

# Hazardous Materials and Terrorist Incident Prevention Curriculum Guidelines

  

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## **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.

## 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.

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- 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.

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.

## 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)

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- 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, record keeping, 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.

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.

### 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

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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

### **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.