

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

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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.

D/PR-2.2	Describe information sources on state of the art prevention technologies and recommended practices in hazardous materials design.
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.
D/PR-2.4	Demonstrate the ability to identify and assess hazards associated with alternative design strategies.
D/PR-2.5	Demonstrate the ability to identify design strategies that optimize safety and prevention opportunities.
D/PR-2.6	Demonstrate the ability to prepare and/or evaluate design plans, specifications, and supporting documents that incorporate and clarify prevention requirements.
D/PR-2.7	Assess strategies for coordinating activities among facility, community, and design team representatives to enhance prevention.
D/PR-3	Given an approved design, assist in promoting prevention through the effective implementation and maintenance of the project.
D/PR-3.1	Assess strategies for preparing contractor and vendor documents that incorporate and clarify the prevention requirements of the design plan.
D/PR-3.2	Assess strategies for assisting construction personnel and vendor representatives to interpret the project's prevention requirements.
D/PR-3.3	Assess strategies for monitoring procurement and construction activities to ensure that prevention requirements are met.
D/PR-3.4	Assess strategies for assisting prevention program managers and operators to develop and implement safe operational systems and employee work procedures.
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.

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