as police, ambulance workers, and firefighters with local fire departments, are covered by the regulations issued by the 23 states that have their own safety and health programs. EPA regulations cover such employees in the other states.

EPA Hazardous Materials Organization

EPA Organization. A number of different federal environmental statutes establish the regulatory framework for hazardous materials safety for communities and the environment. Safety programs and standards, which address prevention, have been included within statutory language that is often intended to address general environmental degradation, rather than accidents in particular. EPA authority for contingency planning and emergency response is primarily from specific language and statutes, e.g., CERCLA, EPCRA, and OPA, which also contain other provisions for long-term problems.

Organizational Structure for Haz Mat Prevention

The organization of safety programs at EPA is complex. This is due, in part, to the Agency's current structure, which organizes programs by environmental medium, typically by statute, and in part to the fragmentation of safety provisions in multiple laws. The fragmentation occurs when organizational structures are designed to accommodate statutes while sometimes de-emphasizing management of programs by function.

EPA administers hazardous materials safety provisions primarily through two offices within its Office of Solid Waste and Emergency Response. These two offices are: the Chemical Emergency Preparedness and Prevention Office (CEPPO), and the Office of Emergency and Remedial Response (OERR). Each office manages programs under multiple statutes. CEPPO is primarily responsible for regulations and programs under the 1986 Emergency Planning and Community Right to Know Act (EPCRA), for accident prevention provisions under §112(r) of the Clean Air Act, for EPA's responsibilities under HMTUSA, and for overall emergency coordination within EPA, including acting as chair of the National Response Team (NRT) and National Incident Coordination Team (NICT), the EPA intra-agency emergency coordination mechanism. OERR is responsible for regulatory and response functions required by CERCLA and SARA, and for EPA response to oil spill incidents under the Oil Pollution Act. Specific OERR responsibilities include: reviewing and approving facility Response Plans as required by the Oil Pollution Act (OPA), developing and writing revisions to the National Contingency Plan; developing prevention activities for fixed oil facilities under the Clean Water Act as amended by OPA; development of reportable quantities regulations; training for state and local first responders; developing and maintaining the Emergency Response Notification System; and response to oil spills and other emergencies in the inland zone. OERR also administers remedial programs under CERCLA.

In addition to its regulatory functions, CEPPO undertakes compliance and guidance programs under various statutory authorities. These programs are designed to support state and local planners and to encourage industry, states and local communities in improving accident prevention, preparedness, and response efforts. Among these efforts are its Accidental Release Information Program; the Chemical Safety Audit Program under CERCLA authorities, which assists industry through facility visits in improving safety practices, technologies and techniques; and CAMEO, the EPA/NOAA computer software designed to aid in emergency planning and response at the state and local levels.

Two other offices within the Office of Solid Waste and Emergency Response have significant responsibility with respect to hazardous materials that affect safety. The Office of Solid Waste is responsible for developing and administering standards under RCRA. Permitting standards for hazardous waste management facilities, for instance, serve to reduce the probability of accidents. Similarly, the Office of Underground Storage Tanks develops and manages technical standards under Subtitle I of RCRA for underground storage of oil and hazardous substances. Both offices also manage corrective action programs for solid waste management units and leaking underground storage tanks.

The Office of Pesticides, Prevention and Toxic Substances manages EPA's system of registering new chemicals for commercial use under authority of the Toxic Substance Control Act (TSCA), and annually tracks emergency and non-emergency toxic releases as required by EPCRA through the Toxic Release Inventory. Through a registration system for potentially new chemical products, EPA receives some 3,000 to 4,000 premanufacturing notices annually. TSCA also requires immediate notification when accidental releases of a toxic chemical present a substantial risk of injury to health or the environment. This office is also responsible for administering programs under the Federal Insecticide, Fungicide, and Rodenticide Act with regard to pesticide safety and worker protection.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

Organizational Structure for Haz Mat Prevention

EPA's Office of Air and Radiation manages programs under the Clean Air Act and leads the EPA response to radiological accidents under the FRERP. Also, through the FRERP, OAR leads the federal response to accidents involving naturally-occurring and accelerator-produced radioactive materials and foreign sources of radiological materials. Recent examples are the 1979 crash of the USSR's nuclear powered COSMOS satellite in Canada, and the 1986 Chernobyl nuclear reactor accident in the Ukraine. Although the FRERP was not activated for these incidents, using the most recent revisions it would be for similar incidents. For smaller radiological incidents which do not require a coordinated federal response, this Office responds with the Office of Solid Waste and Emergency Response using the National Contingency Plan, as occurred in the clean-up of a radium chemical company in Bronx, NY. The Office of Air Quality Programs and Standards develops and implements technical standards under the Clean Air Act to prevent or reduce emergency and non-emergency releases of hazardous materials. Like RCRA standards, those air standards serve, by regulating industry practices, to reduce the probability that accidents will occur.

The Office of Water at EPA, the regional offices, and delegated states, using Clean Water Act authority, establish permitting requirements, and set standards to control the release of pollutants to surface water and to municipal wastewater treatment plants. This Office also contributes to response actions that affect wetlands, coastal areas, and oceans, and overseas implementation of the Safe Drinking Water Act.

As addressed in more detail in Chapter 4, numerous statutory and non-statutory lists of hazardous materials are managed by EPA programs. These lists form the way EPA requirements for accident prevention, preparedness, and response are developed and implemented. The lists, however, have multiple purposes and contain different listed materials based on varying criteria and statutory mandates. All of the Offices described manage lists. These lists do not currently serve an integrated function in terms of data management or regulatory development for accident safety. EPA is developing an electronic Registry of Lists under its Office of Policy, Planning and Evaluation to facilitate integration.

Most of EPA's prevention, preparedness, and response regulations, programs and activities require technical expertise and support for development and implementation. In addition, DOT draws on EPA expertise and information in the development of some of its regulations, particularly for hazard classification.

EPA Regional Organization and Enforcement. Within the ten EPA regional offices, implementation of hazardous materials safety provisions mentioned above is typically divided differently among offices. Regional Administrators have primary responsibility for implementing how their region will administer new regulations and programs. Typically, the regions will assign implementation authority to a media office responsible for a given statute. Because hazardous materials safety regulations have been promulgated under a variety of laws, it is increasingly awkward for EPA to administer its safety programs at the regional level, as well as at headquarters, with its current organizational structure.

EPA statutes also include clauses pertinent to adoption of its laws and/or regulations by the states. EPA statutes generally allow states' adoption and expansion of environmental statutes, provided that the federal standards are the minimum. Unlike the funding programs for the states used by OSHA, federal funding may or may not be provided to the states for implementation.

EPA Training. Training courses for first responders are offered by the Environmental Response Team and through the Regional programs. EPA participates with FEMA, OSHA, and DOT, among others on the Training Committee of the National Response Team in the review and development of courses for contingency planning and responses. Further, EPA develops courses to implement its prevention responsibilities.

Organizational Structure for Haz Mat Prevention

Nuclear Regulatory Commission (NRC)

The Nuclear Regulatory Commission controls the handling of nuclear materials through an extensive licensing and regulatory program. This program includes several different requirements for responsible parties to immediately report releases of radionuclides.

The extent of the Commission’s regulatory jurisdiction is limited to certain types of nuclear materials and to certain parties who may handle these materials. First, the Commission only licenses source, byproduct, and special nuclear material as defined by the Atomic Energy Act. The Commission does not license naturally-occurring and accelerator-produced radioactive materials, although exposure to naturally-occurring radioactive materials may be subject to Commission regulation when they are associated with sources, byproduct, or special nuclear material being used under an active license. Second, the Atomic Energy Act exempts certain activities of the Department of Energy and the Department of Defense involving source, byproduct, and special nuclear materials from Commission license requirements.

The Nuclear Regulatory Commission exercises its statutory authority by imposing a combination of design criteria, operating parameters, and license conditions at the time of construction and licensing. It assures that the license conditions are fulfilled through inspection and enforcement. The Nuclear Regulatory Commission and the states that entered into agreement with the Nuclear Regulatory Commission to assume the regulations of certain programs license more than 20,000 users of radioactive materials.

The NRC and the Department of Transportation (DOT) share responsibility for regulating the transportation of licensed radioactive materials. The NRC regulates the design, construction, use, and maintenance of packagings for larger quantities of radioactive materials. The DOT regulates the carriers of radioactive material, and requires carriers to report to DOT any suspected radioactive contamination involving shipment of radioactive material. The NRC is also responsible for regulating the safeguarding of designated shipments to assure security of nuclear material against theft or sabotage.

Bureau of Alcohol, Tobacco, and Firearms (ATF), Department of Treasury

The Bureau of Alcohol, Tobacco, and Firearms (ATF) has the authority under 18 U.S.C. 40 “to protect commerce from interruption by reducing the hazards to persons or property arising from the misuse and unsafe or insecure storage of explosives.” ATF regulates “any chemical compound mixture or device having a *common or intended* (emphasis added) purpose of functioning by explosion” by licensing manufacturers. The Bureau also prescribes by regulation the configuration, construction, and location of storage magazines. Section 846 of 18 U.S.C. authorizes the Bureau to inspect any accident or fire when there is any reason to believe that explosive materials were involved. The Bureau maintains four teams and responds within 24 hours of an incident. ATF coordinates closely with DOT and DOD on classification of explosives, and with other appropriate agencies on storage.

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) provides extensive guidance, technical and/or financial assistance to State and local governments for emergency preparedness activities which include: planning, training, exercising, mitigation, and information sharing. Under Presidential Executive Order, FEMA has the responsibility to establish overall policies for emergency planning by Federal agencies. It may assess the plans of those agencies and may recommend to the President changes, if necessary.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119

Organizational Structure for Haz Mat Prevention

FEMA is a member of the National Response Team and the Regional Response Teams, which coordinate hazardous materials emergency preparedness, response, and assistance activities among federal agencies, States, and local governments. FEMA may provide advice and assistance to the on-scene coordinator during an emergency regarding temporary or permanent relocation of citizens. FEMA administers the Emergency Broadcast System and a National Warning System which are used by governors and mayors to warn of disasters and communicate with the community in natural and technological emergencies. FEMA also administers an extensive program for emergency management training of State and local personnel through its Emergency Management Institute. Eighteen programs, currently managed under FEMA's Comprehensive Cooperative Agreement (CCA) provide funding and technical assistance to State and local governments for emergency management. Five of these programs provide for technical assistance only. FEMA also supports EPA in the implementation of activities under the Emergency Planning and Community Right to Know Act and DOT under the Hazardous Materials Transportation and Uniform Safety Amendments of 1990.

The U.S. Fire Administration within FEMA, coordinates federal activities related to fire protection in the following areas: fire policy and coordination, firefighter health and safety, fire data and analysis, and fire prevention and arson control. USFA works with federal, State and local governments, fire service organizations, and the private sector to minimize losses of life and property. The USFA may investigate major fire incidents to make recommendations concerning fire safety and prevention. The USFA also provides hazardous materials response training to firefighters.

Prevention Training Issues	Prevention Awareness	Prevention Policy Development	Community Prevention Program Management	Prevention in Operations	Design & Plans Review	Inspection & Enforcement	Appendix A: Prevention Authorities	Appendix B: Training Mandates	Appendix C: Federal Programs	Appendix D: OSHA 1910.119
----------------------------	----------------------	-------------------------------	---	--------------------------	-----------------------	--------------------------	------------------------------------	-------------------------------	------------------------------	---------------------------

Hazardous Materials

Prevention Training Guidelines

**Appendix D:
OSHA Process Safety
Management Standard
1910.119**



OSHA Process Safety Management Standard 1910.119

OSHA PROCESS SAFETY MANAGEMENT STANDARD 1910.119 APPENDIX C NONMANDATORY GUIDELINE

This material was developed by OSHA as a nonmandatory guideline to assist employers and employees in complying with the requirements of 29 CFR 1910.119, *Process Safety Management of Highly Hazardous Chemicals*. Examples presented in this appendix are not the only means of achieving the performance goals in the standard. This appendix neither adds nor detracts from the requirements of the standard.

1. **Introduction to Process Safety Management.**
2. **Employee Involvement in Process Safety Management.**
3. **Process Safety Information.**
4. **Process Hazard Analysis.**
5. **Operating Procedures and Practices.**
6. **Employee Training.**
7. **Contractors.**
8. **Pre-Startup Safety.**
9. **Mechanical Integrity.**
10. **Nonroutine Work Authorizations.**
11. **Managing Change.**
12. **Investigation of Incidents.**
13. **Emergency Preparedness.**
14. **Compliance Audits.**

1. Introduction to Process Safety Management.

The major objective of process safety management is to prevent unwanted releases of hazardous chemicals especially into locations which could expose employees and others to serious hazards. An effective process safety management program requires a systematic approach to evaluating the whole process. Using this approach the process design, process technology, operational and maintenance activities and procedures, nonroutine activities and procedures, emergency preparedness plans and procedures, training programs, and other elements which impact the process are all considered in the evaluation. Process safety management is the proactive identification, evaluation and mitigation or prevention of chemical releases that could occur as a result of failures in process, procedures or equipment.

The process safety management standard targets highly hazardous chemicals that have the potential to cause a catastrophic incident. This standard as a whole is to aid employers in their efforts to prevent or mitigate episodic chemical releases that could lead to a catastrophe in the workplace and possibly to the surrounding community. To control these types of hazards, employers need to develop the necessary expertise, experiences, judgement and proactive initiative within their workforce to properly implement and maintain an effective process safety management program as envisioned in the OSHA standard. This OSHA standard is required by the Clean Air Act Amendments as is the Environmental Protection Agency's Risk Management Plan. Employers, who merge the two sets of requirements into their process safety management program, will better assure full compliance with each as well as enhancing their relationship with the local community.

While OSHA believes process safety management will have a positive effect on the safety of employees in workplaces and also offers other potential benefits to employers (increased productivity), smaller businesses which may have limited resources available to them at this time might consider alternative avenues of decreasing the risks associated with highly hazardous chemicals at their workplaces. One method which might be considered is the reduction in the inventory of the highly hazardous chemical. This reduction in inventory will result in a reduction of the risk or potential for a catastrophic incident. Also, employers including small employers may be able to establish more efficient inventory control by reducing the quantities of highly hazardous chemicals on site below the established threshold quantities. This reduction can

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

be accomplished by ordering smaller shipments and maintaining the minimum inventory necessary for efficient and safe operation. When reduced inventory is not feasible, then the employer might consider dispersing inventory to several locations on site. Dispersing storage into locations where a release in one location will not cause a release in another location is a practical method to also reduce the risk or potential for catastrophic incidents.

2. Employee Involvement in Process Safety Management.

Section 304 of the Clean Air Act Amendments states that employers are to consult with their employees and their representatives regarding the employers efforts in the development and implementation of the process safety management program elements and hazard assessments. Section 304 also requires employers to train and educate their employees and to inform affected employees of the findings from incident investigations required by the process safety management program. Many employers, under their safety and health programs, have already established means and methods to keep employees and their representatives informed about relevant safety and health issues and employers may be able to adapt these practices and procedures to meet their obligations under this standard. Employers who have not implemented an occupational safety and health program may wish to form a safety and health committee of employees and management representatives to help the employer meet the obligations specified by this standard. These committees can become a significant ally in helping the employer to implement and maintain an effective process safety management program for all employees.

3. Process Safety Information.

Complete and accurate written information concerning process chemicals, process technology, and process equipment is essential to an effective process safety management program and to a process hazards analysis. The compiled information will be a necessary resource to a variety of users including the team that will perform the process hazards analysis as required under paragraph (e); those developing the training programs and the operating procedures; contractors whose employees will be working with the process; those conducting the pre-startup reviews; local emergency preparedness planners; and insurance and enforcement officials. The information to be compiled about the chemicals, including process intermediates, needs to be comprehensive enough for an accurate assessment of the fire and explosion characteristics, reactivity hazards, the safety and health hazards to workers, and the corrosion and erosion effects on the process equipment and monitoring tools. Current material safety data sheet (MSDS) information can be used to help meet this requirement which must be supplemented with process chemistry information including runaway reaction and over pressure hazards if applicable.

Process technology information will be a part of the process safety information package and it is expected that it will include diagrams of the type shown in Appendix B of this section as well as employer established criteria for maximum inventory levels for process chemicals; limits beyond which would be considered upset conditions; and a qualitative estimate of the consequences or results of deviation that could occur if operating beyond the established process limits. Employers are encouraged to use diagrams which will help users understand the process.

A block flow diagram is used to show the major process equipment and interconnecting process flow lines and show flow rates, stream composition, temperatures, and pressures when necessary for clarity. The block flow diagram is a simplified diagram.

Process flow diagrams are more complex and will show all main flow streams including valves to enhance the understanding of the process, as well as pressures and temperatures on all feed and product lines within all major vessels, in and out of headers and heat exchangers, and points of pressure and temperature control. Also, materials of construction information, pump capacities and pressure heads, compressor horsepower and vessel design pressures and temperatures are shown when necessary for clarity. In addition, major components of control loops are usually shown along with key utilities on process flow diagrams.

OSHA Process Safety Management Standard 1910.119

Piping and instrument diagrams (P&IDs) may be the more appropriate type of diagrams to show some of the above details and to display the information for the piping designer and engineering staff. The P&IDs are to be used to describe the relationships between equipment and instrumentation as well as other relevant information that will enhance clarity. Computer software programs which do P&IDs or other diagrams useful to the information package, may be used to help meet this requirement.

The information pertaining to process equipment design must be documented. In other words, what were the codes and standards relied on to establish good engineering practice. These codes and standards are published by such organizations as the American Society of Mechanical Engineers, American Petroleum Institute, American National Standards Institute, National Fire Protection Association, American Society for Testing and Materials, National Board of Boiler and Pressure Vessel Inspectors, National Association of Corrosion Engineers, American Society of Exchange Manufacturers Association, and model building code groups.

In addition, various engineering societies issue technical reports which impact process design. For example, the American Institute of Chemical Engineers has published technical reports on topics such as two phase flow for venting devices. This type of technically recognized report would constitute good engineering practice.

For existing equipment designed and constructed many years ago in accordance with the codes and standards available at that time and no longer in general use today, the employer must document which codes and standards were used and that the design and construction along with the testing, inspection and operation are still suitable for the intended use. Where the process technology requires a design which departs from the applicable codes and standards, the employer must document that the design and construction is suitable for the intended purpose.

4. Process Hazard Analysis.

A process hazard analysis (PHA), sometimes called a process hazard evaluation, is one of the most important elements of the process safety management program. A PHA is an organized and systematic effort to identify and analyze the significance of potential hazards associated with the processing or handling of highly hazardous chemicals. A PHA provides information which will assist employers and employees in making decisions for improving safety and reducing the consequences of unwanted or unplanned releases of hazardous chemicals. A PHA is directed toward analyzing potential causes and consequences of fires, explosions, releases of toxic or flammable chemicals and major spills of hazardous chemicals. The PHA focuses on equipment, instrumentation, utilities, human actions (routine and nonroutine), and external factors that might impact the process. These considerations assist in determining the hazards and potential failure points or failure modes in a process.

The selection of a PHA methodology or technique will be influenced by many factors including the amount of existing knowledge about the process. Is it a process that has been operated for a long period of time with little or no innovation and extensive experience has been generated with its use? Or, is it a new process or one which has been changed frequently by the inclusion of innovative features? Also, the size and complexity of the process will influence the decision as to the appropriate PHA methodology to use. All PHA methodologies are subject to certain limitations. For example, the checklist methodology works well when the process is very stable and no changes are made, but it is not as effective when the process has undergone extensive change. The checklist may miss the most recent changes and consequently the changes would not be evaluated. Another limitation to be considered concerns the assumptions made by the team or analyst. The PHA is dependent on good judgement and the assumptions made during the study need to be documented and understood by the team and reviewer and kept for a future PHA.

The team conducting the PHA need to understand the methodology that is going to be used. A PHA team can vary in size from two people to a number of people with varied operational and technical backgrounds. Some team members may only be a part of the team for a limited time. The team leader needs to be fully knowledgeable in the proper implementation of the PHA methodology that is to be used and should be impartial in the evaluation. The other full or part time team members need to provide the team with exper-

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

OSHA Process Safety Management Standard 1910.119

tise in areas such as process technology, process design, operating procedures and practices, including how the work is actually performed, alarms, emergency procedures, instrumentation, maintenance procedures, both routine and nonroutine tasks, including how the tasks are authorized, procurement of parts and supplies, safety and health, and any other relevant subject as the need dictates. At least one team member must be familiar with the process.

The ideal team will have an intimate knowledge of the standards, codes, specifications and regulations applicable to the process being studied. The selected team members need to be compatible and the team leader needs to be able to manage the team, and the PHA study. The team needs to be able to work together while benefiting from the expertise of others on the team or outside the team, to resolve issues, and to forge a consensus on the findings of the study and recommendations.

The application of a PHA to a process may involve the use of different methodologies for various parts of the process. For example, a process involving a series of unit operations of varying sizes, complexities, and ages may use different methodologies and team members for each operation. Then the conclusions can be integrated into one final study and evaluation. A more specific example is the use of a checklist PHA for a standard boiler or heat exchanger and the use of a Hazard and Operability PHA for the overall process. Also, for batch type processes like custom batch operations, a generic PHA of a representative batch may be used where there are only small changes of monomer or other ingredient ratios and the chemistry is documented for the full range and ratio of batch ingredients. Another process that might consider using a generic type of PHA is a gas plant. Often these plants are simply moved from site to site and therefore, a generic PHA may be used for these movable plants. Also, when an employer has several similar size gas plants and no sour gas is being processed at the site, then a generic PHA is feasible as long as the variations of the individual sites are accounted for in the PHA. Finally, when an employer has a large continuous process which has several control rooms for different portions of the process such as for a distillation tower and a blending operation, the employer may wish to do each segment separately and then integrate the final results.

Additionally, small businesses which are covered by this rule, will often have processes that have less storage volume, less capacity, and less complicated than processes at a large facility. Therefore, OSHA would anticipate that the less complex methodologies would be used to meet the process hazard analysis criteria in the standard. These process hazard analyses can be done in less time and with a few people being involved. A less complex process generally means that less data, P&IDS, and process information is needed to perform a process hazard analysis.

Many small businesses have processes that are not unique, such as cold storage lockers or water treatment facilities. Where employer associations have a number of members with such facilities, a generic PHA, evolved from a checklist or what-if questions, could be developed and used by each employer effectively to reflect his/her particular process; this would simplify compliance for them.

When the employer has a number of processes which require a PHA, the employer must set up a priority system of which PHAs to conduct first. A preliminary or gross hazard analysis may be useful in prioritizing the processes that the employer has determined are subject to coverage by the process safety management standard. Consideration should first be given to those processes with the potential of adversely affecting the largest number of employees. This prioritizing should consider the potential severity of a chemical release, the number of potentially affected employees, the operating history of the process such as the frequency of chemical releases, the age of the process and any other relevant factors. These factors would suggest a ranking order and would suggest either using a weighing factor system or a systematic ranking method. The use of a preliminary hazard analysis would assist an employer in determining which process should be of the highest priority and thereby the employer would obtain the greatest improvement in safety at the facility.

Detailed guidance on the content and application of process hazard analysis methodologies is available from the American Institute of Chemical Engineers' Center for Chemical Process Safety.

OSHA Process Safety Management Standard 1910.119

5. Operating Procedures and Practices.

Operating procedures describe tasks to be performed, data to be recorded, operating conditions to be maintained, samples to be collected, and safety and health precautions to be taken. The procedures need to be technically accurate, understandable to employees, and revised periodically to ensure that they reflect current operations. The process safety information package is to be used as a resource to better assure that the operating procedures and practices are consistent with the known hazards of the chemicals in the process and that the operating parameters are accurate. Operating procedures should be reviewed by engineering staff and operating personnel to ensure that they are accurate and provide practical instructions on how to actually carry out job duties safely.

Operating procedures will include specific instructions or details on what steps are to be taken or followed in carrying out the stated procedures. These operating instructions for each procedure should include the applicable safety precautions and should contain appropriate information on safety implications. For example, the operating procedures addressing operating parameters will contain operating instructions about pressure limits, temperature ranges, flow rates, what to do when an upset condition occurs, what alarms and instruments are pertinent if an upset condition occurs, and other subjects. Another example of using operating instructions to properly implement operating procedures is in starting up or shutting down the process. In these cases, different parameters will be required from those of normal operation. These operating instructions need to clearly indicate the distinctions between startup and normal operations such as the appropriate allowances for heating up a unit to reach the normal operating parameters. Also the operating instructions need to describe the proper method for increasing the temperature of the unit until the normal operating temperature parameters are achieved.

Computerized process control systems add complexity to operating instructions. These operating instructions need to describe the logic of the software as well as the relationship between the equipment and the control system; otherwise, it may not be apparent to the operator.

Operating procedures and instructions are important for training operating personnel. The operating procedures are often viewed as the standard operating practices (SOPs) for operations. Control room personnel and operating staff, in general, need to have a full understanding of operating procedures. If workers are not fluent in English then procedures and instructions need to be prepared in a second language understood by the workers. In addition, operating procedures need to be changed when there is a change in the process as a result of the management of change procedures. The consequences of operating procedure changes need to be fully evaluated and the information conveyed to the personnel. For example, mechanical changes to the process made by the maintenance department (like changing a valve from steel to brass or other subtle changes) need to be evaluated to determine if operating procedures and practices also need to be changed. All management of change actions must be coordinated and integrated with current operating procedures and operating personnel must be oriented to the changes in procedures before the change is made. When the process is shut down in order to make a change, then the operating procedures must be updated before startup of the process.

Training in how to handle upset conditions must be accomplished as well as what operating personnel are to do in emergencies such as when a pump seal fails or a pipeline ruptures. Communication between operating personnel and workers performing work within the process area, such as nonroutine tasks, also must be maintained. The hazards of the tasks are to be conveyed to operating personnel in accordance with established procedures and to those performing the actual tasks. When the work is completed, operating personnel should be informed to provide closure on the job.

6. Employee Training.

All employees, including maintenance and contractor employees, involved with highly hazardous chemicals need to fully understand the safety and health hazards of the chemicals and processes they work with for the protection of themselves, their fellow employees and the citizens of nearby communities. Training conducted in compliance with 1910.1200, the Hazard Communication standard, will help employees to be more knowledgeable about the chemicals they work with as well as familiarize them with reading and

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

OSHA Process Safety Management Standard 1910.119

understanding MSDS. However, additional training in subjects such as operating procedures and safety work practices, emergency evacuation and response, safety procedures, routine and nonroutine work authorization activities, and other areas pertinent to process safety and health will need to be covered by an employer's training program.

In establishing their training programs, employers must clearly define the employees to be trained and what subjects are to be covered in their training. Employers in setting up their training program will need to clearly establish the goals and objectives they wish to achieve with the training that they provide to their employees. The learning goals or objectives should be written in clear measurable terms before the training begins. These goals and objectives need to be tailored to each of the specific training modules or segments. Employers should describe the important actions and conditions under which the employee will demonstrate competence or knowledge as well as what is acceptable performance.

Hands-on-training where employees are able to use their senses beyond listening, will enhance learning. For example, operating personnel, who will work in a control room or at control panels, would benefit by being trained at a simulated control panel or panels. Upset conditions of various types could be displayed on the simulator, and then the employee could go through the proper operating procedures to bring the simulator panel back to the normal operating parameters. A training environment could be created to help the trainee feel the full reality of the situation but, of course, under controlled conditions. This realistic type of training can be very effective in teaching employees correct procedures while allowing them to also see the consequences of what might happen if they do not follow established operating procedures. Other training techniques using videos or on-the-job training can also be very effective for teaching other job tasks, duties, or other important information. An effective training program will allow the employee to fully participate in the training process and to practice their skill or knowledge.

Employers need to periodically evaluate their training programs to see if the necessary skills, knowledge, and routines are being properly understood and implemented by their trained employees. The means or methods for evaluating the training should be developed along with the training program goals and objectives. Training program evaluation will help employers to determine the amount of training their employees understood, and whether the desired results were obtained. If, after the evaluation, it appears that the trained employees are not at the level of knowledge and skill that was expected, the employer will need to revise the training program, provide retraining, or provide more frequent refresher training sessions until the deficiency is resolved. Those who conducted the training and those who received the training should also be consulted as to how best to improve the training process. If there is a language barrier, the language known to the trainees should be used to reinforce the training messages and information.

Careful consideration must be given to assure that employees including maintenance and contract employees receive current and updated training. For example, if changes are made to a process, impacted employees must be trained in the changes and understand the effects of the changes on their job tasks (e.g., any new operating procedures pertinent to their tasks). Additionally, as already discussed the evaluation of the employee's absorption of training will certainly influence the need for training.

7. Contractors.

Employers who use contractors to perform work in and around processes that involve highly hazardous chemicals, will need to establish a screening process so that they hire and use contractors who accomplish the desired job tasks without compromising the safety and health of employees at a facility. For contractors, whose safety performance on the job is not known to the hiring employer, the employer will need to obtain information on injury and illness rates and experience and should obtain contractor references. Additionally, the employer must assure that the contractor has the appropriate job skills, knowledge and certifications (such as for pressure vessel welders).

Contractor work methods and experiences should be evaluated. For example, does the contractor conducting demolition work swing loads over operating processes or does the contractor avoid such hazards?

OSHA Process Safety Management Standard 1910.119

Maintaining a site injury and illness log for contractors is another method employers must use to track and maintain current knowledge of work activities involving contract employees working on or adjacent to covered processes. Injury and illness logs of both the employer's employees and contract employees allow an employer to have full knowledge of process injury and illness experience. This log will also contain information which will be of use to those auditing process safety management compliance and those involved in incident investigations.

Contract employees must perform their work safely. Considering that contractors often perform very specialized and potentially hazardous tasks such as confined space entry activities and nonroutine repair activities it is quite important that their activities be controlled while they are working on or near a covered process. A permit system or work authorization system for these activities would also be helpful to all affected employers. The use of a work authorization system keeps an employer informed of contract employee activities, and as a benefit the employer will have better coordination and more management control over the work being performed in the process area. A well run and well maintained process where employee safety is fully recognized will benefit all of those who work in the facility whether they be contract employees or employees of the owner.

8. Pre-Startup Safety.

For new processes, the employer will find a PHA helpful in improving the design and construction of the process from a reliability and quality point of view. The safe operation of the new process will be enhanced by making use of the PHA recommendations before final installations are completed. P&IDS are to be completed along with having the operating procedures in place and the operating staff trained to run the process before startup. The initial startup procedures and normal operating procedures need to be fully evaluated as part of the pre-startup review to assure a safe transfer into the normal operating mode for meeting the process parameters.

For existing processes that have been shutdown for turnaround, or modification, etc., the employer must assure that any changes other than "replacement in kind" made to the process during shutdown go through the management of change procedures. P&IDS will need to be updated as necessary, as well as operating procedures and instructions. If the changes made to the process during shutdown are significant and impact the training program, then operating personnel as well as employees engaged in routine and nonroutine work in the process area may need some refresher or additional training in light of the changes. Any incident investigation recommendations, compliance audits or PHA recommendations need to be reviewed as well to see what impacts they may have on the process before beginning the startup.

9. Mechanical Integrity.

Employers will need to review their maintenance programs and schedules to see if there are areas where "breakdown" maintenance is used rather than an on-going mechanical integrity program. Equipment used to process, store, or handle highly hazardous chemicals needs to be designed, constructed, installed and maintained to minimize the risk of releases of such chemicals. This requires that a mechanical integrity program be in place to assure the continued integrity of process equipment. Elements of a mechanical integrity program include the identification and categorization of equipment and instrumentation, inspections and tests, testing and inspection frequencies, development of maintenance procedures, training of maintenance personnel, the establishment of criteria for acceptable test results, documentation of test and inspection results, and documentation of manufacturer recommendations as to meantime to failure for equipment and instrumentation.

The first line of defense an employer has available is to operate and maintain the process as designed, and to keep the chemicals contained. This line of defense is backed up by the next line of defense which is the controlled release of chemicals through venting to scrubbers or flares, or to surge or overflow tanks which are designed to receive such chemicals, etc. These lines of defense are the primary lines of defense or means to prevent unwanted releases. The secondary lines of defense would include fixed fire protection systems like sprinklers, water spray, or deluge systems, monitor guns, etc., dikes, designed

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

OSHA Process Safety Management Standard 1910.119

drainage systems, and other systems which would control or mitigate hazardous chemicals once an unwanted release occurs. These primary and secondary lines of defense are what the mechanical integrity program needs to protect and strengthen these primary and secondary lines of defenses where appropriate.

The first step of an effective mechanical integrity program is to compile and categorize a list of process equipment and instrumentation for inclusion in the program. This list would include pressure vessels, storage tanks, process piping, relief and vent systems, fire protection system components, emergency shutdown systems and alarms and interlocks and pumps. For the categorization of instrumentation and the listed equipment the employer would prioritize which pieces of equipment require closer scrutiny than others. Meantime to failure of various instrumentation and equipment parts would be known from the manufacturers data or the employer's experience with the parts, which would then influence the inspection and testing frequency and associated procedures. Also, applicable codes and standards such as the National Board Inspection Code, or those from the American Society for Testing and Material, American Petroleum Institute, National Fire Protection Association, American National Standards Institute, American Society of Mechanical Engineers, and other groups, provide information to help establish an effective testing and inspection frequency, as well as appropriate methodologies.

The applicable codes and standards provide criteria for external inspections for such items as foundation and supports, anchor bolts, concrete or steel supports, guy wires, nozzles and sprinklers, pipe hangers, grounding connections, protective coatings and insulation, and external metal surfaces of piping and vessels, etc. These codes and standards also provide information on methodologies for internal inspection, and a frequency formula based on the corrosion rate of the materials of construction. Also, erosion both internal and external needs to be considered along with corrosion effects for piping and valves. Where the corrosion rate is not known, a maximum inspection frequency is recommended, and methods of developing the corrosion rate are available in the codes. Internal inspections need to cover items such as vessel shell, bottom and head; metallic linings; nonmetallic linings; thickness measurements for vessels and piping; inspection for erosion, corrosion, cracking and bulges; internal equipment like trays, baffles, sensors and screens for erosion, corrosion or cracking and other deficiencies. Some of these inspections may be performed by state or local government inspectors under state and local statutes. However, each employer needs to develop procedures to ensure that tests and inspections are conducted properly and that consistency is maintained even where different employees may be involved. Appropriate training is to be provided to maintenance personnel to ensure that they understand the preventive maintenance program procedures, safe practices, and the proper use and application of special equipment or unique tools that may be required. This training is part of the overall training program called for in the standard.

A quality assurance system is needed to help ensure that the proper materials of construction are used, that fabrication and inspection procedures are proper, and that installation procedures recognize field installation concerns. The quality assurance program is an essential part of the mechanical integrity program and will help to maintain the primary and secondary lines of defense that have been designed into the process to prevent unwanted chemical releases or those which control or mitigate a release. "As built" drawings, together with certifications of coded vessels and other equipment, and materials of construction need to be verified and retained in the quality assurance documentation. Equipment installation jobs need to be properly inspected in the field for use of proper materials and procedures and to assure that qualified craftsmen are used to do the job. The use of appropriate gaskets, packing, bolts, valves, lubricants and welding rods need to be verified in the field. Also procedures for installation of safety devices need to be verified, such as the torque on the bolts on ruptured disc installations, uniform torque on flange bolts, proper installation of pump seals, etc. If the quality of parts is a problem, it may be appropriate to conduct audits of the equipment supplier's facilities to better assure proper purchases of required equipment which is suitable for its intended service. Any changes in equipment that become necessary will need to go through the management of change procedures.

OSHA Process Safety Management Standard 1910.119

10. Nonroutine Work Authorizations.

Nonroutine work which is conducted in process areas needs to be controlled by the employer in a consistent manner. The hazards identified involving the work that is to be accomplished must be communicated to those doing the work, but also to those operating personnel whose work could affect the safety of the process. A work authorization notice or permit must have a procedure that describes the steps the maintenance supervisor, contractor representative or other person needs to follow to obtain the necessary clearance to get the job started. The work authorization procedures need to reference and coordinate, as applicable, lockout/tagout procedures, line breaking procedures, confined space entry procedures and hot work authorizations. This procedure also needs to provide clear steps to follow once the job is completed in order to provide closure for those that need to know the job is now completed and equipment can be returned to normal.

11. Managing Change.

To properly manage changes to process chemicals, technology, equipment and facilities, one must define what is meant by change. In this process safety management standard, change includes all modifications to equipment, procedures, raw materials and processing conditions other than “replacement in kind”. These changes need to be properly managed by identifying and reviewing them prior to implementation of the change. For example, the operating procedures contain the operating parameters (pressure limits, temperature ranges, flow rates, etc.) and the importance of operating within these limits. While the operator must have the flexibility to maintain safe operation within the established parameters, any operation outside of these parameters requires review and approval by a written management of change procedure.

Management of change covers such as changes in process technology and changes to equipment and instrumentation. Changes in process technology can result from changes in production rates, raw materials, experimentation, equipment unavailability, new equipment, new product development, change in catalyst and changes in operating conditions to improve yield or quality. Equipment changes include among others change in materials of construction, equipment specifications, piping pre-arrangements, experimental equipment, computer program revisions and changes in alarms and interlocks. Employers need to establish means and methods to detect both technical changes and mechanical changes.

Temporary changes have caused a number of catastrophes over the years, and employers need to establish ways to detect temporary changes as well as those that are permanent. It is important that a time limit for temporary changes be established and monitored since, without control, these changes may tend to become permanent. Temporary changes are subject to the management of change provisions. In addition, the management of change procedures are used to insure that the equipment and procedures are returned to their original or designed conditions at the end of the temporary change. Proper documentation and review of these changes is invaluable in assuring that the safety and health considerations are being incorporated into the operating procedures and the process.

Employers may wish to develop a form or clearance sheet to facilitate the processing of changes through the management of change procedures. A typical change form may include a description and the purpose of the change, the technical basis for the change, safety and health considerations, documentation of changes for the operating procedures, maintenance procedures, inspection and testing, P&IDS, electrical classification, training and communications, pre-startup inspection, duration if a temporary change, approvals and authorization. Where the impact of the change is minor and well understood, a check list reviewed by an authorized person with proper communication to others who are affected may be sufficient. However, for a more complex or significant design change, a hazard evaluation procedure with approvals by operations, maintenance, and safety departments may be appropriate. Changes in documents such as P&IDS, raw materials, operating procedures, mechanical integrity programs, electrical classifications, etc., need to be noted so that these revisions can be made permanent when the drawings and procedure manuals are updated. Copies of process changes need to be kept in an accessible location to ensure that design changes are available to operating personnel as well as to PHA team members when a PHA is being done or one is being updated.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

12. Investigation of Incidents.

Incident investigation is the process of identifying the underlying causes of incidents and implementing steps to prevent similar events from occurring. The intent of an incident investigation is for employers to learn from past experiences and thus avoid repeating past mistakes. The incidents for which OSHA expects employers to become aware and to investigate are the types of events which result in or could reasonably have resulted in a catastrophic release. Some of the events are sometimes referred to as "near misses," meaning that a serious consequence did not occur, but could have.

Employers need to develop in-house capability to investigate incidents that occur in their facilities. A team needs to be assembled by the employer and trained in the techniques of investigation including how to conduct interviews of witnesses, needed documentation and report writing. A multi-disciplinary team is better able to gather the facts of the event and to analyze them and develop plausible scenarios as to what happened, and why. Team members should be selected on the basis of their training, knowledge and ability to contribute to a team effort to fully investigate the incident. Employees in the process area where the incident occurred should be consulted, interviewed or made a member of the team. Their knowledge of the events form a significant set of facts about the incident which occurred. The report, its findings and recommendations are to be shared with those who can benefit from the information. The cooperation of employees is essential to an effective incident investigation. The focus of the investigation should be to obtain facts, and not to place blame. The team and the investigation process should clearly deal with all involved individuals in a fair, open and consistent manner.

13. Emergency Preparedness.

Each employer must address what actions employees are to take when there is an unwanted release of highly hazardous chemicals. Emergency preparedness or the employer's tertiary (third) lines of defense are those that will be relied on along with the secondary lines of defense when the primary lines of defense which are used to prevent an unwanted release fail to stop the release. Employers will need to decide if they want employees to handle and stop small or minor incidental releases. Whether they wish to mobilize the available resources at the plant and have them brought to bear on a more significant release. Or whether employers want their employees to evacuate the danger area and promptly escape to a preplanned safe zone area, and allow the local community emergency response organizations to handle the release. Or whether the employer wants to use some combination of these actions. Employers will need to select how many different emergency preparedness or tertiary lines of defense they plan to have and then develop the necessary plans and procedures, and appropriately train employees in their emergency duties and responsibilities and then implement these lines of defense.

Employers at a minimum must have an emergency action plan which will facilitate the prompt evacuation of employees due to an unwanted release of a highly hazardous chemical. This means that the employer will have a plan that will be activated by an alarm system to alert employees when to evacuate and, that employees who are physically impaired, will have the necessary support and assistance to get them to the safe zone as well. The intent of these requirements is to alert and move employees to a safe zone quickly. Delaying alarms or confusing alarms are to be avoided. The use of process control centers or similar process buildings in the process area as safe areas is discouraged. Recent catastrophes have shown that a large life loss has occurred in these structures because of where they have been sited and because they are not necessarily designed to withstand over-pressures from shockwaves resulting from explosions in the process area.

Unwanted incidental releases of highly hazardous chemicals in the process area must be addressed by the employer as to what actions employees are to take. If the employer wants employees to evacuate the area, then the emergency action plan will be activated. For outdoor processes where wind direction is important for selecting the safe route to a refuge area, the employer should place a wind direction indicator such as a wind sock or pennant at the highest point that can be seen throughout the process area. Employees can move in the direction of cross wind to upwind to gain safe access to the refuge area by knowing the wind direction.

OSHA Process Safety Management Standard 1910.119

If the employer wants specific employees in the release area to control or stop the minor emergency or incidental release, these actions must be planned for in advance and procedures developed and implemented. Preplanning for handling incidental releases for minor emergencies in the process area needs to be done, appropriate equipment for the hazards must be provided, and training conducted for those employees who will perform the emergency work before they respond to handle an actual release. The employer's training program, including the Hazard Communication standard training is to address the training needs for employees who are expected to handle incidental or minor releases.

Preplanning for releases that are more serious than incidental releases is another important line of defense to be used by the employer. When a serious release of a highly hazardous chemical occurs, the employer through preplanning will have determined in advance what actions employees are to take. The evacuation of the immediate release area and other areas as necessary would be accomplished under the emergency action plan. If the employer wishes to use plant personnel such as a fire brigade, spill control team, a hazardous materials team, or use employees to render aid to those in the immediate release area and control or mitigate the incident, these actions are covered by §1910.120, the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard. If outside assistance is necessary, such as through mutual aid agreements between employers or local government emergency response organizations, these emergency responders are also covered by HAZWOPER. The safety and health protections required for emergency responders are the responsibility of their employers and of the on-scene incident commander.

Responders may be working under very hazardous conditions and therefore the objective is to have them competently led by an on-scene incident commander and the commander's staff, properly equipped to do their assigned work safely, and fully trained to carry out their duties safely before they respond to an emergency. Drills, training exercises, or simulations with the local community emergency response planners and responder organizations is one means to obtain better preparedness. This close cooperation and coordination between plant and local community emergency preparedness managers will also aid the employer in complying with the Environmental Protection Agency's Risk Management Plan criteria.

One effective way for medium to large facilities to enhance coordination and communication during emergencies for on plant operations and with local community organizations is for employers to establish and equip an emergency control center. The emergency control center would be sited in a safe zone area so that it could be occupied throughout the duration of an emergency. The center would serve as the major communication link between the on-scene incident commander and plant or corporate management as well as with the local community officials. The communication equipment in the emergency control center should include a network to receive and transmit information by telephone, radio or other means. It is important to have a backup communication network in case of power failure or one communication means fails. The center should also be equipped with the plant layout and community maps, utility drawings including fire water, emergency lighting, appropriate reference materials such as a government agency notification list, company personnel phone list, SARA Title III reports and material safety data sheets, emergency plans and procedures manual, a listing with the location of emergency response equipment, mutual aid information, and access to meteorological or weather condition data and any dispersion modeling data.

14. Compliance Audits.

Employers need to select a trained individual or assemble a trained team of people to audit the process safety management system and program. A small process or plant may need only one knowledgeable person to conduct an audit. The audit is to include an evaluation of the design and effectiveness of the process safety management system and a field inspection of the safety and health conditions and practices to verify that the employer's systems are effectively implemented. The audit should be conducted or lead by a person knowledgeable in audit techniques and who is impartial towards the facility or area being audited. The essential elements of an audit program include planning, staffing, conducting the audit, evaluation and corrective action, follow-up and documentation.

Prevention
Training
IssuesPrevention
AwarenessPrevention
Policy
DevelopmentCommunity
Prevention
Program
ManagementPrevention in
OperationsDesign &
Plans ReviewInspection &
EnforcementAppendix A:
Prevention
AuthoritiesAppendix B:
Training
MandatesAppendix C:
Federal
ProgramsAppendix D:
OSHA
1910.119

Planning in advance is essential to the success of the auditing process. Each employer needs to establish the format, staffing, scheduling and verification methods prior to conducting the audit. The format should be designed to provide the lead auditor with a procedure or checklist which details the requirements of each section of the standard.

The names of the audit team members should be listed as part of the format as well. The checklist, if properly designed, could serve as the verification sheet which provides the auditor with the necessary information to expedite the review and assure that no requirements of the standard are omitted. This verification sheet format could also identify those elements that will require evaluation or a response to correct deficiencies. This sheet could also be used for developing the follow-up and documentation requirements.

The selection of effective audit team members is critical to the success of the program. Team members should be chosen for their experience, knowledge, and training and should be familiar with the processes and with auditing techniques, practices and procedures. The size of the team will vary depending on the size and complexity of the process under consideration. For a large, complex, highly instrumented plant, it may be desirable to have team members with expertise in process engineering and design, process chemistry, instrumentation and computer controls, electrical hazards and classifications, safety and health disciplines, maintenance, emergency preparedness, warehousing or shipping, and process safety auditing. The team may use part-time members to provide for the depth of expertise required as well as for what is actually done or followed, compared to what is written.

An effective audit includes a review of the relevant documentation and process safety information, inspection of the physical facilities, and interviews with all levels of plant personnel. Utilizing the audit procedure and checklist developed in the preplanning stage, the audit team can systematically analyze compliance with the provisions of the standard and any other corporate policies that are relevant. For example, the audit team will review all aspects of the training program as part of the overall audit. The team will review the written training program for adequacy of content, frequency of training, effectiveness of training in terms of its goals and objectives as well as to how it fits into meeting the standard's requirements, documentation, etc. Through interviews, the team can determine the employee's knowledge and awareness of the safety procedures, duties, rules, emergency response assignments, etc. During the inspection, the team can observe actual practices such as safety and health policies, procedures, and work authorization practices. This approach enables the team to identify deficiencies and determine where corrective actions or improvements are necessary.

An audit is a technique used to gather sufficient facts and information, including statistical information, to verify compliance with standards. Auditors should select as part of their preplanning a sample size sufficient to give a degree of confidence that the audit reflects the level of compliance with the standard. The audit team, through this systematic analysis, should document areas which require corrective action as well as those areas where the process safety management system is effective and working in an effective manner. This provides a record of the audit procedures and findings, and serves as a baseline of operation data for future audits. It will assist future auditors in determining changes or trends from previous audits.

Corrective action is one of the most important parts of the audit. It includes not only addressing the identified deficiencies, but also planning, follow-up, and documentation. The corrective action process normally begins with a management review of the audit findings. The purpose of this review is to determine what actions are appropriate, and to establish priorities, timetables, resource allocations and requirements and responsibilities. In some cases, corrective action may involve a simple change in procedure or minor maintenance effort to remedy the concern. Management of change procedures need to be used, as appropriate, even for what may seem to be a minor change. Many of the deficiencies can be acted on promptly, while some may require engineering studies or in-depth review of actual procedures and practices. There may be instances where no action is necessary and this is a valid response to an audit finding. All actions taken, including an explanation where no action is taken on a finding, needs to be documented as to what was done and why.

OSHA Process Safety Management Standard 1910.119

It is important to assure that each deficiency identified is addressed, the corrective action to be taken noted, and the audit person or team responsible be properly documented by the employer. To control the corrective action process, the employer should consider the use of a tracking system. This tracking system might include periodic status reports shared with affected levels of management, specific reports such as completion of an engineering study, and a final implementation report to provide closure for audit findings that have been through management of change, if appropriate, and then shared with affected employees and management. This type of tracking system provides the employer with the status of the corrective action. It also provides the documentation required to verify that appropriate corrective actions were taken on deficiencies identified in the audit.

Prevention Training Issues
Prevention Awareness
Prevention Policy Development
Community Prevention Program Management
Prevention in Operations
Design & Plans Review
Inspection & Enforcement
Appendix A: Prevention Authorities
Appendix B: Training Mandates
Appendix C: Federal Programs
Appendix D: OSHA 1910.119