



# MINIMUM HEALTH AND SAFETY TRAINING CRITERIA

## Guidance for Hazardous Waste Operations and Emergency Response (HAZWOPER) and HAZWOPER-Supporting Training



# FOREWORD



(Photo courtesy of Western Region Universities Consortium [WRUC])

The development of this document was based on a series of national technical workshops sponsored by the National Institute of Environmental Health Sciences (NIEHS) Worker Training Program (WTP), formerly known as the Worker Education and Training Program.

The first workshop was conducted in 1990 and produced the initial “Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response,” better known as the “Minimum Criteria.” This was followed by a second workshop in 1994 to develop interpretive guidance to the Minimum Criteria. The initial Minimum Criteria served as the basis for the nonmandatory Appendix E to the Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) standard at 29 Code of Federal Regulations (CFR) 1910.120.

A third workshop was held in 2005 to update the 1994 Minimum Criteria guidance. At that point, the document was updated to address advances in the development and application of “advanced training technologies,” and attention to all-hazards preparedness training for the emergency response community following 9/11 and the creation of the Department of Homeland Security.

Twelve years later, on Oct. 17 – 18, 2017, the WTP held a fourth workshop on the Minimum Criteria that focused on the following issues: e-learning, collateral duty, proficiency assessment, instructor development, evaluation, disaster training, infectious disease training, and evergreening of curricula.

The workshop was attended by more than 110 participants, which included WTP staff and awardees. The workshop format included an opening speaker; breakout sessions on the above eight topic areas, some existing in the Minimum Criteria document and some new; report-backs from the breakout sessions; small group activities; and a closing plenary on compliance challenges and best practices in compliance with the document. A draft updated Minimum Criteria document was prepared following the workshop and sent to all participants for review and comment. This final guidance document was prepared and issued based on the comments received.

This guidance document is intended to serve as the quality control basis for the training grants awarded by the WTP. While it can be used now, WTP awardees will be required to follow this version of the Minimum Criteria document as of August 2020.

# TABLE OF CONTENTS

	FOREWORD	2
<b>1</b>	ACRONYMS	6
<b>2</b>	DEFINITIONS	7
<b>3</b>	BACKGROUND & INTRODUCTION	10
<b>4</b>	PURPOSE	13
<b>5</b>	SCOPE	14
<b>6</b>	APPLICATION	15
<b>7</b>	ORGANIZATION	16
<b>8</b>	WORKER TRAINING PRINCIPLES AND CHARACTERISTICS OF EXCELLENCE	17
	8.1 Characteristics of Excellence.....	17
	8.1.1 Accuracy.....	17
	8.1.2 Credibility.....	17
	8.1.3 Comprehensive.....	18
	8.1.4 Clarity.....	18
	8.1.5 Practicality.....	18
	8.2 Principles of Adult Education Applicable to HAZWOPER.....	19

# 9

## MINIMUM TRAINING PROGRAM DESIGN CRITERIA

21

9.1 Introduction.....	21
9.2 Assumptions.....	21
9.3 Core Criteria.....	23
9.3.1 Training Director .....	23
9.3.2 Training Facility.....	23
9.3.3 Instructional Staff .....	23
9.3.4 Training Course Materials and Content.....	25
9.3.5 Trainees.....	26
9.3.6 Instructor-Trainee Ratios.....	27
9.3.7 Proficiency Assessment .....	27
9.3.7.1 Initial Training.....	27
9.3.7.2 Refresher Training .....	28
9.3.7.3 Representative Good Practice for Proficiency Assessment.....	29
9.3.8 Course Certificate .....	30
9.3.9 Recordkeeping.....	30
9.3.10 Program Quality Control.....	31

# 10

## TRAINING PROGRAM QUALITY CONTROL CRITERIA

32

10.1 Introduction.....	32
10.2 Training Plan .....	32
10.3 Training Program Management.....	33
10.4 Training Facilities and Resources.....	33
10.5 Instructional Technologies .....	34
10.5.1 Technology Literacy and User-Friendliness.....	34
10.6 Quality Control Program Assessment.....	35
10.7 Annual Update.....	35
10.8 Trainees .....	36
10.8.1 Trainees Engaged in Technology-Enhanced Learning .....	36
10.9 Instructional Environment and Administrative Support .....	36
10.10 Program Evaluation .....	36
10.10.1 Process Evaluation.....	37
10.10.2 Outcome Evaluations .....	38
10.10.3 Impact Evaluation .....	38
10.10.4 Evaluation Model: Kirkpatrick Model .....	39

# 11

## GENERIC MINIMUM TRAINING CURRICULUM GUIDELINES

40

11.1 Hazardous Waste Operations [1910.120(b)-(o)].....	40
11.1.1 Introduction .....	40
11.1.2 Initial Training .....	40
11.1.2.1 General Site Workers .....	41
11.1.2.2 Occasional Site Workers .....	41
11.1.3 Annual Refresher .....	42
11.1.4 On-Site Considerations .....	43
11.2 RCRA/TSD [1910.120(p)].....	43
11.2.1 Introduction .....	43
11.2.2 Initial Training .....	44
11.2.2.1 Initial Off-Site Training .....	44
11.2.2.2 Initial On-Site Training .....	45
11.2.3 Refresher Training.....	45
11.3 Emergency Response [1910.120(q)]: Full Time .....	46
11.3.1 Introduction .....	46
11.3.2 Initial Training .....	46
11.3.3 Refresher Training.....	49
11.4 Emergency Response: Collateral Duty.....	50
11.4.1 Introduction .....	50
11.4.2 Initial Training .....	51
11.4.3 Refresher Training.....	51
11.5 Disaster Response and Recovery Workers .....	51

# 12

## CERTIFICATION

54

# 13

## ANNEXES

55

13.1 Annex A: 29 CFR 1910.120-Supporting Training Programs.....	55
13.2 Annex B: Technical Workshop Agenda .....	57
13.3 Annex C: The Principles of Adult Education: A Checklist for Planners and Evaluators .....	59

# 14

## REFERENCES AND RESOURCES

63

# 1. ACRONYMS

1

<b>ADDIE</b> .....	Analysis, Design, Development, Implementation, and Evaluation
<b>CFR</b> .....	Code of Federal Regulations
<b>DOE</b> .....	Department of Energy
<b>EMS</b> .....	Emergency Medical Services
<b>EPA</b> .....	Environmental Protection Agency
<b>FEMA</b> .....	Federal Emergency Management Agency
<b>HAZMAT</b> .....	Hazardous Materials
<b>HAZWOPER</b> .....	Hazardous Waste Operations and Emergency Response
<b>ICS</b> .....	Incident Command System
<b>NFPA</b> .....	National Fire Protection Association
<b>NIHES</b> .....	National Institute of Environmental Health Sciences
<b>OSHA</b> .....	Occupational Safety and Health Administration
<b>PEPH</b> .....	Partnerships for Environmental Public Health
<b>PPE</b> .....	Personal Protective Equipment
<b>RCRA/TSD</b> .....	Resource Conservation and Recovery Act/Treatment, Storage, and Disposal
<b>SARA</b> .....	Superfund Amendments and Reauthorization Act of 1986
<b>SMART</b> .....	Specific, Measurable, Action-Oriented, Relevant, and Timely
<b>WTP</b> .....	Worker Training Program

## 2. DEFINITIONS

The following definitions apply to this document.

- **1910.120-supporting training** — Specialized training for specific hazards at a site covered by the HAZWOPER regulation. This additional training is usually required by an OSHA standard – such as asbestos, lead, confined spaces, bloodborne pathogens, and process safety management – but may cover hazards and issues that aren't currently regulated, such as mold, infectious diseases, and prevention. (See Annex A.)
- **All-hazards** — Includes a broad range of hazardous incidents, including major natural disasters and chemical, biological, radiological, and explosive incidents. The applicability of the HAZWOPER regulation to natural disasters and explosive events would be determined by OSHA on a case-by-case basis, but the agency has previously confirmed that HAZWOPER applies broadly to chemical, biological, and nuclear incidents.
- **Blended learning** — Learning that combines any or all of the following: instructor-led training, online training, and technology-enhanced training methods.
- **Certificate** — A document stating the successful completion of a training course by a specific individual that is signed by the training provider of the course.
- **Certification** — A written document stating that a training program, curriculum, instructor, or course meets a specified written requirement that is signed by an authorized certifying authority.
- **Competent** — Possessing the skills, knowledge, abilities, experience, and judgment required to perform assigned tasks or activities satisfactorily and safely based on criteria from applicable standards. The employer may use a certificate of successful completion of a training course to help determine if obligations have been met to ensure that employees have necessary competencies as established in relevant OSHA standards.
- **Demonstration** — Showing how to properly use equipment or to correctly follow procedures.
- **Enabling objective** — A subordinate learning objective that supports attainment of the overall course objectives. An enabling objective addresses a single topic. There may be more than one enabling objective within a course module
- **Hands-on training** — Training in a simulated work environment under the supervision of trained and experienced instructors that permits each trainee to perform tasks, make decisions, and/or use equipment appropriate to the job assignment for which training is being conducted.
- **Initial training** — Initial off-site training required by the HAZWOPER standard at 29 CFR 1910.120(e), (p), and (q).
- **Learning objective** — Detailed written statements of the goal that is to be achieved through the attainment of desired knowledge, skills, or abilities that can be measured, demonstrated, or observed.
- **Lecture** — An interactive discourse with a class, led by an instructor who is immediately available to address questions and engage in interactive discussion.

## 2

- **May** — Term used in this document to indicate something is permissible.
- **Online learning** — All course activity is completed through electronic means; there are no required face-to-face sessions within the course and no requirements for classroom or hands-on activity. Classes may be instructor-led or self-paced.
- **On-site training** — The initial actual field experience of individuals who recently successfully completed the initial off-site training course. Supervision by a HAZWOPER-trained and experienced supervisor is required and the duration of such on-site training varies in accordance with the HAZWOPER training category. On-site training is the responsibility of the employer.
- **Peer reviewed** — Reviewed by individuals with relevant knowledge, experience, education, and training appropriate to the materials being reviewed.
- **Pre-entry briefing** — Site-specific briefing required prior to entry and commencement of work at any site covered by the HAZWOPER standard. This is the responsibility of the employer.
- **Proficiency assessment** — The method or methods used to determine that a trainee has acquired the level of achievement in knowledge, skills, and/or abilities specified in the course learning objectives, which may be assessed through written or skills performance methods.
- **Proficient** — Meeting a stated level of achievement.
- **Refresher training** — An annual training program for those who have successfully completed the initial off-site training program specific to their HAZWOPER training category or who have been certified as competent by their employer in accordance with the HAZWOPER regulatory requirements.
- **Shall** — Term used in the document to indicate something is mandatory.
- **Should** — Term used to indicate something is recommended.
- **Site-specific training** — Job site-specific training, often referred to as a “pre-entry briefing,” to acquaint workers new to a job site covered by the HAZWOPER regulation with the site control plan, site hazards, control zones, protective measures required, and the emergency response plan. Site-specific training is the responsibility of the employer.
- **Skills assessment** — The method or methods used to determine that a trainee has mastered the stated level of achievement in skills specified in the training course learning objectives.
- **Skills demonstration** — Actual performance of skills specified in the training objectives in the presence of a qualified instructor, using appropriate equipment, facilities, or drill environments.

- **Technology-enhanced training methods** — Refers to training approaches that use technology to facilitate training. This may include the use of Web-based and other computer-based learning methodologies, virtual and augmented reality, gamification, personal smart communication devices, new communication and data sharing tools, etc. It is assumed that training programs and instructional staff will use and effectively integrate technologies appropriate to achieve the course learning objectives in a manner that ensures training effectiveness and learning retention.
- **Terminal objective** — The training objectives specific to the instructional goals of the course. Individual course modules may have a terminal objective that includes multiple requirements supported by enabling objectives that address a single competency requirement.
- **Trainee/instructor ratio** — The number of trainees per instructor in a learning activity. The required minimum ratios are specified in Table 2 in Section 9.3.6 of this document.
- **Training day** — Eight contact hours (unless otherwise specified by specific class guidelines). The eight contact hours are for training activities only and do not include breaks or lunch periods. Periodic, brief breaks during the instruction are acceptable to ensure an effective learning environment.
- **Training director** — The individual responsible for the overall management of all aspects of a training program.
- **Training hour** — Sixty actual training contact minutes.
- **Training hours** — The number of training hours devoted to lecture, learning activities, small group work sessions, demonstrations, evaluations, and/or hands-on exercises. Where integrated technology-enhanced single student techniques are used, the training director shall determine and document the applicable training hours.
- **Training mentor** — An experienced trainer who has demonstrated proficiency in training for specific courses and is deemed reliable by the training director to provide constructive learning and feedback for new instructors.
- **Training program** — A written document by a training provider that addresses all of the requirements established in Section 9 of this document.
- **Training provider** — Any organization providing a training program. This document is primarily focused on organizations that provide training through an NIEHS/WTP training grant.
- **Train-the-trainer** — A model used to describe training potential instructors or less experienced instructors to deliver training materials. Trainers need two separate sets of skills and knowledge: they must know the topic they are teaching and the principles of adult education.

# 3. BACKGROUND & INTRODUCTION

## 3

**Worker safety and health training can save lives and prevent injuries and illness. This has been the experience of the National Institute of Environmental Health Sciences (NIEHS) Worker Training Program (WTP), which has trained more than 3 million workers since its inception in 1987. NIEHS' mandate came through the Superfund Amendments and Reauthorization Act of 1986 (SARA), which also required the Occupational Safety and Health Administration (OSHA) to promulgate health and safety standards to protect and train workers engaged in hazardous waste operations. OSHA promulgated a final standard in March 1990 at 29 Code of Federal Regulations (CFR) 1910.120. The act also established and funded a grants program for the training and education of workers engaged in work covered by that OSHA standard.**

The intent of the training grants program was to develop and deliver the highest quality training programs geared toward the adult learner. The initial quality control for the WTP was developed through a participatory national technical workshop in 1990 and issued by the WTP in 1991. This original “Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response,” better known as the “Minimum Criteria,” was updated in 1994 to provide interpretive guidance to selected sections of the document. Following a technical workshop in 2005, the Minimum Criteria document was updated again to reflect the evolving strategic priorities of the WTP, and it has served as the quality control basis for WTP training awardees until the present time.

There have been many developments in training since the inception of the WTP in 1987. These developments in training are due to a series of lessons learned in safety and preparedness related to historic national disasters, infectious disease outbreaks, and other occurrences that place workers and communities at risk of exposure to hazardous substances. The program has, over the years, conducted a number of national technical workshops, such as Best Practices in Using Technology in HAZMAT Training in 2017 and the NIEHS WTP Infectious Disease Workshop in 2016, for the purpose of developing additional guidance for the training grants program.

This guidance document, which has been similarly developed through a national technical workshop process, updates the version released in January 2006 to include advances in adult education in the hazardous waste operations and emergency response (HAZWOPER) sector, particularly in the use of technology-enhanced training methods, proficiency assessment, disaster responses, and requirements for additional training programs to support HAZWOPER work.

This guidance emphasizes the principles of adult education (Section 8), establishes minimum criteria for designing training programs (Section 9), establishes quality control requirements for training programs (Section 10), and provides generic guidelines for training curriculum (Section 11). The latter addresses the three primary sectors established in the HAZWOPER standard: hazardous waste operations [29 CFR 1910.120(b)-(o)]; Resource Conservation and Recovery Act of 1976 (RCRA) treatment, storage, and disposal (TSD) operations [29 CFR 1910.120(p)]; and emergency response operations [29 CFR 1910.120(q)]. In addition, training grant program awardees are required to annually conduct quality control audits and certify that their programs comply with this guidance.

---

## Guiding Principles

The following are broad, overarching principles that frame the more detailed guidance in this document.

---

29 CFR 1910.120 provides the needed framework for protecting hazardous waste workers and emergency responders. It is the most proactive OSHA standard for protecting workers who respond to disasters, both natural and man-made. In the latter category, OSHA has indicated that terrorist acts involving chemical, biological, radiological, and nuclear weapons would be covered by the standard. Acts involving explosive agents may also be covered, depending on the types of exposures generated by the acts.

---

This guidance is primarily intended for organizations that provide hazardous waste worker and emergency response training under grants from NIEHS but may likewise prove valuable to any organization that provides similar occupational health and safety training.

---

This document draws on and references other guidance materials that provide excellent recommendations for training the intended target populations. Of particular note are the National Fire Protection Association (NFPA) guidelines and the April 2003 edition of the Federal Emergency Management Agency's (FEMA) "*Guidelines for HazMat/WMD Response, Planning and Prevention Training: Guidance for Hazardous Materials Emergency Preparedness (HMEP) Grant Program.*" The FEMA guidance has been fully adopted by reference in this document.

---

Whenever there is doubt about the appropriate category of training, the more comprehensive and protective option should be applied.

---

Peer-to-peer training with hands-on activities is the most effective model for worker training. This guidance recommends that hands-on training should fill at least one-third of the training program hours.

---

Hands-on training is an essential component of HAZWOPER and HAZWOPER-supporting training. As the WTP has matured, its acceptance of online learning and integration of technology-enhanced training has grown. The WTP has embraced the concept of blended learning, whereby a training program can operate in all training modalities. In such an approach, the objectives of each individual training course are considered carefully prior to choosing the training modality. And while the program recognizes the challenges related to getting workers into the classroom, it still believes that hands-on, participatory training offers the best environment and experience for learning. The program also believes that online learning should be used primarily for awareness-level training or for knowledge-based training that does not require a skills development component.

---

Proven adult-learning techniques should be the core of all worker training.

---

Worker safety and health training must be provided in a language and at a literacy level the participant can understand. If a worker does not speak or comprehend English, instruction must be provided in a language that the

worker can understand. Similarly, if the worker's vocabulary is limited or there is evidence of low literacy among participants, the training must account for this limitation.

Training organizations should follow a code of conduct that ensures that both trainers and trainees are treated with dignity and respect. This code of conduct should ensure there is no discrimination, belittling, or harassment, and that there is respect for multiple cultures and genders during training.

Worker safety and health training must be preceded by a needs analysis to ensure the appropriate knowledge, skills, and attitudes are being transmitted. The training must be followed by a proper evaluation to document the knowledge, skills, or attitudes were acceptably transmitted and that the worker possesses the necessary abilities to perform the tasks.

Post-disaster training must be tailored to the specific hazards presented by each disaster and should be revised as often as significant new hazard information becomes available or the stage of the disaster changes.

The original 1991 Minimum Criteria guidance was the basis of the OSHA nonmandatory appendix on training in the 29 CFR 1910.120 standard (Appendix E, Training Curriculum Guidelines). This update of the Minimum Criteria maintains most of the original recommendations; changes are intended to make the original material more clear, relevant, and/or protective of workers.



(Photo courtesy of  
Alabama Fire College)

# 4. PURPOSE



**The purpose of this document is to establish minimum health and safety training criteria for programs and providers to meet the training requirements established in:**

- The Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120).
- 1910.120-supporting training.
- All-hazards prevention, preparedness, and response training as defined in the National Response Plan<sup>1</sup> dated December 2004.

In addition, this guidance is intended to help trainers integrate new training technologies and techniques into their programs, improve annual refresher training, and increase the effectiveness of their courses by emphasizing the principles of adult education and this document's guiding principles.

---

<sup>1</sup> The National Response Plan was superseded by the first version of the National Response Framework in 2008. The National Response Framework, Third Edition, was released in June 2016.

## 5. SCOPE

### 5

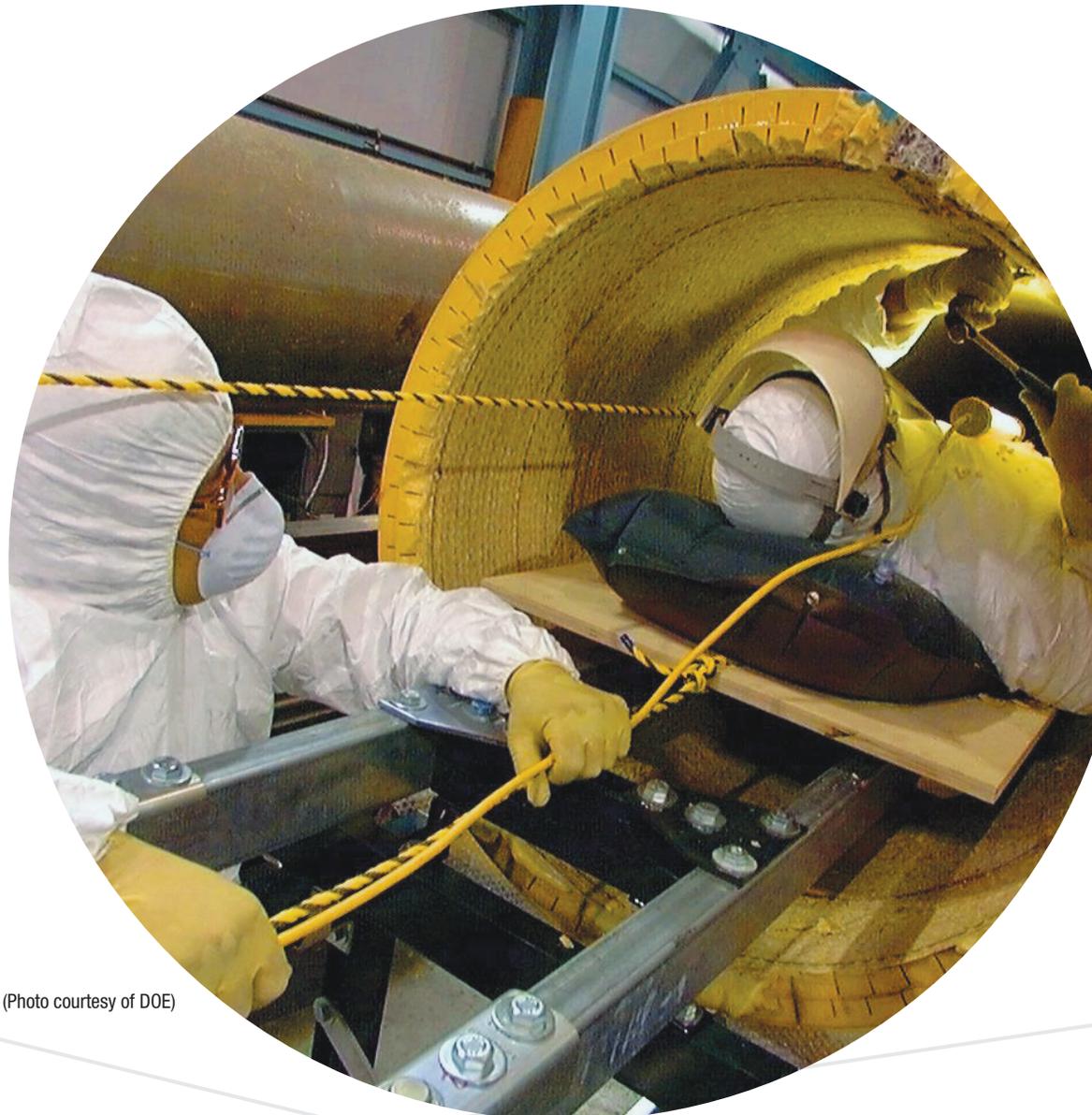
These criteria apply to training providers offering training to all training populations established within 29 CFR 1910.120(e); 29 CFR 1910.120(p)(7) and (p)(8)(iii); and 29 CFR 1910.120(q)(4), (q)(5), (q)(6), (q)(7), and (q)(8). They likewise apply to all 1910.120-supporting training programs and all-hazards prevention, preparedness, and response training offered by those training providers, based on the requirement that initial training has been successfully completed in accordance with 29 CFR 1910.120(e), (p), or (q).

## 6. APPLICATION

6

**These criteria are applicable to all NIEHS/WTP training grant awardees for all 29 CFR 1910.120-based training, 1910.120-supporting training, and all-hazards prevention, preparedness, response, and recovery training for which the awardee is funded by the NIEHS/WTP.**

The criteria are recommended, however, to all other training organizations providing 29 CFR 1910.120-based training as a guide.



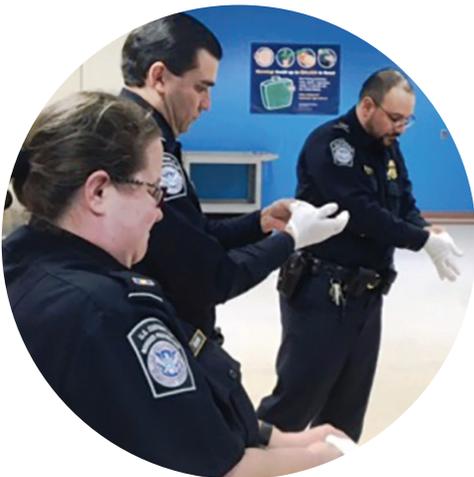
(Photo courtesy of DOE)

# 7. ORGANIZATION

## 7

This document is organized in the following manner:

- Section 8 presents worker training principles and characteristics of excellence to which all training providers should adhere.
- Sections 9, 10, and 11 provide minimum training program design criteria, quality control criteria, and curriculum guidelines, respectively, which apply to the initial and refresher training requirements within the HAZWOPER standard at 29 CFR 1910.120(e), (p), and (q).
- All-hazards training programs exclusively focus on the emergency response [29 CFR 1910.120(q)] sector and may be integrated into both full-time and collateral duty emergency responder training or provided as additional separate training modules or courses subsequent to initial training. Sections 9 and 10 apply to these training programs.
- Section 12 addresses accreditation/certification of training programs covered in this guidance.
- Section 13.1 (Annex A) provides guidance specific to all 1910.120-supporting training programs. Sections 9 and 10 apply to these programs as well. Such training programs, however, shall for purposes of this guidance not be considered as part of the initial HAZWOPER training programs, but as separate training programs.
- Section 13.2 (Annex B) provides the agenda for the technical workshop that served as the basis for the revisions to this document.
- Section 13.3 (Annex C) provides a checklist for planners and evaluators regarding the principles of adult education.
- Section 14 provides a list of references and resources.



# 8. WORKER TRAINING PRINCIPLES AND CHARACTERISTICS OF EXCELLENCE

## 8

Applying these principles to the development and delivery of training programs should ensure that the programs are excellent and provide the best possible basis for working in hazardous environments in a safe and healthful manner. The criteria should also help workers participate in reducing the hazards that create such environments. The training provider must recognize and incorporate the following characteristics of excellence and principles of adult education to meet the spirit of this guidance document.

---

## 8.1 Characteristics of Excellence

The best training programs embody the following characteristics, which should be required of every program offered under these criteria. The programs are:

1. Accurate
2. Credible
3. Comprehensive
4. Clear
5. Practical

---

### 8.1.1 Accuracy

Accuracy can be ensured by requiring that the training materials be prepared and reviewed by qualified individuals, updated on an annual basis, and applied by appropriately qualified and experienced individuals employing appropriate training techniques and methods.

---

### 8.1.2 Credibility

Employing educational methods appropriate to adult learners is particularly important for the high-hazard work environment. Credibility is enhanced when instructional staff is experienced in applying the knowledge and skills that they are teaching, establishing a “peer” relationship with the trainee. Excellent programs often include “reality check” learning activities that give trainees the continuing opportunity to measure the relevance of the instructional materials against their own personal experiences. Credibility is also enhanced when materials are based on the best available science and best practices in the field.

---

### 8.1.3 Comprehensive

Minimally acceptable training programs must cover everything required for someone to safely conduct assigned work activities, a requirement that is particularly critical for working with hazardous materials. Providing inadequate information or failing to ensure that the trainee has mastered the minimum necessary knowledge and skills can be dangerous to that trainee. Any training under the HAZWOPER standard must be comprehensive rather than simply meeting the minimum number of training hours specified in the standard. For that reason, the criteria are presented in considerable detail in this guidance, recognizing that the fundamental training objective is to achieve acceptable knowledge and skills among trainees already skilled in their trade without any regard for the training duration.

---

### 8.1.4 Clarity

Training programs must not only be accurate, credible, and comprehensive; they must also be clear. If the material is understandable only by someone with a college education, then the program will fail many workers. Training materials should be written in the language and grammar of everyday speech appropriate for the target audience and delivered in a language the participants can understand. Further, training material developers should measure readability levels to ensure that the training materials are appropriate for their target audience. They should accommodate a range of different literacy levels and learning styles, as discussed in Section 8.2.

---

### 8.1.5 Practicality

Training programs should present information and ideas and develop skills that students see as directly useful in their working lives.

## 8.2 Principles of Adult Education Applicable to HAZWOPER

The vast majority of HAZWOPER students are adults who already possess the knowledge, skills, and abilities to work in their current occupations, such as firefighters, emergency medical support personnel, rail workers, construction workers, chemical process operators, and utility workers. The objective of HAZWOPER training is to provide the additional knowledge, skills, and abilities to permit these workers to safely perform their trade in high-hazard environments. Achieving this requires basing instructional materials, techniques, staff, and setting upon sound and proven principles of adult education that are tailored to the specific target audience.

The following are the basic principles of adult education applied to HAZWOPER and related training programs:

**Adults learn best by doing.** Knowledge alone is insufficient in the HAZWOPER environment. Workers must also be competent and proficient in the unique skills that are required in such work. Hands-on training, learning activities, and proficiency assessment are mandatory.

**The training environment must be conducive to learning.** HAZWOPER training has two distinct learning environments: the initial off-site training and the on-site, supervised training. The off-site training must provide the knowledge required to perform the work in the HAZWOPER environment and verify the satisfactory attainment of the related skills. On-site, supervised training is intended to verify that the student can safely apply the necessary knowledge and skills in the actual workplace.

**New skills should be based on current skills.** The new skills required by a firefighter, construction worker, or other skilled worker to safely perform their work in a hazardous materials (HAZMAT) incident or hazardous waste cleanup operation must be constructed on the individual's current occupational skills. Heavy equipment operators, for example, should already be qualified to operate their equipment before receiving training to operate the equipment under the unique circumstances of the hazardous waste cleanup site. This approach greatly facilitates learning, peer interaction, and retention.

**Adults learn from a variety of learning activities.** These activities include hands-on demonstrations and activities, role playing, case studies, audiovisual presentations, discovery exercises, planning exercises, group discussions, lecture-discussions, report-back sessions, drills and exercises, computer use, website access, computer simulations, and blended approaches using integrated instructional technologies.

**Adult learners need direct experience to apply new skills in the work environment.** This principle is the underpinning of the necessity of the hands-on component of skills training. Scores on a knowledge test are not a satisfactory indication that new skills can be effectively and safely applied in the work setting.

**Adults need frequent, nonjudgmental feedback.** Adult learners need to know how they are doing in a manner that is not judgmental. Training must respect students' existing knowledge, skill, experiences, and circumstances. Opportunities must be provided for constructive feedback to each student in the training course.

**Small group activities are important to adult learners.** This approach provides an opportunity for individual learners to share and discuss what they have learned with their peer students, as adult learners benefit from the experiences of other participants.

**Adult learners respond better when they have the opportunity to learn from their peers.** The WTP has recognized the critical importance of peer instructors since the inception of the program and continues to do so.

**Adult learning must be reinforced.** The knowledge and skills learned for work in the HAZWOPER environment must be retained to be of value to the student. This is the primary purpose of refresher training, which must include critical skills aspects. Site-specific training and periodic drills also serve as reinforcement mechanisms as newly learned knowledge and skills are applied in an actual or simulated work environment.

**Learning methods must consider the learner's technological fluency.** Not all adult learners are comfortable or fluent with technology-enhanced training tools, such as computer-based or Web-based methods. The student's comfort level and fluency with technology must be considered before choosing technology-enhanced instructional methods and during curriculum design and delivery.

**Adult education is empowering.** The knowledge, skills, and experiences adults gain in educational programs should empower them to improve the conditions under which they work and live.

Annex C provides a checklist for planners and evaluators regarding the principles of adult education.

# 9. MINIMUM TRAINING PROGRAM DESIGN CRITERIA

## 9.1 Introduction

The following minimum general criteria apply to all providers of initial and annual refresher training required by the 29 CFR 1910.120 regulations (HAZWOPER), the 29 CFR 1910.120-supporting training programs detailed in Annex A, and all-hazards supplemental training programs. The minimum initial and refresher HAZWOPER training curriculum guidelines are addressed in Section 11 of this document.

## 9.2 Assumptions

The HAZWOPER regulation requires initial off-site training and demonstration of the required minimum competencies in each of three primary categories of work covered by the regulation: hazardous waste cleanup operations, RCRA/TSD, and emergency response. The hazardous waste cleanup operations section of the standard also requires initial on-site, supervised training after completion of the initial off-site training program. This is the responsibility of the employer and is not addressed in this guidance.

The required annual refresher training is included in this section and in the Minimum Training Curriculum Guidelines (Section 11) based on the assumption that if initial training programs are provided, refresher training will be as well. Refresher training may be provided off-site or on-site. Given this assumption, this document recognizes that there are exceptions where training providers may not be the same for the delivery of the various training elements, i.e., 1910.120 core, refresher, 1910.120-supporting, and all-hazards training.

This document does not provide guidance for craft, trade, job classification, or task training. This document is based on the assumption that all trainees possess the knowledge, skills, and abilities specific to their individual craft or trade prior to entering a HAZWOPER training program. Further, under no circumstances should a worker be allowed to engage in work covered by the HAZWOPER regulation unless he or she has successfully completed the applicable HAZWOPER training and is in possession of the necessary skills and abilities to perform the work assigned. Training programs that also provide trade or craft training must ensure that this training is successfully completed before the worker begins the applicable HAZWOPER course. Under no circumstances shall such training be conducted concurrent with HAZWOPER training or counted toward the required minimum HAZWOPER training hour requirements.

This guidance recognizes that additional standard-specific training may be required for operations covered by the HAZWOPER standard where additional hazards may be present, such as confined spaces. Annex A covers 1910.120-supporting training. The need for all-hazards training has emerged as a result of the 9/11 terrorist attacks; the creation of the National Response Plan, the National Response Framework, and the National Disaster Recovery Framework; and the issuance of several supplemental training awards by the NIEHS/WTP. Any training

provider offering training in these additional 1910.120-supporting and all-hazards training categories must meet the applicable requirements established in this document in Sections 9 and 10.

Refresher training requirements in the HAZWOPER regulations vary to some degree among the three primary HAZWOPER categories. The assumption in this guidance is that documented proficiency assessments are required in all annual refresher training, and this may include evaluation of selected skills proficiency.

The HAZWOPER regulations establish minimum initial training hours for the different work categories and minimum annual refresher training hours for some of these categories. The NIEHS/WTP awardees (and others such as OSHA and FEMA) have more than three decades of experience in providing and evaluating these various training requirements. This experience has led to the conclusion that, for most target populations, the OSHA-required minimum training hours are not adequate to ensure the necessary competencies. The objective of training, particularly in the high-hazard HAZWOPER environment, is the achievement of the necessary competencies and not simply completion of the minimum training hours required. OSHA-established minimum training hours must be met, but additional training hours may be required to achieve the needed competencies. This is particularly the case for the emergency response sector when all-hazards modules are added or integrated into the training courses. The following table provides a summary of the range of training hours required among the WTP awardees and addressed in the FEMA document to meet the minimum competencies:

<b>TABLE 1</b>	
<b>Hazardous Waste Operations</b>	
General site worker	40–80 hours*
Other than General site worker	24–36 hours*
Update Other than General site worker to General site worker	16–24 hours*
Refresher, annual	8 hours
<b>RCRA/TSD</b>	
Initial	24–40 hours*
Refresher, annual	8 hours
<b>Emergency Response</b>	
Awareness level	4–16 hours*
Operations level	8–40 hours*
Technician level	40–240 hours*
Refresher	8 hours**
<b>Disaster Site Worker (OSHA Outreach Training Program)</b>	<b>7.5–16 hours</b>

\* Upper end of range exceeds OSHA minimum.

\*\* Exceeds upper end for some levels of training or assigned duties.

Finally, it is assumed that training providers and their instructional staff will use a range of training techniques and methods, including technology-enhanced, that are appropriate to meeting the course training objectives.

---

## 9.3 Core Criteria

**A written training plan shall be prepared, implemented, maintained, and updated as necessary on an annual basis. It shall include the following elements at a minimum.**

---

### 9.3.1 Training Director

Each training program shall be under the direction of a training director who is responsible for the program. The training director must demonstrate the capacity for providing leadership, for ensuring productivity of appropriate worker health and safety training and education programs, and for managing the training programs, including quality assurance and program evaluation. In addition, the training director shall have a minimum of two years of worker education experience. The training director is also responsible for several specific aspects of the training program, which are identified in the following subsections.

---

### 9.3.2 Training Facility

Training facilities shall have available sufficient resources, equipment, and site locations to perform classroom and hands-on training in a setting conducive to effective learning for each specific course offered, and shall have sufficient organization, qualified instructional staff, support staff, technology, and services to conduct such training.

When the curriculum employs technology-enhanced training methods, the facility or other training location shall have sufficient information technology support staff and infrastructure (working hardware, Internet/Wi-Fi activity and strength, tested and secure software applications, adequate IT security measures) to meet the classroom demands of the participants and the types of technology-enhanced training methods being used.

---

### 9.3.3 Instructional Staff

Instructors shall be deemed competent by the training director to instruct specific courses on the basis of:

- Documented relevant experience.
- Successful completion of the courses they intend to instruct.
- Successful completion or rotation of co-instructing with a training mentor who instructs courses on topics they will teach.
- Successful demonstration and/or implementation of adult education principles and adult learner-centered teaching training facility techniques for training (refer to Section 8.2).
- Successful demonstration of effective course instruction techniques, including voice pitch/volume, body language, and time management.
- Successful demonstration of use and implementation of equipment and technology-enhanced training methods that will be used for courses they will teach.
- Successful completion of a train-the-trainer program specific to the topics they will teach.
- An annual evaluation of instructional competence by the training provider.

It is desirable that the same organization provide the courses and train-the-trainer program. To the extent possible, instructors should be experienced in the HAZWOPER category they intend to instruct and be peers of the trainees.

It is also desirable that instructors exercise ethical values and cultural sensitivity when providing training to different target populations. Each training provider should have a code of conduct or code of ethics by which trainers must abide. This code should include the recognition that cultural differences and similarities between people exist and should not be assigned a value (positive, negative, better or worse, right or wrong). This allows one to respect and value other cultures and can reduce cultural barriers between trainers and their students.

Instructors shall be required to maintain competency by:

- Participating in continuing education or professional development programs. Acceptable continuing education or professional development programs should be determined by the training director.
- Successfully completing annual instructor refresher training.
- Being recertified by the training director after an annual review of instructional competency.

New instructors shall be assigned to work with a training mentor, or a more experienced instructor, for their first training(s). The training director or his or her designee will determine if the new instructor has successfully demonstrated proficiency in the course content.

The instructor annual refresher shall be devoted to applicable educational techniques, applicable training technologies, new or revised federal standards applicable to the courses being instructed, and hands-on training, as appropriate. When new training methods, including technologies, are introduced into the training program, instructors shall be trained to effectively apply them prior to using them in the courses they are instructing.

The annual review of instructor competency shall include, at a minimum, observation by the training director or his or her designee of instructional delivery, review and discussion of observations with the instructor, and an analysis of the instructor performance based on evaluations completed by trainees during the previous year.

Instructors providing instruction in the 1910.120-supporting training programs identified in Annex A and in all-hazards training shall be certified competent to offer such instruction by the training director using the preceding criteria as guidance. Where required by certain of these supporting training programs, such as Asbestos or Construction Safety and Health (OSHA 10- and 30-hour programs and Disaster Site Worker 7.5- and 15-hour programs), the instructor shall be certified or authorized in accordance with the applicable requirements established by the certifying or authorizing authority.



(Photo courtesy of the Hazardous Materials Training and Research Institute)

### 9.3.3.1 Instructional Staff Using Technology-Enhanced Training Methods

Instructors who are using technology-enhanced training methods must be competent in the use of any technologies that are part of the curriculum. They must also be competent in knowing how to repair or replace technology-enhanced training tools that fail during a training session or have adequate support staff to do so, in order that trainee learning will not be disrupted by technology failures.

Instructors that use technology-enhanced training methods should also be proficient in the following:

- **Content knowledge.** The instructor must be able to competently deliver the content via the selected training technology/ies.
- **Engaging students.** The instructor must be able to facilitate discussion and encourage conversation among the students using the selected technology-enhanced training method/s. This includes behaviors such as using personal examples, asking questions, addressing others by name, initiating discussion, using humor, and using inclusive pronouns. For situations where the instructor and the students are not in the classroom together, the instructor should respond to the students in a timely manner.
- **Technology.** The instructor must be familiar with the technology-enhanced training tool and/or system. Their knowledge should include basic use of the tool/system, technology troubleshooting skills, and ability to identify alternative technology-enhanced training solutions until problems are solved.
- **Good communication skills.** The instructor must possess good communication skills that transcend the traditional learning environment and are enhanced to fit the technology-enhanced training environment.
- **Ability to manage learners.** Instructors must develop the skill set needed to manage online users. Instructors must master the technique of holding students accountable in a technology-enhanced training environment.
- **Assessment.** The instructor must incorporate various methods of assessing the learner's knowledge. This includes methods such as online tests and quizzes, papers, blogging, email, discussions, and polling questions.

---

### 9.3.4 Training Course Materials and Content

The training director shall ensure the review and approval of all course materials and other training aids, including but not limited to the course syllabus for each course offered, trainee manuals, instructor manuals, audiovisual aids, technology-enhanced training methods, handouts, demonstration equipment, and hands-on equipment, prior to their initial use and as needed thereafter or at least annually. The training director shall document the review and approval process.

The training director shall also ensure that all written materials, audiovisual aids, technology-enhanced training applications, and proficiency assessment instruments for each course are peer reviewed by technically competent external reviewers or by a standing advisory board established for that specific purpose. These reviewers shall possess relevant expertise and experience in the disciplines appropriate to the course subject. One or more of the reviewers shall be an experienced worker representing those to whom the training is directed.

Training courses shall be developed and updated as necessary to be consistent with the recognized principles of instructional design, such as the ADDIE method (Analysis, Design, Development, Implementation, and Evaluation), as discussed in detail in the U.S. Department of Energy (DOE) Systematic Approach to Training Handbook (DOE-HDBK-1078-94) and addressed in ANSI/ASSE Z-490.1-2016. Learning objectives shall be developed that are realistic,

meaningful, attainable, and measurable based on guidance such as SMART (Specific, Measurable, Action-Oriented, Relevant, and Timely).

Instructors shall integrate a variety of teaching strategies and activities to meet the needs of multiple learning styles, cultures, and/or generations within the training target audience. In addition to the traditional lecture format, instructors should consider incorporating activities that involve group work and discussion, active learning, mentoring, technology integration, and three-way learning.

Additional references that specifically consider the NIEHS/WTP target audiences can be found in the November 1998 WTP workshop report, “Guidelines for Training in Support of Workplace Safety and Health Programs,” and in several reports from WTP Trainers’ Exchange conferences. The Trainers’ Exchange reports are available on the National Clearinghouse for Worker Safety and Health Training (National Clearinghouse) [website](#). The Office for Domestic Preparedness provided a useful tool for analyzing delivery methods (called DMAT) and a comprehensive review of the ADDIE method in its 2003 “Approach for Blended Learning.” The methods used shall be fully documented by the training director.

Particular attention should be devoted to the following with respect to course design and content:

- a. Characteristics of the training target audience, including language, culture, and literacy.
- b. Target audience training needs.
- c. Course prerequisites, if any.
- d. Learning objectives, including learning objectives for each course module.
- e. Analysis and selection of delivery methods appropriate to the training target audience, training location, and learning objectives.
- f. Instructional materials including, but not limited to, an instructor’s manual with lesson plans and learning objectives, a trainee manual, training aids, and learning technologies.
- g. Effective alternatives for training/instruction should certain resources or technologies not be available at the designated training location.
- h. Evaluation methods and criteria for satisfactory completion of the course.

---

### 9.3.5 Trainees

The program shall ensure, to the extent possible, that the trainees recruited are capable of being employed in work involving hazardous waste operations and/or emergency response. If trainees are currently employed in a trade, craft, or specific job/task classification, the program shall ensure, and document as appropriate, that they already possess the necessary skills of their trade, craft, or job/task classification. Trainees may be approved by the training director through a written justification based on the requirement that the basic trade, craft, or job/task classification competencies have been or will be achieved prior to commencing HAZWOPER training.

When necessary, the training program shall also have a written policy on the necessary medical clearance for trainees to participate in the course and engage in any required hands-on activities, such as respirator donning and doffing. No certificates of successful completion of the training shall be issued if the trainee is unable to complete all course elements deemed to be essential by the training director.

### 9.3.6 Instructor-Trainee Ratios

All classroom instruction shall not exceed 25 trainees per instructor. The ratio of students to instructors for hands-on activities is based on the level of attention needed for the protective ensemble being worn: levels A and B require greater scrutiny by the instructor because of the increased risks of falls, heat stress, and claustrophobic reactions (Table 2). Ratios are also applicable to skills demonstrations to ensure effective and timely assessments, as well the safety of the trainees. No less than two instructors shall be present during any hands-on training activity that involves the wearing of personal protective or other equipment.

**TABLE 2**

Ensemble level	Ratio (Trainee/Instructor)
C & D	10:1
A & B	5:1

For online-learning classes, opportunities for interactive questions and discussion with an instructor or other knowledgeable person should be provided during the time allotted for course completion.

For training using technology-enhanced methods in a classroom, instructors must be able to provide or access the support necessary to meet the learning goals in the time allotted for class. During group and hands-on activities, there must be a sufficient number of trainers available to answer questions and prompt group discussions.

For courses in which the worker may have literacy limitations that could affect their understanding of the content and/or how to use the training technologies, sufficient instructors must be available to ensure that trainees can successfully engage in the training. The same consideration is needed for workers who lack literacy and competence in the technologies being used.

### 9.3.7 Proficiency Assessment

#### 9.3.7.1 Initial Training

WTP trainee proficiency shall be evaluated using a documented process. The training director, course instructors, and relevant curriculum staff will develop and use tools that are appropriate to evaluate the attainment of knowledge, skills, and attitudes for the learning objectives of individual lessons and the overall training program.

A variety of tools may be used to assess trainee proficiency. Proficiency must be measurable, demonstrable, and/or observable as suitable for the stated learning objectives. The type, number, and extent of evaluation activities are dependent on the written objectives and skill requirements for a specific course. Assessment tools include, but are not limited to, written examinations, technology-enhanced methods such as anonymous polling apps, observation of skills demonstrations, tabletop exercises, and individual or group projects.

Proficiency assessment methods, regardless of the approaches used, shall be justified, documented, periodically reviewed, and approved by the training director using generally accepted procedures. Assessment tools must be reviewed and updated as necessary to reflect any changes in curriculum and federal, state, or local regulations, as appropriate, and must be approved by the training director. The dates that such modifications occur must

be recorded and retained in course materials and records. Periodic internal and/or external peer review is recommended.

Specific proficiency assessment tools and level of minimum achievement shall be specified in writing by the training director. By convention for adult education and training courses, thresholds for satisfactory completion include 100 percent attendance, a minimum 70 percent score on written examinations, and 100 percent mastery of demonstrable skills. Written examinations and demonstrable skills must be mapped to the learning objectives, so that modifications do not inadvertently result in loss of assessment of critical skills.

On occasion, trainees may not meet the criteria for successful completion or proficiency. In such cases, it may be appropriate for the trainers to use their best judgement to correct and counsel trainees and to allow repeat or equivalent opportunities for successful completion. For example, incomplete attendance for good reason (emergencies, etc.) may be made up by alternative assignments for the topics missed, or some students may have poor reading skills but may be able to verbally demonstrate good understanding of concepts normally assessed in written examinations.

Given the nature and importance of many demonstrable skills, remedial actions and feedback can and should be used to assist trainees in order to achieve 100 percent mastery. Such demonstrable skills include safe use and operation of equipment or selecting, inspecting, donning, and doffing personal protective equipment (PPE). If, after re-assessment, trainee performance continues to be deficient, the trainee must retake the course before receiving a certificate of successful completion. All assessments must be completed by the course instructor(s).

Thresholds for successful completion of proficiency tools may be modified, as appropriate, by the training director. However, in the interest of clarity and fairness to trainees, the thresholds must be specified and communicated before assessment.

Documentation and recordkeeping of proficiency assessment tools, trainee achievement scores, and certificates of completion are required. WTP training organizations may find it most practical to create checklists or similar tools to document satisfactory completion of course components by trainees. Copies (electronic or paper) or spreadsheets with appropriate levels of detail must be made for proficiency assessment tools, achievement score records, and certificates of successful completion. These records must be retained by the training organization for appropriate periods of time, according to the policies and procedures of the organization. In the absence of an organizational policy, a minimum of five years is required for training course record retention.

#### *9.3.7.2 Refresher Training*

Trainee proficiency shall be assessed by using a written assessment and/or other proficiency tools, such as observation of demonstrable skills. Such tools must be selected and developed by the training director to evaluate selected knowledge and individual skills appropriate to the refresher for the initial course. The level of minimum achievement necessary for proficiency shall be specified in writing by the training director.

Proficiency assessment methods, regardless of the approaches used, shall be justified, documented, periodically reviewed, and approved by the training director using generally accepted procedures. Assessment tools must be reviewed and updated as necessary to reflect any changes in the initial curriculum and federal, state, or local regulations, as appropriate, and must be approved by the training director. Periodic internal and/or external peer review is recommended.

### *9.3.7.3 Representative Good Practice for Proficiency Assessment*

Written examinations for two-day to five-day initial courses generally include a minimum of 50 questions relevant to the learning objectives of the course. For eight-hour refresher courses, written examinations generally include a minimum of 15 questions relevant to the course learning objectives, but documented alternatives, such as skills demonstrations, may also be appropriate. Examinations may be administered through written or verbal means, as deemed appropriate by the training director.

Some WTP training organizations administer pre- and post-course examinations. Many trainers review and correct examination answers after the post-test to help trainees recognize and retain the correct answers before leaving training.

Regarding the periodic review and update of assessment tools, many providers perform reviews and updates at least annually. Additional course review and update may be necessary to reflect any modifications in curriculum due to federal, state, or local regulations. Updates must be approved by the training director. The dates that such modifications occur must be recorded and retained in course materials and records.

Regarding the observation of demonstrable skills, most providers use checklists to track completion of specific tasks. Some trainers use cellphone applications to help retain certain records. The use of this and other technology is encouraged, with the caveat that some technologies may become obsolete and may result in the inadvertent loss of critical performance assessment records. Therefore, alternate methods of recordkeeping may be necessary.

Some trainers use photographs or videos of trainees when performing activities or when dressed-out with PPE for evaluation, self-appraisal, and documentation. However, instructors should be aware that privacy issues or trainee preferences may limit such use in certain cases.

Some courses or sections of courses may be limited to participants who have completed medical clearance for training or use of PPE. Instructor demonstrations may be used instead of observation for these participants. In such cases, training providers may find it advisable to note on materials and course certificates of completion that the courses or sections of the courses are for “awareness,” and that participants are not fully qualified to use specified PPE or to perform certain tasks.

---

### 9.3.8 Course Certificate

Written documentation shall be provided to each trainee who successfully completes the course of instruction based on the proficiency assessment requirements in 9.3.7 and attendance for the duration of the course. This documentation shall include a signed certificate containing the following information, at a minimum:

- a. Name of the trainee.
- b. Course title indicating the HAZWOPER category to which the course applies.
- c. Course completion date.
- d. Statement that the trainee has successfully completed the course.
- e. Name and address of the training provider.
- f. Date that annual refresher training is required or statement that such is not required or an expiration date.
- g. List of the levels of PPE used by the trainee to complete the course (optional).
- h. An individualized, unique certificate number.

An appropriate laminated wallet-sized or a durable and nonreproducible card with a photograph of the trainee and the above information may also be issued to the trainee by the training provider. Such a card shall include the trainee's unique certificate number.

For HAZWOPER-supporting training programs or all-hazards training courses, certifications of successful completion of the course shall meet requirements for that course by the applicable regulatory entity. Where no such written certification is required, a certificate shall be issued by the training provider containing the appropriate information using the preceding certificate information listing as a guide.

---

### 9.3.9 Recordkeeping

#### Student records

The training provider shall maintain records listing:

- The dates courses were presented.
- Name of, and unique identifier for, each course trainee.
- A clear indication of which trainees successfully completed each course.
- The number of the training certificate issued to the trainee, cross-referenced by name, unique identifier, and date of course completion.

The training provider shall maintain records for all initial training, refresher training, 1910.120-supporting training, and all-hazards training for a minimum of five years after the last date that the trainee completed a course by the training provider or as otherwise required by state or federal regulations or requirements. Such records shall be provided to the trainee, to an individual designated in writing by the trainee, and to a representative, if mandated by law.

## Instructor records

The training provider shall maintain records for instructors that document:

- Their qualifications.
- Certifications received.
- Annual instructor refresher courses taken.
- Professional development programs completed.
- Annual certification of instructional competency issued by the training director.

---

### 9.3.10 Program Quality Control

The training director shall develop and maintain a written quality control and evaluation plan. At least annually, the training director shall conduct or cause to have conducted a program quality control audit based on that plan, which shall be in writing. Program modifications to address identified deficiencies, new standards or regulations, or new training methods shall be documented, approved, and implemented. The audit and program modifications documents shall be maintained by the training provider. Program quality control audits shall follow the criteria included in Section 10, “Training Program Quality Control Criteria.”

The training director shall provide in a timely manner whatever information and documentation may be requested during an NIEHS/WTP audit.

# 10. TRAINING PROGRAM QUALITY CONTROL CRITERIA

## 10

### 10.1 Introduction

The criteria that follow should be used as an audit checklist by training providers, training directors, and others, such as the NIEHS awardee peer review audit teams. The factors listed in this section for determining the quality and appropriateness of training are applicable to 1910.120 courses, 1910.120-supporting courses (Annex A), and all-hazards courses.

### 10.2 Training Plan

A written plan is critical for developing effective training and must consider every step of the curriculum development process: the curriculum analysis, design, development, implementation, and evaluation. The plan must also consider instructor training, training materials and aids (both instructor and trainee), and teaching methods. Auditors of the program should review the following:

- The written training plan.
- The title of the courses, the 1910.120 training category that each course addresses, duration of training, course content, and course schedules.
- Training and qualifications of the assigned instructional staff.
- The course syllabus.
- Course prerequisites.
- The training needs of the target audience (based on a “needs assessment”).
- Course design, including considerations of adult education principles, the characteristics of the target audience, instructional strategies and media, and the basis for the learning methods chosen, particularly with respect to the integration of new instructional technologies and techniques.
- Learning objectives, for the course and for each module.
- The course development process, including appropriate technical input, external review, evaluation, and documentation.
- The instructional methods, including demonstrations and hands-on activities.
- Monitoring of student safety, progress, and performance during training.
- The assessment process, including pre-testing (if employed), written tests, and skills tests including acceptable levels of performance.
- The evaluation process and implementation of the recommended changes.

---

## 10.3 Training Program Management

The management of the program should also be evaluated to see how well the organization delivers training, using the following criteria:

- The training director's leadership in ensuring quality of health and safety training.
- Competency of the staff to meet the demands of delivering high-quality HAZWOPER, HAZWOPER-supporting, and all-hazards training.
- Clear lines of authority, responsibility, and accountability, including clearly defined staff duties, particularly the relationship of the training staff to the overall program.
- Appropriateness and adequacy of the training methods used by the instructors.
- Instructor competency in applying all instructional methods, including newly introduced instructional technologies.
- Documented assessments of learning effectiveness and retention for specific teaching methods.
- Sufficiency of the time committed by the training director and staff to the training program.
- Ratio of instructor to trainees by instructional method (classroom, hands-on, skills assessment, etc.).
- Availability, appropriateness, and commitment of human and equipment resources.
- Management controls, including management of collaborators, consultants, and contractors.
- In the case of multiple-site training programs, adequacy of the management of the satellite centers, including back-up plan for off-site training.

---

## 10.4 Training Facilities and Resources

The adequacy and appropriateness of the facilities and resources for supporting the training program should be considered, including:

- Space and equipment to conduct training.
- Facilities for hands-on training.
- In the case of multiple-site programs, equipment and facilities at the satellite centers.
- Equipment, technical support, and resources for technology-enhanced training.

## 10.5 Instructional Technologies

There has been a dramatic expansion in the use of new instructional technologies for safety and health training. WTP awardees have been at the forefront of pioneering these technologies for worker training and evaluating the results. They conducted three national workshops to develop guidance, which should be used as the initial basis for evaluation. The workshop reports, “HAZWOPER Training: Utilizing Advanced Training Technologies,” “Development of an Integrated WETP ATT Program: Final Report,” and “Best Practices in Using Technology in HAZMAT Training,” are available from the [National Clearinghouse](#). The quality and effectiveness of training programs that use such technologies should be considered. Factors to consider include:

- What impact will new training technologies have on the achievement of learning objectives?
- What is the ability of the training target audience to effectively respond to and use such technologies?
- Does the application of new training technologies enhance the learning experience? How? Is it documented? Has retention been evaluated?
- Have training objectives been modified subsequent to the introduction of new training technologies? If so, how well have the new objectives been assessed? Have the results of such assessments been applied to the training program?
- Where self-paced, technology-enhanced methods have been applied, what approaches have been used to ensure the students attain the knowledge and skills specified in the course learning objectives?
- Where self-paced, technology-enhanced methods have been applied to skills objectives, how has the required skills proficiency been assessed? How have applicable training hours for such methods been determined and applied?
- Has the training provider assigned the necessary personnel and support for a successful introduction of new training technologies?
- Has the training provider effectively and seamlessly integrated new training technologies?

---

### 10.5.1 Technology Literacy and User-Friendliness

Technology-enhanced learning tools need to be used diligently, and in a way that enhances the learning experience while considering the technology literacy of the trainees. Some suggested criteria for technology-enhanced activities include:

- Providing easy-to-follow instructions to facilitate the registration process and course completion (e.g., picture-based step-by-step instruction guide that can be easily accessed).
- Using a platform or system (learning management system or massive open online courses) that is accessible to most learners (i.e., is not specific to one Web browser or computer operating system; can be accessed from any computer with an Internet connection).
- Bringing a nonelectronic backup (e.g., paper-based tests) should the required equipment fail.
- Testing the technology at the training location prior to delivery.
- Ensuring sufficient time is built into the overall course agenda for technology-enhanced components (consider unforeseen issues with learners, technology, Wi-Fi, etc.).

- Providing technology required for the course (for example, bringing tablets (pre-loaded with course material) to in-class sessions, confirming Internet/Wi-Fi (if needed) will be available).
- Considering and attempting to maximize the interaction of participants, including communicating questions and answers and encouraging participant-to-participant dialogue.

Online learning activities are more popular as a supplement to in-class training or stand-alone learning modules. While a potentially great tool, the lack of direct access to an instructor creates unique challenges. When creating/publishing online learning modules, the following should be considered (in addition to the above-mentioned criteria):

- Providing contact information on a landing/home page to provide general help for learners (e.g., forgotten password, course not running properly).
- Type of content and format (e.g., a text-heavy presentation may be difficult to follow for certain learners). For example, include pictures and videos instead of text, or use closed-captioning or narration to help deliver the information.

---

## 10.6 Quality Control Program Assessment

The written quality control and evaluation plan should consider the adequacy and appropriateness of:

- The advisory committee and/or outside reviewers to provide overall technical policy guidance.
- The competency and role of the advisory committee and outside reviewers.
- The minutes or reports of the advisory committee or outside reviewers' meetings or written recommendations.
- Instructor performance.
- Course evaluations, including feedback, updating, and corrective action.
- The disciplines and expertise being used within the quality control and evaluation program.
- The role of trainee evaluations to provide feedback for training program improvement.

---

## 10.7 Annual Update

The training director should ensure there is an annual update to the written quality control and evaluation plan. The annual update provides an opportunity to consider how well the program has:

- Included all applicable regulatory changes, best available science and best practices in the field.
- Implemented course updates that have occurred during the preceding year.
- Integrated new training technologies.
- Integrated modules among HAZWOPER, HAZWOPER-supporting, and all-hazards training courses.
- Documented the course approvals that are the responsibility of the training director, as specified in this document.

---

## 10.8 Trainees

Adequacy and appropriateness of the program for accepting trainees should be considered, including:

- Assurance that the trainees already possess the necessary knowledge and skills of their trade, craft, or job classification, including documentation that basic skills training has been satisfactorily completed prior to HAZWOPER training.
- Methods the program uses to ensure that recruits are capable of satisfactorily completing the course.
- Compliance with the medical clearance policy.
- Methods the program uses to ensure that recruits are able to use new training technologies, where required.

---

### 10.8.1 Trainees Engaged in Technology-Enhanced Learning

In programs where trainees will be engaged in technology-enhanced learning, the following should be considered:

- Evaluating the computer literacy levels of trainees (if required); ensure instructors are qualified and capable of offering extra help to trainees.
- Providing advanced instruction/pre-course requirements to help bring all trainees up to the required technology literacy level (e.g., pre-course video instruction or presentation).

---

## 10.9 Instructional Environment and Administrative Support

The instructional environment for the training program should be considered for the adequacy and appropriateness of:

- The institutional commitment to the worker-training program.
- The administrative structure and capacity for administrative support.
- The financial resources to support the training program.
- The instructional technology infrastructure.

---

## 10.10 Program Evaluation

Program evaluation can provide important information about the training program overall. It can allow a training director and stakeholders to understand if the program has been implemented as intended and what has happened as a result of the training. A program evaluation provides data and findings that can be used to make decisions about a program, such as how to adjust it or whether to continue or expand it, and to communicate program successes, challenges, and opportunities to stakeholders.

NIEHS has created resources and held workshops to support evaluation across NIEHS grants and within the WTP. The resources include:

- NIEHS Partnerships for Environmental Public Health (PEPH) *Evaluation Metrics Manual*.
- A national Worker Training Program *Logic Model*. The PEPH Evaluation Metrics Manual describes a logic model as “a framework for showing the relationship between the activities a project conducts and the ultimate impacts or outcomes it achieves. Logic models illustrate the key elements of a project, help identify the relationships between project activities and goals, and describe the intended impacts and how they can be measured.”
- NIEHS WTP *training evaluation resources*, including a workshop report, evaluation profiles, and other documents.

When a training organization embarks on a program evaluation, the process should include the development of a written evaluation plan that describes:

- The overall approach that will be used to guide the evaluation, including why the evaluation is being conducted.
- How the findings will be used.
- The evaluation design and data collection sources and methods.

The plan specifies what will be done, how it will be done, who will do it, and when it will be done. The development of a logic model specific to the program being evaluated is recommended, as it can help stakeholders understand the program components and intended outcomes and guide discussion of focusing an evaluation on priority evaluation questions. It is important to involve partners and other stakeholders as the program designs and implements the evaluation and assesses and communicates findings.

Each training director, or their designee, should conduct process and outcome evaluation of their training program to understand the program implementation and effectiveness as an ongoing part of their quality control plan. Conducting an impact evaluation allows a training director and stakeholders to assess the longer-term effects of the program. A periodic impact evaluation focused on the priority needs of program stakeholders is encouraged.

Training organizations need to follow federal requirements on human subjects protections if data collection is for research purposes. The U.S. Department of Health and Human Services defines research as “a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program which is considered research for other purposes. For example, some demonstration and service programs may include research activities.”<sup>2</sup>

---

### 10.10.1 Process Evaluation

A process evaluation determines whether program activities have been implemented as intended. It can assess adherence to regulatory requirements and guidance as well as how accessible and acceptable it is to the target population.

When conducting a process evaluation, the training director or designee should consider the extent to which:

- Instructors are knowledgeable and capable.
- Program objectives are clearly stated.
- Evaluation tools adequately assess program elements, program objectives, and outcomes.
- Participant assessment(s) accurately assess key knowledge, skills, and abilities as defined in learning objectives.
- Appropriate facilities and staff are available and committed to the program (i.e., are institutional resources sufficient to achieve the goals).
- An appropriate mix of classroom, demonstration, and hands-on is included in training.
- New training technologies have been appropriately integrated into the program.

---

2 45 CFR 46.102 (Code of Federal Regulations Title 45, Public Welfare, Department of Health And Human Services, Part 46.102 Protection of Human Subjects, Definitions). Available: <https://www.hhs.gov/ohrp/regulations-and-policy/regulations/45-cfr-46/index.html#46.102> [accessed 31 May 3018].

- Training delivery methods are appropriate for the training target audience.
- Instructors are following their training outlines/syllabi.
- Course materials are current and accurate.

---

### 10.10.2 Outcome Evaluations

Outcome evaluation measures effects of the training program on the target population by assessing progress in the proposed or expected outcomes or program and learning objectives. Outcome evaluation allows the training director or designee to determine the degree to which program participants achieve the target knowledge, skills, and abilities and if and how the program affects their subsequent actions.

When conducting outcome evaluations, the training director or designee should consider the extent to which:

- Training program addresses the stated goals and is achieving intended outcomes.
- Training program is meeting the intent and requirements of applicable regulations and guidance.
- Participants demonstrate targeted knowledge, skills, and/or abilities.
- Participant assessments demonstrate adequately meeting learning objectives.
- Training program affects program participants' actions or safety environment after the training program.
- Recommended improvements to the training program are identified and addressed.

---

### 10.10.3 Impact Evaluation

Impact evaluation assesses the effectiveness of the training program in achieving its ultimate goals. Impact evaluation helps determine the degree to which the program has made an impact on systemic issues in the workplace, including changes in worker and/or employer practices related to safety; workplace hazards; workplace policies, procedures, availability, and use of equipment; injuries and illnesses; safety culture; and work efficiency. Economic evaluation can also be conducted to assess impacts around costs relative to effects. Though not required by the Minimum Criteria, training program directors are highly encouraged to periodically conduct impact evaluation focused on priority evaluation questions important to program stakeholders.

When conducting impact evaluations, the training director or designee should consider the extent to which:

- Participants use knowledge, skills, and abilities acquired through training both on the job and in their daily lives.
- Participants' work behaviors/practices have changed (e.g., more attention to safety, practices safety precautions, identifies hazards).
- Participants, as well as supervisors and employers, have changed or attempted to change workplace policies, practices, or equipment to increase workplace safety.

- Supervisors, superintendents, and/or employers support safety and health training, consistently improving safety culture.
- Safety record of employer has improved, or reports of injuries and deaths averted from proper handling of a hazardous work environment show improvement.
- Worker retention related to safety and health has increased.
- Employee skills better match job requirements.
- Training meets employer and worker needs.
- Increased protection or resilience of communities has occurred.
- Costs of program resources are being expended efficiently or positively in comparison to outcomes.

---

#### 10.10.4 Evaluation Model: Kirkpatrick Model

The *Kirkpatrick Model* is useful for evaluating training effectiveness. The four levels can help develop a plan for assessing outcomes and impacts.

##### The Kirkpatrick Model

**Reactions (level 1):** The degree to which participants find the training favorable, engaging, and relevant to their jobs. This is often attained through post-training feedback using participant questionnaires (e.g., what did you like, what could be improved).

**Learning (level 2):** The degree to which participants acquire the intended knowledge, skills, attitude, confidence, and commitment based on their participation in the training. This is often evaluated using participant assessments (e.g., written exams, proficiency assessments, pre- and post-tests).

**Behavior (level 3):** The degree to which participants retain and apply what they learned during training when they are back on the job. This is often attained through training participant surveys/interviews, retests, refresher training reflection, and workplace observations. Required drivers of level 3 are “processes and systems that reinforce, encourage, and reward performance of critical behaviors on the job.”<sup>3</sup>

**Results (level 4):** The degree to which targeted outcomes occur as a result of the training. Isolating the effects of training is difficult, as other factors will impact training participant actions and workplace safety and health. This can be attained by using some methods to obtain information, including worker and employer surveys and interviews. For more quantitative information, programs may try to access data on injuries and near misses, safety records, and economic impact, but this information is usually difficult to obtain and/or is incomplete.

---

3 The New World Kirkpatrick Model. Available: <https://www.kirkpatrickpartners.com/Our-Philosophy/The-New-World-Kirkpatrick-Model> [accessed 24 May 2018].

# 11. GENERIC MINIMUM TRAINING CURRICULUM GUIDELINES

## 11

The following guidelines are for those operations specifically identified in OSHA regulation 29 CFR 1910.120 as requiring training. The guidelines in the following subsections indicate the required minimum competencies that must be demonstrated by the trainees taking the indicated course. The training provider is responsible, in accordance with Section 9 of this document, for the conduct of the needs assessment and development of the appropriate learning objectives, course curriculum, course modules, and associated training materials required to achieve these competencies for the target audience.

## 11.1 Hazardous Waste Operations [1910.120(b)-(o)]

### 11.1.1 Introduction

This section applies to the initial off-site training required by the OSHA HAZWOPER standard at 1910.120(e) applicable to cleanup operations for general site workers and other than general site workers (occasional workers), including the required annual refresher training for general site workers. It does not apply to the required initial on-site training, after initial off-site training, or to the site-specific training required before entry onto a site, as these are the responsibilities of the employer. Hazardous waste cleanup managers and supervisors require initial training and three days of on-site supervised experience, plus an additional eight hours of specialized training at the time of job assignment and annual refresher training. This section does not address managers and supervisors training, although the initial off-site general site worker course may largely meet the needs of the initial 40-hour training program for such personnel.

Additional training may be required if hazards that are covered by separate regulations are present at a site. Annex A describes many such programs that are termed 1910.120-supporting training programs. Of importance, while these supporting training programs may be certified or accredited by another authority, the requirements in this document apply to those programs as well if they are funded under a NIEHS/WTP training grant award. These training programs are in addition to the core and refresher courses. This also applies to the all-hazards preparedness and response training, in which several awardees are engaged. These programs are training courses in addition to the initial and refresher courses.

### 11.1.2 Initial Training

Curriculum for hazardous waste operations, required by OSHA 29 CFR 1910.120(e), shall address the following minimum competencies established by OSHA and the additional listed competencies and shall be taught in a minimum of 40 hours. The standard also provides for the initial off-site training of occasional site workers,

which shall be a minimum of 24 hours. Such programs shall include the appropriate training objectives for the competencies required in the initial general site worker course tailored to the job assignment of the occasional worker. This reduction in hours is only acceptable to OSHA if workers are not exposed above the exposure limits.

Should an occasional worker be upgraded to a general site worker, an additional 16 hours of off-site instruction is required, addressing curriculum topics needed to complete the full 40-hour curriculum. This guidance recommends that the upgrade training encompass a minimum of 24 additional hours to more fully bridge the gap in potential hazards between the two types of job assignments.

#### *11.1.2.1 General Site Workers*

The initial off-site general site worker training course shall be a minimum of 40 training hours in duration, shall devote a minimum of one-third of the training hours to hands-on training, and shall be of sufficient detail that trainees can demonstrate competency in the following topics:

- a. The HAZWOPER standard requirements.
- b. Health hazards.
- c. Safety hazards and safe work practices and procedures.\*
- d. The rudiments of confined spaces hazards and entry restrictions (additional training is required for entry).
- e. Emergency response plan and procedures.
- f. Materials handling procedures and equipment.\*
- g. Sampling procedures, precautions, and applications.\*
- h. Sample collection, monitoring, handling, packaging, and shipment.\*
- i. Respiratory protection, including program requirements and selection, use, care, and limitations.\*
- j. Personal protective ensembles (levels A, B, C, and D) and selection, use, care, and limitations.\*
- k. Decontamination principles, practices, and procedures.\*
- l. Worker rights and responsibilities.
- m. Medical surveillance requirements.
- n. Monitoring requirements, monitoring instruments, their limitations, and demonstration of competency with instruments trainees may be required to use.\*
- o. Site safety and health plans.
- p. The Hazard Communication standard and its requirements and purpose.
- q. The information that is to be provided to the worker upon initial site entry.

*\*Should include a hands-on component.*

#### *11.1.2.2 Occasional Site Workers*

Occasional workers, as defined in the HAZWOPER standard, are on-site only infrequently and then only for a specific, limited task. The standard further presumes that such workers are not exposed in excess of the applicable exposure limits and are not, therefore, required to wear respiratory protection. Initial off-site training of 24 hours duration and one day of on-site supervised training is required. The OSHA standard provides no guidance as to the competencies required for such workers. The standard does state, however, that workers who upgrade to full-time workers or who

are subsequently required to wear respirators shall be provided an additional 16 hours of training and two days of on-site supervision. The upgraded training shall essentially encompass the competencies required in the 40-hour full-time general site worker course.

For training providers offering “occasional worker” training, the course should address the applicable competencies required for the general site worker, excluding those competencies clearly associated with the OSHA-stated reason for a required upgrade, such as respirator wear.

Providers offering the upgrade training must address all of the competencies required for the general site worker and an additional eight hours of training specific to the competencies required in the initial 24-hour occasional site worker course, for a total of 24 hours of upgrade training.

The 24-hour occasional worker curriculum should address the following subject areas, for which learning objectives sufficient to permit demonstration of competencies must be developed:

- a. Health hazards.
- b. Safety hazards.
- c. Confined spaces: awareness.
- d. Emergency response: overview.
- e. Respiratory protection: awareness.
- f. PPE: awareness.
- g. Decon: awareness.
- h. Rights and responsibilities.
- i. Medical surveillance.
- j. Site safety and health plans.
- k. Hazard Communication standard.
- l. Minimum of six hours of hands-on or demonstration activities.



(Photo courtesy of WRUC)

### 11.1.3 Annual Refresher

General site workers and supervisors must have a minimum of eight hours of annual refresher training. A needs assessment should be done prior to, or during, the initial hour of the refresher training to identify any deficiencies in skills or knowledge that the class may have. The eight-hour off-site annual refresher training required by OSHA at 1910.120(e)(8) for general site workers and for supervisors shall be conducted only by training programs offering the initial course. The course content shall include, at a minimum, a core curriculum established for the eight-hour refresher training required by 1910.120(e)(8), based on the initial general site worker course.

Individuals developing the refresher course curriculum should:

- **Review and retrain on relevant topics** covered in the initial (24- or 40-hour) course using reports by the trainees of their relevant experiences during the preceding year to facilitate the review. Relevant topics may include essential safety and health aspects such as PPE, respiratory protection, decontamination, site safety and health plans, and topics identified in lessons learned reports. These topics may also be extrapolated from

OSHA standards interpretations, national statistics, journal articles, and/or major incidents that may apply by the instructor.

- **Update materials covered in the initial course**, including new technologies used in hazardous waste cleanup, task changes, and subject matter that applies to increased worker protection.
- **Review changes** to pertinent provisions of RCRA, SARA, and The Frank R. Lautenberg Safety for the 21st Century Act and to pertinent OSHA standards. The review may be presented alone or integrated into other subject matter. If the latter approach is taken, workers must be advised of the provision update.
- **Introduce additional subject areas**, including topics that affect worker health and safety that may not have been covered in the initial 40-hour training program, such as bloodborne pathogens and emerging all-hazards issues.
- **Provide hands-on opportunities** for new developments in PPE, such as new or altered donning/doffing procedures for respirators and new decontamination procedures for protective garments.
- **Review newly-developed monitoring equipment**, including lecture/demonstration and hands-on training as appropriate. The operating principles, capabilities, and limitations should be addressed.

A minimum of two hours of hands-on or demonstration activities is recommended.

---

### 11.1.4 On-Site Considerations

The HAZWOPER standard requires that general site workers be provided off-site initial training of a minimum of 40 hours before being allowed to work on such sites, and that they be provided three additional days of supervised instruction by a HAZWOPER-trained and experienced supervisor on-site. For occasional workers, 24 hours of off-site initial training and one day of on-site supervised training is required. The purpose of this on-site training is to ensure that the worker has mastered the required knowledge and skills, has the abilities to perform the required work safely, and understands the limitations imposed by the “occasional site worker” designation. This on-site training is the responsibility of the employer.

To aid the employer in tailoring on-site supervised training, the training provider should make a detailed initial course outline available to the employer.

---

## 11.2 RCRA/TSD [1910.120(p)]

### 11.2.1 Introduction

29 CFR 1910.120(p)(7) and (p)(8)(iii) establish the requirements for training of employees of employers conducting operations at treatment, storage, and disposal (TSD) facilities. 1910.120(p)(7) establishes a requirement for a minimum of 24 hours of initial training, but no competencies are listed. Eight-hour annual refresher is also required. 1910.120(p)(8)(iii) requires “training for emergency response employees” and lists several competencies that are to be achieved. Not all employees are required to be trained to the degree specified in the standard if the employer segregates the emergency response function between an adequate number of employees to control an emergency and others that are trained at the awareness level to recognize an emergency, summon fully-trained emergency response personnel, and take no actions to control the incident.

For purposes of this section, all TSD employees are assumed to be required to have the specified initial and refresher training at 1910.120(p)(7). The following “initial off-site” and “initial on-site” competencies must be addressed in such courses.

Emergency response employee training covered under 1910.120(p)(8)(iii) must address the applicable competencies specified in Section 11.3, but tailored to the individual TSD site.

---

## 11.2.2 Initial Training

Initial TSD worker training includes an off-site and on-site component, each of which is addressed separately in the following subsections.

### 11.2.2.1 Initial Off-Site Training

The initial off-site training course required in paragraph (p) of 1910.120 for the 24-hour training program, including a minimum of eight hours of hands-on training, shall enable trainees to demonstrate competency in the following areas:

- a. The applicable paragraphs of 29 CFR 1910.120 and the elements of an employer’s occupational safety and health program.
- b. Relevant hazards such as chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards.
- c. General relevant safety hazards, including those associated with electrical hazards, powered equipment, lockout procedures, vehicular operations, and walking-working surfaces.
- d. Confined-space hazard recognition and related procedures.
- e. Work practices to minimize employee risk from workplace hazards.
- f. Emergency response plan and procedures, including first aid that meets the requirements of paragraph (p)(8) of 1910.120.
- g. Procedures to minimize exposure to hazardous waste and various types of waste streams, including the materials handling program and spill containment programs.
- h. The hazard communication programs meeting the requirements of 29 CFR 1910.1200.
- i. Medical surveillance programs meeting the requirements of 29 CFR 1910.120(p)(3), including the recognition of signs and symptoms of overexposure to hazardous substances and known synergistic interactions.
- j. Decontamination programs and procedures meeting the requirements of 29 CFR 1910.120(p)(4).
- k. The employer’s requirements to implement a training program and its elements.
- l. The criteria and programs for proper selection and use of PPE, including respirators.
- m. The applicable appendices to 29 CFR 1910.120.
- n. Principles of toxicology and biological monitoring as they pertain to occupational health.
- o. The rights and responsibilities of employees and employers under OSHA (including 1910.120[p]) and RCRA.
- p. Hands-on exercises and demonstrations with equipment to illustrate the basic principles that may be used during the performance of work duties, and donning and doffing of PPE.

- q. Reference sources, efficient use of relevant manuals, and knowledge of hazard coding systems, including information contained in hazardous waste manifests.
- r. The job skills required before employees are permitted to participate in or supervise field activities. Each employer has the responsibility to ensure that additional job-specific training is provided following the basic health and safety training.
- s. Air monitoring methods and equipment. This should include discussions of how to evaluate monitoring results provided by outside consultants.

#### *11.2.2.2 Initial On-Site Training*

The employer shall provide hazardous waste workers with information and training as required by 29 CFR 1910.120(p). This training shall be conducted prior to employees' initial assignment into a work area, be appropriate to their potential for exposure, and shall cover the following topics:

- a. The emergency response plan and procedures, including first aid meeting the requirements of paragraph (p)(8) of 1910.120.
- b. A review of the employer's hazardous waste handling procedures, including the materials handling program and elements of the spill containment program, location of spill response kits/equipment, and names of those trained to respond.
- c. The hazard communication program meeting the requirements of 29 CFR 1910.1200.
- d. A review of the employer's medical surveillance program meeting the requirements of 29 CFR 1910.120(p)(3), including the recognition of signs and symptoms of exposure to relevant hazardous substances and known synergistic interactions.
- e. A review of the employer's decontamination program and procedures meeting the requirements of 29 CFR 1910.120(p)(4).
- f. An overview of the employer's training program (meeting the requirements of 1910.120[p][7]) and the parties responsible for that program.
- g. A review of the employer's PPE and respirator programs, including the proper selection and use of PPE based on specific site hazards.
- h. All relevant site-specific procedures addressing potential safety and health hazards.
- i. Safe use of engineering controls and equipment on-site.
- j. Names of personnel and alternates responsible for site safety and health.

---

#### **11.2.3 Refresher Training**

The HAZWOPER standard requires a minimum of eight hours of annual refresher training. However, the standard is silent with regard to the content of such refresher training. An effective RCRA/TSD refresher-training curriculum should consider the following points and must include a hands-on module:

- a. An initial needs assessment to identify deficiencies in skills or knowledge that the class may have.
- b. Lessons learned, if any.
- c. Review of TSD site-specific critical elements of the initial training course.
- d. Update of materials in the initial training course, as appropriate.

- e. Review of any pertinent regulatory changes.
- f. Review of new technologies applicable to TSD operations, and new monitoring methods and equipment.
- g. Hands-on review of skills essential to worker protection and revisions to procedures associated with their use, such as respirators and chemical protective clothing.

---

## 11.3 Emergency Response [1910.120(q)]: Full Time

---

### 11.3.1 Introduction

The emergency response section of the HAZWOPER standard, 1910.120(q), applies to the response to hazardous substance releases without regard to location, and includes hazardous substances and biological, chemical, and nuclear materials. The response function categories are awareness level, operations level, technician level, hazardous material specialist, and on-scene incident commander. Increasingly, response with respect to acts of terror is being seamlessly integrated into emergency response training programs. The last version of NFPA 472 applicable to emergency responder competencies is one example.

The emergency response groups to which the training provisions of 1910.120(q) (or the identical section of the U.S. Environmental Protection Agency (EPA) standard at 40 CFR 311 for emergency response personnel not covered by the OSHA standard) apply include but may not be limited to the following:

- Full-time career fire service personnel.
- Paid part-time fire service or emergency personnel.
- Unpaid part-time firefighters or emergency personnel.
- Full-time fire service personnel who are organized as industrial fire brigades and/or hazardous materials teams.
- Police officers (municipal officers, sheriffs, public safety officers, state troopers, etc.).
- Emergency medical services personnel.

For purposes of this document, these emergency response groups are considered “full-time” emergency responders and are assumed to already possess the knowledge, skills, abilities, and judgment appropriate to their job classification. Full-time emergency response organizations are encouraged to train with organizations whose employees are anticipated, based on past experience, a mutual aid agreement, or a contract, to provide skilled support personnel at an emergency incident.

---

### 11.3.2 Initial Training

Full-time emergency responders, as defined in the OSHA standard at 1910.120(q) and detailed in the preceding section, shall be trained in accordance with their duties or function in a hazardous substances response. Specific training categories appropriate to the NIEHS/WTP training grants program, based upon role and function in such a response are:

- a. First responder awareness.
- b. First responder operations.

- c. Hazardous materials technician.
- d. Hazardous materials specialist.
- e. Incident commander.
- f. Emergency medical services (see also EPA 40 CFR 311).

The training competencies required for each category are different, as are the times required to meet those competencies. The following guidelines establish the minimum competencies that must be objectively demonstrated by the trainee for each of the specific training categories listed above. These competencies are taken verbatim from the OSHA standard at 29 CFR 1910.120(q)(6). Of key importance to this guidance, the April 2003 edition of FEMA's "Guidelines for HazMat/WMD Response, Planning, and Prevention Training" is hereby adopted by reference. That document lists the minimum required competencies and suggested learning objectives in each responder category, as established in the HAZWOPER standard, and provides other recommended competencies based on the latest addition of NFPA 472 and 473. For each responder category, the training provider shall review the recommended additional competencies and suggested learning objectives in the FEMA guidelines document and adopt those that are applicable to the training provider's target audience and responder category. The training director shall approve, document, and maintain these courses.

---

*a. First responder awareness level, 1910.120(q)(6)(i):*

Must be able to objectively demonstrate competency in the following:

- An understanding of what hazardous substances are, and the risks associated with them in an incident.
- An understanding of the potential outcomes associated with an emergency created when hazardous substances are released.
- The ability to recognize the presence of hazardous substances in an emergency.
- The ability to identify the hazardous substance, if possible.
- An understanding of the role of the first responder awareness individual in the employer's emergency response plan, including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
- The ability to realize the need for additional resources, and to make appropriate notifications to the communications center.

---

*b. First responder operations level, 1910.120(q)(6)(ii):*

- Must be able to objectively demonstrate competency in the following:
- Awareness level competencies.
- Knowledge of basic hazard and risk assessment techniques.
- Know how to select and use proper PPE provided to the first responder operations level.
- An understanding of basic hazardous materials terms.
- Know how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available with their unit.
- Know how to implement basic decontamination procedures.
- An understanding of the relevant standard operating procedures and termination procedures.

---

*c. Hazardous materials technician, 1910.120(q)(6)(iii):*

Must be able to demonstrate competency in the following:

- Operations level competencies.
- Know how to implement the employer's emergency response plan.
- Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment.
- Be able to function within an assigned role in the Incident Command System (ICS).
- Know how to select and use proper specialized chemical PPE provided to the hazardous materials technician.
- Understand hazard and risk assessment techniques.
- Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and PPE available with the unit.
- Understand and implement decontamination procedures.
- Understand termination procedures.
- Understand basic chemical and toxicological terminology and behavior.

---

*d. Hazardous materials specialist, 1910.120(q)(6)(iv):*

Must be able to demonstrate competency in the following:

- Technician level competencies.
- Know how to implement the local emergency response plan.
- Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment.
- Know the state emergency response plan.
- Be able to select and use proper specialized chemical PPE provided to the hazardous materials specialist.
- Understand in-depth hazard and risk techniques.
- Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.
- Be able to determine and implement decontamination procedures.
- Have the ability to develop a site safety and control plan.
- Understand chemical, radiological, and toxicological terminology and behavior.

---

*e. Incident commander, 1910.120(q)(6)(v):*

Must be able to demonstrate competency in the following:

- Operations level competencies.
- Know and be able to implement the employer's ICS.
- Know how to implement the employer's emergency response plan.
- Know and understand the hazards and risks associated with employees working in chemical protective clothing.

- Know how to implement the local emergency response plan.
- Know the state emergency response plan and of the Federal Regional Response Team.
- Know the importance of decontamination procedures.
- Several additional requirements within 29 CFR 1910.120(q)(3)(i-ix) may be applicable as well in developing the learning objectives specific to the above competency requirements.

---

*f. Emergency medical services (EMS):*

The HAZWOPER standard lists no competency requirements for EMS personnel participating in a hazardous materials response beyond the general duty to properly train individuals to perform their assigned role in a hazardous materials emergency. The FEMA guidelines provide recommended training competencies and learning objectives for EMS level 1 and 2 personnel based on NFPA 473. Training providers who offer courses for EMS level 1 and 2 personnel should select those recommended competencies and learning objectives from among those listed in the FEMA document for their training target audience as the basis on which to develop their training course(s).

---

*g. Additional training topics:*

The following additional training topics merit consideration for inclusion in each of the preceding training categories:

- Hazard recognition.
- Safe work practices and procedures.
- General site safety.
- Site safety plans and standard operation procedures.
- Decontamination procedures and practices.
- Emergency procedures, first aid, and self-rescue.
- Safe use of field equipment.
- Safe sampling techniques.
- Storage, handling, use, and transportation of hazardous materials.
- Use, care, and limitations of PPE, with emphasis on respiratory protective devices.
- Rights and responsibilities of employees under OSHA standards and other laws concerning safety and health, right-to-know, compensation, and liability.
- Medical monitoring requirements.
- Community relations.
- Incident Command System.

---

### 11.3.3 Refresher Training

All full-time emergency response personnel trained in accordance with 1910.120(q)(6) are required to have annual refresher training or to demonstrate competency based on the methodology used by the employer annually in the hazardous materials emergency response category to which they have been trained. No minimum hours for such refresher training are required by the standard.

Providers of 1910.120(q) refresher training should develop a refresher course curriculum that addresses the required competencies for the pertinent responder categories and should ideally include a drill exercise as the hands-on component of the course.

# 11

## 11.4 Emergency Response: Collateral Duty

### 11.4.1 Introduction

A large and varied group of first responders may be pulled into a hazardous materials incident to provide specific support services incidental to their primary occupation. These personnel are involved in the emergency response phase under 29 CFR 1910.120(q), but have no function after the emergency is terminated and cleanup has begun, unless they have additional training. This applies whether the hazardous situation was man-made (e.g., purposely released by terrorist, incidental to the act of terrorism) or incidental to a natural disaster (e.g., flooding, hurricanes, earthquakes). This category includes, among others:

- a. **Skilled support personnel** such as heavy equipment operators in the construction sector, railroad personnel who operate equipment that could be used in an incident response, and certain hospital personnel, which are described at 29 CFR 1910.120(q)(4). This covers workers who are not necessarily an employer's own employees, are not expected to serve in an emergency response capacity, but are suddenly called upon (e.g., as a one-time occurrence) to provide assistance at a scene involving a hazardous substance release.
- b. **Specialist employees** who provide their expertise to the first responders with respect to specific hazardous materials, which are described at 29 CFR 1910.120(q)(5).
- c. **A variety of workers under 29 CFR 1910.120(q)(6)**. These are employees who are engaged in emergency response but are not full-time responders and are usually not part of an emergency response team.

The following are examples of categories of workers who fall under 1910.120(q)(6):

- Industrial workers with part-time duties in chemical emergency response.
- Service and maintenance workers such as power utility and facility workers.
- Security guards.
- Transportation workers: truck, rail, water, warehouse.
- Public works personnel.
- Sanitation workers.
- Street and highway maintenance workers.
- Hospital first receivers.
- Hospital "skilled support personnel" as described by OSHA (Whittaker 4/25/97).
- Volunteers (as described at 29 CFR 553.101).

For purposes of this document, these categories are termed collateral duty.

---

## 11.4.2 Initial Training

Emergency response training for collateral duty responders is established in the OSHA standard at 1910.120(q)(4) for skilled support personnel, 1910.120(q)(5) for specialist employees, and 1910.120(q)(6) for a wide range of emergency response, operations, technicians, and specialists. The OSHA Construction Focus Four Module can serve as a useful resource to help responders.

a. **Skilled support personnel:**

Skilled support personnel are to be provided a “just-in-time” on-scene training briefing about the hazards of the site and actions to be taken to protect the individual worker. Except for the “just-in-time” training briefing at the time of deployment, no other training is required by the OSHA standard. Employers who wish to keep their employees on the site after the incident transitions from an emergency response/rescue to a cleanup must provide the required additional training. In addition, it is strongly encouraged that skilled support personnel train with first responders in their local jurisdiction in advance of an incident so they are familiar with one another prior to an incident.

b. **Specialist employees:**

The OSHA standard requires that specialist employees receive training or demonstrate competency in their area of specialization annually.

c. **Other workers under 1910.120(q)(6):**

The OSHA standard requires that employees who participate or are expected to participate in emergency response shall be given training and that training is based on the duties and function to be performed by each employee. Collateral duty workers under (q)(6) are primarily covered by either (q)(6)(i), First responder awareness level, or (q)(6)(ii), First responder operations level.

---

## 11.4.3 Refresher Training

Annual refresher training or annual certification of competency by their employer is required for responders trained to the following levels: first responder awareness, first responder operations, hazardous materials specialist, and hazardous materials technician. It is also required for specialist employees. For the other collateral duty personnel identified in this section, there are currently no established annual refresher requirements. Refresher training is recommended, however. It could be of value, particularly in this currently dynamic sector, if it includes new developments in the collateral duty sector, lessons learned, and revalidation of key protective measures, such as respirator use.

---

## 11.5 Disaster Response and Recovery Workers

NIEHS awardees were instrumental in partnering with OSHA to develop the OSHA Disaster Site Worker course, which is primarily focused on skilled support personnel and includes mandatory hands-on respirator training. Consequently, this document strongly supports providing the OSHA course for all skilled support personnel. Such training is to be provided by instructors authorized as course instructors by successfully completing the OSHA Disaster Site Worker Trainer course.

Transportation workers who may engage in after-incident cleanup activities also require initial training pursuant to 1910.120(e), and the OSHA Disaster Site Worker course may be an appropriate additional course as well. Fixed facility workers are required to be trained in the facility emergency response plan and, if management intends to use facility employees to respond to a hazardous materials emergency, those employees are required to be trained in the appropriate emergency response categories described in 1910.120(q)(6) and Section 11.3 of this document. If a facility hazardous materials incident requires off-site workers for the subsequent cleanup, they must be trained in accordance with 1910.120(e).

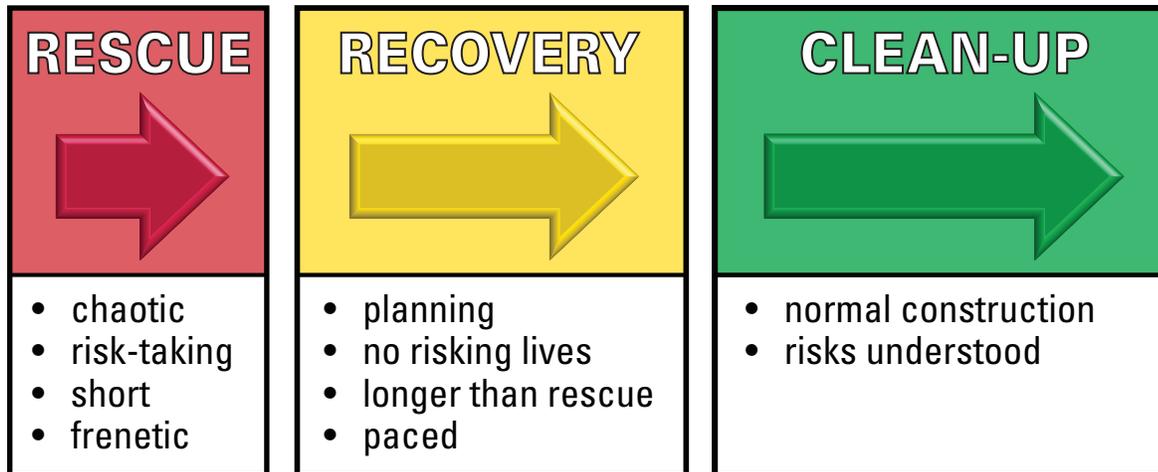
If, however, the employer elects to use facility employees to conduct such a cleanup on the company property, those employees must be trained specific to the OSHA Respiratory Protection standard and the Hazard Communication standard, among others as specified in 1910.120(q)(11)(ii). Such training may be considered 1910.120-supporting training per Annex A of this document.

All rescue and recovery workers, who will or may be providing assistance at disasters, should be trained prior to being deployed to a disaster site. Training should include general training, site-specific training, task-specific training, and pre-deployment and pre-job briefings. Short and specific training (sometimes referred to as site-specific training) should focus on critical survival skills and on the direct hazards or most hazardous conditions that may be found at the site.

Populations to be trained include:

- Day laborers
- Volunteers (spontaneous, organized)
  - Operations training for volunteers during disaster response and recovery should be addressed.
  - Volunteers are strongly encouraged to receive disaster preparedness training prior to deploying to disaster sites. Volunteers are also encouraged to join a legitimate volunteer organization, such as a Community Emergency Response Team, the Red Cross, or National Voluntary Organizations Active in Disaster, rather than heading out on their own. At a minimum, volunteers should receive an awareness site-specific training before entering any disaster area.
  - The National Incident Management System is a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work together seamlessly and manage incidents involving all threats and hazards—regardless of cause, size, location, or complexity—in order to reduce loss of life, property, and harm to the environment. Responses to disasters are usually coordinated through the ICS. The ICS provides a structure to promote effective coordination among responders. It allows for an integrated organizational structure that is not hindered by jurisdictional boundaries. In addition to the training established by OSHA, it is important for those who are responding to disasters to be trained on the ICS to better understand the operating structure of any disaster.
- Homeowners
- Business owners

## Phases of Response: Impact on Safety



*Extending rescue extends risk for response workers.*

The following are additional resources to consider during training:

- National Response Team “[Guidance for Managing Worker Fatigue During Disaster Operations](#)”
- NIEHS/WTP “[Awardee Instructor Deployment Guide](#)”
- NIEHS/WTP [Disaster Worker Resiliency Training](#)
- [OSHA Construction Focus Four Module](#) (Falls, Caught-In or -Between, Struck-By, and Electrocution)

Awardees providing training for workers involved during the response and/or recovery phase of a national disaster should be familiar with the following documents: National Response Plan, National Response Framework, National Disaster Recovery Framework, and the National Contingency Plan (for oil spills).

## 12. CERTIFICATION

# 12

OSHA initially addressed accreditation or certification of training programs under 29 CFR 1910.120 with a Notice of Proposed Rulemaking in 1990. OSHA has never finalized that rule at 29 CFR 1910.121. Instead, OSHA issued a nonmandatory training appendix to the 29 CFR 1910.120 standard (Appendix E), which was based in large part on the original NIEHS/WTP Minimum Criteria requirements for such training under the WTP grants program.

Accreditation or certification of some of the 1910.120-supporting training programs in Annex A of this document is already covered by existing requirements, such as the Asbestos Hazard Emergency Response Act for asbestos abatement activities. Many of the remaining programs are governed by requirements established in specific OSHA standards, but are not required to be accredited or certified, nor is it likely that they will be in the future.

Each training provider for which this guidance is applicable shall annually certify in writing that the training program meets the requirements established in this guidance specific to the HAZWOPER courses, 1910.120-supporting training courses, and all-hazards training courses offered. Where certification or accreditation is also required by another certifying/accrediting entity, such as for asbestos abatement, it shall be noted, and a copy of the applicable certification/accreditation appended.

(Photo courtesy of  
New Jersey/New York  
Hazardous Materials  
Worker Training Center)



# 13. ANNEXES

HAZWOPER-trained workers may be required to have additional training due to particular hazards present on specific HAZWOPER sites. Typically, such additional training is associated with hazards that may be present for which specific regulations or standards require training. An example is radiation training associated with mixed waste remediation work. This guidance terms these training programs “1910.120-supporting training.” They are presented in Annex A. Several such 1910.120-supporting programs are identified, as are the training requirements and certification/accreditation authorities for each where such currently exist. Under the scope of the NIEHS/WTP training grants program these 1910.120-supporting training programs are funded on the basis of the individual grants contract.

Annex B provides the agenda for the technical workshop that served as the basis for this document.

Annex C provides a checklist with respect to the principles of adult education, which is referenced in Section 8 of this document.

---

## 13.1 Annex A: 29 CFR 1910.120-Supporting Training Programs

Employers engaged in work covered by the HAZWOPER standard may need additional worker training (possibly including certification) that is associated with specific hazards that may be present in a particular HAZWOPER work environment for which there are additional applicable standards or regulations. Such additional competency training may be applicable to hazardous waste site operations [29 CFR 1910.120(b)-(o)], RCRA/TSD operations [29 CFR 1910.120(p)], and emergency response operations [29 CFR 1910.120(q)]. Additionally, there may be other trainings that have direct relevance to 1910.120 in order to maintain a safe and healthful work environment but are not part of a required training regimen.

For purposes of the NIEHS/WTP grant program, such additional training programs for target training populations that have been trained and certified in accordance with 1910.120(e), (p), or (q) as a prerequisite may be funded by the program if such additional training programs are included in the annual renewal application, approved, and meet the following criteria in addition to the criteria specified in Sections 9 and 10 of this document.

**OSHA 10 and 30 for General Industry and Construction:** Training must be conducted by an instructor who has completed the OSHA 500 Trainer Course for Construction or the OSHA 501 Trainer Course in Occupational Safety and Health Standards for General Industry and has been authorized by OSHA.

**Disaster Site Worker Outreach Training Program:** A training program for disaster site workers who provide skilled support services (e.g., utility, demolition, debris removal, heavy equipment operation) or site cleanup services in response to natural and man-made disasters. Specifically, it is recognized that all workers at disaster sites need to be aware of the differences between the hazards on disaster sites and regular construction or demolition worksites; to know what procedures or PPE will protect them from those hazards; to know how to successfully decontaminate

themselves; and to be able to inspect, don, and doff air-purifying respirators. Also, the program will make management and labor aware that pre-incident training is essential for ensuring disaster site worker safety and health. Training must be conducted by a trainer who has completed the OSHA Disaster Site Worker Trainer course.

**Radiation:** Training for Rad Worker I and Rad Worker II must be in accordance with DOE 10 CFR 835 and the DOE G 441.1-12 guide or other specific federal agency regulations or standards specific to worker radiation training should such be required for the specific project.

**Asbestos:** The training program shall be accredited by the applicable state or regional EPA office authority for asbestos operations specified by that authority if the employer requires certified workers to engage in such operations. The EPA Model Accreditation Plan at 40 CFR 763 Subpart E, Appendix C or 40 CFR 763.93 (a)(1) are applicable per the OSHA asbestos regulations depending upon the classification of the work.

**Confined Spaces:** Confined space recognition training is a requirement in the core HAZWOPER training programs. However, entry into confined spaces requires additional confined spaces training in accordance with 29 CFR 1910.146, Permit-Required Confined Spaces, or 29 CFR 1926 Subpart AA, Confined Spaces in Construction. Such shall be conducted by instructors certified as competent to do so by the training director.

**Infectious Diseases:** Training shall be provided by an instructor certified or authorized as competent by the training director. While there is no national infectious disease standard, one may refer to the California Aerosol Transmissible Disease standard. The NIEHS pathogen safety data guide and training module (October 2016) are available on the National Clearinghouse [website](#).

**Lead:** Training shall be conducted by instructors certified as competent by the training director and shall be in accordance with 29 CFR 1910.1025 or 29 CFR 1926.62. If required by the employer, the lead training program shall be accredited by the applicable state authority.

**Bloodborne Pathogens:** Training shall be provided by an instructor certified as competent by the training director and shall be in accordance with 29 CFR 1910.1030.

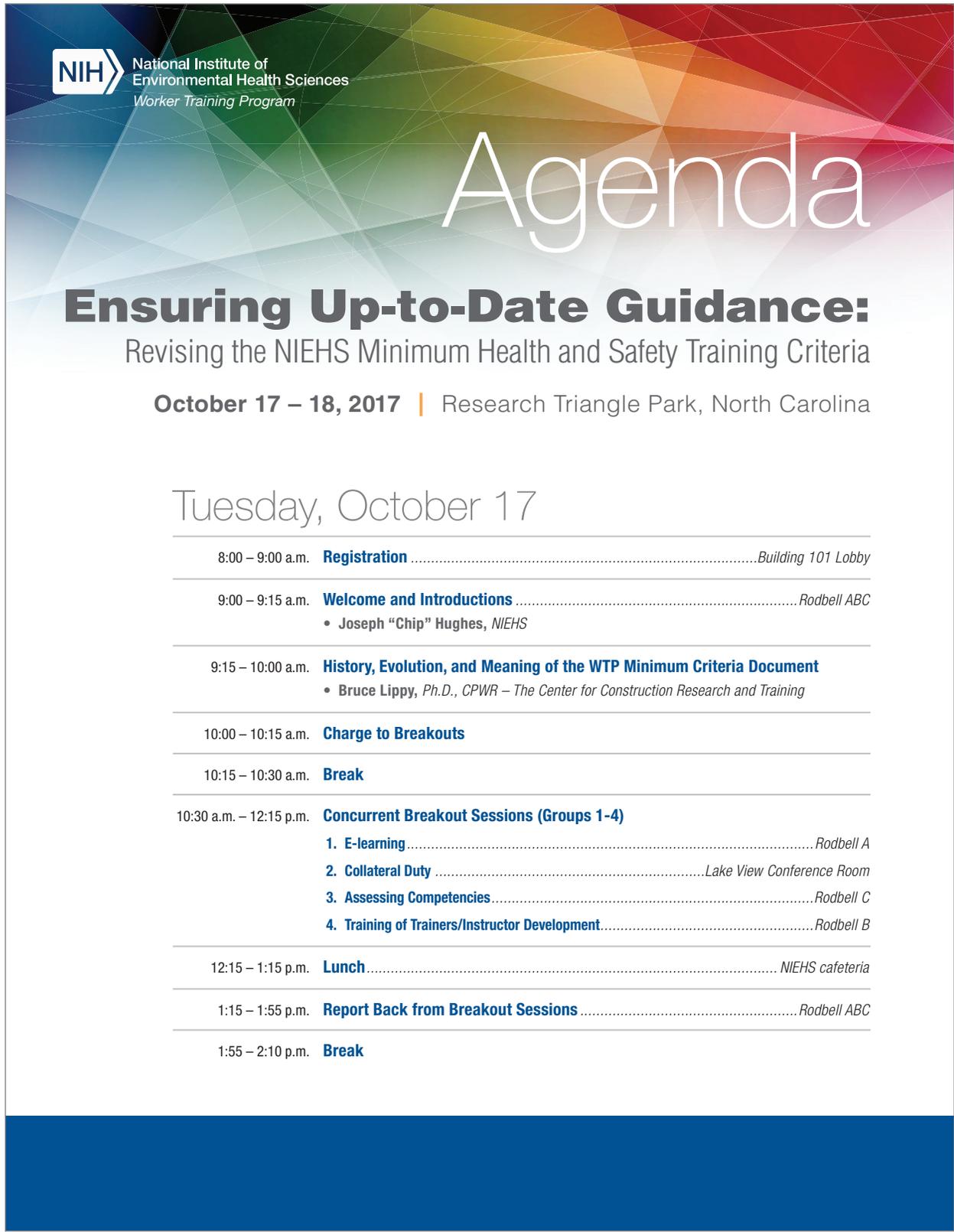
**Lockout/Tagout:** Training shall be provided by an instructor certified as competent by the training director and shall be in accordance with 29 CFR 1910.147, The Control of Hazardous Energy.

**Process Safety Management:** Training shall be conducted by an instructor certified as competent by the training director and shall be in accordance with 29 CFR 1910.119, 29 CFR 1926.64, or 40 CFR 68. This training may include lessons learned prevention training, hazard identification training, or process hazard analysis training.

**Mold:** “Guidelines for the Protection and Training of Workers Engaged in Maintenance and Remediation Work Associated with Mold” (May 2005) and “NIEHS Disaster Recovery: Mold Remediation Guidance, Health and Safety Essentials for Workers, Volunteers, and Homeowners” (May 2013) are available on the National Clearinghouse [website](#).

**Trenching and Shoring:** Training in accordance with 29 CFR 1926 Subpart P, Excavations, shall be conducted by an instructor certified as competent by the training director.

## 13.2 Annex B: Technical Workshop Agenda



**NIH** National Institute of Environmental Health Sciences  
Worker Training Program

# Agenda

## Ensuring Up-to-Date Guidance: Revising the NIEHS Minimum Health and Safety Training Criteria

October 17 – 18, 2017 | Research Triangle Park, North Carolina

### Tuesday, October 17

---

8:00 – 9:00 a.m. **Registration** ..... *Building 101 Lobby*

---

9:00 – 9:15 a.m. **Welcome and Introductions** ..... *Rodbell ABC*  
• Joseph “Chip” Hughes, NIEHS

---

9:15 – 10:00 a.m. **History, Evolution, and Meaning of the WTP Minimum Criteria Document**  
• Bruce Lippy, Ph.D., CPWR – The Center for Construction Research and Training

---

10:00 – 10:15 a.m. **Charge to Breakouts**

---

10:15 – 10:30 a.m. **Break**

---

10:30 a.m. – 12:15 p.m. **Concurrent Breakout Sessions (Groups 1-4)**  
1. **E-learning** ..... *Rodbell A*  
2. **Collateral Duty** ..... *Lake View Conference Room*  
3. **Assessing Competencies** ..... *Rodbell C*  
4. **Training of Trainers/Instructor Development** ..... *Rodbell B*

---

12:15 – 1:15 p.m. **Lunch** ..... *NIEHS cafeteria*

---

1:15 – 1:55 p.m. **Report Back from Breakout Sessions** ..... *Rodbell ABC*

---

1:55 – 2:10 p.m. **Break**

2:10 – 4:00 p.m.	<b>Concurrent Breakout Sessions (Groups 5-8)</b>	
	5. Evaluation .....	Rodbell A
	6. Disaster Training .....	Rodbell B
	7. Infectious Disease Training .....	Rodbell C
	8. Evergreening of Curricula .....	Lake View Conference Room
4:00 – 4:15 p.m.	<b>Break</b>	
4:15 – 5:00 p.m.	<b>Report Back from Breakout Sessions</b> .....	Rodbell ABC
5:15 p.m.	<b>First Bus Departs for Hotel</b>	
5:45 p.m.	<b>Second Bus Departs for Hotel</b>	

## Wednesday, October 18

8:00 – 9:00 a.m.	<b>Registration</b> .....	Building 101 Lobby
9:00 – 9:15 a.m.	<b>Recap of Previous Day and Set Up for Day 2</b> .....	Rodbell ABC
9:15 – 10:15 a.m.	<b>Small Group Discussions on Topics 1-4</b> .....	Rodbell ABC
10:15 – 10:30 a.m.	<b>Break</b>	
10:30 – 11:15 a.m.	<b>Small Group Discussions on Topics 5-8</b> .....	Rodbell ABC
11:15 a.m. – noon	<b>Discussion on Compliance Challenges and Best Practices in Compliance with the Minimum Criteria Document</b> .....	Rodbell ABC
noon – 12:15 p.m.	<b>Next Steps and Adjourn</b>	
12:30 p.m.	<b>First Bus Departs for RDU Airport</b>	
1:15 p.m.	<b>Second Bus Departs for RDU Airport</b>	

## 13.3 Annex C: The Principles of Adult Education: A Checklist for Planners and Evaluators

The following is intended to assist trainers and training directors who are developing a training program, and evaluators who are assessing a program's quality.

### General Principles

The best training programs take advantage of the following characteristics of adult learners:

- Adults are self-motivated.
- Adults expect to gain information that has immediate application to their lives.
- Adults learn best when they are actively engaged.
- Adult learning activities are most effective when they are designed to allow students to develop both technical knowledge and general skills.
- Adults learn best when they have time to interact, not only with the instructor but also with each other.
- Adults learn best when asked to share each other's personal experiences at work and elsewhere.

### Meeting the Needs of the Adult Learner

---

#### Does the learning environment encourage active participation?

- How are the chairs, tables, and other learning stations arranged in the classroom?
- How does this arrangement encourage or inhibit participation and interaction?
- Can the arrangement be changed easily to allow different kinds of interaction?
- Is the climate of the classroom sufficiently comfortable to allow learning?

---

#### Does the social environment or atmosphere in the learning environment encourage people to participate?

- Are warm-up activities or "ice breakers" needed to put people at ease?
- Do trainers allow participants to say things in their own words, or do they translate what is said into other words or jargon?
- Are participants encouraged to listen carefully to each other?
- Are they encouraged to respect different points of view?
- Are they encouraged to use humor and is the humor appropriate?

---

#### People learn in different ways. Do the learning activities in the training program provide participants with an opportunity to do each of the following?

- Listen
- Look at visuals
- Ask questions
- Read
- Write

- Practice with equipment
- Discuss critical issues
- Identify problems
- Plan actions
- Try out strategies in participatory ways

---

**Does the program effectively promote participatory learning activities?**

- Is enough time allotted for participant interaction?
- Have the instructors developed workable and effective interactive activities?
- Does the physical environment encourage interaction?
- Does the atmosphere in the classroom encourage interaction?
- Are the learning activities sensitive to cultural differences among the participants?
- Does the training engage participants in critical thinking and analysis about the subject being covered?

---

**What kind of participatory activities are used in the program, and how much time is devoted to each?**

- Role playing
- Case studies
- Audiovisual discussions
- Discovery exercises
- Planning exercises
- Mapping activities
- Group discussions
- Lecture-discussions
- Report-back sessions
- Evaluation sessions
- Drills and exercises
- Computer use, website access, simulations
- Blended approaches using integrated instructional technologies

---

**How effectively do the lectures in the program encourage participation?**

- Are they combined with a participatory exercise?
- Are they brief?
- Are they well organized?
- Are audiovisual aids incorporated in the lecture?
- Does the lecturer rely too heavily on his or her notes?
- Was there enough time for questions and comments from others?
- Does the lecturer promote challenging questions about the content being delivered?

---

**How effective are the participatory activities used in the program?**

- Are the purposes of the activities clearly specified?
- Are the tasks that people are expected to complete clearly described?
- Are participants given enough information to complete the expected tasks?

- Is the information accompanying the activity clearly presented and easily understood?
- Is the information presented relevant to the task?
- Are participants given enough time to perform the expected tasks?
- Are participants given enough time to share what they have learned from the tasks with each other?
- Are the participants given a clear summary of the main points they were expected to learn in the activity?

---

**How effectively do the case studies and role-playing activities in the program encourage participation?**

- Is the situation being discussed familiar to the participants?
- Does the situation evoke strong feelings in the participants?
- Does the situation lead to an in-depth analysis of the problem?
- Does the situation encourage people to consider a range of possible strategies for dealing with the problem?
- Are people provided with enough information to participate in the activity in a meaningful way?
- Are people provided with too much information so that they have no room to improvise or to call on their own experience?
- Are people provided with an opportunity to discuss the social, cultural, and historical contexts of the situations?

---

**How effectively does the organization of the program encourage participation?**

- Are discussion groups small enough to ensure participation? (No more than four to six people.)
- Is the ratio of discussion groups to instructors small enough? (A single instructor cannot effectively supervise more than three or four groups.)
- Is there enough room to enable each group to talk amongst itself without disruption?
- Does each group have its own moderator and notetaker?
- Does the responsibility for leading and recording the discussion rotate among those willing to do the job?
- Are the groups supplied with guidelines about how to lead and report their discussions?
- Do the activities make allowances for anyone in the group who may have problems reading and writing?

---

**Is the program sensitive to literacy differences?**

- Do the trainers check privately with anyone having reading and writing difficulties?
- Is reading aloud or writing in front of the group only voluntary and never mandatory?
- Are all instructions and other required material read aloud?
- Do the materials incorporate enough visual aids and props?
- Do the trainers repeat out loud anything they write on a board or flip chart?
- Are evaluations conducted to assure that the trainees comprehend the training material?

---

**Do the audiovisual aids used by the training program encourage participation?**

- Do the instructors write an ongoing record of what is being discussed on the board or flip charts?
- Are participants encouraged to challenge the record if they consider it inaccurate?
- Are approaches using integrated instructional technologies effective in eliciting participation?

## Guidelines for Leading an Effective Discussion

---

### Getting a Discussion Started

- Use a provocative “trigger,” small group exercise, or other activity to give the group something to talk about.
  - Plan a few specific questions that ask for opinions about the activity.
  - Use “brainstorming” activities to elicit as many different ideas on a given topic as possible.
  - Use small discussion groups (or “buzz groups”) to elicit controversial interpretations or perspectives.
  - Use open-ended questions and controversial positions to evoke strong responses, but only after people have gotten used to talking together.
- 

### Keeping a Discussion Going

- Ask questions that require the group to come up with ideas themselves rather than just respond to the instructor’s ideas.
- Encourage people to draw on their own experiences by asking questions.
- Call on people; it may be necessary to keep discussion going.
- Redirect questions to the group—ask if others have ideas on the subject.
- Try to keep everyone involved. Don’t allow one or two people to dominate.
- Set a good example: Keep your own comments brief.
- Provide opportunities and encouragement for those who may be hesitant to participate.

*Much of this material was adapted from Nina Wallerstein and Harriet Rubenstein, “Teaching about Job Hazards,” American Public Health Association, 1993.*

# 14. REFERENCES AND RESOURCES

---

AFL-CIO and George Meany Center for Labor Studies. 2002. Teaching Techniques for Labor Education.

---

American National Standards Institute. 2016. ANSI/ASSE Z490.1-2016 – Criteria for Accepted Practices in Safety, Health, and Environmental Training.

---

American Public Health Association. 2017. APHA Policy Statement 20175: Ensuring Language Justice in Occupational Safety and Health Training. Available: <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2018/01/18/ensuring-language-justice> [accessed 4 May 2018].

---

Burke MJ, Salvador RO, Smith-Crowe K, Chan-Serafin S, Smith A, Sonesh S. 2011. The dread factor: how hazards and safety training influence learning and performance. *J Appl Psychol* 96(1):46-70.

---

Burke MJ, Sarpy SA, Smith-Crowe K, Chan-Serafin S, Salvador RO, Islam G. 2006. Relative effectiveness of worker safety and health training methods. *Am J Public Health*, 96(2):315-324.

---

Bush, GW. 2003. Homeland Security Presidential Directive 8: National Preparedness. Available: <https://www.hsdl.org/?abstract&did=441951> [accessed 25 April 2018].

---

California Department of Public Health. 2018. California's Aerosol Transmissible Disease Standards and Local Health Departments. Available: <https://www.cdph.ca.gov/Programs/CCDPPH/DEODC/OHB/CDPH%20Document%20Library/ATD-Guidance.pdf> [accessed 25 April 2018].

---

Centers for Disease Control and Prevention. 2012. Improving the Use of Program Evaluation for Maximum Health Impact: Guidelines and Recommendations. Available: <https://www.cdc.gov/eval/guidelines/index.htm> [accessed 25 April 2018].

---

Centers for Disease Control and Prevention. Types of Evaluation. Available: <https://www.cdc.gov/std/Program/pupestd/Types%20of%20Evaluation.pdf> [accessed 25 April 2018].

---

Emergency Response and Preparedness Subcommittee to the National Advisory Committee on Occupational Safety and Health. Sept. 14, 2016. Final Draft Regulatory Language.

---

Federal Emergency Management Agency/U.S. Fire Administration. 2003. Guidelines for HazMat/WMD Response, Planning, and Prevention: Guidance for the Hazardous Materials Emergency Preparedness (HMEP) Grant Program. Available: <https://www.hsdl.org/?abstract&did=454471> [accessed 25 April 2018].

---

Jackson B, Baker J, Ridgely S, Bartis J, Linn H. 2004. Protecting Emergency Responders, Volume 3: Safety Management in Disaster and Terrorism Response. NIOSH Publication No. 2004-144. Available: <https://www.rand.org/pubs/monographs/MG170.html?src=mobile> [accessed 25 April 2018].

---

Johns Hopkins Bloomberg School of Public Health. 2002. Worker Training in a New Era: Responding to New Threats. NIOSH Publication No. 2004-173. Available: [https://www.niehs.nih.gov/about/events/pastmtg/assets/docs\\_n\\_z/technical\\_workshop\\_report\\_2002\\_508.pdf](https://www.niehs.nih.gov/about/events/pastmtg/assets/docs_n_z/technical_workshop_report_2002_508.pdf) [accessed 25 April 2018].

- Kirkpatrick Partners. The Kirkpatrick Model. Available: <https://www.kirkpatrickpartners.com/Our-Philosophy/The-Kirkpatrick-Model> [accessed 25 April 2018].
- National Fire Protection Association. 2018. NFPA 1500, Standard on Fire Department Occupational Safety, Health, Wellness Program.
- National Fire Protection Association. 2002. NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents.
- National Fire Protection Association. 2002. NFPA 472, Standard for Professional Competence of Responders to Hazardous Materials Incidents.
- National Fire Protection Association. 2002. NFPA 473, Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents.
- National Institute of Environmental Health Sciences. 2017. Best Practices in Using Technology in HAZMAT Training. Available: [https://www.niehs.nih.gov/about/events/pastmtg/hazmat/assets/2017/wtp\\_spring\\_17\\_workshop\\_report\\_508.pdf](https://www.niehs.nih.gov/about/events/pastmtg/hazmat/assets/2017/wtp_spring_17_workshop_report_508.pdf) [accessed 25 April 2018].
- National Institute of Environmental Health Sciences. 2017. Emergency Support Activation Plan: Awardee Instructor Deployment Guide. Available: [https://tools.niehs.nih.gov/wetp/public/hasl\\_get\\_blob.cfm?ID=10602](https://tools.niehs.nih.gov/wetp/public/hasl_get_blob.cfm?ID=10602) [accessed 25 April 2018].
- National Institute of Environmental Health Sciences. 2016. Pathogen Safety Data Guide and Training Module. Available: <https://tools.niehs.nih.gov/wetp/index.cfm?id=2554> [accessed 25 April 2018].
- National Institute of Environmental Health Sciences. 2015. Disaster Worker Resiliency Training Materials. Available: <https://tools.niehs.nih.gov/wetp/index.cfm?id=2528> [accessed 25 April 2018].
- National Institute of Environmental Health Sciences. 2013. NIEHS Disaster Recovery: Mold Remediation Guidance, Health and Safety Essentials for Workers, Volunteers, and Homeowners. Available: [https://tools.niehs.nih.gov/wetp/public/hasl\\_get\\_blob.cfm?ID=9795](https://tools.niehs.nih.gov/wetp/public/hasl_get_blob.cfm?ID=9795) [accessed 25 April 2018].
- National Institute of Environmental Health Sciences. 2012. Partnerships for Environmental Public Health Evaluation Metrics Model. NIH Publication No. 12-7825. Available: [https://www.niehs.nih.gov/research/supported/assets/docs/a\\_c/complete\\_peph\\_evaluation\\_metrics\\_manual\\_508.pdf](https://www.niehs.nih.gov/research/supported/assets/docs/a_c/complete_peph_evaluation_metrics_manual_508.pdf) [accessed 25 April 2018].
- National Institute of Environmental Health Sciences. 2012. Worker Training Program Logic Model. Available: [https://www.niehs.nih.gov/about/events/pastmtg/hazmat/assets/2012/old/wtp\\_2012\\_fam\\_lm\\_508.pdf](https://www.niehs.nih.gov/about/events/pastmtg/hazmat/assets/2012/old/wtp_2012_fam_lm_508.pdf) [accessed 25 April 2018].

---

National Institute of Environmental Health Sciences. 2006. Minimum Health and Safety Training Criteria: Guidance for Hazardous Waste Operations and Emergency Response (HAZWOPER), HAZWOPER-Supporting, and All-Hazards Disaster Prevention, Preparedness, and Response. Available: [https://tools.niehs.nih.gov/wetp/public/hasl\\_get\\_blob.cfm?ID=2464](https://tools.niehs.nih.gov/wetp/public/hasl_get_blob.cfm?ID=2464) [accessed 30 April 2018].

---

National Institute of Environmental Health Sciences. 2005. Guidelines for the Protection and Training of Workers Engaged in Maintenance and Remediation Work Associated with Mold. Available: [https://tools.niehs.nih.gov/wetp/public/hasl\\_get\\_blob.cfm?ID=2034](https://tools.niehs.nih.gov/wetp/public/hasl_get_blob.cfm?ID=2034) [accessed 25 April 2018].

---

National Institute of Environmental Health Sciences. 2002. Learning from Disasters: Weapons of Mass Destruction Preparedness Through Worker Training. Available: [https://www.niehs.nih.gov/about/events/pastmtg/assets/docs\\_n\\_z/technical\\_workshop\\_report\\_wmd2002\\_508.pdf](https://www.niehs.nih.gov/about/events/pastmtg/assets/docs_n_z/technical_workshop_report_wmd2002_508.pdf) [accessed 25 April 2018].

---

National Institute of Environmental Health Sciences. 2001. Development of an Integrated WETP ATT Program: Final Report.

---

National Institute of Environmental Health Sciences. 1999. Computer and Internet-Based Learning Methods for Safety and Health Training: Compendium of Applicable Resources and References.

---

National Institute of Environmental Health Sciences. 1999. HAZWOPER Training: Utilizing Advanced Training Technologies. Available: [https://www.niehs.nih.gov/about/events/pastmtg/hazmat/assets/1999/wtp\\_workshop\\_report\\_spring\\_1999\\_hazwoper\\_508.pdf](https://www.niehs.nih.gov/about/events/pastmtg/hazmat/assets/1999/wtp_workshop_report_spring_1999_hazwoper_508.pdf) [accessed 25 April 2018].

---

National Institute of Environmental Health Sciences. 1998. Guidelines for Training in Support of Workplace Safety and Health Programs.

---

National Institute of Environmental Health Sciences. 1994. Interpretive Guidance to the Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response.

---

National Institute of Environmental Health Sciences. 1991. Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response.

---

National Institute of Justice. 2002. Guide for the Selection of Personal Protective Equipment for Emergency First Responders. Volume I. NIJ Guide 102-00.

---

Obama, B. 2011. Presidential Policy Directive 8: National Preparedness. Available: <https://www.dhs.gov/presidential-policy-directive-8-national-preparedness> [accessed 30 April 2018].

---

Occupational Safety and Health Administration. 2011. Construction Focus Four Training Materials. Available: [https://www.osha.gov/dte/outreach/construction/focus\\_four/](https://www.osha.gov/dte/outreach/construction/focus_four/) [accessed 25 April 2018].

---

Occupational Safety and Health Administration. 2010. OSHA Training Standards Policy Statement. Available: <https://www.osha.gov/dep/standards-policy-statement-memo-04-28-10.html> [accessed 4 May 2018].

---

Occupational Safety and Health Administration. 2007. Inspection Procedures for 29 CFR 1910.120 and 1926.65, Paragraph (q): Emergency Response to Hazardous Substance Releases. CPL 02-02-073.

---

Occupational Safety and Health Administration. 2005. OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances. Available: [https://www.osha.gov/dts/osta/bestpractices/html/hospital\\_firstreceivers.html](https://www.osha.gov/dts/osta/bestpractices/html/hospital_firstreceivers.html) [accessed 25 April 2018].

---

Occupational Safety and Health Administration. 2003. Technical Enforcement and Assistance Guidelines for Hazardous Waste Site and RCRA Corrective Action Clean-up Operations HAZWOPER 1910.120 (b)-(o) Directive. CPL 02-02-071.

---

Occupational Safety and Health Administration. 1998. Inspection Procedures for 29 CFR 1910.120 and 1926.65, Paragraph (q): Emergency Response to Hazardous Substance Releases. CPL 02-02-059.

---

Occupational Safety and Health Administration. 1994. Training Curriculum Guidelines - (Non-mandatory). 29 CFR 1910.120 Appendix E.

---

Occupational Safety and Health Administration. Disaster Site Worker Course: Curriculum. Course 7600.

---

Occupational Safety and Health Administration. Disaster Site Worker Train-the-Trainer Course: Curriculum. Course 5600.

---

Occupational Safety and Health Administration. Occupational Safety and Health Standards. 29 CFR 1910.

---

Occupational Safety and Health Administration. Safety and Health Regulations for General Industry. 29 CFR 1926.

---

Office for Domestic Preparedness. 2004. Universal Task List. Available: <https://www.hsdl.org/?abstract&did=452804> [accessed 25 April 2018].

---

Office for Domestic Preparedness. 2003. ODP Approach for Blended Learning. Version 1.0. Available: <http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=9D07E38FC7B6BAF707AF1DB2319492A8?doi=10.1.1.131.1720&rep=rep1&type=pdf> [accessed 25 April 2018].

---

Office for Domestic Preparedness. 2002. Emergency Responder Guidelines. Available: <https://www.hsdl.org/?abstract&did=773487> [accessed 25 April 2018].

---

Office for Domestic Preparedness/International Association of Fire Fighters. 2001. Emergency Response to Terrorism: Operations, A Safe Response for Public Safety Personnel. Available: [http://www.wscff.org/iaff7thdistrict/handout%20TOC%208\\_2\\_04.pdf](http://www.wscff.org/iaff7thdistrict/handout%20TOC%208_2_04.pdf) [accessed 25 April 2018].

---

Office of State and Local Government Coordination and Preparedness. 2004. Course Approval Process (Federally Funded and/or Developed Courses). Draft.

---

U.S. Department of Energy. 2014. Training Program Handbook: A Systematic Approach to Training. DOE-HDBK-1078-94. Available: <https://www.standards.doe.gov/standards-documents/1000/1078-astd-1994-reaff-2014> [accessed 25 April 2018].

---

U.S. Department of Energy Labor Training Working Group. 2015. Evaluation of E-Learning: Selection Criteria for Training.

---

U.S. Department of Homeland Security. 2017. National Incident Management System, Third Edition. Available: <https://www.fema.gov/media-library/assets/documents/148019> [accessed April 25 2018].

---

U.S. Department of Homeland Security. 2016. National Disaster Recovery Framework, Second Edition. Available: <https://www.fema.gov/media-library/assets/documents/117794> [accessed 25 April 2018].

---

U.S. Department of Homeland Security. 2016. National Response Framework, Third Edition. Available: <https://www.fema.gov/media-library/assets/documents/117791> [accessed 25 April 2018].

---

U.S. Department of Homeland Security. 2007. Universal Task List. In: The National Preparedness Guidelines. Appendix B. Available: <https://www.hsdl.org/?abstract&did=478815> [accessed 25 April 2018].

---

U.S. Department of Homeland Security. 2004. National Response Plan. Available: <https://www.hsdl.org/?abstract&did=450766> [accessed 25 April 2018].

---

U.S. Environmental Protection Agency. 2015. National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Overview. Available: <https://www.epa.gov/emergency-response/national-oil-and-hazardous-substances-pollution-contingency-plan-ncp-overview> [accessed 25 April 2018].

---

U.S. Environmental Protection Agency. 2004. Radiation Health and Safety Implementation Plan. Final Draft.

---

U.S. National Response Team. 2009. Volume I: Guidance for Managing Worker Fatigue During Disaster Operations. Available: <https://www.nrt.org/sites/2/files/FatigueTADfinal.pdf> [accessed 25 April 2018].



National Institute of  
Environmental Health Sciences  
*Worker Training Program*