WORKSHOP REPORT

NIEHS
National Institute of Environmental Health Sciences

Worker Education and Training Program

Minimum Health and Safety Training Criteria:

GUIDANCE FOR

Hazardous Waste Operations and Emergency Response (HAZWOPER) HAZWOPER-Supporting and All-Hazards Disaster Prevention, Preparedness, & Response

Based upon
NIEHS/WETP National Technical Workshop — March 30-April 1, 2005

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FOREWORD

This document is based upon a National Technical Workshop sponsored by the National Institute of Environmental Health Sciences (NIEHS), Worker Education and Training Program (WETP) conducted on March 30-April 1, 2005 in Los Angeles, CA. It was the third such training quality workshop conducted by the program since its creation in 1987; the initial workshop, conducted in 1990, produced the "Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response" followed by the "Interpretive Guidance" to the Minimum Criteria conducted in 1994. The initial "Minimum Criteria" served as the basis for the non-mandatory Appendix E to the OSHA Hazardous Waste Operations and Emergency Response standard at 29 CFR 1910.120.

This third workshop was conducted to update the "Minimum Criteria" guidance, which has served as the primary quality control foundation for the Worker Education and Training Program for the past 18 years. During that period, however, there have been significant advances in the development and application of advanced training technologies and substantial recent attention to all-hazards preparedness training for the emergency response community since 9/11 and the creation of the Department of Homeland Security.

The workshop was attended by over 110 participants from the WETP, the WETP grantees, and others invited from the public and private sectors. The workshop process included an opening plenary session with two expert panels, six breakout sessions on topical areas from the preliminary draft straw man document, and a closing plenary of reports and discussions of findings and recommendations from each breakout session. A draft workshop report was prepared following the workshop and sent to all participants for review and comment. Based upon the comments received, this final workshop report was prepared and issued.

This guidance document is intended to serve as the quality control basis for the training grants awarded by the Worker Education and Training Program beginning in FY 2006.

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1. INTRODUCTION

Worker safety and health training saves lives. This has been the experience of the Worker Education and Training Program of the National Institute of Environmental Health Sciences, which has trained over a million workers since its beginning in 1987. Its mandate came through the Superfund Amendments and Reauthorization Act of 1986, which also required 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 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 to the adult learner. The initial quality control for the program was developed through a participatory national technical workshop in 1990 and issued by the Program in 1991. This original "Minimum Criteria" was updated in 1994 as the "Interpretive Guidance" to the "Minimum Criteria." The 1994 guidance has served as the quality control basis for the WETP training grants program to the present time.

There have been many developments in training since the inception of the grants program in 1987. Advances in training technologies and the emergence of all-hazards preparedness training in the emergency response sector since the terrorist attacks of 9/11 are two specific examples. The Program has, over the years, conducted a number of national technical workshops, such as "Advanced Training Technologies" conducted in 1999, 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, essentially updates the original "Minimum Criteria" to include advances in adult education in the hazardous waste operations and emergency response sector, particularly advanced training technologies application and integration, requirements for additional training programs to support HAZWOPER work, and post-9/11 all-hazards preparedness training including that for skilled support personnel as identified in HSPD#8.

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)], 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.

1. 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 manmade. 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.
2. 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.

3. This document draws upon and references other guidance materials that provide excellent recommendations for training the intended target populations. Of particular note are the National Fire Protection Association guidelines and the FEMA "Guidelines for Haz Mat/WMD Response, Planning and Prevention Training: Guidance for Hazardous Materials Emergency Preparedness (HMEP) April 2003 Edition. The FEMA guidance has been fully adopted by reference in this document.

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

5. 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.

6. Computer-based training methods can greatly augment the effectiveness and reduce the cost of hazardous waste worker training, but should not be the sole form of training when workers' health and safety are at risk especially with respect to skills training.

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

8. 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.

9. 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.

10. The original 1991 Minimum Criteria guidance was the basis of the OSHA non-mandatory appendix on training in the 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, or protective of workers.

2. 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; and
- all-hazards prevention, preparedness, and response training as defined in the National Response Plan 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.

3. SCOPE

These criteria apply to training providers offering training to all training populations established within 29 CFR 1910.120(e), (p)(7) and (8) (iii), and (q)(4),(5),(6),(7), and (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 upon the requirement that initial training has been successfully completed in accordance with 1910.120 (e), (p), or (q).

4. APPLICATION

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

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

5. ORGANIZATION

This document is organized in the following manner:

1. Worker training principles and characteristics of excellence to which all training providers should adhere are presented in Section 8.
2. Minimum training program design criteria, quality control, and curriculum guidelines are provided in sections 9, 10, and 11 respectively, which apply to the initial and refresher training requirements within the HAZWOPER standard at 1910.120 (e), (p), and (q).
3. 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.
4. All-hazards training programs exclusively focus on the emergency response [29 CFR 1910.12-(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.
5. Annex C provides (in CD format) the "Guidelines for Haz Mat/WMD Response, Planning, and Prevention Training" developed by FEMA and dated April 2003, which is adopted by reference.
6. Annex D provides planners and evaluators with a checklist of adult education principles.

6. 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, blood-borne pathogens, and process safety management – but may cover hazards and issues that aren't currently regulated, such as mold and prevention-based training. (See Annex A.)

All-hazards — includes a broad range of hazardous incidents covered under a declaration of a "nationally significant event" that triggers the National Response Plan (NRP). Although commonly referred to as Weapons of Mass Destruction (WMD), this category encompasses a broader range of hazards in the new NRP, including major natural disasters, 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.

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.

Core training — Initial off-site training as established in 29 CFR 1910.120 (e), (p), and (q).

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 con ducted.

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.

May — term used in this document to indicate something is permissible.

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.

Proficient — meeting a stated level of achievement.

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.

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 — often referred to as advanced training technologies such as web-based and other computer-based learning methodologies. It is assumed that training programs and instructional staff will utilize and effectively integrate whatever technologies are appropriate to achieve the course learning objectives in a manner that assures 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 I in section 9.3.6 of this document.

Training Director — The individual responsible for the overall management of all aspects of a training program.

Training day — eight contact hours. 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 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 utilized the training director shall determine and document the applicable training hours.

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/WETP training grant.

7. ACRONYMS

ADDIE ..... Analysis, Design, Development, Implementation, and Evaluation

ANSI ..... American National Standards Institute

CFR ..... Code of Federal Regulations

DHS ..... Department of Homeland Security

DOE ..... Department of Energy

FEMA ..... Federal Emergency Management Agency

HAZMAT ..... Hazardous Materials

HAZWOPER... Hazardous Waste Operations and Emergency Response standard at 29 CFR 1910.120

HSPD ..... Homeland Security Presidential Directive

ODP ..... Office for Domestic Preparedness

OSHA ..... Occupational Safety and Health Administration

NFPA ..... National Fire Protection Association

NIEHS ..... National Institute of Environmental Health Sciences

NIOSH ..... National Institute for Occupational Safety and Health

NRP ..... National Response Plan. DHS, December 2004

PPE ..... Personal Protective Equipment

PSM ..... Process Safety Management (OSHA standard at 29 CFR 1910.119)

RCRA/TSD .... Resource Conservation and Recovery Act/Treatment Storage and Disposal

RW I ..... Radiation Worker I (Level 1 training course established by DOE standard)

RW II ..... Radiation Worker II (Level 2 training course established by DOE standard)

SARA ..... Superfund Amendment and Reauthorization Act of 1986

SMART ..... Specific, Measurable, Action-oriented, Relevant, and Timely

TSCA ..... Toxic Substances Control Act

UTL ..... Universal Task List (DHS)

WETP ..... Worker Education and Training Program

WMD ..... Weapons of Mass Destruction

8. WORKER TRAINING PRINCIPLES AND CHARACTERISTICS OF EXCELLENCE

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 embrace 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; and
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 a periodic 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.

8.1.3 Comprehensive

Minimally acceptable training programs must cover everything required for someone to work safely in the industry, a requirement that is particularly critical for working with hazardous materials. Providing inadequate information or failing to assure 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, believable, 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 for the target audience. Further, training material developers should measure readability levels to assure 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 the following Principles of Adult Education.

8.1.5 Practicality

Training programs should present information, ideas, and 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 fire fighters, 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, exercises, and proficiency assessment are essential.

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 upon current skills. The new skills required by a fire fighter, ironworker, or laborer to safely perform their work in a 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 as well.

Adults learn from a variety of learning activities including role playing, case studies, audio-visual presentations, discovery exercises, planning exercises, group discussions, lecture-discussions, report-back sessions, drills and exercises, computer use, web site 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 need for 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 non-judgmental 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 WETP 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 students comfort level and fluency with technology must be considered before choosing technology-enhanced instructional methods and also during curriculum design.

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 D provides a Checklist for Planners and Evaluators of 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 (termed WMD by WETP) 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 upon 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, 120-supporting, and all-hazards training.

This document does not provide guidance for craft, trade, job classification, or task training. This document is based upon 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, and the issuance of several supplemental training awards by the NIEHS/WETP. 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 written proficiency assessments are required in all annual refresher training and, in those courses where skills proficiency needs to be demonstrated, such shall be included.

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/WETP awardees (and others such as

OSHA and FEMA) have over a decade 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 assure 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 provides a summary of the range of training hours required among the WETP grantees and addressed in the FEMA document (Annex C) to meet the minimum competencies:

TABLE 1	
Hazardous waste operations:	
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
RCRA/TSD:	
Initial:	24-40 hours*
Refresher, annual:	8 hours
Emergency Response:	
Awareness level:	4-16 hours*
Operations level:	8-40 hours*
Technician level:	40-240 hours*
Refresher:	8 hours*
Disaster Site Worker (OSHA 7600):	16 hours
* Upper end of range exceeds OSHA minimum.	

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, assuring 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 sub-sections.

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, and services to conduct such training.

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 in which they are intended to instruct;
- successful completion of a train-the-trainer program specific to the topics they will teach; and
- 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.

Instructors shall be required to maintain competency by:

- participating in continuing education or professional development programs;
- successfully completing annual instructor refresher training; and
- being re-certified by the Training Director subsequent to an annual review of instructional competency.

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 in which 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 upon evaluations completed by trainees during the previous year.

Instructors providing instruction in the 1910.120-supporting training programs identified in Annex A and all-hazards training shall be certified competent to offer such instruction by the Training Director utilizing the preceding criteria as guidance. Where required by certain of these supporting training programs, such as asbestos or Construction Safety and Health (OSHA 10), the instructor shall be certified or authorized in accordance with the applicable requirements established by the certifying or authorizing authority.

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 course syllabus for each course offered, trainee manuals, instructor manuals, audio-visual aids, enhanced technology methods, handouts, demonstration equipment, hands-on equipment and other such training materials 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, audio/visual, enhanced technology 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 DOE Systematic Approach to Training manual (DOE-HDBK-1078-94), and addressed in ANSI Z-490.1-2001 (reference 17). Learning objectives shall be developed that are realistic, meaningful, attainable, and measurable based upon guidance such as SMART (Specific, Measurable, Action-oriented, Relevant, and Timely).

Additional references that specifically consider the NIEHS/WETP target audiences can be found in the WETP workshop report "Guidelines for Training in Support of Workplace Safety and Health Programs," November 1998 and in several reports from WETP trainers' exchange conferences, all of which can be found at the National Clearinghouse for Worker Safety and Health Training web site (*www.wetp.org*). The Office for Domestic Preparedness provides a useful tool for analyzing delivery methods (called DMAT) and a comprehensive review of the ADDIE method (See ODP's 2003 Blended Learning Approach in Reference 31). 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
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 method appropriate to the training target audience and the 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. Evaluation methods and criteria for satisfactory completion of the course

9.3.5 Trainees

The program shall assure, 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 assure, 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 upon 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 certifications 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 assure 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

9.3.7 Proficiency Assessment

9.3.7.1 Initial training

Proficiency shall be evaluated and documented with a written assessment and a skills demonstration developed by the training director and staff to evaluate whether the program achieves its stated objectives. The level of minimum achievement in the written assessment shall be specified in writing by the training director. Students must demonstrate full mastery of the required skills for satisfactory completion of the course. Should a trainee fail to achieve full mastery, remedial actions to assist the trainee may be used, based upon approval and documentation by the Training Director.

The written assessment instrument shall be a minimum of 50 questions relevant to the learning objectives of the course. The written assessment instrument may be administered orally, if deemed appropriate by the Training Director. The methods used shall be documented by the Training Director.

For the performance assessment, the task chosen and the means to rate successful completion must be fully documented by the training director and shall be specific to the training course upon which it is based. The number of skills assessment tasks will, therefore, be based upon the skill requirements of the specific course.

The proficiency assessment methods, regardless of the approaches used, shall be justified, documented, peer reviewed, and approved by the Training Director using generally accepted procedures. The test/performance measures must be reviewed and updated as necessary to reflect any changes in the curriculum and must be approved by the Training Director.

Written assessments designed to meet the above requirements may be conducted using computer-based platforms. However, hands-on skills assessment must be conducted in the physical presence of a qualified instructor using appropriate skills demonstration equipment, facilities, or drill environments.

9.3.7.2 Refresher training

Proficiency shall be assessed by the use of a written assessment and, if appropriate, a skills demonstration approved by the Training Director as appropriate for the specific HAZWOPER class. The level of minimum achievement necessary for proficiency shall be specified in writing by the Training Director. The written assessment may be administered orally, if deemed appropriate by the Training Director. The methods used shall be documented by the Training Director.

There shall be a minimum of 15 questions in the written test. The Training Director shall justify in writing the choice of tasks for skills tests and the means to rate successful completion. The tasks chosen shall be appropriate for the HAZWOPER initial course in which the trainees are certified. Skill assessments shall be conducted in the presence of a qualified instructor. The refresher training proficiency assessments shall be reviewed and updated as necessary to reflect changes in the core and refresher curriculum.

The refresher course proficiency assessments are not required to be peer reviewed and approved. However, when the initial training course curriculum upon which the refresher training is based is revised, peer reviewed and approved, consideration of the relevant subjects to be included in the refresher course shall be considered.

9.3.8 Course certificate

Written documentation shall be provided to each trainee who successfully completes the course of instruction based upon 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 personal protective equipment used by the trainee to complete the course
h. An individualized certificate number

An appropriate laminated wallet-sized or a durable and non-reproducible 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 training 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 Record keeping

Student records

The training provider shall maintain records listing:

- the dates courses were presented,
- name and social security number (or other unique identifier) of each course trainee,
- a clear indication of which trainees successfully completed each course, and
- 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 participant, 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,
- the professional development programs completed., and
- the 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 upon 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 the next section "Training Program Quality Control Criteria."

The Training Director shall provide in a timely manner whatever information and documentation may be requested in the course of an NIEHS/WETP audit.

10. TRAINING PROGRAM QUALITY CONTROL CRITERIA

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 grantee 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;
- Course syllabus;
- Course prerequisites;
- The training needs of the target audience (based upon 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;
- 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; and
- The evaluation process and implementation of the modifications required.

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 assuring 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; and
- 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 enhanced technology training.

10.5 Instructional Technologies

There has been a dramatic expansion in the use of new instructional technologies for safety and health training. The WETP awardees have been at the forefront of pioneering these technologies for worker training and evaluating the results. They conducted two national workshops to develop guidance, which should be used as the initial basis for evaluation. The reports, NIEHS/WETP "Hazwoper Training: Utilizing Advanced Training Technologies" Workshop report (8) and the "Development of an Integrated WETP ATT Program: Final Report" (9), can be found at www.wetp.org. The quality and effectiveness of training programs when utilizing such technologies should be considered including:

- 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, computer-based learning methods have been applied, what approaches have been used to assure the students attain the knowledge and skills specified in the course learning objectives?
- Where self-paced, computer-based 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?

10.6 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; and
- 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;
- implemented course updates that have occurred during the preceding year.
- integrated new training technologies;.
- integrated modules among HAZWOPER, HAZWOPER-supporting, and all-hazards training course; and.
- 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; and
- methods the program uses to ensure that recruits are able to use new training technologies, where required.

10.9 Instructional environment and administrative support

The institutional 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 administrative support,
- the financial resources to support the training program, and
- the instructional technology infrastructure.

10.10 Program evaluation

Key questions for evaluating the quality and appropriateness of an overall training program should include the following:

- Are the program objectives clearly stated?
- Is there evidence that the program is accomplishing its objectives?
- Are appropriate facilities and staff available and committed to the program?
- Is there an appropriate mix of classroom, demonstration, and hands-on training?
- Where new training technologies have been integrated into the program, has the impact on and value to the program been assessed?
- Is the program providing quality worker health and safety training that fully meets the intent and requirements of the applicable regulations?
- What are the program's strengths?
- What are the program's weaknesses?
- What is recommended to improve the program?
- Are they instructing according to their training outlines?
- Is the evaluation tool current and appropriate for program content?
- Are the course materials current and the delivery methods relevant to the training target audience?
- Are the measures of program outcome adequate?

11. GENERIC MINIMUM TRAINING CURRICULUM GUIDELINES

The following guidelines are for those operations specifically identified in OSHA regulations 29 CFR 1910.120 as requiring training. The guidelines in the following sub-sections 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 9.0 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 core off-site training required by the OSHA HAZWOPER standard at 1910.120(e) applicable to clean-up 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, subsequent to 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 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 a number of 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/WETP training grant award. These training programs are considered to be in addition to the core and refresher courses. This also applies to the all-hazards preparedness and response training in which a number of the awardees are engaged. These programs are considered to be 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 up-graded 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 up-grade training encompass a minimum of 24 additional hours.

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 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 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

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 8-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 8-hour refresher training required by 1910.120(e)(8), based upon the initial general site worker course.

Individuals developing the refresher course curriculum should:

- Review and retrain on relevant topics covered in the 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 clean-up, task changes, and subject matter that applies to increased worker protection.
- Review changes to pertinent provisions of RCRA, SARA, and the Toxic Substances

Control Act (TSCA) 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 blood-borne pathogens and emerging all-hazards issues.

- Provide hands-on opportunities for new developments in personal protective equipment, 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 3 additional days of supervised instruction by a HAZWOPER-trained and experienced supervisor on-site. For occasional workers, 24 hours off-site initial training and 1 day on-site supervised training is required. The purpose of this on-site training is to assure 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 available a detailed initial course outline to the employer.

11.2 RCRA/TSD [1910.120(p)]

11.2.1 Introduction

29 CFR 1910.120(p)(7) and (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 sub-sections.

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 8 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 section 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 20 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 personal protective equipment, 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 personal protective equipment and respirator programs including the proper selection and use of PPE based upon 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, 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, 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, termed WMD, 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 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 fires fighters 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.), and
- 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.

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/WETP training grants program, based upon role and function in such a response are:

- First responder awareness,
- First responder operations,
- Hazardous materials technician,
- Hazardous materials specialist,
- Incident commander, and
- Emergency medical services (EMS).

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 FEMA "Guidelines for Haz Mat/WMD Response, Planning, and Prevention Training" April 2003 edition 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 upon 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 Guideline document and adopt those that are applicable to the training providers target audience and responder category. The Training Director shall approve, document, and maintain these courses.

a. **First responder awareness level, 1910.120(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 personal protective equipment 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 personal protective equipment 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)(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.

- Know how to select and use proper specialized chemical personal protective equipment 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 personal protective equipment 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)(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 personal protective equipment 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 personal protective equipment 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)(v):**

Must be able to demonstrate competency in the following:

- Operations level competencies.
- Know and be able to implement the employer's incident command system.
- 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 guideline provides recommended training competencies and learning objectives for EMS level 1 and 2 personnel based upon 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 upon 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 personal protective equipment 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

11.3.3 Refresher

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 upon 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.

11.4 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. None are currently required to have pre-incident hazardous materials response training, although that may be changing because of emerging DHS training requirements based upon HSPD#8 for skilled support personnel for example and OSHA interpretations specific to hospitals (Whittaker. 4/25/97). 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 clean-up has begun, unless they have additional training. This applies whether the hazardous substances were purposely released by terrorist or were incidental to the act of terrorism. This category includes, among others:

- 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).
- 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).

The following are examples of additional skilled support personnel and specialist employees:

- 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).

For purposes of this document, this category is 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 and 1910.120(q)(5) for specialist employees.

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 standards for these

personnel, although many employers are opting for more training so their workers can stay on the site after the incident transitions from emergency response/rescue to clean-up.

NIEHS awardees were instrumental in partnering with OSHA in developing the OSHA Disaster Site Worker Course (designated 7600 by the OSHA Training Institute), 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 Train-the-Trainer Course (OTI 5600). Upon successfully completing the 7600 course, students receive a certificate and OSHA 7600 card (the "course" card), which permit those workers to enter and work as skilled support personnel at disaster response sites. For workers already trained in accordance with 1910.120(e), *Clean-up*, a separate certificate and card (the "program" card) are issued, which permit these workers to subsequently engage in the clean-up activities that are designated as HAZWOPER sites.

Transportation workers who may engage in after-incident clean-up activities also require initial training pursuant to 1910.120(e) and the OSHA 7600 course may be an appropriate 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 subsequent cleanup that is covered by the HAZWOPER standard, off-site workers trained in accordance with 1910.120(e) are required. 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.

The recent "OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving Release of Hazardous Substances" (4) identifies certain hospital personnel as potential skilled support personnel and states that the briefing per 1910.120(q)(4) is required. That guideline recommends that employers identify such potential skilled support personnel and provide pre-incident training prior to a mass casualty incident. Of interest, the OSHA hospital first receiver's guideline also notes that such skilled support personnel who may be required to wear a respirator in a skilled support role should be medically cleared for respirator use and properly fit tested, but doesn't require additional training. This apparently conflicts with the requirements for additional upgrade training of "occasional" cleanup workers when, subsequent to their initial training, it becomes necessary for them to wear respiratory protection. It appears appropriate that a skilled support personnel training program be developed to serve the hospital sector. Such a course could use the OSHA First Receivers document as a basis with additional elements specific to the individual hospital program.

<u>b. Specialist employees</u>:

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

c. Hospital First Receivers:

The OSHA hospital first receiver's document (4) provides guidance on the level of training appropriate for personnel assigned specific duties in a response. Awareness level, operations level, skilled support personnel briefings, and HAZCOM training are addressed. Required competencies are listed for the awareness and operations level training, which are identical to those for the same full-time responder levels detailed in the preceding section of this document. Awareness and operations level training must be based upon the minimum competencies required in 29 CFR 1910.120q)(6)(i) and (ii) specific to the hospital setting. Additional training competencies should be selected from the FEMA Guidelines, which are based upon NFPA 472.

11.4.3 Refresher

Annual refresher training or annual certification of competency by their employer is required for responders trained to the awareness and operations levels. 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 is based upon new developments in the collateral duty sector, lessons learned, and re-validation of key protective measures such as respirator wear.

12. CERTIFICATION

OSHA initially addressed accreditation or certification of training programs under 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 non-mandatory training appendix to the standard (Appendix E), which was based in large part on the original NIEHS/WETP Minimum Criteria requirements for such training under the WETP grants program.

Accreditation or certification of some of the 1910.120-supporting training programs in Annex A of this draft document is already covered by existing requirements, such as AHERA 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.

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/WETP training grants program these 1910.120-supporting training programs are funded on the basis of the individual grants contract.

Annex B provides the technical workshop agenda and participants list, which served as the basis for this document.

Annex C provides the FEMA HAZ MAT/WMD response guidelines document, which serves as a central reference document to the Emergency response sections of this document under section 11.3 and 11.4. It is provided with paper versions of this document in CD format. The FEMA guidance is also available from the National Clearinghouse website at: http://www.wetp.org/wetp/public/hasl_get_blob.cfm?ID=1465

Annex D 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 [1910.120 (b)-(o)], RCRA/TSD operations [1910.120(p)], and emergency response operations [1910.120(q)]. Additionally, there may be other trainings that have direct relevance to 1910.120 but are not part of a required training regimen.

For purposes of the NIEHS/WETP 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 pre-requisite 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 Train-the-Trainer course for Construction or OSHA 501 for General Industry and has been authorized by OSHA.

Radiation: Training for Rad Worker I and Rad Worker II must be in accordance with DOE 10 CFR 835 and 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*. Such shall be conducted by instructors certified as competent to do so by the Training Director.

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.

Blood borne 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.

Lock out/Tag out: 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 (PSM): 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." 2005. Available from the National Clearinghouse at *www.wetp.org*.

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 and participants.

NIEHS **Worker Education and Training Program**

Technical Conference

March 30 – April 1, 2005
Manhattan Beach, CA

Manhattan Beach Marriott • 1400 Parkview Avenue • Manhattan Beach, CA 90266 • (310) 546-7511

Agenda

2005 Spring Technical Conference

Wednesday, March 30, 2005

Keeping Quality Current:
An Update of the NIEHS Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response

2:00 p.m. **NIEHS Welcome** — **Joseph Hughes**, WETB, NIEHS and **Dennis Lang**, DERT, NIEHS

2:15 p.m. **Plenary Panel One:** The Importance of HAZWOPER

Moderator: **Joseph Hughes**, WETB, NIEHS

HAZWOPER: an indispensable training tool

- The role, importance, and positive impact of 1910.120 — **Rich Nickle**, ATSDR
- The challenges to the responder community in incident response, the importance of consensus standards, and the impact of the NRP — **Wayne Yoder**, DHS

3:00 p.m. **Break**

3:15 p.m. **Plenary Panel Two:** Critical Crosscutting Issues

Moderator: **Bruce Lippy**, Clearinghouse

- Adult Learning Techniques — **Betty Szudy**, LOHP
- E-learning — **Doug Feil**, Kirkwood Community College
- Evaluation — **Tom McQuiston**, PACE Union

4:30 p.m. **Charge to the Breakouts** — **John Moran** and **Donald Elisburg**, Clearinghouse

5:00 p.m. **Closing**

5:15 p.m. **Meeting of the breakout co-facilitators and note takers** (Room 207)

Keeping Quality Current:
An Update of the NIEHS Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response

Agenda

2005 Spring Technical Conference

Thursday, March 31

8:00 a.m. **Breakfast available**

8:30 a.m. **Breakout sessions**

- **1:** General Criteria
- **2:** Program QC, Accreditation/Self-certification, Worker Training Principles, and Characteristics of Excellence
- **3:** Training Curriculum Guidelines 1910.120 (b)-(o) including .120-supporting and WMD
- **4:** Training Curriculum Guidelines for RCRA/TSD 1910.120 (p)
- **5:** Training Curriculum Guidelines for Full-time Emergency Response 1910.120(q)
- **6:** Training Curriculum Guidelines for Collateral Duty Emergency Response under 1910.120(q) including collateral duty facility emergency responders, hospital first receivers, SSP, specialist employers

10:30 a.m. **Break**

10:45 a.m. **Breakout sessions continue**

12:00 p.m. **Lunch**

Luncheon speaker **Robert Gottlieb**, Occidental College, co-author of the book, "The Next Los Angeles: The Struggle for a Livable City"

1:30 p.m. **Breakout sessions continue** (with break around 3:00)

5:00 p.m. **Closing**

5:30–7:30 p.m. **Reception**

Friday, April 1, 2005

8:00 a.m. **Breakfast available**

8:30 a.m. **Final meeting of breakout groups**

10:00 a.m. **Break**

10:15 a.m. **Plenary Session:** Reports of the Breakout Co-chairs and Discussion

11:45 a.m. **Next Steps and Closing** **Joseph Hughes** and **Bruce Lippy**, Clearinghouse

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13.3 Annex C: USFA/FEMA "Guidelines for Haz Mat/WMD Response, Planning, and Prevention Training." April 2003 Edition.

PDF version may be downloaded from:

http://www.usfa.fema.gov/downloads/pdf/publications/hmep9-1801.pdf

Guidelines for Haz Mat/ WMD Response, Planning and Prevention Training

Guidance for Hazardous Materials Emergency Preparedness (HMEP) Grant Program

April 2003 Edition

FEMA

13.4 Annex D: 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 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 in teraction?
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
audio-visual discussions
discovery exercises
planning exercises
mapping activities
group discussions
lecture-discussions
report-back sessions
evaluation sessions
drills and exercises.
computer use, web site access, simulations.
blended approaches utilizing 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 audio-visual aids incorporated in the lecture?
Does the lecturer rely too heavily on his or her notes?
Was their 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 4 to 6 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 note-taker?

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 audio-visual aids used by the training program encourage participation?

Do the instructors write an on-going 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 utilizing 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 instructors 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.

Provides 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

1. "Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response." NIEHS/WETP Technical Workshop on Training Quality. December 1991.
2. "Interpretive Guidance to the Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response." NIEHS/WETP. Workshop Report. April 1994.
3. "Guidelines for Haz Mat/WMD Response, Planning, and Prevention." Guidance for the Hazardous Materials Emergency Preparedness Grant Program. FEMA. April 2003 Edition.
4. "OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass Casualty Incidents Involving the Release of Hazardous Substances." OSHA. December 2004.
5. "Inspection Procedures for Hazardous Waste Operations and Emergency Response Standard, 29 CFR 1910.120 and 1926.65, Paragraph (q): Emergency Response to Hazardous Substance Releases. CPL 02-02-059. OSHA. April 24, 1998.
6. "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. OSHA. November 11, 2003.
7. "Training Curriculum Guidelines-(Non-mandatory)." 29 CFR 1910.120 Appendix E. OSHA. August 12, 1994.
8. "Hazwoper Training: Utilizing Advanced Training Technologies." Report of the NIEHS/WETP National Technical Workshop "Computer and Internet-Based Learning Methods for Safety and Health Training." September 1999.
9. "Development of an Integrated WETP ATT Program: Final Report." NIEHS/WETP January 2001.
10. "Protecting Emergency Responders. Volume 3. Safety Management in Disaster and Terrorism Response." NIOSH Publication No. 2004-144.
11. "Emergency Response to Terrorism: Operations, A Safe Response for Public Safety Personnel." Department of Justice (DOJ), Office of Justice Programs (OJP), Office of Domestic Preparedness (ODP) and IAFF. September 2001.
12. "Learning from Disasters: Weapons of Mass Destruction Preparedness Through Worker Training." Report of a National Technical Workshop held April 25-26, 2002. NIEHS/WETP.
13. "Worker Training in a New Era: Responding to New Threats." Report of a Conference in Baltimore, MD. October 26-27, 2002. NIOSH Publication No. 2004-173.
14. NFPA 471 "Recommended Practice for Responding to Hazardous Materials Incidents, 2002 Edition.
15. NFPA 472 "Standard for Professional Competence of Responders to Hazardous Materials Incidents." 2002 Edition.
16. NFPA 473 "Standard for Competencies for EMS Personnel Responding to Hazardous Materials Incidents." 2002 Edition.
17. ANSI Z490.1-2001. "American National Standard Criteria for Accepted Practices in Safety, Health, and Environmental Training." July 2001.

18. 29 Code of Federal Regulations Part 1910 Safety and Health Regulations for General Industry and Part 1926 Safety and Health Regulations for Construction.

19. "Guidelines for Training in Support of Workplace Safety and Health Programs." Guidance Document and Technical Workshop Report of Workshop held November 12-13, 1998. NIEHS/WETP.

20. "Disaster Site Worker Train-the-Trainer Course: Curriculum." Course 5600. OSHA.

21. "Disaster Site Worker Courser: Curriculum." Course 7600. OSHA.

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

23. "Radiation Health and Safety Implementation Plan." Final Draft. EPA. April 30, 2004.

24. "Computer and Internet-Based Learning Methods foe Safety and Health Training." Compendium of applicable resources and references. NIEHS/WETP National Clearinghouse. March 10, 1999.

25. "National Response Plan (NRP)." Department of Homeland Security. Includes Emergency Support Function (ESF) Annexes, Support Annexes (including Worker Safety and Health Support Annex), Incident Annexes, Applicable Executive Orders, and Applicable Presidential Directives (HSPD 1-10). December 2004.

26. "National Incident Management System (NIMS)." Initial System, Final draft, July 18, 2003 and NIMS Derived Compliance statements-Revised, DHS. June 23, 2004.

27. "Emergency Responder Guidelines." Office of Domestic Preparedness (ODP), Office of Justice Programs (OJP). August 1, 2002.

28. "Universal Task List." Office of Domestic Preparedness, DHS. July 30, 2004.

29. "Universal Task List Manual." Version 1.0. Draft. ODP/DHS. July 31, 2004.

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

31. "ODP Blended Learning Approach." Version 1.0. ODP/DHS. November 27, 2003.

32. "Office of State and Local Government Coordination and Preparedness (SLGCP). Course Approval Process (Federally Funded and/or Developed Courses)." Draft. DHS. October 15, 2004.

33. Compendium of OSHA HAZWOPER standard interpretations from 1994-2004. Available from the National Clearinghouse via *www.wetp.org*.