REVIEW DRAFT

INTERPRETIVE GUIDANCE TO THE *Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response*

Resulting from a Technical Workshop
Sponsored by the National Institute of Environmental Health Sciences
March 29 - 31, 1994

NATIONAL CLEARINGHOUSE FOR WORKER SAFETY AND HEALTH TRAINING FOR HAZARDOUS MATERIALS, WASTE OPERATIONS AND EMERGENCY RESPONSE

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CHARGE FOR THE MARCH 1994 TECHNICAL WORKSHOP TO PROVIDE INTERPRETIVE GUIDANCE TO THE *Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response*CHARGE FOR THE MARCH 1994 TECHNICAL WORKSHOP TO PROVIDE INTERPRETIVE GUIDANCE TO THE *Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response*

The purpose of this technical workshop is to develop guidance that will enhance the use of the *Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response.*

The "Minimum Criteria" itself will not be changed. The document, developed in a tripartite technical workshop March 1990, has successfully withstood the test of wide usage in the occupational safety and health professional community. As a result, it is now to be adopted as a non-mandatory appendix to the OSHA regulations 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response.

The goal for this workshop is to develop interpretive guidance to augment the use of the "Minimum Criteria." This workshop's discussion should focus on clarification, explanation, examples, and expanded commentary on the original document.

Workshop discussions should also formulate more specific information for the upcoming training-program accreditation proposal, both 29 CFR 1910.121 and the soon-to-be announced parallel proposed rule that would accredit training programs that come under 29 CFR 1910.120 (q) for public sector emergency responders.

The audience for the interpretive guidance is the same as that for the "Minimum Criteria" including employers, worker representatives, health and safety professionals, training providers, governmental agencies, and others with interests in worker health and safety training for hazardous waste operations and emergency response.

While specific to hazardous waste operations and emergency response, much of the principles and material here will apply to allied areas, e.g., asbestos abatement worker training, lead-based paint abatement worker training, etc.

The workshop will strive for completeness within the time allotted. Chairs should allot a reasonable time for each topic. If consensus is unachievable in the time frame, brief minority reports may be included.

A draft report will be assembled and the result of the workshop discussion circulated widely for comment.

INTRODUCTION TO THEINTRODUCTION TO THE INTERPRETIVE GUIDANCE DOCUMENT

The purpose of this document is to provide interpretive guidance to selected sections of the original NIEHS "Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response" document.

In approaching that purpose, a Technical Workshop, the product of which is this document, was held in March, 1994. That Workshop centered around four Technical Workgroups: General Hazardous Waste Operations, RCRA Operations-Treatment, Storage and Disposal, Public and Facility Emergency Response, and Collateral Duty Emergency Response. The first two were based upon the original Minimum Criteria document sections of the same title. The last two, however, reflected an expansion of the single Emergency Response section in the original document into two discrete emergency activities: essentially full-time off-site emergency response and collateral duty site-specific emergency response.

This document is the original document in its entirety with the additional interpretive guidance developed during the March, 1994 Workshop included in Sections IV, V, and VI. Section VII, Accreditation, was not addressed. To assist the reader, those sections to which interpretive guidance has been added are marked by asterisks in the Table of Contents which follows this introduction. The original "Minimum Criteria" text is underlined throughout this document.

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FOREWORDFOREWORD

This final document reports the result of a technical workshop on training quality, "Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response," held March 22-24, 1990, in Washington, D.C. The meeting was sponsored by the National Institute of Environmental Health Sciences (NIEHS).

The Workshop

NIEHS worker training program grantees identified a need to establish criteria for determining the quality of worker health and safety training programs. This was believed to be especially critical for meeting the training requirements of the Occupational Safety and Health Administration's (OSHA) rule for hazardous waste operations and emergency response (29 CFR 1910.120). The NIEHS worker training program grantees planned a workshop to identify, evaluate, discuss, and make recommendations on training quality issues in this area. A planning committee met twice to develop a draft discussion document for the workshop's deliberations. The workshop brought together representatives from each of the NIEHS grantees, and invited experts from management, labor, academia, and government. A balance of such representations was sought for each of the workshop's five subsessions. The subsession topics included the following:

1. General criteria
2. General hazardous waste operations and site-specific training
3. RCRAStreatment, storage, and disposal (TSD) sites
4. Emergency response
5. Guidelines for accreditation

The Report

At the closing plenary, a draft final report from the workshop was sent out for review by participants. Comments offered during the closing plenary and for a period after the meeting were received and included as appropriate in the final document. The report represents the views of the technical experts and rather than an official position by any agency, including NIEHS. On the behalf of the workshop participants, the final report has been submitted to the docket for consideration.

Background of the NIEHS Training Grant Program

The United States is a major producer of hazardous waste. The Environmental Protection Agency (EPA) estimates that 57 million metric tons are produced each year. In addition, OSHA estimates that 13,600 spills of hazardous materials occur annually outside fixed facilities and 11,000 spills occur annually within fixed facilities. An estimated 1.2 million workers are involved in uncontrolled hazardous material clean up and emergency response.

NIEHS is authorized under the Superfund Amendments and Reauthorization Act of 1986 (SARA) to award grants to nonprofit organizations that demonstrate experience in implementing and operating worker health and safety training and education programs and that demonstrate the ability to reach and involve in training programs target populations of workers who are or will be engaged in hazardous materials waste removal, containment, or emergency response operations.

This NIEHS program helps protect the thousands of people involved in such occupations as well as the communities in which they are working. This is done by training workers and their supervisors to minimize the risk of exposure to uncontrolled hazardous materials. To help provide the trained workers necessary to deal with a problem of this magnitude, NIEHS funded 11 grants for worker safety and health training during Fiscal Year 1987 with 5 new grants added in Fiscal Year 1990. Collectively the grants cover training on a national basis for all the OSHA-required populations and operations and include a fire department, international unions, and university worker training programs. All of the university-based programs represent a consortium of one or more non-profit organizations who each bring particular strengths to the programs. In all, there are over 60 institutions involved in training program development and delivery. These grant programs have undergone extensive evaluation for quality assurance by NIEHS. At the end of the first three years of the NIEHS training grant program, grantees had developed 54 curricula and trained more than 120,000 workers in over 2,000,000 contact hours.

Preparation of the Minimum Criteria for Worker Health and Safety Training for Hazardous Waste Operations and Emergency Response was indeed challenging considering the extensive comments, discussion, and input received during and subsequent to the technical workshop in March 1990. Based upon review of this information and numerous discussions with some of the workshop's subsession chairs, we are confident that this document represents a consensus of workshop participants and post-workshop commentors' views.

The second printing of this document has incorporated minor clarifications and editorial changes to the original text.

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PREFACEPREFACE

The Superfund Amendments and Reauthorization Act of 1986 (SARA) contained requirements and funding for the establishment of a grant program for the training of workers engaged in the hazardous waste operations and emergency response. Funding for the training grant program was established for a five-year period, and responsibility for the program was vested in National Institute of Environmental Health Sciences (NIEHS). NIEHS awarded grants for the first year of the program in September 1987.

NIEHS established stringent requirements for the development of quality, state-of-the-art training programs by the grantees. In addition, NIEHS has pursued a rigorous quality control audit program.

At a meeting of all of the grantees and the NIEHS grants administrator in June 1989, it was recognized that while the grantees had developed and were delivering quality training programs in their respective areas of specialty and meeting the stringent NIEHS requirements, that a comprehensive list of criteria for training providers was not only appropriate for these grantees but would provide guidance to other federal agencies, state agencies, and private organizations engaged in hazardous waste operations. As a result, an ad hoc committee was established to consider the merits of the concept and to develop a draft document if appropriate.

The ad hoc committee concurred on the merit of the concept, developed a draft document, and met in early January 1990 to refine the draft. The ad hoc committee draft was then circulated to NIEHS, all grantees, and a broad range of external experts for review and comment. The grantees, the external experts, and several federal agency representatives then held a meeting in Washington, DC, in March 1990. This NIEHS Training Grant Technical Workshop focused on the draft document. The result of the workshop is presented in this report.

March 29 - 31, 1994

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March 22-24, 1990
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TECHNICAL WORKSHOP TO DEVELOP *MINIMUM CRITERIA FOR WORKER HEALTH AND SAFETY TRAINING FOR HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE*

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WORKSHOP HIGHLIGHTSWORKSHOP HIGHLIGHTS

A. The Process

The technical workshop participants were provided with copies of the draft documents prepared by the NIEHS Grantees Ad-Hoc Committee. The workshop was then approached as follows:

1. At an opening plenary session, federal agencies with a role in monitoring hazardous materials gave presentations. These agencies included EPA, FEMA, DOT-USCG, DOT-HMTA, NIOSH, and ATSDR.

2. A presentation in general session by OSHA addressed the recently proposed training provider accreditation regulations under 29 CFR 1910.121.

3. Individual workshop sessions were then held that focused on minimum general criteria; general hazardous waste operations; RCRA operationsStreatment, storage, and disposal; emergency response; and guidelines for accreditation.

4. At a closing plenary session, each of the workshop chairs presented and discussed the results of the workshop sessions.

5. An open discussion period followed the workshop chair reports.

6. Prior to their departure from the conference, all participants were provided copies of the revised documents developed during the workshop.

7. Participants were afforded the opportunity to comment further on the documents developed during the workshop conference. A number of comments were received and discussed with the relevant workshop chair, and the final document was prepared.

B. General Comments

There was general concurrence on a number of issues that went beyond the scope of the workshop and subsessions. These were:

1. Minimum Training Hours

   The OSHA standards under 29 CFR 1910.120 mandate minimum training hours and address the topics to be covered in such training. All participants agreed that the topics required could not be adequately addressed in a quality training program activity within the specified minimum hours.

2. Emergency Response

   Emergency response personnel are covered by the OSHA 29 CFR 1910.120

regulations but are not addressed in the OSHA proposed training accreditation regulations under 29 CFR 1910.121. Nearly all participants agreed that emergency response personnel should be covered by the OSHA accreditation regulations.

3. General Hazardous Waste Operations 24-Hour Training Category

The final OSHA regulations under 29 CFR 1910.120 established a new occasional worker category for general hazardous waste-site operations. This group of workers requires only 24 hours of training rather than the 40-hour minimum established for general site workers. There was nearly complete agreement among participants that this special category for a reduced training requirement could not be sufficiently detailed to develop a recommended guideline.

4. Refresher Training

There was general agreement that refresher training where mandated by 29 CFR 1910.120 should be covered by the accreditation procedures and should be delivered only by training providers whose relevant core program is already accredited.

5. Hands-on Training

There was general agreement that hands-on training should be an essential element of the generic training programs and should fill at least one-third of the training program hours.

6. 29 CFR 1910.120 Categories

The OSHA regulations under 1910.120 essentially focus upon these major hazardous materials operations categories: general hazardous waste operations, RCRA-TSD operations, and emergency response. Each deals with and is faced with potential exposure to hazardous materials. Yet the setting for each is dramatically and materially different. Hazardous waste operations, for example, are covered not only by the 1910.120 but generally by the OSHA construction standards under 29 CFR 1926. RCRA sites are covered by the OSHA general industry standards under 29 CFR 1910.

The work environment, employment practices, and other factors vary dramatically in these different settings. For this reason, these basic issues need to be considered when addressing training programs to meet the needs of workers and employers in these diverse settings.

A. INTRODUCTIONA. INTRODUCTION

Section 126 of the Superfund Amendments and Reauthorization Act of 1986 (SARA) requires that the Occupational Safety and Health Administration (OSHA) promulgate health and safety standards for the protection of employees engaged in hazardous waste operations. That section also requires that such health and safety standards include training standards. Further, the section establishes and funds a grant program for the training and education of workers engaged in hazardous waste removal, containment, and emergency response. The responsibility for the grant program is placed with the National Institute of Environmental Health Sciences (NIEHS).

NIEHS has developed a nationwide grant program and awarded a number of grants to various training providers. These grant programs are midway through their third year of operation with two additional years envisioned on the basis of funding established in SARA. The NIEHS grantees provide a wide range of training programs serving specific worker populations.

Grantees spent the initial grant year in preparation for a full schedule of training and in recruiting trainees. Their activities included curriculum and training material development, curriculum testing in pilot courses, staffing, equipment acquisition, and establishment of management and evaluation systems. In the first grant year (October 1987 S September 1988) the grantees reported training over 10,000 participants. Reports from the second grant year are being assessed, but preliminary analysis shows that the grant program trained over 30,000 workers.

OSHA promulgated the required standards as interim regulations contained within 29 CFR 1910.120 and final regulations under the same CFR title. The final regulations became effective on March 6, 1990. Recently, the Environmental Protection Agency (EPA) promulgated regulations (40 CFR Part 311, June 23, 1989) requiring that state and local governments with employees engaged in hazardous waste operations in states that do not have approved state OSHA plans comply with the final OSHA regulations under 29 CFR 1910.120. Training requirements now apply to such employees as well in those 29 states. Elements of the final 29 CFR 1910.120 regulations have been challenged in court. Most relevant is the "new"[1] 24-hour training category. Results of the legal action may affect this document.

The OSHA standards cover the following, each of which has training requirements:

A. Cleanup operations including initial investigations at uncontrolled hazardous waste sites

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[1] **Interim 29 CFR 1910.120, in response to requirements under SARA Section 126, contained only the 40-hour minimum training requirements for hazardous waste site workers. The Final 1910.120 added a special category of waste site workers who require only 24-hour training.**

B. Corrective actions involving cleanup at Resource Conservation and Recovery Act (RCRA) sites

C. Operations involving hazardous wastes at treatment, storage, and disposal (TSD) facilities

D. Emergency response operations involving hazardous substances

Under the OSHA standards only general criteria are provided for training and trainers. OSHA has proposed a training program accreditation standard that will be under 29 CFR 1910.121. A final 29 CFR 1910.121 standard is at best over a year away and probably much more than that. In the interim there are no criteria that permit government agencies or the employers of trained personnel to evaluate or judge the acceptability, appropriateness, or quality of training programs, much less the competence of those trained. Further, annual refresher training has begun, and the quality of such training faces the very real potential of erosion to the level of the least competence of refresher trainees. This problem is exacerbated by the widely differing in training programs being provided to meet the initial training requirements as well as a lack of verification of basic training adequacy.

II. PURPOSEII. PURPOSE

The purpose of these standards is to establish minimum criteria for training providers and training programs necessary to meet the training requirements specified in 29 CFR 1910.120.

III. SCOPEIII. SCOPE

These criteria apply to all training populations established within 29 CFR 1910.120, specifically 29 CFR 1910.120(e); 29 CFR 1910.120(p)(7),(8)(iii); and 29 CFR 1910.120(q)(6),(7),(8).

IV. MINIMUM GENERAL CRITERIA

The following minimum general criteria apply to all training providers. The minimum generic training curriculum for each training population identified in 29 CFR 1910.120 is addressed in the section that follows this one.

The following minimum general criteria are intended to apply to all training providers of the initial core and the annual refresher courses intended to meet the training requirements established within the OSHA HAZWOPER standard at 29 CFR 1910.120. The minimum generic core and refresher training curricula for the targeted training populations engaged in hazardous waste site, RCRA/TSD site, and emergency response operations as set forth in the standard are addressed in Section ii of this document.

A. **Assumptions**A. **Assumptions**

Training programs must be designed on the basis of the needs assessments of the hazardous waste site, RCRA/TSD site, and emergency response operations. In these criteria, the needs assessment is based upon and must be consistent with the OSHA regulations under 29 CFR 1910.120. The OSHA regulations address two principal training requirements: initial and refresher (off-site) for both workers and supervisors, and job-site-specific. This document focuses on off-site initial and refresher training in all 1910.120 categories, hereafter referred to as "generic," and job-site-specific training, which is the responsibility of the site-specific employer. In addition, suggested guidelines for accreditation of these training programs are addressed.

The OSHA standard addresses two principal training requirements: initial core (off-site) and annual refresher training for workers and supervisors and site-specific training for those who have successfully completed the core training and, if appropriate, subsequent refresher training. This document focuses on the off-site initial core and the refresher training programs for the three primary hazardous waste operations and emergency response categories established in the standard. The initial off-site core training program is referred to herein as "generic". Annual refresher training is addressed as a "generic" training program in this document as well, although it is recognized that such may be provided off-site or on-site.

Site-specific training is required for each new "site" within the scope of 29 CFR 1910.120 at which a worker or supervisor is assigned to first work regardless of the capacity in which such worker or supervisor will be engaged at that site. While site-specific training is the responsibility of each individual employer at each specific site, this document does include general recommendations with regard to the elements of such site-specific training programs exclusive of the supervised work component thereof.

It is assumed that the generic training programs meeting the needs of the three targeted training categories established in this standard are unique because the nature of the tasks performed and the related exposure hazards are different for each category. Thus, no single generic training program is applicable to all three categories. In addition, the minimum generic training program curriculum are based upon the assumption that the trainee already posses the skills of his/her trade or job classification in which he/she will be engaged in the HAZWOPER setting or will obtain the skills of the trade or job classification through other training programs. It is understood, however, that under no circumstances should a worker be allowed to

engage in hazardous waste operations without appropriate HAZWOPER training (certification) and the necessary skills to perform the job function to which assigned. Also, on-the-job skills training must not be allowed in a hazardous work environment.

Finally, there is the growing recognition that certain specialty jobs or unique hazards posed by specific HAZWOPER activities may require added core training elements. These are not explicitly stated in this document; though the minimum generic curriculum offers a foundation for building the added elements that may be needed. It is appreciated that refresher training, though referencing the core course category, needs also to address specialty needs of the target trainee group.

B. **Definitions**B. **Definitions**

Training Hour	A training contact hour
Training Day	Eight contact hours of training delivery

Contact hours does not include breaks or lunch periods, but allowances should be made for periodic breaks during the day to ensure a comfortable learning environment.

Training Hours	Number of training hours devoted to lecture, learning activities, small group work sessions, demonstration, evaluations, and/or hands-on experience
Lecture	An interactive discourse with a class, led by an instructor
Demonstration	Showing by actual use of equipment, procedures, or the like
Hands-on Training	Training in a simulated work environment that permits each trainee to have experience performing tasks, making decisions, and/or using equipment appropriate to the job assignment for which training is being conducted
Initial Training	Generic core training required by 29 CFR 1910.120, specified for different worker populations
Refresher Training	An annual training program for those who have successfully completed an initial training program or who have been so certified by their employer

REPLACE WITH:

An annual training program for those who have successfully completed an initial core training program specific to their training category or who have been

certified as competent by their employer as appropriate to the requirements established in 29 CFR 1910.120.

Job-Site-Specific Individual job-site-specific training, which the employer is responsible to perform as specified in 29 CFR 1910.120

Trainee/Instructor Ratio The number of trainees per instructor in a learning activity

Competent Possessing the skills, knowledge, experience, and judgment to perform assigned tasks or activities satisfactorily, as determined by the employer

Proficient Meeting a stated level of achievement

C. **Core Criteria** C. **Core Criteria**

1. Training Facility 1. Training Facility

Training facilities shall have available sufficient resources, equipment, and site locations to perform didactic and hands-on training for each specific course offered. Also, training facilities shall have sufficient organization, support staff, and services to conduct training in each of the courses offered.

2. Training Director 2. Training Director

Each training program shall be under the direction of a training director who is responsible for the program. The training director must have a minimum of two years of worker education experience.

3. Instructors 3. Instructors

Training instructors should have an overview of the entire training course, and should, if possible, have previously successfully completed the course which they will be instructing from the same training program in which they will be instructing. It is further desirable that instructors include persons who are familiar with the type of hazardous waste activities which their trainees can expect to encounter, and who are, to the extent feasible, peers of the trainees.

Each instructor shall be deemed competent on the basis of previous documented experience in his or her area of instruction, successful completion of a train-the-trainer program specific to the topics he or she will teach, and an evaluation of instructional competence by the training director.

Also, instructors shall be required to maintain professional competency by participating in continuing education or professional development programs and/or by successfully completing an annual refresher course and having an annual review by the training director. At a minimum, the review process

shall include observation of instructor delivery by the training director, review of observations with the trainer, and an analysis of the instructor performance evaluations completed by the students during the previous year.

The annual refresher required for instructors should be devoted to professional, educational techniques, emerging technologies and hands-on training and should not be the annual worker refresher training course. The refresher course is to be specific to the targeted training category which the instructor is teaching to include professional, technical and hands-on sections or modules which are specific to that training category.

4. Course Materials4. Course Materials

All course materials including but not limited to trainee manuals, instructors' manuals, audio-visual aids, handouts, demonstration equipment, hands-on equipment, and other factors, shall be approved by the training director and used by the training provider.

All other training aids and materials used shall also be approved by the training director on an annual basis by documenting the review process and the actions taken and used by the training provider.

Course materials must be reviewed and updated at least annually. Course equipment must be in good working order and properly maintained.

All written and audio-visual materials in training curricula shall be peer reviewed by technically competent outside reviewers or by a standing advisory committee. These reviewers shall, at a minimum, possess expertise in the following disciplines: occupational health, industrial hygiene and safety, chemical/environmental engineering, worker education, and emergency response, as appropriate. One or more reviewers should be an experienced worker representing those to whom the training is directed.

The training provider should make use of the reference materials available from the NIEHS National Clearinghouse for Worker Health and Safety Training for Hazardous Materials, Waste Operations, and Emergency Response as a source of state-of-the-art HAZWOPER training materials.

5. Trainees5. Trainees

The program for recruiting and selecting students, at a minimum, should include:

a. assurance that the students recruited are or will be involved in work where chemical exposures are likely and that they already possess the necessary skills of their trade(s), including necessary documentation if applicable, or justification of course appropriateness for recruited students;

Students recruited should be capable of being employed or are currently employed in a workplace engaged in HAZWOPER work.

Students recruited should possess the necessary experience and skills of their trade or profession.

b. a policy on the necessary medical clearance.

6. Ratios6. Ratios

All classroom instruction shall not exceed 30 students per instructor except for the first responder awareness level courses. Hands-on activities ratios, at a maximum, are based on Personal Protective Equipment (PPE) levels and are as shown in Table 1.

Ratios should also relate to the practicality of efficiently documenting the skills demonstration requirements, as well as the safety of the trainees. No less than two instructors shall be present during hands-on training activities.

TABLE 1

PPE Level	Ratio (Trainee-Instructor)
C & D	10 - 1
A & B	5 - 1

7. Proficiency Assessment7. Proficiency Assessment

a. Initial training

Proficiency shall be evaluated and documented by the use of a written assessment and/or skill demonstrations selected and developed by the training director and staff to evaluate the knowledge and individual skills gained from the courses. The level of minimum achievement necessary for proficiency shall be specified in writing by the training director.

If a written test is used, there should be a minimum of 50 questions. If a written test plus a performance test is used, there should be a minimum of 25 questions. If a performance test is used, the tasks chosen and the means to rate successful completion must be fully documented by the training director.

If a performance test is used, THE HANDS-ON TRAINING ELEMENTS SHOULD INCLUDE SPECIFIC MINIMUM TASKS WHICH EACH TRAINEE SHOULD BE REQUIRED TO DEMONSTRATE PROFICIENCY IN PERFORMING.

The content of the written exam and/or performance tasks shall be relevant to the objectives of the course. The test/performance measures must be updated at least annually to reflect changes in the curriculum and must be approved by the Training Director.

The proficiency assessment method, regardless of the approach or combination of approaches employed, shall be justified, documented, and approved by the Training Director using generally accepted methods such as those of Ebel (Reference 13).

Proficiency of those taking the additional courses for supervisors shall be evaluated and documented by using proficiency assessment methods specified above. These proficiency assessment methods must reflect the additional responsibilities borne by supervisory personnel in hazardous waste operations and emergency response, to protect both workers and the public from illness and injury.

b. Refresher Training

Proficiency shall be evaluated by the use of a written assessment and/or skill demonstrations selected and developed by the training director to evaluate the knowledge and individual skills gained from the courses. The level of minimum achievement necessary for proficiency shall be specified in writing by the training director.

If a written test is used, there should be a minimum of 25 questions. If a written test plus a performance test is used, there should be a minimum of 12 questions. If a performance test is used, the tasks chosen and the means to rate successful completion must be fully documented by the training director.

The content of the written exam and/or performance tasks shall be relevant to the objectives of the course. The test/performance measures must be updated at least annually to reflect changes in the curriculum and must be approved by the Training Director.

The proficiency assessment method, regardless of the approach or combination of approaches employed, shall be justified, documented, and approved by the Training Director using generally accepted methods such as those of Ebel (Reference 13).

Additional references should include:

(17) Handbook of the American Society of Training and Development.(1987).
(18) John Patrick, Training: Research and Practice. (1992).

8. Course Certificate8. Course Certificate

Written documentation shall be provided to each trainee who satisfactorily completes the training course as specified in Section 7, Proficiency

Assessment above. This documentation shall include:

a. name of the trainee;
b. course title;
c. course date;
d. statement that the trainee has successfully completed the course;
e. name and address of the training provider;
f. date annual refresher is due (if required), or expiration date;
g. an individualized number;
h. level of Personal Protective Equipment (PPE) used by the trainee (optional).

The course certificate should consider the following clarifications to the above, as appropriate:

1. The course title should indicate the HAZWOPER training category to which the course applies such as "General Hazardous Waste Worker".
2. The course date should be the date that the course is successfully completed.
3. The certificate should specifically state "This certificate indicates successful completion of training as required by 29 CFR 1910.120" or the equivalent.
4. Once the OSHA Accreditation standard has been promulgated, the certificate should include a statement that the training provided is by an OSHA accredited training provider.

This documentation may include a certificate and an appropriate wallet-sized laminated card with a photograph of the trainee and the above information thereon, appropriate for specific trainee job assignment requirements. When such course certificate cards are provided, the training certificate number shall be shown thereon.

9. Recordkeeping9. Recordkeeping

Training providers shall maintain records listing the dates courses were presented, names and social security numbers or other unique individual ID of individual course attendees, the names and social security numbers or other individual identifying numbers of trainees successfully completing each course, and the number of the training certificate issued to each successful trainee by name and social security number or other individual identifying number. Such records shall cover both initial and refresher training and shall be maintained for a period of at least five years or as otherwise mandated by Federal regulation after the last date an individual participated in a training program provided by the Training Provider. Further, such records shall be provided to the trainee and/or one designated in writing by the trainee and/or as mandated by law.

10. Program Quality Control10. .....Program Quality Control

At least annually, the training director shall conduct or direct a program quality control audit, which shall be put in writing. Program modifications to address deficiencies, if any, shall be documented, approved, and

implemented by the training provider. The audit and the program modification documents shall be maintained at the training facility. Program quality control audits shall encompass the criteria included in the next section, General Program Quality Control Criteria.

V. GENERAL PROGRAM QUALITY CONTROL CRITERIAV. GENERAL PROGRAM QUALITY CONTROL CRITERIA

Factors listed here are criteria for determining the quality and appropriateness of worker health and safety training for hazardous waste operations and emergency response.

The General Program Quality Control Criteria which follows can be utilized by training providers, training procurers, and others as an audit check list. It has been developed and crafted over a number of years by the NIEHS Hazardous Waste operations and Emergency Response Training grant program by and for the use of the NIEHS grantee peer review audit teams.

A. **Training Plan**A. **Training Plan**

Adequacy and appropriateness of the training program's curriculum development, instructor training, distribution of course materials, and direct student training should be considered, including

1. the duration of training, course content, and course schedules/agendas;

2. the different training requirements of the various target populations, as specified in the appropriate minimum generic training curriculum;

3. the process for the development of curriculum, which includes appropriate technical input, outside review, evaluation, and program pretesting;

4. the adequate and appropriate inclusion of hands-on, demonstration, and instruction methods;

5. adequate monitoring of student safety, progress, and performance during the training.

B. **Program Management, Training Director, Staff, and Consultants**B.**Program Management, Training Director, Staff, and Consultants**

Adequacy and appropriateness of staff performance in delivering an effective training program should be considered, including

1. demonstration of the training director's leadership in assuring quality of

health and safety training;

2. demonstration of the competency of the staff to meet the demands of delivering high quality hazardous waste worker health and safety training;

3. organization charts establishing clear lines of authority;

4. clearly defined staff duties including the relationship of the training staff to the overall program;

5. evidence that the training organizational structure suits the needs of the training program;

6. appropriateness and adequacy of the training methods used by the instructors;

7. sufficiency of the time committed by the training director and staff to the training program;

8. adequacy of the ratio of training staff to students;

9. availability and commitment to the training program of adequate human and equipment resources in the areas of

   a. health effects,
   b. safety,
   c. personal protective equipment (PPE),
   d. operational procedures,
   e. worker protection practices/procedures;

10. appropriateness of management controls;

11. adequacy of the organization and appropriate resources assigned to assure appropriate training;

12. in the case of multiple-site training programs, adequacy of satellite centers management.

C. **Training Facilities and Resources**C.**.....Training Facilities and Resources**

Adequacy and appropriateness of the facilities and resources for supporting the Training Program should be considered, including

1. space and equipment to conduct the training;

2. facilities for representative hands-on training;

3. in the case of multiple-site programs, equipment and facilities at the satellite centers.

D. **Quality Control and Evaluation**D. **..... Quality Control and Evaluation**

Adequacy and appropriateness of quality control and evaluation plans for training programs should be considered, including

1. a balanced advisory committee and/or competent outside reviewers to give overall policy guidance;

2. clear and adequate definition of the composition and active programmatic role of the advisory committee or outside reviewers;

3. adequacy of the minutes or reports of the advisory committee or outside reviewers' meetings or written communications;

4. adequacy and appropriateness of the quality control and evaluation program to account for instructor performance;

5. adequacy and appropriateness of the quality control and evaluation program to ensure appropriate course evaluation, feedback, updating, and corrective action;

6. adequacy and appropriateness of disciplines and expertise being used within the quality control and evaluation program;

7. adequacy and appropriateness of the role of student evaluation to provide feedback for training program improvement.

E. **Students**E. **Students**

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

1. assurance that the students already possess the necessary skills of their trade(s), including necessary documentation;

2. appropriateness of methods the program uses to ensure that recruits are capable of satisfactorily completing training;

3. review and compliance with the medical clearance policy.

F. Institutional Environment and Administrative SupportF.Institutional Environment and Administrative Support

The adequacy and appropriateness of the institutional environment and administrative support system for the training program should be considered, including

4. adequacy of the institutional commitment to the worker training program;

5. adequacy and appropriateness of the administrative structure and administrative support.

G. Summary of Evaluation QuestionsG. .....Summary of Evaluation Questions

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

6. Are the program objectives clearly stated?

7. Is the program accomplishing its objectives?

8. Are appropriate facilities and staff available?

9. Is there an appropriate mix of classroom, demonstration, and hands-on training?

10. Is the program providing quality worker health and safety training that fully meets the intent of regulatory requirements?

11. What are the program's main strengths?

12. What are the program's main weaknesses?

13. What is recommended to improve the program?

14. Are they instructing according to their training outlines?

15. Is the evaluation tool current and appropriate for the program content?

16. Is the course material current and relevant to the target group?

The "Principles of Adult Education" which follows is based upon recently published materials which address this critical dimension of worker training activities. It was reviewed and discussed during the 1994 Technical Workshop and is included in this document as an information and guidance reference for training providers, their instructional staff and those preparing training materials.

THE PRINCIPLES OF ADULT EDUCATIONTHE PRINCIPLES OF ADULT EDUCATION: A CHECKLIST FOR PLANNERS AND EVALUATORS

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

I. General Principles

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

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

II. Meeting the Needs of Adult Learners

1. Does the physical environment of the classroom encourage active participation?

    a) how are the chairs, tables, and other learning stations arranged in the classroom?
    b) how does this arrangement encourage or inhibit participation and interaction?
    c) can the arrangement be changed easily to allow different kinds of interaction?

2. Does the social environment or atmosphere in the classroom encourage people to participate?

    a) are warm-up activities or "ice breakers" used to put people at ease?
    b) Do trainers allow participants to say things in their own words, or do they translate what is said into other words or jargon?

c) Are participants encouraged to listen carefully to each other?
d) Are they encouraged to respect different points of view?
e) Are they encouraged to use humor?

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

a) listen
b) look at visuals
c) ask questions
d) read
e) write
f) practice with equipment
g) discuss critical issues
h) identify problems
i) plan actions
j) try out strategies in participatory ways

4. Does the program effectively accommodate participatory learning activities?

a) Is enough time allotted for participant interaction?
b) Have the instructors developed workable and effective interactive activities?
c) Does the physical environment encourage interaction?
d) Does the atmosphere in the classroom encourage interaction?
e) Are the learning activities sensitive to cultural differences among the participants?

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

a) role playing
b) case studies
c) audio-visual discussions
d) discovery exercises
e) planning exercises
f) mapping activities
g) group discussions
h) lecture-discussions
i) report-back sessions
j) evaluation sessions

6. How effectively do the lectures in the program encourage participation?

a) Are they combined with a participatory exercise?
b) Are they brief? (20 minutes at most, preferably less)
c) Are they well organized?
d) Are audio-visual aids incorporated in the lecture?

e) Does the lecturer rely too heavily on his or her notes?
f) Was their enough time for questions and comments from others?

7. How effective are the participatory activities used in the program?

a) Are the purposes of the activities clearly specified?
b) Are the tasks that people are expected to complete clearly described?
c) Are participants given enough information to complete the expected tasks?
d) Is the information accompanying the activity clearly presented and easily understood?
e) Is the information presented relevant to the task?
f) Are participants given enough time to perform the expected tasks?
g) Are participants given enough time to share what they have learned from the tasks with each other?
h) Are the participants given a clear summary of the main points they were expected to learn in the activity?

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

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

9. How effectively does the organization of the program encourage participation?

a) Are discussion groups small enough to ensure participation? (No more than 4 to 6 people.)
b) Is the ratio of discussion groups to instructors small enough? (A single instructor cannot supervise more than three or four groups well).
c) Is there enough room to enable each group to talk amongst itself without disruption?
d) Does each group have its own moderator and note-taker?
e) Does the responsibility for leading and recording the discussion rotate among those wiling to do the job?
f) Are the groups supplied with guidelines about how to lead and report their discussions?
g) Do the activities make allowances for anyone in the group who may have problems reading and writing?

10. Is the program sensitive to literacy differences?

    a) Do the trainers check privately with anyone having reading and writing difficulties?
    b) Is reading aloud or writing in front of the group only voluntary and never mandatory?
    c) Are all instructions and other required material read aloud?
    d) Do the materials incorporate enough visual aids and props?
    e) Do the trainers repeat out loud anything they write on a board or flip chart?

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

    a) Do the instructors write an on-going record of what is being discussed on the blackboard or flip charts?
    b) Are participants encouraged to challenge the record if they consider it inaccurate?
    c) Is no more than 10 percent of the training program devoted to showing films, video tapes or slides?

12. Guidelines for Leading an Effective Discussion

    a) Getting a Discussion Started

        (1) Use a provocative "trigger," small group exercise, or other activity give the group something to talk about.
        (2) Plan a few specific questions that ask for opinions about the activity.
        (3) "Brainstorming" activities help elicit as many different ideas on a given topic as possible.
        (4) "Buzz groups" help elicit controversial interpretations or perspectives.
        (5) Open-ended questions and controversial positions can evoke strong responses. They are therefore more likely to be useful after people have gotten used to talking together.

    b) Keeping a Discussion Going

        (1) Ask questions that require the group to come up with ideas themselves rather than just respond to your ideas.
        (2) Questions should encourage people to draw on their own experiences.
        (3) Calling on people may be necessary to keep discussion going.
        (4) Redirect questions to the group--ask if others have ideas on the subject.
        (5) Try to keep everyone involved. Don't allow one or two people to dominate.

(6) Set a good example: keep your own comments brief.

This material was adapted from Nine Wallerstein and Harriet Rubenstein, *Teaching About Job Hazards* (American Public Health Association, 1993), especially Sections IV and VIII.

VI. MINIMUM GENERIC TRAINING CURRICULUM GUIDELINESVI. MINIMUM GENERIC TRAINING CURRICULUM GUIDELINES

The following minimum generic training curriculum guidelines are for those operations specifically identified in OSHA regulations 29 CFR 1910.120 as requiring training. Issues such as qualifications of instructors, training certification, and similar criteria appropriate to all categories of operations addressed in 1910.120 have been covered in the preceding section and are not re-addressed in each of the generic guidelines. Basic core requirements for training programs that are addressed include

A. General Hazardous Waste Operations

1. Off-site
2. Refresher
3. On-site;

B. RCRA operationsSTreatment, Storage, and Disposal;

C. Emergency Response;

Emergency response is composed of two sectors:

1. Public and Facility Safety (1910.120 (q))
2. Collateral Duty (1910.120) (l), (p)(8), and (q))

A. General Hazardous Waste Operations and Site-Specific TrainingA.General Hazardous Waste Operations and Site-Specific Training

Hazardous Waste Operations and Site-Specific Training for the General Site Worker

1. Off-Site1. Off-Site - Minimum training course content for hazardous waste operations, required by OSHA 29 CFR 1910.120(e), shall include the following topics or procedures to be taught in a minimum of 40 hours.

... shall include, at a minimum, the following topics or procedures.

a. Regulatory Knowledge - The content of training for regulatory knowledge is almost universally seen as a difficult topic to teach. Specifically, it is believed that the major goal of this section is to prepare the student to read and understand OSHA standards. Since it is not realistic to expect students to remember all of the standards that apply to a hazardous waste site, let alone the content of each standard, empowering the student to feel comfortable in seeking out, reading and understanding the appropriate standards is a minimum requirement.

Regulatory knowledge as a stand alone topic in the General Waste Site Worker off-site course does not occupy a large quantity of time.

However, this topic is taught as an integrated portion of both the Technical Knowledge and Technical Skills requirements. As an example, 29CFR1910.146, governing Confined Spaces, may be mentioned in discussing regulatory requirements for hazardous waste site work. A more thorough discussion about confined spaces would appear when discussing Site Safety and Health Plans, Emergency Response Plans, and Characterizing Site Hazards.

Objectives:

As overall objectives for regulatory knowledge, the student will:

1. Know how to read an OSHA Standard.
2. Be able to review the scope and application of the standard.
3. Complete a review of the definitions, making sure that workers understand key terms.

(1) An overview of 29 CFR 1910.120 and the core elements of an occupational safety and health program.

(2) The content of a medical surveillance program as outlined in 29 CFR 1910.120(f).

For the purpose of regulatory knowledge, the student will be able to identify relevant portions of a complete medical surveillance program, to include, but not be limited to:

- Identify, according to the OSHA Hazardous Waste Standard
  - who is covered by a program of medical surveillance
  - the frequency and content of medical examinations
  - the required credentials of the examining physician
  - employer responsibilities for medical examinations
  - the content of the physician's written opinion
  - the record-keeping requirements, and
  - the confidentiality of medical results;
- Identify their rights and responsibilities as patients in terms of confidentiality, access to records, and reporting of medical exam results;
- Understand the value and maintenance of their own occupational history reports;
- Information provided to the physician by the employer regarding suspected occupational hazards.

(3) The content of an effective site safety and health plan consistent with requirements of 1910.120(b)(4)(ii).

For the purpose of regulatory knowledge, the student will be able to identify relevant portions of a complete site safety and health plan, to include, but not be limited to:

- ! Contact personnel and alternates for site safety and health
- ! Safety, health, and other hazards present on a given site;
- ! Personal protective equipment requirements;
- ! Engineering controls and equipment safety;
- ! Medical surveillance techniques requirements, including recognition of symptoms and signs that might indicate overexposure to hazards;
- ! An emergency response plan meeting the requirements for safe and effective responses to emergencies, including all necessary equipment;
- ! Confined space entry procedures;
- ! A spill containment program; and
- ! Decontamination procedures.

(4) Emergency response plan and procedures as outlined in 29 CFR 1910.38 and/or 1910.120(1)

For the purpose of regulatory knowledge, the student will be able to identify relevant portions of a complete site emergency response plan, to include, but not be limited to:

- ! Key elements of an emergency response plan **(Need to expand here)**;
- ! Key personnel requirements for an Emergency Response Team;
- ! Key elements of a Contingency Plan **(Need to expand here)**;
- ! Emergency response actions which require additional training; and

(5) Adequate illumination

(6) Sanitation recommendation and equipment

(7) Overview and explanation of OSHA's hazard-communication standard (29 CFR 1910.1200 or 29 CFR 1926.59) and confined space standard (29 CFR 1910.146)

(8) Overview of other applicable regulations including but not limited to the construction standard (29 CFR 1926) and guidelines such as those for working in hot environments

Suggest replacing "...in hot environments." with "...in temperature extremes."

(9) Rights and responsibilities of employees and employers under OSHA and EPA, and other relevant regulations

Generic off-site training must address basic employee legal rights and responsibilities of general application, such as OSHA

standards and enforcement procedures. However, when training providers are aware that trainees are likely to be employed at hazardous waste sites with special regulatory requirements, e.g., Department of Energy facilities, the off-site training should also cover these requirements.

b. Technical Knowledge - The basis for providing hazardous waste operations training to the general site worker is the prevention of accidents and illness involving that worker. To that end, it is felt that the following goals and objectives, at a minimum, must be met.

Goals

Overall goals for a successful training program should be:

1. Identification, evaluation, and control of potentially hazardous situations.
2. Differentiation between the types of hazards
3. Understanding of the various systems used in hazard recognition and control.

Objectives

In support of the above listed goals the worker will, at a minimum, be able to:

- describe and utilize a model for hazard recognition
- identify physical hazards in their workplace
- perform a characterization of their workplace
- identify potentially hazardous outcomes of chemical incompatibility
- utilize resources to identify hazards and initiate personal protection and corrective measures.
- discuss OSHA and EPA requirements that are applicable to safe work practices
- identify and review sample standard operating procedures used for worker protection at hazardous waste sites.

For health hazards (i.e., chemical, radiological, or biological) at a hazardous waste site, multiple sources of information exist to provide the general site worker with pertinent data about these hazards. These include Material Safety Data Sheets (MSDS), NIOSH Pocket Guides, New Jersey Fact Sheets, HSIF, DOT Handbooks, ChemTrec, etc. It is imperative that the worker develop the technical knowledge and skill to identify, from one or more of these sources, the following:

(1) Types of potential exposures to chemical, biological, and radiological hazards; types of human responses to these hazards and recognition of those responses; principles of toxicology and

information about acute and chronic hazards; health and safety considerations of new technology

Objectives - The trainee will recognize the importance of:

- Routes of entry
- Acute and Chronic exposure
- Dose response
- Carcinogenic and Teratogenic effects
- mg/m^3
- Permissible Exposure Limits (PEL)
- Threshold Limit Value (TLV)
- Short-term Exposure Limit (STEL)
- Ceiling
- Immediate Danger to Life and Health (IDLH)
- Lower Exposure Limit (LEL)
- Upper Exposure Limit (UEL)
- Synergistic effects

(2) Fundamentals of chemical hazards including but not limited to vapor pressure, flash point, pH, physical properties and oxidizers

Objectives - The trainee will recognize the significance of the following terms:

- Corrosive
- Oxidizer
- Reactivity
- Vapor Density
- Specific Gravity
- etc.

(3) Fire and explosion hazards (i.e., flammable and combustible liquids, reactive materials)

Objectives - The trainee will recognize the following terms, as they relate to fire and explosion hazards:

- Flammable
- Combustible
- Flash Point
- etc.

With regard to the hazards involved with general site safety hazards the following program element objective must be addressed:

(4) General safety hazards such as electrical hazards, powered equipment hazards, walking-working surface hazards, excavation hazards, and hazards associated with hot and cold temperature

extremes

Objectives: The worker will identify, list and demonstrate the ability to abate the potentially hazardous situations through the use of engineering, administrative controls, equipment, and any new relevant technology and procedures. that may be presented in the following:

- walking and working surfaces
- overhead and underground facilities
- heavy equipment
- energy sources that may include but not be limited to: electrical, pneumatic, hydraulic, etc.
- heavy loads
- ergonomics
- hearing conservation

(5) The contents of an effective confined space program including but not limited to trenches and tank and vault entries

Objectives: Workers will:

- Define a confined space, and permitting requirements for the same;
- Describe ways confined spaces present hazardous occupational conditions;
- Describe preliminary steps for safe entry;
- Define the elements of, and regulatory requirements for, a confined space training program

(6) Work practices to minimize employee risk from site hazards

(7) Safe use of engineering controls, equipment, and any new relevant technology or procedures

(8) Overview and demonstration of air sampling and monitoring equipment that may be used in a site monitoring program

Objectives: Workers will:

- Identify the different types of air sampling that might be conducted at hazardous waste sites;
- Identify the types of air monitoring equipment available
- Identify some hazards that can be monitored;
- Describe the limitations of air monitoring equipment, methods and strategies
- Recognize the value of direct reading instruments to provide immediate air concentration results at the hazardous waste

site;
- ! Interpret the readings of common instruments;
- ! Evaluate air monitoring results presented to them by employers and compare these results to standards and guidelines.

(9) Container sampling procedures and safeguarding; general drum and container handling procedures including special requirements for laboratory waste packs, shock-sensitive wastes, and radioactive wastes

Objectives: Workers will:

- ! Identify hazards related to drums;
- ! Describe procedures for avoiding or minimizing these six hazards;
- ! Identify and explain how different types of engineering controls can protect worker health and safety;
- ! Identify and explain how different types of administrative controls can protect worker health and safety;
- ! Identify, list, describe and demonstrate manual and mechanical drum handling techniques;
- ! Identify, list, describe and demonstrate routine, as well as emergency, overpacks techniques and procedures; and
- ! Identify, list, describe and demonstrate situations and procedures to be followed when lab packs, shock sensitive and radioactive wastes are encountered.

(10) The elements of a spill containment program

- ! Identify what can be done to limit the number of spills on site;
- ! List several elements of an effective spill response plan;
- ! Demonstrate correct procedures in spill response, including: donning of personal protective equipment; use of monitoring instruments for chemical identification; setting up site control zones; decontamination;
- ! Recognize the importance of **NOT** participating in a spill response if training or equipment is inadequate;
- ! List several items which should be available for spill control

(11) Proper use and limitations of material handling equipment (refer to above section)

(12) Procedures for safe and healthful preparation of containers for shipping and transport

(13) Methods of communication to include those used while in PPE.

The worker shall identify, list, describe and demonstrate the use of electronic communication devices which may be found at a hazardous waste site. The worker shall identify, list, describe and demonstrate the use of hand signals commonly used at hazardous waste sites.

c. Technical Skills - Application and demonstration of technical knowledge to achieve competency and proficiency in performance of hazardous waste and/or emergency response actions.

(1) Selection, use, maintenance, and limitations of personal protective equipment (PPE) including the components and procedures for carrying out a respirator program to comply with 29 CFR 1910.134 requirements

RESPIRATORY PROTECTION

Technical Knowledge Goals: To ensure that workers understand:

! The purpose of respiratory protection;
! The importance of effective respirator programs;
! The limitations of all types of respirators.

Technical Skills Goals: To ensure that workers understand

! The selection and use of appropriate respiratory equipment.

Technical Knowledge Objectives: Workers will:

! Identify situations where respiratory protection is needed;
! Evaluate whether or not their respirator program meets the OSHA standards;
! List components of a respirator program as required by OSHA;
! Define the terms:

IDLH	A.P.R.
M.V.C.	Fit Factor
protection factor	Fit Test
M.V.L.	Qualitative Fit Test
oxygen-deficiency	Quantitative Fit Test
Breakthrough	Positive Pressure
Odor Threshold	Negative Pressure
S.C.B.A.	Pressure Demand
S.A.R.	Demand
P.A.P.R.	Open Circuit
	Closed Circuit

! List the main categories of respirators;
! For air-purifying respirators, name advantages and disadvantages of a full-facepiece mask; vs. a half facepiece mask;
! Name reasons for poor respirator fit;
! List types of respirators which are acceptable for use in

atmospheres which are unknown, may be immediately dangerous to life and health, and are deficient in oxygen;
- List limitations associated with major types of respirators;
- Describe the difference between demand and pressure demand SCBAs in terms of facepiece pressure and protection factors;

Technical Skills Objectives: The worker will be able to:
- Maintain an APR, Atmospheric Supplied Respirators and escape only SCBA, including inspection and cleaning where appropriate;
- Don and Doff APR and Atmospheric Supplied Respirators
- Perform a positive and negative fit test on respirators.

PERSONAL PROTECTIVE EQUIPMENT/CHEMICAL PROTECTIVE CLOTHING

Technical Knowledge Goals: Ensure that workers understand:
- The purpose of chemical protective clothing;
- The limitations of chemical protective clothing;
- The varieties of chemical protective clothing available.

Technical Skills Goals:
- How to wear and maintain chemical protective clothing;

Technical Knowledge Objectives: Workers will:
- List the three major routes of entry of toxins in to the body, and how CPC provides protection against such entry;
- Identify the difference between Level A, Level B, Level C, and Level D;
- Identify physical and psychological effect of wearing CPC;
- Name limitations which affect the degree of protection afforded by a chemical protective suit
- Identify the importance of using hazard recognition and health hazard evaluation CPC selection;
- Identify the major components of a personal protective equipment program;
- Define permeation, penetration, and degradation and interpret basic permeation data for CPC;
- Identify the greatest physical hazard facing workers suited in PPE;
- Describe the signs and symptoms of heat stress; and

Technical Skills Objectives: Workers will be able to:
- Don and doff PPE in an appropriate manner and describe precautions to be taken while wearing it;
- Demonstrate the proper procedures for inspection, maintenance, and storage of PPE;
- Demonstrate appropriate communication signals while working in CPC.

(2) Instruction in decontamination programs including personnel,

equipment, and hardware; hands-on training including level A, B, and C ensembles and a decon line; field activities including don and doff of ensembles to a level commensurate with the workers' anticipated job function and responsibilities and to the degree required by potential hazards

Technical Knowledge Goals: Ensure that workers understand:

- The purpose and principles of decontamination;
- The potential for work-related exposure in using decontamination methods;
- Procedures for Emergency Decontamination.

Technical Skills Goals:

- Demonstration of decontamination principles to use in the field;
- Proper equipment to be used in decontamination; and
- Methods of contaminated water containment.

Technical Knowledge Objectives: Workers will:

- Identify decontamination principles used in the field; and
- Identify, list, and describe procedures for emergency decontamination procedures.

Technical Skills Objectives: Workers will be able to

- Demonstrate the correct procedures for doffing chemical protective clothing;
- Demonstrate the assembly and operation of field decontamination equipment.

(3) Sources for additional hazard information; exercises using relevant manuals and hazard coding systems

d. In addition, the following general items should be required in the training program:

(1) Issuance of a laminated, dated card or certificate with photo, denoting limitations and level of protection for which the worker is trained

(2) Attendance at all modules, successful completion of exercises, and final written or oral examination with at least 50 questions and passing score of at least 70 percent

Evaluation to document knowledge and skills acquisition should be consistent with the DOE guideline, **Guides to Good Practices: Evaluation Instrument Examples** (FSC 6910-0002)

(3) A minimum of one-third of the program devoted to hands-on exercises

(4) A core curriculum established for the 8-hour refresher training required by 29 CFR 1910(e)(8), with delivery of such course(s) limited to training programs accredited for the generic general hazardous waste operations course. Proposed content for refresher training program is presented in 2. Refresher in this section.

(5) A core curriculum established for the required additional 8-hour training for supervisors. Successful completion of the 40-hour off-site generic course shall be a prerequisite to the supervisors' course. Delivery of the supervisors' course should be limited to training programs accredited for the generic 40-hour course.

2. Refresher2. Refresher

A needs assessment should be done prior to, or during the initial hour of, the refresher training to identify areas of skill or knowledge deficiency of the class.

The 8-hour off-site annual refresher training required by OSHA at 29 CFR 1910.120(e)(8) for workers and for supervisors shall be conducted only by training programs accredited for the 40-hour course. Its course content shall include at a minimum the following topics and procedures:

A core curriculum established for the 8-hour refresher training required by 29 CFR 1910(e)(8), with delivery of such course(s) limited to training programs accredited for the generic general hazardous waste operations course. Proposed content for refresher training program is presented in 2. Refresher in this section.

a. Review of and retraining on relevant topics covered in the 40-hour course, as appropriate, using reports by the trainees on their relevant experiences to facilitate the review

Relevant topics may include but not be limited to the following: PPE, respiratory protection, health effects, etc.

The utilization of reports from the trainees, with regard to their pertinent experiences,may be most advantageously addressed by the instructors review of site violations and situations that have required modification or other response to documents that may include, but not limited to, the site safety and health plan.

In situations where a refresher is conducted for individuals not from one specific site a review of problematic areas that have arisen throughout the hazardous materials arena may be reviewed at this juncture. These topics may be extrapolated from national statistics, journal articles and/or major incidents that may apply.

b. Update on developments with respect to material covered in the 40-hour

course, including new technologies in hazardous waste clean-up

Methodology of task performance changes and subject matter that applies to the increased protection of the worker as well as any further updates in technology that is relevant to the initial 40- hour complement of subject matter. Also note area (e) below for further guidance.

c. Review of changes to pertinent provisions of RCRA, SARA, and Toxic Substances Conservation Act (ToSCA) and to pertinent OSHA standards

Review of pertinent provisions may be presented alone or they may be massaged into other subject matter areas . It is important that if the latter is undertaken that the worker be advised as to a provision update.

d. Introduction of additional subject areas as appropriate

Appropriate subject matter for introduction at this point should include topics that effect worker health and safety but may not have been covered in the initial 40-hour training program. Instruction in the area of bloodborne pathogens and infectious wastes may serve as a viable example.

e. Hands-on review of new and/or altered suiting-up/decontamination procedures and new developments in personal protective equipment

Lecture/demonstration that has been utilized in (b) from above may coincide with this particular provision. Again, as before , this may be an area that would allow for integration.

f. Review of newly developed air and contaminant monitoring equipment

Lecture/demonstration and hands-on training when appropriate audience is being addressed. Information with regard to the operating principles, capabilities and limitations should be addressed in this segment of the training.
(NOTE: in discussion during planning sessions addressed the general site workers need to be able to actually operate specific instruments. General consensus was that an overview and general interpretation of instrument results was appropriate. However in specific scenarios where worker were expected to actual utilize these instruments- such provisions should be made.)

g. For items e. and f. above, a minimum of two-hours of hands-on, or demonstration activities, is recommended.

The use of case studies and/or small group activities to convey core topic areas should be used whenever possible.

3. On-Site3. On-Site

a. The employer shall provide hazardous waste workers information and training as required by 29 CFR 1926.59(h) prior to initial assignment into their work area, as follows:

(1) The requirements of the hazard communication program including the location and availability of the written program, required lists of hazardous chemicals, and material safety data sheets

Compliance here may be achieved by the responsible party actually presenting the worker with a walk-through of the program and it's elements.

(2) Activities and locations in their work area where hazardous substances may be present

Discussion and review of site work map may best facilitate this endeavor as opposed to actually taking the worker to the work site prior to the completion of this site specific training.

(3) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearances, or other evidence [sight, sound, or smell] of hazardous chemicals when being released, and applicable alarms from monitoring devices that record chemical releases)

Lecture/demonstration as to the operation of devices and systems. The provision of past or probable scenarios and the activation of such may also be of benefit.

(4) The physical and health hazards of substances known or potentially present in the work area

This information may be best presented while a study of the site map , as suggested in (2) above, is performed. This would also allow for the integration of the hazard communication program to be accessed and utilized by the worker.

(5) The measures employees can take to help protect themselves from work-site hazards, including specific procedures the employer has implemented

Training would describe policies and procedures that may be found in site safety and health plans as well as in work task analysis and job performance standards. This would provide the worker with the procedural, engineering and administrative methodology necessary to afford the greatest level of protection to those involved in site activities.

(6) An explanation of the labeling system and material safety data sheets, and how workers can obtain and use the appropriate hazard information

(7) The elements of the confined space program including special PPE, permits, monitoring requirements, communication procedures, emergency response, and applicable lock-out procedures

This training may include examples of confined spaces that may be encountered at the site and therefore a more specific correlation with the above mentioned requirements at said specific site. It should also be noted that the confined space training delivered during the initial 40-hour training program may fall well short of the training requirement as specified in 29CFR 1910.146. It shall then be up to those responsible for health and safety, at the specific site, to require additional training for personnel who will in fact be charged with the task of confined space entry, attendant duties and rescue operations.

b. The employer shall provide hazardous waste workers information and training as required by 29 CFR 1910.120(e) and provide a review and access to the site safety and health plan, as follows:

(1) Names of personnel and alternates responsible for site safety and health

(2) Safety and health hazards present on the site

(3) Selection, use, maintenance, and limitations of personal protective equipment specific to the site

The utilization of site safety and health plans as well as the use of chemical protective clothing compatibility data may also be useful in presentation of information to the worker.

(4) Work practices by which the employee can minimize risks from hazards

(5) Safe use of engineering controls and equipment available on site

(6) Site decontamination procedures established to minimize worker contact with hazardous substances, including

(a) worker decontamination

(b) clothing decontamination

(c) equipment decontamination

(7) Elements of the site emergency response plan, including

(a) pre-emergency planning;

(b) personnel roles and lines of authority and communication;

(c) emergency recognition and prevention;

(d) safe distances and places of refuge;

(e) site security and control;

(f) evacuation routes and procedures;

(g) decon procedures not covered by the site safety and health plan;

(h) emergency medical treatment and first aid;

(i) emergency equipment and procedures for handling emergency incidents.

c. The employer shall provide hazardous waste workers information and training on personal protective equipment used on the site, such as the following:

(1) PPE to be used based upon known or anticipated site hazards

(2) PPE limitations of materials and construction; limitations during temperature extremes, heat stress, and other appropriate medical considerations; use and limitations of respirator equipment as well as documentation procedures as outlined in 20 CFR 1910.134

(3) PPE inspection procedures prior to, during, and after use

(4) PPE donning and doffing procedures

(5) PPE decontamination and disposal procedures

(6) PPE maintenance and storage

(7) Task duration as related to PPE limitations

d. The employer shall teach the employee about the site medical surveillance program relative to the particular site, including

(1) specific medical surveillance programs that have been adapted for the site;

(2) specific signs and symptoms related to exposure to hazardous materials on the site;

(3) the frequency and extent of periodic medical examinations that will be used on the site;

(4) maintenance and availability of records;

(5) personnel to be contacted and procedures to be followed when signs and symptoms of exposures are recognized.

e. The employees will review and discuss the site safety plan as part of the training program. The location of the site safety plan and all written programs will be discussed with employees and the mechanisms for access, review, and reference described.

B. RCRA OperationsSTreatment, Storage, and DisposalB. RCRA Operations?Treatment, Storage, and Disposal

Introductory Statement

The following pages are intended to help any interested person evaluate training programs offered in compliance with the OSHA Hazardous Waste Operations and Emergency Response standard (29 CFR 1910.120), especially those designed to satisfy the minimum requirements for workers at RCRA-designated transportation, storage, and disposal (TSD) sites.

MINIMUM CRITERIA

At a minimum, acceptable programs should withstand the close scrutiny detailed in Section V of the NIEHS "Minimum Criteria" document; and, they should cover at least those topics listed in Section VI.B of the document, which details the minimum generic curriculum guidelines for training workers at RCRA-designated TSD sites.

Actually assessing the degree to which a particular training program meets these minimum criteria and guidelines can be a complicated and delicate affair. Training programs for workers at RCRA-designated TSD sites are expected to cover a great deal of often esoteric material, and to graduate hundreds of thousands of well-informed, properly educated and trained individuals each year, so that the work of treating, storing, and disposing of the nation's hazardous waste stream (at least that portion of it that flows through RCRA-designated sites) can go forward safely and efficiently.

In addition, the training programs called for under the standard must cope with two other special problems.

First, they must provide training to many people who have not had the most positive classroom experiences. Therefore, the programs need to pay special attention to the ways they both deliver the training and evaluate its impact and effectiveness.

Second, the programs need to confront the well-established gap between academic (or theoretical) understanding and actual job performance. Academic achievement--as measured, for example, by high test scores--is not a good predictor of whether some one can perform a particular practical task . Training programs, therefore, need to leave room for many different ways of presenting information, and for evaluating and documenting trainee proficiency.

CHARACTERISTICS OF EXCELLENCE

All the best training programs share the following characteristics, and should be required of every program offered under the standard. A good training program is, at a minimum:

1) Accurate;
2) Believable;
3) Comprehensive; and,
4) Clear.

These are the ABC's of good training.

Accuracy. If the information and understanding being conveyed is inaccurate or misleading, then, obviously, the program has failed in its most basic mission. Requirements that the training materials be prepared by, and that the training be conducted by, appropriately qualified individuals are intended to ensure the accuracy of the material being taught.

Believability. But if accurate information and understanding is conveyed in such a way that people refuse to believe it or take it seriously, the program has equally failed. Education is measured by how much information is received, not by how much is transmitted. That is one reason why it is so important to verify that learning has taken place. Delivering instruction in educational methods appropriate to adult learners and workplace settings, however, also helps to ensure a program's credibility. Some programs even insist upon including "reality check" learning activities that give class participants a continuing opportunity to measure the relevance of the material they are being taught against their actual, real-life circumstances--a practice that conforms with the best and most successful adult learning theories.

Comprehensiveness. Minimally acceptable training programs must also cover everything required for someone to work safely in the industry. Half a loaf is rarely better than a whole loaf when it comes to working with hazardous materials. On the contrary, only knowing the half of it could be dangerous. Any training in hazardous waste operations is therefore under a special mandate to be comprehensive, and the standard sought to ensure such comprehensiveness by spelling out the topics to be covered in considerable detail. The best programs have also discovered that they have occasionally needed to go beyond the standard in a couple of respects, as is clear from the following material.

Clarity. Finally, training programs have not only to be accurate, believable, and comprehensive, they have to be clear. If the material is understandable only by graduate students, then the program has again failed in its basic mission. Training materials should be written in the language and grammar of everyday speech (whether English, Spanish, or what have you). They should accommodate a range of different literacy levels and learning styles by incorporating various audio, visual, and kinetic aids. And they should approach the same core knowledge from a number of different angles. For these reasons, the best programs rely on participatory learning activities, and they strenuously avoid fragmenting the training into dozens of little "sound bites" offered up over the course of several weeks in pre-digested snippets. Instead, the best programs offer a continuous, integrated, "holistic" learning environment, in which successive learning tasks can build on each other, enabling one's understanding to expand geometrically.

The following materials are offered to assist in assessing programs along these lines:

1) sample course outlines, together with estimates of the time devoted to each topic; and,

2) a list of the specific information and understanding covered in a representative program for workers at RCRA-designated TSD sites.

The comments and examples provided under each section reflect the materials developed by and training experience of the NIEHS Superfund Training Program awardees.

1. As a minimum, the off-site training course required in paragraph (p) of 1910.120 for the 24-hour training program shall include the following topics:

    a. Overview of the applicable paragraphs of 29 CFR 1910.120 and the elements of an employer's comprehensive and effective occupational safety and health program

STANDARD & EMPLOYER SAFETY AND HEALTH PROGRAM

Most programs review two sections of the standard; sections "p" and "q". Often workers attending a 24 hour training for RCRA/TSD facilities may be from an industrial facility which is not a TSD facility. Nonetheless, these workers will be responsible for handling hazardous waste materials at the facility and/or responding to an emergency incident involving these materials. In the case of a course at the facility or provided to a group of workers from the same facility, it is preferable that the training provide a review of the employers' safety and health program. However, in the case of training courses which are delivered upon an open-enrollment basis where workers representing a variety of facilities are present, a more general review of the elements of a health and safety program are provided. In either case, workers should be provided with an opportunity to explore the elements of a health and safety program, as required by OSHA, and to reflect upon either the program in place at their workplace or the lack of, or insufficiency of, such a program.

Goals:
Students will know more about:

1. The history of safety regulations from OSHA, DoT, the EPA, and other agencies.
2. The scope and application of the hazardous waste standard, especially the elements of a comprehensive and effective employer safety and health program.

Objectives:

Students will be able to:

1. describe how relevant regulations from OSHA, DoT, EPA, etc., are structured.
2. describe the scope and application of the hazardous waste standard.
3. define key terms in the standard.
4. list the requirements for a comprehensive and effective employer safety and health programs as detailed in Section P of the hazardous waste standard.
5. list the requirements for employer emergency response programs as detailed in Section Q of the hazardous waste standard.

b. Overview of relevant hazards such as, but not limited to, chemical, biological, and radiological exposures; fire and explosion hazards; thermal extremes; and physical hazards

HEALTH HAZARD RECOGNITION

This section is usually called "Health Hazard Recognition" or "Investigating Worksite Health Hazards." Students learn how to recognize and research hazardous materials. They learn the clues to help identify the chemicals and other hazards they may be exposed to at work. This section establishes the groundwork for understanding what controls are needed to adequately protect workers from hazardous waste material exposures. Some programs also try to include how repetitive processes, awkward positions, and excessive lifting can lead to traumatic injuries, and how to prevent them.

Goals:
Students will know more about:

1. How to identify and evaluate potentially hazardous situations
2. The differences between types of hazards
3. The systems used in hazard recognition and prevention.

Objectives:
Students will be able to:

1. Describe a model for hazard recognition and how it can be used to characterize workplace hazards.
2. List hazardous properties of chemicals.
3. List clues for identifying hazardous chemicals.
4. Identify major outcomes of chemical incompatibility.
5. Describe the components of "fire science", including the fire triangle, flash point, and flammable range.
6. Use resources such as the DOT Emergency Response Guide to identify and understand placards and labels.
7. Recognize labeling systems in hazardous waste, including manifests, profiles, etc.
8. Describe the various methods for the control of workplace hazards, including engineering controls, work design, administrative controls, substitution of dangerous materials, etc.

c. General relevant safety hazards including those associated with electrical hazards, powered equipment, lockout procedures, vehicular operations, and walking-working surfaces

SAFETY HAZARDS

In the formative years of this training under the 1910.120 requirement, safety hazards were often addressed in the hazard recognition section of the training courses. However, increasingly, programs separate this information and provide more detailed training about safety hazards. This unit should concentrate as much as

possible on common safety hazards--such as walking and working surfaces, overhead and underground utilities, heavy equipment, electrical hazards from tools and equipment, heavy loads, etc.

Goals:
Students will know more about:

1. How to recognize safety hazards.
2. The methods for accident prevention related to the above listed safety hazards.

Objectives:
Students will be able to:

1. Identify physical hazards that may be found at their workplaces, including:
   a. Working around heavy equipment
   b. Slips, trips, and falls
   c. Excavations
   d. Unguarded machinery
   e. Electrical hazards
2. Describe safety measures required to prevent falls at floor and wall openings.
3. Describe the function of a ground fault interrupter.
4. List safety precautions that can prevent injury from electrical equipment.
5. List measures that can help to prevent injury from working around heavy equipment.
6. Describe the function of trenching and shoring.
7. Describe the components of a lock-out/tag-out program.

d. Confined-space hazards and procedures

CONFINED SPACE HAZARDS

OSHA requires additional specific training before a person is permitted to enter for permitted confined spaces. This training section therefore provides only an introduction to methods and measures employed for protecting health and safety when conducting confined space entry. Special emphasis is placed on measures to prevent injury and illness.

Goals:
Students will know more about:

1. How to recognize a confined space hazard.
2. What personal protective equipment they should wear in confined space emergencies.
3. OSHA's requirements for permitted confined space entry

Objectives:
Students will be able to:

1. Define the elements of confined spaces.
2. Describe ways confined spaces present hazardous occupational conditions.
3. List the components of a good confined spaces training program.
4. List why this introductory training has not prepared them to enter a confined

space for any reason.

e. Work practices to minimize employee risk from workplace hazards

WORK PRACTICES

All programs discuss work practices which can be used to reduce risks from workplace hazards. However, these are integrated throughout the course and all course materials, rather than having a specific module address these. Many programs stress the need for: additional training; the use of engineering controls as a priority above personal protective equipment; using the buddy system; using safe lifting practices; a variety of safety precautions like machine guarding, ground fault interrupters, shoring and trenching, lockout and tagout, etc. Many programs emphasize that students understand: the notion that personal protective equipment is "the final defense"; that the use of personal protective equipment presents health and safety risks and therefore should always be preceded with adequate and appropriate training with the equipment that is to be used; the importance of and the limitations of hazard and exposure monitoring; and above all, that health and safety is best secured through concerted and collective activity which provides workers with greater power and security as well as legal protection.

Some programs provide a specific module regarding Safe Work Practices.

Goals:
Students will know more about:
1. Safe work practices.
2. The role of safe work practices in an overall safety and health program.

Objectives:
Students will be able to:
1. Discuss the OSHA and EPA requirements for safe work practices
2. Define the term "Standard Operating Procedure" and understand how SOPs are necessary to reduce the risk of injury and illness
3. Identify elements of common SOPs relevant to major activities commonly performed at a variety of TSD facilities.

f. Emergency response plan and procedures including first aid meeting the requirements of paragraph (p)(8) of section 1910.120

C. EMERGENCY RESPONSEC. EMERGENCY RESPONSE

Programs use a variety of group activities to teach this module. Most use a case study that is either criticized by the class and/or used as the basis for a mock incident for which the class must develop and implement an emergency response plan. Most programs do not include First Aid or CPR in a 24-hour course, but offer it separately.

Goals:
Students will know more about:
1. The functions and objectives of an emergency response team
2. How to examine their employer's emergency response plan in terms of the

requirements of the OSHA standard, 1910.120

3. The need for a critical appraisal of incident organization systems, including the functions of hierarchy, roles, and channels of communication

Objectives:
Students will be able to:

1. List the elements of an emergency response plan
2. List six key personnel requirements for an Emergency Response Team
3. Describe what is required in a Contingency Plan
4. Understand emergency response actions which require additional training
5. Develop recommendations for an effective emergency prevention and response plan

g. A review of procedures to minimize exposure to hazardous waste and various types of waste streams, including the materials handling program and spill containment programs

SPILL CONTROL AND SAFE HANDLING

All programs include one of the following modules: either "Handling Drums and Other Containers", or "Spill Control." Usually these topics are combined in a single module/chapter, such as "Spill Control and Safe Handling." These modules usually include both classroom discussion and hands-on practice through a variety of exercises and activities. Often programs offer hands-on activities wherein students practice worksite activities while in either level C or level B protective gear. These activities may be handling drums, containing leaks, using air monitoring equipment, establishing and using a decontamination line, using radio equipment, etc. Many programs engage the students in a mock incident or drill activity where students are presented with a final opportunity to put into practice the various elements of the training. This incident or drill is then analyzed jointly by the students and instructors, as a final review of the training and as a vehicle for further discussion of anticipated workplace activities.

Goals:
Students will learn more about:

1. How to distinguish between emergency and non-emergency spills.
2. Elements of materials handling and spill containment.

Objectives:
Students will be able to:

1. Identify types of hazards related to drums.
2. Describe procedures for avoiding or minimizing these hazards.
3. Identify what can be done to limit the number of spills on a RCRA site.
4. List the elements of an effective spill response plan.
5. Demonstrate correct procedures in spill response, including: donning of personal protective equipment; Use of monitoring instruments for chemical identification; Setting up site control zones; Decontamination
6. Recognize the importance of **NOT** participating in a spill response if training or equipment is inadequate

7. List items that should be available for spill control
8. List actions to take in response to a spill
9. Identify the difference between an emergency and a small quantity spill that can be contained by non-emergency personnel

h. An overview and review of hazard communication programs meeting the requirements of 29 CFR 1910.1200

HAZARD COMMUNICATION

Programs either offer a separate module for hazard communication programs or cover this in the health effects or hazard recognition modules. In either case, some basic elements are covered. This is a general review and rarely addresses the elements of an employers specific Hazard Communication Program. Hazard Communication training is wholly separate from the training provided to meet the requirements of 1910.1200. Some programs also cover waste labeling, even though it is not required by 1910.1200.

Goals:
Students will know more about how to find out about the hazards to which they are exposed.

Objectives:
Students will be able to:
1. Identify what information must be on in-plant labels and materials safety data sheets
2. Describe how to get access to labels, MSDSs and monitoring information
3. Use and evaluate labels and MSDSs
4. Define terms commonly used on Material Safety Data Sheets, including: vapor pressure, TLVs, PELs, IDLH

i. A review of 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 including known synergistic interactions

MEDICAL SURVEILLANCE

Some programs address this in a specific module and others include it along with discussions of health effects and toxicology. Many programs use this section to help workers understand how these programs can be used to protect their health and also how to recognize the limits of medical surveillance programs. Some programs include an overview of other OSHA medical surveillance requirements, including respiratory protection, air contaminants, hearing, DoT, etc.

Goals:
Students will know more about the function and limitation of medical surveillance under 1910.120.

Objectives:
Students will be able to:

1. Identify, according to the OSHA Hazardous Waste Standard:
   - # who is covered by a program of medical surveillance
   - # the frequency and content of medical examinations
   - # the required credentials of the examining physician
   - # who pays the costs of medical examinations
   - # the content of the physician's written opinion
   - # the record-keeping requirements, and
   - # the confidentiality of medical results
2. Identify their rights and responsibilities as patients in terms of confidentiality, access to records, and reporting of medical exam results
3. Differentiate between primary, secondary, and tertiary disease prevention, as it relates to Medical Surveillance
4. List other medical surveillance requirements that might be applicable.
5. Understand the value of and how to prepare and maintain their own occupational history reports

j. A review of decontamination programs and procedures meeting the requirements of 29 CFR 1910.120(p)(4)

DECONTAMINATION PROGRAMS

Decontamination is an important set of procedures designed to protect TSDF workers, other people (family members, co-workers, community residents), and the environment from exposures or contamination by hazardous materials. Non-emergency response TSDF employees should understand the decontamination process and its importance, as well as how to decontaminate the type of personal protective and other equipment they are likely to use in non-emergency situations. TSDF workers who are not designated and **trained** as TSDF emergency responders are not generally involved in decontamination procedures of more comprehensive safety and personal protective equipment.

In these modules, students usually are given the opportunity to evaluate their own experiences when executing decontamination strategies in class. They may explore the difficulties that may be encountered in attempting decontamination procedures in their own work environment.

Goals:
Students will know more about:

1. The purpose and principles of decontamination
2. The adaptability of decontamination principles to use in the field
3. The correct procedures for doffing protective clothing
4. The potential for work-related exposure in using decontamination methods

Objectives:
Students will be able to:

1. List the relevance of decontamination
2. Identify decontamination principles used in the field

3. Demonstrate the correct procedures for taking off chemical protective clothing
4. Explain the relationship of decontamination to health hazards

k. A review of an employer's requirements to implement a training program and its elements

EMPLOYER TRAINING PROGRAMS

This is usually covered in the "Rights and Responsibilities" section of the course. The training requirements of both sections of 1910.120 (p & q) are generally reviewed. Both general training and emergency responder training requirements for RCRA facility workers are covered.

l. A review of the criteria and programs for proper selection and use of personal protective equipment, including respirators

PERSONAL PROTECTIVE EQUIPMENT

Most programs offer two distinct modules on these subjects: Respiratory Protection, and Personal Protective Equipment or Chemical Protective Clothing. In both cases, an extensive degree of hands-on training is provided. Students are introduced to personal protective equipment. However, in the majority of cases, the emphasis of these modules is to facilitate an understanding on the part of the students regarding the limitations and inherent dangers of this equipment - in regards to worker health and safety. The module regarding chemical protective clothing usually addresses the issues related to heat stress. The module regarding respiratory protection usually addresses AN employer's required respiratory protection program. Many programs provide hands-on training with both Air Purifying Respirators (APR) and Self-Contained Breathing Apparatus (SCBA).

A. Respiratory Protection Module

Goals:
Students will know more about:
1. The purpose of respiratory protection
2. The importance of effective respirator programs
3. The limitations of various types of respirators
4. The use of appropriate respiratory equipment
5. The importance of fit-testing

Respiratory Protection Module, Objectives:
Students will be able to:
1. Identify situations where respiratory protection is needed
2. Evaluate whether or not their respirator program meets the OSHA standards
3. List components of a respirator program as required by OSHA
4. Define the terms: IDLH, protection factor, and oxygen-deficiency
5. List the main types of respirators
6. Identify the specific situations, criteria, and procedures for upgrading or

downgrading the level of protection
7. List the reasons for poor respirator fit.
8. Demonstrate how to checkout and wear an APR and a SCBA
9. Describe the difference between quantitative and qualitative fit-testing
10. Explain the place of respiratory protection in the hierarchy of control

B. Chemical Protective Clothing Module

Goals:
Students will know more about:
1. The need to use chemical protective clothing
2. The limitations of chemical protective clothing and possible adaptations of equipment
3. How to wear and maintain chemical protective clothing
4. The varieties of chemical protective clothing available
5. The importance of fit-testing.

Objectives:
Students will be able to:
1. List the three major routes of entry of toxins in to the body, and how CPC provides protection against such entry
2. Identify physical and psychological effects of wearing CPC
3. Identify the importance of using hazard recognition and health hazard evaluation in CPC selection.
4. Identify components of a personal protective equipment program.
5. Don and doff PPE in an appropriate manner and describe precautions to be taken while wearing it.
6. Identify the proper procedures for inspection, maintenance, and storage of PPE
7. Define permeation, penetration, and degradation and interpret basic permeation data for CPC.
8. Describe the signs and symptoms of heat stress
9. Demonstrate appropriate communication signals while working in CPC

m. A review of the applicable appendices to 29 CFR 1910.120

REVIEW OF STANDARD APPENDICES

Few programs can incorporate reviews specific to the appendices within the constraints of a 24-hour training program. However, the elements of the appendices regarding the testing of PPE and the descriptions of the levels of protection are basic parts of the personal protection equipment training, as detailed in the section above. In addition, the manuals used by NIEHS funded programs generally include either an appendix or a set of lists providing both titles of reference books and materials and agencies and organizations, both governmental and non-governmental, which are useful and supportive resources. In these cases, the training program generally also makes available to students demonstration copies of reference materials and books. In this way, students can browse through these materials during the course and ask trainers questions about their use. Students can also learn in this way how to obtain

copies of the books and materials that they find interesting and useful.

n. Principles of toxicology and biological monitoring as they pertain to occupational health

HEALTH EFFECTS

Many programs incorporate this information into a module that discusses the health effects related to chemical exposures. This module may be called, "Health Hazard Recognition", "Health Hazard Evaluation", "Toxicology", "Hazard Awareness", or "Health Hazards on the Job". Information presented in this module includes: Chemical states (dusts, mists, vapors, solids, gas, liquid, etc.); Routes of Entry; Dose response and duration; Types of health effects; Limits and standards, e.g. TLVs, PELs, RELs, STELs, etc.; and sometimes, Medical surveillance programs. Many programs help students learn to use resources such as the NIOSH Pocket Guide to Chemical Hazards, Material Safety Data Sheets, Waste Material Profile Sheets, Manifest Sheets, etc. Activities are presented which give students opportunities to use these materials as research aids. Often students are encouraged to critically approach chemical limits and to assess if restriction of exposures within these limits will in fact prevent them from developing exposure related illnesses. Some programs take time to help students understand the processes by which standards are set and to hold discussions about whether or not workers' interests are best supported in this process.

Goals:
Students will know more about:

1. The routes of entry of toxins and the overall effects (acute and chronic) of toxins on the body.
2. The exposure guidelines (IDLH, TLV, PEL, etc.)
3. The terminology and interpretation of the data on a Material Safety Data Sheet or other documentation

Objectives:
Students will be able to:

1. List routes of entry of toxins into the body
2. State the difference between acute and chronic illness
3. State the difference between short-term and long-term exposures.
4. Describe the meaning of TLV, PEL, and IDLH, and action levels.
5. List problems associated with MSDSs and other documentation
6. Describe possible effects of exposures to chemicals in the workplace
7. Describe where in the body toxins act; tell the difference between local and systemic effects.
8. Identify and use resources to find out what is known about the health and safety hazards posed by a toxin.

o. Rights and responsibilities of employees and employers under OSHA (including 1910.120[p]) and RCRA

RIGHTS AND RESPONSIBILITIES

Most programs have presented an historical background to help workers to understand the political processes which led to the laws and regulations mandating this training. In addition, several programs provide for a discussion of the problem of hazardous waste and how this became a national problem. Often this material is covered in two separate manual or workbook chapters, but one course module takes between 2 -3 hours and includes various group activities such as large group discussions, role plays, speak-outs, and small group table-top activities. Some programs also includes a discussion of health and safety committees and how workers can protect and improve health and safety conditions. Often this section contains a review of the pertinent environmental laws affecting such activity by working people.

Goals:
Students will know more about:

1. The basic legal and political structures established to protect working people
2. Working people's rights and responsibilities under the law

Objectives:
Students will be able to:

1. Explain the employer's responsibility to provide a safe and healthy work place under OSHA regulations.
2. List the functions of OSHA
3. List rights that workers have under OSHA
4. Identify steps workers should take before refusing to do an unsafe job
5. Identify basic health and safety rights that can be addressed by health and safety committees
6. Describe the major hazardous waste laws and determine which regulations apply to their workplace.

p. Hands-on exercises and demonstrations with equipment to illustrate the basic equipment principles that may be used during the performance of work duties, and donning and doffing of PPE

HANDS-ON EXERCISES

In addition to the hands-on activities already described, most programs also include hands-on training of air monitoring equipment and its usage. The following subject areas include hands-on training. (Level A dress-out is usually not done in 24-hour training programs.)

1. Respiratory Protection Equipment; APR and SCBA
2. Chemical Protective Clothing; Level C and Level B; suits, gloves, boots, etc.
3. Decontamination; usually practice in establishing decontamination lines and procedures, using decontamination equipment (or simulating use)
4. Air monitoring instruments; at least colormetric tubes and associated pumps, Combustible gas and oxygen meters; sometimes photoionizing detectors. Rarely are flame ionizing detectors discussed. Radiation survey meters may be explained and used.
5. A dressout/monitoring exercise, or a work practice activity performed in protective gear.

6. A mock drill to practice emergency response procedures, or a more extensive work practice activity.

q. Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems to include information contained in hazardous waste manifests

HAZARD CODING SYSTEMS

As stated in the explanation to Section M., a variety of reference materials are either listed in manual appendices, provided for review in classes, and/or actually used in the training. Most of the NIEHS training programs issue to each student a copy of the NIOSH Pocket Guide to Hazardous Chemicals and the DOT Emergency Response Guide. Many of the activities in the course help students to understand how to use these reference materials in their efforts to identify and evaluate hazardous materials. Most programs also review hazard coding systems such as DOT placards, HMIS labels, tank car identification, etc.

r. At least 8 hours of hands-on training

HANDS-ON TRAINING

See the list of exercises in "p" above. These exercises generally require between 8 - 12 hours of training time.

s. Training in the job skills required for employees' job function and responsibility before they 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.

New item recommended.

t. Air monitoring methods and equipment. This should include discussions of how to evaluate monitoring results provided by outside consultants.

AIR MONITORING

The standard does not specifically require training regarding air monitoring. However, experience has brought most of the NIEHS sponsored training programs to include this training in their programs for RCRA/TSDF workers. This training often incorporates hands-on use of the equipment. Activities are usually presented which help the students understand how to evaluate air monitoring data.

Goals:

Students will know more about:

1. The use of direct reading instruments to determine airborne concentration
2. The types of air monitoring equipment available
3. The limitation of direct reading devices

4. How to compare results to the Standards or Guidelines
5. The importance of the units in which a result is reported

Objectives:
Students will be able to:

1. Name instruments commonly used for detecting organic vapors
2. Identify whether or not an instrument is intrinsically safe
3. Understand and be able to interpret the readings of several common instruments
4. Describe why the work environment is monitored
5. Identify some hazards that can be monitored
6. Explain the different types of air sampling that might be done at a TSD facility
7. Evaluate air monitoring results presented to them by employers and critically review them.
8. Describe air-monitoring record-keeping requirements

2. The individual 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, shall be appropriate to their potential for exposure, and shall cover the following topics:

The training detailed in the sections already listed takes at least 24 hours and offers a general focus upon health and safety for hazardous waste workers at industrial facilities. It usually does not address the specific aspects of the programs which have been developed and implemented at an individual worksite. Therefore, all of the following elements of a training program need to be provided following the basic 24 hours of training and must be focused specifically upon what has been put into place at the worksite.

a. The emergency response plan and procedures including first aid meeting the requirements of paragraph(p)(8) of 1910.120

Many training programs incorporate specific emergency response plans into emergency response planning curriculum. A range of training activities are used to help workers become familiar with the plan and to facilitate their participation in determining the adequacy of the plan. Often, a drill based upon an emergency scenario is presented as the basis for the training. Using such a scenario as part of on site training, facility personnel could be divided into team groups based upon proposed roles in an emergency response incident. Then the groups would review established pre-emergency plans; identify and confirm established personnel roles, lines of authority, and communication; they would review established emergency recognition and prevention measures and safe distances and places of refuge. Site security and control measures would be reviewed and assessed, as well as evacuation routes and procedures, decontamination procedures, personal protection and emergency equipment, and mechanisms for emergency alerting and response procedures. Finally, emergency medical treatment and first aid procedures would require review and assessment. All of this would then be put into action as the drill

proceeded.

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

Off site training, as described above, can provide workers with generic information regarding hazardous waste handling procedures. However, site specific training is necessary to assure that workers are adequately prepared to handle hazardous waste materials in a manner which best protects their health and safety. On-site training can greatly enhance the prevention of illness and injury at the facility when it presents the materials handling and spill containment programs, and is designed to make certain that workers are fully aware of the location of response kits and equipment and the trained responders at the facility. When this training is provided in a manner which fully encourages workers to discuss these procedures, the facility as a whole can benefit by involving those workers most familiar with plant operations in a process of training, review, and assessment.

c. The hazard communication program meeting the requirements of 29 CFR 1910.1200

The OSHA Hazard Communication Standard specifically exempts hazardous waste materials. However, RCRA/TSD facilities often use a wide range of hazardous chemicals in processes to treat hazardous waste. These may be used in water treatment, incineration, and other operations. The Hazard Communication program must fully address these hazards to workers' health and safety. The effectiveness of any training addressing control and protection methods and measures is always optimized when workers are provided ample opportunity to become proficient in the use of this equipment and the implementation of these procedures. Hands-on training with the equipment which will be used at the facility greatly enhances measures to prevent illness, injury and accidents.

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 including known synergistic interactions

Training to review the employer's medical surveillance program will best serve workers' health needs if the following issues are addressed.

1. Information is provided indicating that the physician and medical team are specially trained in occupational medicine and occupational diseases. Assurances of the lead physician's board-certification or eligibility in occupational medicine can be made here.

2. Worker's need assurances regarding the extensiveness of the physician's experience in diagnosing and treating occupational diseases.

3. If chest x-rays are taken, workers need assurances that the physician reading the x-rays is a qualified "B" reader.

4. The appropriateness of the program for the specific exposures and hazards encountered in the workplace: which tests are provided, why, and how the employee can use the results.

5. The rights of the employee and whether or not they must participate in the program.

6. How to recognize the signs and symptoms of exposure to relevant hazardous substances including known synergistic interactions.

e. A review of the employer's decontamination program and procedures meeting the requirements of 29 CFR 1910.120(p)(4)

The above description of the emergency response plan training provides an appropriate model for on-site training regarding the decontamination program. A hands-on, interactive training that provides workers ample opportunity to review and assess the established decontamination program and procedures will greatly enhance health and safety measures. Following review and assessment of the program and procedures, practice routines, in full protective gear, can develop worker proficiency in the implementation of these procedures.

f. An overview of the employer's training program (meeting the requirements of 1910.120[p][7]) and the parties responsible for that program

Providing workers with an outline of the training program and information regarding training providers helps them to understand the schedule of training which they will undertake. Since training must be provided prior to work assignment, an overview of the training program will help to establish the hazardous nature of the work.

g. A review of the employer's personal protective equipment program (PPE and respiratory protection) including the proper selection and use of PPE based upon specific site hazards

As detailed in part 1 above, the generic off-site training provided workers with a broad overview of personal protective equipment that they will likely need to use with proficiency. It also should have stressed the importance of further regular training with the specific equipment that they will use. On-site training needs to be designed so that it provides workers with ample opportunities for hands-on experience with the equipment they will use. The PPE selection criteria based upon specific site hazards need not only to be reviewed, but presented in ways which provide workers with opportunities to apply those criteria when making selections. Training activities can be developed which present a number of scenarios about which workers can make appropriate decisions regarding PPE selection.

h. All relevant site-specific procedures addressing potential safety and health hazards. This may include, as appropriate, biological and radiological exposures, fire and explosion hazards, thermal extremes, and other physical hazards; safety hazards such as electrical hazards, powered equipment, lock-out procedures, vehicular operations, and walking-working surfaces

The most effective form of training provides workers with opportunities to think critically about situations and circumstances of their work. Therefore, training sessions addressing site-specific procedures for safety and health hazards will have the greatest impact when structured to encourage collective discussion regarding these procedures. Exercises and activities can be developed for small working groups in which workers plan to take actions based upon presented scenarios.

Each scenario can either include a range of hazards or a single hazard. In a training session for 15 - 20 workers, groups of four or five workers could each work on a different scenario. When each smaller group reports back to the whole group, all of the workers will have an opportunity to review a range of hazards and safety and health procedures. In this way, each individual worker has an opportunity to reflect upon what they know about a specific hazard and its related safety and health procedure within a small group. Then all of the workers have a chance to collectively discuss the full range of hazards and procedures on the site. This type of training, when presented regularly as either refresher training or update training, provides a forum for ongoing discussions of safety and health conditions at the facility.

i. Safe use of engineering controls and equipment on site

Again, training regarding the safe use of engineering controls and equipment on site will have the greatest impact if it includes opportunities for collective discussion and hands-on practice. A well rounded presentation will include an explanation of the controls and their location, opportunities for workers to discuss whether or not they think that the controls are appropriate, and activities in which the workers can practice using the various control mechanisms.

j. Names of personnel and alternates responsible for site safety and health

On-site training needs to make certain that workers know who at the facility is responsible for various safety and health activities. Not only do workers need to be provided with lists of names and how to contact these individuals, but they need time to get comfortable talking about health and safety issues with these key personnel. The training facilitator can establish a mechanism in which conversations about health and safety can take place. A relaxed and open atmosphere will encourage discussion. Workers need to be assured that their health and safety concerns are taken seriously and given appropriate consideration. In order for workers to raise health and safety concerns and maintain a focus upon preventing accidents at the facility they need to feel confident that raising concerns will not result in retaliatory action. They also need demonstration that appropriate resources are being dedicated to ensure healthy and safe operations.

Sample Course Agendas

Sample #1

Day 1

8:00 - 8:30	Introduction and Overview
8:30 - 10:30	Rights and Responsibilities
10:30 - 12:00	Hazard Recognition
12:00 - 1:00	LUNCH
1:00 - 2:00	Hazard Recognition, Safety hazards
2:00 - 3:30	Health Hazard Evaluation
3:30 - 5:00	Sampling and Air monitoring

Day 2

8:00 - 9:00	Respirator Program
9:00 - 10:30	SCBA & APR Exercises
10:30 - 12:00	Chemical Protective Clothing
12:00 - 1:00	LUNCH
1:00 - 2:00	CPC continued
2:00 - 3:30	Decontamination
3:30 - 5:00	Dressout Monitoring Exercise

Day 3

8:00 - 9:00	Confined Space
9:00 - 10:30	Spill Control
10:30 - 12:00	Emergency Planning
12:00 - 1:00	LUNCH
1:00 - 3:00	Mock Incident/Drill
3:00 - 4:00	Critique and Review the Incident
4:00 - 5:00	Test and Course Critique

Sample #2

Day 1

8:00 - 9:00	Introduction and Overview
9:00 - 10:15	What is Hazardous Waste
10:15 - 11:15	Hazardous Waste Regulations
11:15 - 12:00	Hazard Identification
12:00 - 1:00	LUNCH
1:00 - 2:00	Hazard Identification
2:00 - 3:00	Respiratory Protection Programs
3:00 - 4:00	Hands-on respirator training
4:00 - 5:00	Fire Safety and Chemical Incompatibilities

Day 2

8:00 - 9:45	Health and Safety/ Legal Rights
9:45 - 10:30	Confined Spaces
10:30 - 12:00	Air Monitoring

12:00 - 1:00	LUNCH
1:00 - 2:00	Personal Protective Equipment
2:00 - 3:45	How Chemicals May Harm You
3:45 - 5:00	Occupational Disease

Day 3

8:00 - 8:45	Drum Handling
8:45 - 10:15	Emergency Response Planning
10:15 - 12:00	Preparation for Spill activity
12:00 - 1:00	LUNCH
1:00 - 3:30	Hands-on spill response incident
3:30 - 4:15	Summary, critique and discussion
4:15 - 5:00	Evaluation and course critique

Sample 3: (Industry provided)

Day 1

Introduction		
	Intro to 24/40 hour Hazardous Waste Training	45 min.
Compliance	Regulatory Compliance	45 min.
Industrial Hygiene	Toxicology	60 min.
	Exposure Monitoring	30 min.
	Site Safety and Health Plan Elements	30 min.
Safety	Hazard Communication Part 1: Program Components	90 min.
	Hazard Communication Part II: Physical & Health Hazards	90 min.
Medical	Medical Surveillance Program	60 min.
	Bloodborne Pathogens	15 min.
Hearing Conservation	Hearing Conservation	30 min.

Day 2

Safety	Electrical Safety	45 min.
	Lockout/Tagout	45 min.
	Guarding/Equipment Hazards	30 min.
	Fire Prevention	45 min.
	Walking/Working surfaces	30 min.
	Confined Spaces	60 min.
	Cumulative Trauma/Back Care	60 min.
	Thermal Extremes	45 min.
	Welding, Cutting, Brazing	30 min.
Control	Work Practices that Minimize Risk	90 min.
Handling & Transport	Handling/Sampling	60 min.
Control	Personal Protective Equipment	120 min.
	Respiratory Protection Equipment	120 min.

	Decontamination	45 min.
Practical Exercise	Selected Practical Exercise	135 min.

Sample #4

Day 1

Introduction	7:30-8:30
Rights & Responsibilities	8:30-9:30
Break	9:30-9:45
Hazard Recognition	11:30-12:05
Health Hazard Recognition	1:15-2:15
Break	2:15-2:30
Monitoring	2:30-3:30
Monitoring Lab	3:30-4:30

Day 2

Review of Day 1	7:30-7:45
Hazard Control	7:45-9:30
Break	9:30-9:45
Respiratory Protection	9:45-11:30
Lunch	11:30-12:15
Respiratory Protection Lab	12:15-2:15
Break	2:15-2:30
Chemical Protective Clothing	2:30-4:30

Day 3

Chemical Protective Clothing Lab	7:30-7:45
Break	7:45-9:30
Work Practices	9:45-10:30
Work Practices Lab	10:30-11:30
Lunch	11:30-12:15
Decontamination	12:15-1:15
Emergency Response	1:15-2:15
Break	2:15-2:30
Emergency Response (cont.)	2:30-3:30
Evaluation	3:30-4:30

Sample #5:

Course Name	**Credit hours**
Right to Know (OSHA)	3
Personal Protective Equipment (OSHA)	2
Respiratory Protective Equipment (OSHA)	2

General Safety (OSHA)	1
Physical Hazards (OSHA)	3
Confined Workspaces (OSHA)	2
Container Handling (OSHA)	1
Decontamination (OSHA)	3
Health & Safety Plan (OSHA)	2
Sampling Techniques (OSHA)	2
Spill Response (OSHA)	2
Tanker Procedures (OSHA)	1
Lockout Procedures (OSHA)	1
TSDF SOP	1

3. In addition, the following should be required:

a. It has been proposed that paragraph (p)(7) of section 1910.120 of Title 29 of the Code of Federal Regulations be revised to read as follows:

> Initial training for qualified[2] individuals shall be for a minimum of 24 hours supplemented by site- and job-specific training commensurate with the potential for exposure to hazardous materials.

b. The consensus of the committee is that there should be a core curriculum established for the minimum 8-hour refresher training and the supervisor training required in 29 CFR 1910.120 and that the delivery of such courses should be limited to training programs accredited for the generic RCRAStreatment, storage, and disposal course.

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[2] (Trained and evaluated by the employer as competent to perform basic job skills.)

C. Emergency Response

The Emergency Response section of this document contains two sub-sections:

C1: Public and Facility, Off-Site, Full-Time Emergency Response.C1: Public and Facility, Off-Site, Full-Time Emergency Response.

C1A: The Emergency Response section from the original NIEHS Minimum Criteria Document.C1A: The Emergency Response section from the original NIEHS Minimum Criteria Document.

C1B: The Public and Facility (Off-Site, Full-Time) Emergency Response guidance material which is the product of that Work Group during the March 1994 Work Shop.C1B:The Public and Facility (Off-Site, Full-Time) Emergency Response guidance material which is the product of that Work Group during the March 1994 Work Shop.

C2: Collateral Duty Emergency Response.C2:Collateral Duty Emergency Response.

Due to a number of developments occurring in the full-time emergency response sector over the intervening years since the original NIEHS Minimum Criteria document was developed, the deliberations of that Work Group in the March 1994 Work Shop could not easily be framed within the context of the original document's emergency response section. Therefore, under C1 of this document, the original minimum criteria document section on emergency response is provided as C1A. Under C1B, the product of the March 1994 Work group is presented without cross-reference to the original minimum criteria document.

Section C2, on the other hand, which is Collateral Duty Emergency Response, does contain specific linkages to the emergency response section in the original minimum criteria document.

In planning the March 1994 Technical Workshop, emergency response activities were intentionally separated into the two focuses: Off-site full-time and collateral duty. This separation was made with the view that the nature of emergency response was different in this two activities. That is, off-site emergency responders are required to be prepared to respond to hazardous materials emergencies in a nearly unlimited response environment about which they may have very limited prior information such as rail or truck incidents, an industrial plant incident, or an uncontrolled hazardous waste site incident. Collateral duty emergency responders, on the other hand, typically serve as the on-site emergency response team at a fixed location and do, as a consequence, have a relatively high level of knowledge about the hazardous materials and situations with which they are expected to perform the emergency response activity.

C1: Public and Facility, Off-Site, Full-Time Emergency Response

C1A: The Emergency Response section from the original NIEHS Minimum

Criteria Document.

1. Consensus Items

The emergency response subcommittee reached consensus on the following items:

a. Emergency responders' training programs should be included under part (c) of OSHA's proposed 29 CFR 1910.121. This recommendation includes all emergency responders both public and private.

b. A minimum acceptable level of training and course content must be defined. Such a training program shall be tiered to the extent required of emergency response (e.g., first responder, haz-mat team member, haz-mat specialist, etc.). The program shall also address the specific issues as identified by the NIEHS through its hazardous waste worker training grants program, as follows:

(1) Hazard recognition

(a) Nature of hazardous material
(b) Practical applications of hazard recognition, including related presentations on biology, chemistry, and physics

(2) Principles of toxicology, biological monitoring, and risk assessment

(3) Safe work practices and general site safety

(4) Engineering controls and hazardous waste operations

(5) Site safety plans and standard operating procedures

(6) Decontamination practices and procedures

(7) Emergency procedures, first aid, and self rescue

(8) Safe use of field equipment

(9) Handling, storage, and transportation of hazardous wastes

(10) Use, care, and limitations of personal protective clothing and equipment

(11) Safe sampling techniques

(12) Rights and responsibilities of workers under OSHA and other related statutes concerning right to know, protection, compensation, and liability

(13) Medical monitoring requirements and issues

(14) Community relations.

c. When determining minimum criteria for training programs for emergency responders, OSHA should examine the curricula of courses developed under NIEHS grants.

d. The number of hours of training as prescribed by OSHA for training of emergency responders is inadequate to appropriately teach them the health and safety material required for their protection.

e. Section e. applies only to fire fighters and certain other emergency personnel who are in the following ten categories:

(1) Full-time career fire fighters and other emergency personnel who are members of a local or state agency or an organized department with statutory responsibility for response to hazardous materials incidents on demand at any location;
(2) Paid part-time, seasonal, or reserve fire fighters or emergency personnel (Included are those paid an annual stipend or on a per hour basis. Excluded are those receiving only indirect compensation such as insurance, retirement, etc. Also excluded from this section are industrial personnel whose full-time job is not chemical emergency response);
(3) Unpaid part-time, seasonal, or reserve fire fighters or emergency personnel;
(4) Full-time fire fighters who are organized as industrial fire brigades employed by a corporate body or a contractor who, as a function of their employment, are expected to react or respond to hazardous materials incidents;
(5) Municipal police officers;
(6) Police emergency services;
(7) County police;
(8) Public safety officers;
(9) State troopers/highway patrol; and
(10) Sheriffs.

Chemical emergency responders covered by 1910.120, but not included in the above ten categories are not covered by section e. of this document.

For employees who are emergency responders and who fall within the above ten categories, the program shall include a means of assuring professional qualification in performing required emergency response. An example which could be appropriate is NFPA Standard 472, Professional Competencies of Responders to Hazardous Materials Incidents, with the following additions:

(1) Employee rights and employer responsibilities;
(2) Health and safety effects of exposure;
(3) Clarification of "reserved" sections;
(4) Replacement of the term "authority having jurisdiction" with OSHA (The subcommittee has concerns about the use of this term. The subcommittee does not intend that the term ever serve to limit the health and safety protection of the employees.); and
(5) Health and safety information and training appropriate for their role and responsibility comparable to that found in the 29 CFR 1910.121 proposed rule for site workers of equivalent exposure, as outlined in the following course content for awareness/operation levels and technician/specialist levels.

2. Specific Course Content: Awareness/Operational Levels (as taken from 1910.121[h][2])Specific Course Content: Awareness/Operational Levels (as taken from 1910.121[h][2])

At a minimum, the awareness/operational level courses shall include the following topics where they are applicable to the job to be performed:

a. Overview of applicable paragraphs of 29 CFR 1910.20

b. Employee rights and responsibilities under OSHA and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) [as amended]

c. Overview of relevant chemical exposure to hazardous substances (i.e., toxics, carcinogens, irritants, sensitizers, etc.)

d. Overview of the principles of toxicological and biological monitoring

e. Use of monitoring equipment with hands-on practice

f. Overview of site hazards including fire and explosion, confined spaces, oxygen deficiency, electrical hazards, powered equipment hazards, and walking-working surface hazards

g. The contents of a safety and health plan for incidents

h. Use of personal protective equipment and the implementation of the personal protective equipment program

i. Work practices that will minimize employee risk from incidents

j. Hands-on field exercises and demonstrations

k. Emergency response planning and response, including first aid

l. Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances

m. Decontamination programs and procedures

n. Safe use of engineering controls and equipment

o. Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems

3. Specific Course Content: Technician/Specialist Level (as taken from 1910.121[h][1])Specific Course Content: Technician/Specialist Level (as taken from 1910.121[h][1])

At a minimum, the training courses required for the technician/specialist level for emergency response shall include the following topics where they are applicable to the job to be performed:

a. Overview of the applicable paragraphs of 29 CFR 1910.120

b. Effect of chemical exposures to hazardous substances (i.e., toxicity, carcinogens, irritants, sensitizers, etc.)

c. Effects of biological and radiological exposures

d. Fire and explosion hazards (i.e., flammable and combustible liquids, reactive materials)

e. General safety hazards, including electrical hazards, powered equipment hazards, walking-working surface hazards, and hazards associated with hot and cold temperature extremes

f. Confined space, tank and vault hazards, and entry procedures

g. The incident command system including the assignment of responsibility for the health and safety of emergency responders

h. Specific safety, health, and other hazards that are to be addressed

at an incident and in the general safety and health plan for incidents

i. Use of personal protective equipment and the implementation of the personal protective equipment program

j. Work practices that will minimize employee risk from incident hazards

k. Safe use of engineering controls and equipment and any new relevant technology or procedure

l. Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances

m. The contents of a model safety and health plan for incidents

n. Use of monitoring equipment with hands-on practice

o. Implementation and use of an informational program

p. Drum and container handling procedures and the elements of a spill containment program

q. Selection and use of material handling equipment

r. Methods for assessment of risk and handling of radioactive wastes

s. Methods for handling shock-sensitive wastes

t. Laboratory waste pack handling procedures

u. Container sampling procedures and safeguards

v. Safe preparation procedures for shipping and transport of containers

w. Decontamination program and procedures

x. Emergency response plan and procedures, including first aid

y. Safe site illumination levels

z. Site sanitation procedures and equipment for employee needs

aa. Review of the applicable appendices to 29 CFR 1910.120

bb. Sources of reference, additional information, and efficient use of relevant manuals and hazard coding systems

cc. Principles of toxicology and biological monitoring

dd. Employee rights and responsibilities under OSHA and CERCLA as amended.

C1B: The Public and Facility (Off-Site, Full-Time) Emergency Response guidance material which is the product of that Work Group during the March 1994 Work Shop.

The following minimum general criteria apply to all training providers. The minimum generic training curriculum for Public and Facility Safety population identified in 29 CFR 1910.120 is addressed in the section that follows this one.

Assumptions
Training programs must be designed on the basis of the needs assessments of the hazardous waste site, RCRA/TSD site, and emergency response operations. In these criteria, the needs assessment is based upon and must be consistent with the OSHA regulations under 29 CFR 1910.120.

Instructors
Each instructor shall be deemed competent on the basis of previous documented experience in his or her area of instruction, successful completion of a train-the-trainer program specific to the topics he or she will teach, and an evaluation of instructional competence by the training director to assure compliance with NFPA 1041 or its equivalent to assure compliance which meets jurisdictional needs.

Also, instructors shall be required to maintain professional competency by participating in continuing education or professional development programs and/or by successfully completing an annual refresher course and having an annual review by the training director. At a minimum, the review process shall include observation of instructor delivery by the training director, review of observations with the trainer, and an analysis of the instructor performance evaluations completed by the students during the previous year. The refresher training should address those new areas that would allow for the maintenance of state of the art training.

Course Materials
All course materials including but not limited to trainee manuals, instructors' manuals, audio-visual aids, handouts, demonstration equipment, hands-on equipment, and other factors, shall be approved by the training director and used by the training provider. All course materials must meet at a minimum those relevant standards such as OSHA and NFPA 471, 472, 473, 1500, and 600 for Industrial Fire Brigades.

Course materials must be reviewed and updated at least annually. Course equipment must be in good working order and properly maintained.
All written and audio-visual materials in training curricula shall be peer reviewed by technically competent outside reviewers or by a standing advisory committee. These reviewers shall, at a minimum, possess expertise in the following disciplines: occupational health, industrial hygiene and safety, chemical/environmental engineering, worker education, and emergency response, as appropriate. One or more reviewers should be an experienced worker representing those to whom the training is directed.

The program for recruiting and selecting students, at a minimum, should include

assurance that the students recruited are or will be involved in work where hazardous materials emergency response is likely and that they already possess the necessary skills of emergency response, including necessary basic training including and pre-requisite skills before advancing to the next level.

Definitions

Emergency Responder

An emergency responder for purposes of this provision is a full-time career emergency responders and other emergency personnel who are members of a local or state agency or an organized department with statutory responsibility **or authorization** for response to hazardous materials incidents on demand without regard to location;

A paid part-time, seasonal, or reserve emergency responders or emergency personnel (Included are those paid an annual stipend or on a per hour basis. Excluded are those receiving only indirect compensation such as industrial personnel whose full-time job is not emergency response);

Unpaid part-time, seasonal, or reserve emergency responders or emergency personnel;

Full-time emergency responders who are organized as industrial fire brigades employed by a corporate body or a contractor who, as a function of their employment, are expected to react or respond to hazardous materials incidents;

For employees who are emergency responders and who fall within the above categories, the program shall include a means of assuring professional qualification in performing required emergency response.

An example which could be appropriate in addition to the NIEHS Minimum General Criteria is the NFPA Standard 472, Professional Competencies of Responders to Hazardous Materials Incidents.

First Responder Awareness

First responders at the awareness level are personnel who are likely to discover or witness a hazardous materials emergency or, in the course of their normal duties, may be the first persons on the scene of an emergency involving hazardous materials. First responders at the awareness level are expected to recognize that hazardous materials are present, protect themselves, call for trained personnel, and secure the area. The most important duty of these personnel is to make proper notification to begin the emergency response sequence. The first responders' role at this level should involve no potential for their exposure to hazards related to an incident.

First Responder Operations

First responders at the operations level are those persons who respond to releases or potential releases of hazardous materials as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release. They shall be trained to respond in a defensive fashion to control the release from a safe distance and keep it from spreading.

Hazardous Materials Technician

Technicians are those persons who respond to releases or potential releases of hazardous materials for the purpose of controlling the release. They are more aggressive than first responders at the operations level in that they will approach the point of release to plug, patch, or otherwise stop the release of a hazardous materials substance. They are expected to use specialized chemical protective clothing and specialized control equipment.

Incident Commander
The incident commander is the person responsible for all decisions relating to the management of an incident and is in charge of the incident site. This is the equivalent to the on-scene incident commander as defined by OSHA 1910.120.

EMS Level 1
Emergency medical service responders Level 1 are persons who, in the course of their normal duties, may be called on to perform patient care activities in the cold zone at a hazardous materials incident. EMS responders Level 1 shall provide prehospital care *only* to those individuals who no longer pose a significant risk of secondary contamination.

EMS Level 2
Emergency medical services responders Level 2 are persons who, in the course of their normal activities, may be called on to perform patient care and decontamination activities in the warm zone (the area where personnel and equipment decontamination and hot zone support take place) at hazardous materials incidents. Level 2 responders are called on to provide care to individuals who still pose a significant risk of secondary contamination. In addition, personnel at this level shall be able to coordinate EMS activities at a hazardous materials incident and provide medical support to and decontamination of hazardous materials response personnel.

First Responder Operations level
First responders at the operational level are those persons who respond to releases or potential releases of hazardous materials as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release. They shall be trained to respond in a defensive fashion to control the release from a safe distance and keep it from spreading.

Consensus items

a. Emergency responder's training programs should be included under part (c) of OSHA's proposed 29 CFR 1910.121. This recommendation includes all emergency responders both public and private.

b. A minimum acceptable level of training and course content must be defined based upon a thorough task analysis. Such a program shall be tiered to the extent required of emergency response (e.g., first responder, hazardous material technician, incident management, emergency medical technician, etc.). The program shall also address the specific issues as identified by the NIEHS through its hazardous waste worker training grants program, as follows:

Training and Curriculum

This document identifies the curriculum required of emergency response organizations and training providers when providing direct training or curriculum for emergency responders to hazardous materials incidents. Specifically it addresses the curriculum for emergency responders at the first responder operations level, hazardous materials technicians, incident commanders emergency medical technicians, and off-site specialist employees.

Purpose

The purpose of this general criteria document is to specify minimum competencies for emergency responders to hazardous materials incidents. The criteria document is a minimum guideline and should not be used to restrict or limit in any way efforts that may go well beyond these minimum criteria elements.

First Responder at the Operational Level

Emergency responders at the First Responders Operational level shall be trained to meet all of the minimum general requirements at the operational levels including the training requirements required to meet federal Occupational Safety and Health Administration (OSHA), state and local occupational health and safety regulations and the U.S. Environmental Protection Agency (EPA) requirements, whichever are appropriate for their jurisdiction.

The goal of the curriculum at the operational level shall be to provide first responders with the knowledge and skills to perform emergency response tasks safely. Therefore, in addition to being competent at the awareness level, the first responder at the operational level shall be able to:

Legal rights and Responsibilities

The First Responder should have a thorough understanding of the regulations and various Federal, state and local regulations that impact directly upon the safety and health of emergency responders at hazardous materials incidents.

The First Responder should be able to:

Identify OSHA standards addressing the safety of hazardous materials emergency responders

Identify the agency responsible for enforcing 29 CFR 1910.120 in their jurisdiction

Describe the two types of emergency response plans

List three organizations that have developed voluntary worker protection standards

Explain how requirements described in 29 CFR 1910.120 are enforced in their jurisdiction

Identify the amount of training required by 29 CFR 1910.120 for their level of responsibility

Describe medical surveillance program as required by OSHA regulations

List the elements of a personal protective equipment (PPE) program required by 29 CFR 1910.120

Describe the two types of Right-to-Know Laws and the purpose of each

Explain why employee compliance with safety and health standards is important

Describe how NIOSH Health Hazard Evaluations are conducted

Explain the Right to Refuse Work provisions of the OSH Act

Describe three or more types of worker protection clauses

List the legal options available to emergency responders who are injured in the line of duty

List the requirements of occupational health and safety programs created to protect the emergency responder, including Lockout/Tagout, Confined Space, Respiratory Protection, Hazard Communication and Workers Compensation.

Common Alarms

The presence of hazardous materials in the fire fighting environment and the First Responders role in such incidents in critical to the safety and health of emergency responders. First Responders should be able to:

Describe how various common alarms involve hazardous materials

Explain why the ability to recognize and identify hazards is important to First Responders

Explain how the location of an incident may indicate the type and quantity of hazards present

Discuss some of the hazards involved with specific industries

Discuss the tasks involved in a standardized approach to incidents involving hazardous materials

Safety and Health

The First Responder must be knowledgeable with the routes of chemical exposure, various effects of exposure, preventative strategies, and medical surveillance. First Responders should be able to:

Be familiar the four major routes of chemical exposure/entry

Describe the toxic effects on the body that may result from exposure

List at least five type of biological hazards

Define "medical surveillance"

Identify the elements of medical surveillance

Explain why medical surveillance is important to First Responders

Discuss the requirements for medical surveillance under the applicable OSHA and EPA standards.

Discuss the requirements for Blood borne pathogens/infectious control program under the applicable standards

Define: TLV, PEL, STEL, IDLH

Explain the difference between chronic and acute exposure

Hazardous Materials

(a) Recognition and Identification

First Responders should be knowledgeable of the basic clues that may help them detect the presence of hazardous materials during an emergency. First Responders should be able to:

List four basic clues to identify hazardous materials

Describe the Department of Transportation system of placarding

Recognize the Department of Transportation placards and labels and describe the hazards represented

Describe the NFPA 704 Marking System

Identify the following highway cargo tanks by shape and list at least one commodity carried in each:

Pressure cargo tank
Low pressure cargo tank
Non-pressure cargo tank
Corrosive liquid tank
Cryogenic liquid cargo tank
Tube trailer
Dry bulk commodity carrier

Identify the following rail tank cars by shape and list at least one commodity carried in each:

Pressure tank car
Non-pressure tank car
High pressure tank car
Corrosive liquid tank car
Cryogenic liquid tank car
Covered hopper car
Ton container car

Identify the following tank containers by shape
Non-pressure tank containers
Pressure tank containers

Identify non-bulk containers
Bags
Bottles
Drums

(b) Basic Principals of Chemistry

First Responders should be familiar with basic chemical and physical properties of hazardous materials. This knowledge will assist them in predicting how materials and their containers will react in an incident and assist in determining the possible danger to response personnel and civilian populations. The First Responder should be able to:

Recognize the three states of physical matter

Define:
Vapor pressure
Flash point
Lower and upper explosive limits
Specific gravity
Solubility
Vapor density

Anticipate the outcome of a hazard given the hazardous materials involved in a provided scenario

Describe the factors affecting the rate of chemical reactions

State the relationship between the Fahrenheit and Centigrade temperature

Describe how the pH scale can be used to assess the hazards of acids and bases

Discuss three types of radiation and the methods for protecting against exposure

Personal Protective Equipment
The First Responder should be able to describe the types of personal protective clothing and equipment (PPE) worn by First Responders and explain the limitations of this gear including decontamination, inspection, and storage.
The First Responder should be able to:

Explain the limitations of structural fire fighting gear

Describe the types of respiratory equipment

Explain the use, functions and limitations of self-contained breathing apparatus (SCBA)

Describe decontamination procedures necessary from un-intentional exposures (rather than the decontamination of haz-mat technicians)

Explain when and why PPE should be inspected

Describe PPE storage methods

Scene Management
The First Responder should be knowledgeable of importance of incident management systems in hazardous materials emergency response. The First Responder should understand their roles and responsibilities in a typical incident management system and be able to:

Identify the function of sectors or divisions/groups within the jurisdictions of ICS

Explain the importance of scene management at a hazardous materials incident

Identify the major common function of the jurisdiction's command system

Identify the major command functions of an incident management system

Identify the functions of sectors within the incident management system

List the areas or functions that might be found within each zone

Define Hot, Warm, and Cold Zones

Describe the First Responder's initial actions on arriving at an incident

Identify specific roles for First Responders in h/m incidents

Provide an overview of decontamination procedures

Provide an overview of termination procedures

Explain why post-incident analysis and evaluation is a necessary element of scene management

Pre-Incident Management

The First Responder should understand the importance of preparing and planning for hazardous materials incidents before they occur. First Responders should understand the specific steps that should be followed and the types of information that should be included in developing comprehensive pre-plans. The First Responder should be able to:

State the objectives of pre-incident planning

Explain the process for developing a pre-incident plan

List the types of information needed in order to assess risk

Explain how to assess community vulnerability

List resources that may be considered when pre-planning

Describe environmental factors that should be considered when pre-incident planning

Hazardous Materials Emergency Response Incident Management

The curriculum for incident management must prepare an individual who may be required to take command at a hazardous materials event, particularly during the early stages of the incident. The curriculum must at a minimum address risk assessment, management of basic tasks at a hazardous materials incident and the minimum general criteria elements identified for First Responders.

Upon completion of these minimum general criteria elements the individual should be able to:

Describe the purpose of an incident management system

Define the management concepts that apply to an incident management system

Identify the major components of an incident management system

List at least three agencies/laws that pertain to incident management at hazardous materials incidents

Briefly explain how command is established

Explain how to assess the hazards at an incident and evaluate the resources needed

State the guidelines for balancing risks and benefits when determining a course of action

Discuss situations when protecting-place may be an alternative to evacuation

Describe the difference between strategic goals and tactical objectives

Identify at least one method for tracking personnel at an incident scene

Explain how command is transferred

Command Staff
Upon completion of this minimum general criteria element, command staff should be able to:

Describe the role and responsibilities of the Safety Officer

List at least five areas monitored by the safety officer

List two or more concerns that might be included in a Safety Officer's follow up report after an incident

Describe the role and responsibilities of the Liaison Officer

List at least five state and local agencies that may respond to hazardous materials incidents

List at least three federal agencies that may respond to hazardous materials incidents

List at least two private agencies that may respond to a hazardous materials incident

Describe the role and responsibilities of the Public Information Officer

Structuring the Response
Upon completion of this minimum general criteria element command staff should be able to:

Identify the terms and staff titles applied to the components of his or her Department's Incident Management system

Explain how different command levels are implemented as an incident grows in complexity

Describe the purpose and responsibility of the Planning Section

Identify three or more units that may be part of the Planning Section

Describe the purpose and responsibilities of the Logistics Section

Describe the purpose and responsibilities of the Finance Section

Identify two or more units that may be in the Finance Section

Describe the purpose and responsibilities of the Operations Section

Identify at least three units that maybe part of the Operations Section

The Hazardous Materials Sector/Group
Upon completion of this minimum general criteria element command staff should be able to:

Identify the staffing requirements for the major functions within the Hazardous Materials sector/group

Describe the purpose and responsibilities of the Site Control function

Define Hot, Warm, and Cold Zones

Describe the purpose and responsibilities of the Hazardous Materials Safety Officer

List five or more common hazards at hazardous materials incidents

Describe the purpose and responsibilities of the Research function

Describe the purpose and responsibilities of the Entry function

Describe the purpose and function of the Decontamination function

Explain how a decontamination plan is developed

Define the types of chemical protective clothing

List three factors that determine field selection of protective clothing and self-contained breathing apparatus

Termination of the Incident
Upon completion of this minimum general criteria element command staff should be able to:

Identify the jurisdiction's role in incident cleanup

Identify the concerns that should be addressed when concluding the fire department's activities at the site

Describe how hazardous waste is handled during the termination phase

List three follow-up measures that will help protect the health and safety of personnel responding to hazardous materials incidents

List at least five items that can be used to document the fire department's activities at hazardous materials incidents

List five concerns that should be addressed during a post-incident analysis

Provide an overview of the jurisdiction's cost recovery laws and regulations

Hazardous Materials Emergency Response Emergency Medical Services

These curriculum elements address the concept of emergency medical service as applied to hazardous materials incidents. Students are also introduced to the relevant laws and standards that govern emergency care at hazardous materials operations.

Upon completion of this program, emergency medical responders will be able to:

Define Ahazardous materials@ as used in this training program

State the objectives of the Superfund Amendments and Reauthorization Act of 1986 (SARA), 29 CFR 1910.120, and 40 CFR 311

List three methods to ensure personnel safety at a hazardous materials incident

Explain the pre-incident responsibilities of EMS personnel

Describe the on-scene responsibilities for EMS providers

EMS and Scene Management

These elements cover the procedures, precautions, and actions that should be taken when EMS personnel arrive at the scene of a hazardous materials incident. Some of the information (e.g., Scene Management) assumes that EMS personnel are the first to arrive at the scene.

Upon completion of this unit, participants will be able to:

Discuss pre-incident information and equipment requirements for EMS response

List what clues are important when approaching an incident scene

Describe the basic elements of the incident management system

Describe the layout of Hot, Warm and Cold zones used at a hazardous materials incident

List the components and actions that are part of an effective size-up

Discuss the safety considerations for attempting a rescue at a hazardous materials scene

These curriculum elements describe the role of EMS in providing medical support to other emergency responders. The curriculum focuses on health-related problems that may occur as a result of using personal protective clothing. Upon completion of this unit, participants will be able to:

Describe the major tasks of EMS providers at a hazardous materials incident

List the limitations of chemical protective clothing

Discuss the health risks associated with PPE use at a hazardous materials incident

Describe the elements of pre-and post-entry assessments

These curriculum elements address toxic hazardous materials capable of harming living organisms. Various toxic effects and factors enhancing or limiting those effects are also discussed. Upon completion of this unit, participants will be able to:

Explain how the concentration of a substance and the duration of exposure determine toxic effect

Distinguish between acute and chronic exposure

Define the following terms:

- LD_{50}
- LC_{50}
- TLV
- PEL
- STEL
- IDLH

List the seven categories of toxic substances

Describe the three major routes of entry

Cite one toxic effect of each of the specific organ systems

Describe at least one hazard for each DOT hazard class

Patient Treatment

This unit discusses patient treatment from several different approaches, including signs and symptoms, organ systems, and specific agents.

Upon completion of this unit, participants will be able to:

Describe how to perform gross decontamination on an exposed patient

Perform a thorough assessment of patients who have been contaminated with hazardous materials

Provide appropriate supportive care depending on the organ system affected

Describe the specific care that should be given for exposure to:
- Asphyxiant
- Irritants
- Organophosphate insecticides
- Smoke inhalation
- Heat and cold injuries

Safely transport patients who have been exposed to hazardous materials

Hazardous Materials Technician Level

Hazardous materials technicians shall be trained to meet all requirements at the First Responder Operation level and at the technician level. In addition, hazardous materials technicians shall meet the training requirements and be provided medical surveillance in accordance with Federal Occupational Safety and Health Administration (OSHA), local occupational health and safety regulatory and the U.S. Environmental Protection Agency (EPA) requirements.

The goal of training curriculum at the technician level is to provide the hazardous materials technician with the knowledge and skills to perform the following tasks safely.

Properties of Hazardous Materials
The Technician level emergency responders in order to accomplish their objectives in a safe and healthful manner should have a solid foundation in the properties of hazardous materials. The Technician upon completion of training, should be able to:

Discuss how matter can change among the three physical states

Define the various terms used to describe the physical and chemical properties of materials

Identify the physical and chemical properties of materials by U.S. DOT Hazard class

Describe the process of polymerization and the effect of inhibitors on the process

Explain how gasses are compressed and liquefied

Discuss why the concept of vapor pressure is particularly important to

hazardous materials teams

Distinguish between water soluble and water insoluble substances

Describe the action of oxidizers in reactions and cite at least two examples

List three types of radioactivity and the appropriate protective measures that minimize exposure to each

Discuss the properties of pH, strength, and concentration relative to acids and bases; using this information, evaluate the corrosively of various acids and bases

Basic Chemistry

Define common chemistry terms

Describe how chemicals are grouped in the Periodic Table

List the elements in the Periodic Table that tend to be most reactive

Describe the basic structure of an atom

Explain how chemicals bond

Describe the process of a chemical reaction

Explain how the rate of a reaction can be changed

Define saturated, unsaturated, and aromatic hydrocarbons

Describe how a hydrocarbon derivative is made

Describe the properties of three families of hydrocarbon derivatives

Detection Devices

Discuss the purpose and use of detection and monitoring devices

Discuss the factors influencing the quality of instrument readings

Discuss the considerations when interpreting readings

Identify the basic components of combustible gas indicators

List five situations in which an oxygen deficient atmosphere should be suspected

Discuss the significance of finding an indication of an oxygen deficient

atmosphere

Describe the purpose of the ultraviolet lamp in photo ionization detectors

Discuss the principals of chemistry underlying the operation of organic vapor analyzers

Describe uses for organic vapor analyzers in the survey and gas chromatography (GC) modes

Give examples of radiation detection devices that are appropriate for each of the three types of radiation discussed in this unit

Recognition and Identification

Identify U.S. Department of Transportation placards

Explain United Nations (UN) Classification and Identification numbers

Identify DOT labels

Identify Environmental Protection Agency (EPA) labels

Explain the National Fire Protection Association (NFPA) 704 marking system

Explain the U.S. military marking system

Recognize hazardous highway cargo by the design of the carrier

Recognize hazardous rail cargo by the markings and fittings on tank cars

Describe various Types of non-bulk packaging

Recognize hazardous materials stored at fixed sites by the design of the containers

Work Area Hazards

List 10 or more site hazards

Describe the ways in which each of these site hazards can be minimized

List 5 or more operational hazards

Describe the ways in which each of these operational hazards can be minimized

Pre-Incident Planning

Discuss three reasons for pre-incident planning

Discuss the importance of pre-incident planning in transportation corridors

List at least five areas assessed in pre-incident planning

Discuss the roles of various federal, state, and local agencies in local hazardous materials emergency response

Exposure and the Body's Response

Discuss the factors that influence the toxic effects of hazardous materials

Describe the process of exposure and the resulting effects of toxicants

Understand the various standards, guidelines, and units of measure that are designed to limit exposure to hazardous materials

Identify the areas of the respiratory tract that are particularly susceptible to effects of various toxicants

Discuss the effects of toxic substances on the cardiovascular system as well as signs and symptoms of these effects

Discuss the effects of toxic substances on the liver

Recognize the signs and symptoms of effects on the urinary and reproductive systems that may be caused by exposure to hazardous materials

List the effects of toxic substances on the skin

Discuss the various responses of the nervous system to toxic exposures

Medical Surveillance

Define medical surveillance

Discuss how a medical surveillance program helps prevent work-related illness and injury

List the elements of medical surveillance

Discuss the three main purposes of pre-placement testing and medical examination

List the types of periodic medical exams

Describe the process for reviewing a medical surveillance program

On-Scene Emergency Medical Care

Recognize signs and symptoms that may indicate exposure to hazardous materials

Evaluate situations requiring emergency decontamination of fire department personnel

Perform emergency decontamination

Provide emergency medical care in the event of skin or eye contamination with corrosives and other materials

Give examples of simple and chemical asphyxiant and appropriate emergency care procedures for each

Discuss acute hazards associated with specific respiratory irritants, such as nitrogen oxides, phosgene gas, and solvents

Describe emergency care to fire department personnel experiencing organophosphate toxicity

Discuss prevention and treatment of heat and cold injuries

Personal Protective Equipment

List the clothing and equipment components that make up the various chemical protective ensembles

Describe the factors to be considered in determining the minimum inventory of PPE for a hazardous materials team

Describe the types of protective clothing, their use, and limitations of each

List the guidelines for purchasing chemical protective clothing

List three actions that should be taken to examine PPE prior to purchase

List three NFPA chemical protective suit standards and their applications

Describe relevant specifications for other types of PPE

Describe how to identify NFPA-compliant products

List the basic steps in on-site selection of PPE

Describe the three types of hazard levels associated with selection of PPE

Describe the three types of hazard levels associated with PPE selection

Describe other hazards that impact PPE selection

Use chemical resistance data to select appropriate chemical resistant clothing

Describe how to apply chemical resistance data to determine PPE compatibility

Discuss reasons for downgrading or upgrading PPE

Define significant exposure

Describe methods for estimating PPE contamination levels and disposing of equipment

Cite considerations for selecting protective clothing in the field

Define degradation, penetration, and permeation and discuss how each of these affect personal protective clothing

Describe the differences between SCBA and SAR equipment

Identify types of SCBA

Describe areas to be covered in standard operating procedures for use of personal protective equipment

Describe procedures for the inspection, maintenance, and storage of chemical protective clothing

List measures that can be taken to minimize the risk of heat-related injuries

Basic Control Techniques

Identify five factors that should be evaluated during initial size-up

List at least three methods used to identify a hazard

List at least three factors that should be considered when assessing risk

Provide an overview of their response teams mission statement and standard operating procedures

Describe how foam blankets are used in vapor suppression

Explain dilution and neutralization

Describe how absorbents and adsorbents contain leaks

Describe how dams, dikes, diversion, and booms contain leaks

Identify materials for plugging and patching

Describe over packing as a control method

Describe how valve and shutoff control can stop releases from fittings

Explain how product transfer is accomplished

Describe the roles of local industry and the fire department in emergency response and termination

Apply a foam blanket for vapor suppression

Construct a dike

Plug or patch a leaking drum

Overpack a drum

Decontamination

Describe how contamination can be prevented

Discuss the purpose and types of contamination

Describe how personal protective equipment (PPE) becomes contaminated and the factors that affect the extent of contamination

Discuss the methods for testing the effectiveness of decontamination and the limitations of these methods

List the objectives of an effective decontamination plan

Describe the basic steps in decontamination ensembles that include either vapor-protective or liquid splash-protective suits

Incident Command and Termination

Explain why an Incident Command System is necessary

Identify the management concepts that are employed in an Incident Command System

List the major components of an Incident Command System

Draw the organizational structure of an Incident Command System

Describe the functions of each part of the Incident Command Structure

Explain, in detail, the Operations function within a hazardous materials Incident Command Structure

Describe how incident command is assumed and transferred

Highway Transportation of Hazardous Materials

Describe the type of carrier and material most commonly involved in highway hazardous materials incidents

Describe the type of information available from shipping papers and cargo tank markings

List two designations found on specification plates

List the five basic types of specification cargo tanks

Describe three or more characteristics of non-pressure cargo tanks

Describe three or more characteristics of low pressure cargo tanks

Describe three or more characteristics of pressure cargo tanks

Describe three or more characteristics of corrosive cargo tanks

Describe three or more characteristics of cryogenic cargo tanks

List three other types of cargo tanks that may carry hazardous materials

Identify three other types of cargo tanks that may carry hazardous materials

Identify the characteristics of the various materials used in the construction of cargo tanks

Identify cargo tank features designed to accommodate specific products

Locate loading/off loading piping and values and describe common causes of unintentional releases and basic handling procedures

List common problems and basis handling procedures associated with venting and safety relief devices used on cargo tanks

List two factors that affect the severity of tank damage

List four factors that affect tank metal ductility

List four factors that affect internal pressure cargo tanks

Identify and interpret the effect of cracks, dents, scores, and gouges

Properly inspect pressure cargo tanks for damage

Identify five or more materials used to plug and patch cargo tanks

Describe and oversee the safe implementation of four product removal methods

Rail Transportation of Hazardous Materials

Describe what is involved in a typical hazardous materials rail incident

Identify at least 5 of the 25 hazardous materials most commonly shipped by rail

Explain the entries found on shipping papers

Describe the purpose and location of tank car initials and number

Describe the purpose and location of specific markings

List and describe the characteristics of the four general categories of tank cars

Explain how non-pressure tank cars can be distinguished from pressure tank cars

Identify the two most common materials used to construct tank

Describe the uses of at least four features that may be added to tank cars

Identify the fittings used for loading and unloading tank cars

Identify the fittings for pressure and vacuum relief

Identify the fittings used for gauging innage and outage

Identify three types of miscellaneous fittings

Describe and perform basic leak control measures for loading and unloading fittings

Describe and perform basic leak control measures for pressure/vacuum relief fittings

Describe and perform basic leak control measures for fittings used for miscellaneous fittings

List two factors that affect the severity of tank damage

List four factors that affect tank metal ductility

List four factors that affect internal pressure of tank cars

Identify tank car cracks, dents, scores, gouges, wheel burns, and rail burns

Interpret the effect of a crack, dent, score, gouge, wheel burn, or rail burn on a tank car

Properly inspect a pressure tank car for damage

Use a tank car dent gauge

Complete a tank car damage assessment form

Identify four field product removal methods

Define "hot tapping" and "cold tapping"

Explain when product transfers are used

Describe the purpose of flaring and explain when this method is used
Explain when venting and burning is used

Additional perspective with regard to understanding and developing linkages between training programs for off-site, full-time emergency responders and the tasks they are expected to perform can be found in the Workbook: "Performing Job Task Analysis for the National Fire Protection Association Professional Qualifications Standards" issued in February 1992 by the NFPA Professional Qualifications Correlating Committee Task Force.

C2: Collateral Duty Emergency Response.

This workshop dealt with emergency responders who are NOT COVERED under section C(1)(e) of the NIEHS Minimum Criteria document. It addressed part- time industrial and transportation emergency responders (1910.120(q)) as well as uncontrolled site emergency response (1910.120(l)) and RCRA emergency response (1910.120(p)(8)). The workshop participants agreed that responders within these categories must be trained as specified by paragraphs (e) and (p) respectively, as well as that level of training defined by 1910.120(q)(6) as an emergency responder.

It is important to keep in perspective the levels of training defined by 1910.120(q)(6); First Responder Awareness, First Responder Operations, Hazardous Materials Technician and Hazardous Materials Specialist. There are clear duties within each of these levels and any of this training should not be used to permit workers to respond beyond their level of training or skill level.

As defined by 1910.120(q)(6), "Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident."

At levels beyond awareness, the role of ongoing training, drills, reviews, updates and site specific training is critical.

1. Consensus Items

   The emergency response subcommittee reached consensus on the following items:

   a. Emergency responders' training programs should be included under part (c) of OSHA's proposed 29 CFR 1910.121. This recommendation includes all emergency responders both public and private.

All emergency responders must attend training as defined by this section or the section covering Public Sector and Facility Responders. Unless excluded under section 1(e) below, emergency response programs must follow the course content for the level of response.

This includes all refresher programs. A reasonable amount of flexibility needs to be incorporated into the guidelines of refresher training in order to prevent repetitiveness and lack of attention on the part of both instructors and participants. Suggested topics to include in refreshers could be:

(1) Hands-on drills
(2) Evaluation of hypothetical releases
    These need to be varied in amount, location, type of chemical, major weather disturbances, etc.
(3) Evaluation of near misses, actual responses and lessons learned.

(4) Reference updates.
(5) Review modules.

b. A minimum acceptable level of training and course content must be defined. Such a training program shall be tiered to the extent required of emergency response (e.g., first responder, hazmat team member, hazmat specialist, etc.). The program shall also address the specific issues as identified by the NIEHS through its hazardous waste worker training grants program, as follows:

This committee will cover these consensus items under point (2), operations level training.

(1) Hazard recognition

(a) Nature of hazardous material
(b) Practical applications of hazard recognition, including related presentations on biology, chemistry, and physics

(2) Principles of toxicology, biological monitoring, and risk assessment

(3) Safe work practices and general site safety

(4) Engineering controls and hazardous waste operations

NOTE: Hazardous waste operations information is only relevant to emergency response as covered by paragraphs, 1910.120 (l) and/or 1910.120 ((p)(b).

(5) Site safety plans and standard operating procedures

(6) Decontamination practices and procedures

(7) Emergency procedures, first aid, and self rescue

(8) Safe use of field equipment

(9) Handling, storage, and transportation of hazardous wastes

(10) Use, care, and limitations of personal protective clothing and equipment

(11) Safe sampling techniques

(12) Rights and responsibilities of workers under OSHA and other related statutes concerning right to know, protection, compensation, and liability

(13) Medical monitoring requirements and issues

(14) Community relations.

As detailed in section (A) Assumptions of the Minimum General Criteria, this curriculum guideline is designed for mandated generic training. In addition, there are specific programs that need to be developed and implemented at each worksite. The following site specific items need to be provided and reviewed following the generic course.

1) The emergency response plan including site specific training plans.
   * Evacuation plans as required in 1910.38 and clarified in OSHA Instruction CPL 2-2.59, Inspection Procedures for the Hazardous Waste Operations and Emergency Response Standard, 29 CFR 1910.120, Paragraph (q): *Emergency Response to Hazardous Substance Releases.*

2) The hazard communication program.

3) The medical surveillance program.

4) The respiratory protection plan.

5) The personal protective equipment plan.

6) A review of all site-specific procedures to address all safety and health hazards.

7) Safe use of all engineering controls and equipment on site.

8) Names of personnel and alternates who are responsible for site safety and health.

c. When determining minimum criteria for training programs for emergency responders, OSHA should examine the curricula of courses developed under NIEHS grants.

d. The number of hours of training as prescribed by OSHA for training of emergency responders is inadequate to appropriately teach them the health and safety material required for their protection.

We can not overemphasize the need for continual training. We do not believe that the full curriculum can be achieved in the OSHA mandated hours. It is a dangerous assumption to mandate a specific number of hours and not continue reviews, updates, drills, site specific training and other training activities.

e. Section e. applies only to fire fighters and certain other emergency personnel who are in the following ten categories:

Emergency Response training for workers covered in the following list is not covered by this section. Training guidelines are covered in section C1B.

(1) Full-time career fire fighters and other emergency personnel who are members of a local or state agency or an organized department with statutory responsibility for response to hazardous materials incidents on demand at any location;

(2) Paid part-time, seasonal, or reserve fire fighters or emergency personnel (Included are those paid an annual stipend or on a per hour basis. Excluded are those receiving only indirect compensation such as insurance, retirement, etc. Also excluded from this section are industrial personnel whose full-time job is not chemical emergency response.)

(3) Unpaid part-time, seasonal, or reserve fire fighters or emergency personnel;

(4) Full-time fire fighters who are organized as industrial fire brigades employed by a corporate body or a contractor who, as a function of their employment, are expected to react or respond to hazardous materials incidents;

(5) Municipal police officers;

(6) Police emergency services;

(7) County police;

(8) Public safety officers;

(9) State troopers/highway patrol; and

(10) Sheriffs.

Chemical emergency responders covered by 1910.120, but not included in the above ten categories are not covered by section e. of this document.

Examples of sectors of workers not in the above 10 categories may include for example (but are not limited to):

Industrial workers with part time duties in chemical emergency response

Hospital workers
Service and maintenance

Housekeeping
Trades and building maintenance

Technical
Nurses
Lab, X-ray and specialty technicians

Transportation
Highway, Drivers, Railway, Warehouse

Water and Sewer workers
Waste water treatment plant

Department of Public Works

Maintenance

For employees who are emergency responders and who fall within the above ten categories, the program shall include a means of assuring professional qualification in performing required emergency response. An example which could be appropriate is NFPA Standard 472, Professional Competencies of Responders to Hazardous Materials Incidents, with the following additions:

(1) Employee rights and employer responsibilities;

(2) Health and safety effects of exposure;

(3) Clarification of "reserved" sections;

(4) Replacement of the term "authority having jurisdiction" with OSHA (The subcommittee has concerns about the use of this term. The subcommittee does not intend that the term ever serve to limit the health and safety protection of the employees.); and

(5) Health and safety information and training appropriate for their role and responsibility comparable to that found in the 29 CFR 1910.121 proposed rule for site workers of equivalent exposure, as outlined in the following course content for awareness/operation levels and technician/specialist levels.

2. Specific Course Content: Awareness/Operational Levels (as taken from 1910.121[h][2]). Specific Course Content: Awareness/Operational Levels (as taken from 1910.121[h][2])

This section is divided into two sections. Section 2.1 is for first responder awareness level and section 2.2 is for first responder operations level.

2.1 FIRST RESPONDER AWARENESS LEVEL

First responders at the awareness level are likely to witness or discover a hazardous substance release and be responsible for initiating an emergency response process by notifying the proper authorities of the release. They would take no further action. Further guidance on the role of awareness level training is included in: OSHA Instruction CPL 2-2.259, Inspection Procedures for the Hazardous Waste Operations and Emergency Response Standard, 29 CFR 1910.120, Paragraph (q): *Emergency Response to Hazardous Substance Releases*; and Occupational Safety and Health Administration Directorate of Compliance Programs HAZWOPER Interpretive Quips, March 1993 Version.

First responder awareness level shall have sufficient training in the following areas {from 1910.120(q)(6)(i)}:

(A) An understanding of what hazardous substances are, and the risks associated with them in an incident.
(B) An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
(C) The ability to recognize the presence of hazardous substances in an emergency.
(D) The ability to identify the hazardous substances if possible.
(E) 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.
(F) The ability to realize the need for additional resources and to make appropriate notifications to the communication center.

As a minimum, the first responder awareness level training workers under 1910.120(q)(6)(i) should consist of eight hours and include the following topics:

a. Overview of applicable paragraphs of 29 CFR 1910.120. Included is understanding of the role and limitations of first-on-the-scene personnel and procedure for notifying trained emergency responders.

b. Employee and employer rights and responsibilities under OSHA and other applicable health and safety regulations.

c. Overview of relevant chemical exposure to hazardous substances (i.e., toxics, carcinogens, irritants, sensitizers, etc.)

d. Overview of principles of toxicology, including routes of entry, dose-response relationship, chronic and acute effects.

e. Overview of hazards and the health and safety risks associated with them in an incident, including fire and explosion, confined spaces, oxygen deficiency, electrical hazards, powered equipment hazards, and

walking-working surface hazards. Included is the ability to recognize generic and industry-specific clues that may help detect the presence of hazardous materials during an emergency.

e. Work practices that will minimize employee risk from incidents.

f. Emergency response planning and response.

g. Requirements for medical surveillance, including the recognition of signs and symptoms of overexposure to hazardous substances.

h. Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems. Sources may include the DOT Emergency Response Guidebook, DOT placarding and labeling systems, shipping papers and Uniform Hazardous Waste Manifest, Association of American Railroads Emergency Action Guides and site specific references and resources.

2.2 FIRST RESPONDER OPERATIONS LEVEL

The following section is intended for first responder operations level. The HAZWOPER standard {from (q)(6)(ii)} defines this level of response as:

> "individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures."

First responders at the operations level shall have sufficient training in the following areas {from 1910.120(q)(6)(ii)} in addition to those listed for the awareness level:

(A) Knowledge of the basic hazard and risk assessment techniques.
(B) Know how to select and use proper personal protective equipment provided to the first responder operational level.
(C) An understanding of basic hazardous materials terms.
(D) 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.
(E) Know how to implement basic decontamination procedures.
(F) An understanding of the relevant standard operating procedures and termination procedures.

Workers performing emergency response at this level will need to be fully trained under other standards (such as Hazard Communication, Access to Records, Evacuation Plans, etc.). This curriculum is NOT meant to take the place of such training and may overlap with requirements of these standards. The following list is recommended guidelines for First Responder Operations Level training.

At a minimum, the awareness/operational level courses shall include the following topics where they are applicable to the job to be performed:

This list of recommended topics for operations level responders is a minimal list and will need to be expanded based on the industry and job titles of the participants in each particular class. A Minority believe that there is a potential danger in listing additional subjects because some trainers might use the list as an exclusive list of subjects to cover.

The committee emphasized that these topics need to be included "where they are applicable to the job to be performed" as stated in the original Minimum Criteria document.

a. Overview of applicable paragraphs of 29 CFR 1910.20

This is a misprint from 1910.121. The standard referred to here is 1910.120.

General introduction to HAZWOPER and definitions.
Major sections of HAZWOPER paragraph Q.
Requirements of HAZWOPER site specific emergency response plans.

b. Employee rights and responsibilities under OSHA and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) [as amended]

Give background and an overview of Occupational Safety and Health Act of 1970 and the responsibilities of OSHA.
Explain limitations of OSHA; minimal nature of OSHA standards. (Minority would delete).
Explain the employer's responsibility to provide a safe and healthy workplace under OSHA regulations.
Explain basic OSHA protection through Hazard Communication and Access to Records.
List other applicable OSHA standards.
Discuss limitations of OSHA's PELs.

Discuss other related statutes concerning worker protection, compensation and liability.
Describe basic aspects of community right to know.

Explain the relationship of NIOSH and OSHA.
Describe a NIOSH Health Hazard Evaluation.

c. Overview of relevant chemical exposure to hazardous substances (i.e., toxins, carcinogens, irritants, sensitizers, etc.)

The emphasis in this section is relevant chemical exposures and potential exposures during emergency response as listed in 121(h)(2)(iii).

d. Overview of the principles of toxicological and biological monitoring

Health hazards of the major chemicals participants work with and may potentially be exposed to during a chemical emergency.
Factors that are relevant to how great the risk a worker is exposed to (amount of chemical, time of exposure, concentration, etc.).
Describe the health hazards commonly associated with different major classes of chemicals.
Describe the major routes of entry
Describe the target organs for a chemical substance
Types of general health effects.
Distinguish between chronic and acute effects of chemical substances.
Basic familiarity with nature of carcinogen, mutagen and teratogen.

e. Use of monitoring equipment with hands-on practice

Understand the purpose, use and limitations of sampling instruments.
Use and limitations of colorometric tubes and other direct reading instruments.
General types of instruments that are available.
Measurement of oxygen content and explosive level
Limitations and use of 8-hour Time Weighted Averages and OSHA PELs.
Proper calibration of instruments.

f. Overview of site hazards including fire and explosion, confined spaces, oxygen deficiency, electrical hazards, powered equipment hazards, and walking-working surface hazards

Many of these topics are more appropriately covered with in depth discussion in specific training under the respective standards.

This section may include discussion of physical, chemical, radiological, ergonomic and biological hazards.
The hazards with changes in physical state.
Properties of compressed, cryogenic and liquified gasses.
Control of hazardous energy (lockout requirements for mechanical, hydraulic and other sources of energy).
Pressurized systems hazards.
Electrical hazards.
Working surfaces - Slip, trip, fall hazards.
Excavation hazards.
Heavy equipment hazards.
Heat/Cold stress review.
Ergonomics - Lifting, Material Handling.
Biological
Bloodborne pathogens.
Insect vectors (for example lyme disease).

Vermin (for example plague, hantavirus, rabies, etc.)

Handling, storage and transportation of hazardous chemicals.
Distinguish between water soluble and insoluble substances.
Basic principles of chemical incompatibility.
Describe the various physical states in which a chemical can be present in the work environment.
Describe the hazards that different forms of a chemical present.
Basic familiarity with lower and upper explosive limits.
Basic familiarity with vapor pressure and flash point.
Basic familiarity with vapor density and its application in an emergency.
Other relevant chemical properties (which may be listed on the MSDS or other resource).
Understand basic hazardous materials terms.

Minority did not want to list the above physical properties.

Basic types of radioactivity (alpha, beta, gamma and neutron).
Basic health hazards of radioactive substances.
Difference between external and internal exposure to radioactivity.
Basic control methods (time, distance and shielding).

g. The contents of a safety and health plan for incidents

The Emergency Response plan can be a section of the safety and health plan.
The Emergency Response plan shall include the following points (as specified in 1910.120(q)(2):

(1) Pre-emergency planning and coordination with outside parties.
(2) Personnel roles, lines of authority, training, and communication.
(3) Emergency recognition and prevention.
(4) Safe distances and places of refuge.
(5) Site security and control.
(6) Evacuation routes and procedures.
(7) Decontamination.
(8) Emergency medical treatment and first aid.
(9) Emergency alerting and response procedures.
(10) Critique of response and follow-up.
(11) PPE and emergency equipment.
(12) Emergency response organizations may use the local emergency response plan or the state emergency response plan or both, as part of their emergency response plan to avoid duplication.

See paragraph k in Section 2.2. above.

h. Use of personal protective equipment and the implementation of the personal protective equipment program

Review of PPE as the LAST control measure (after engineering controls etc.)
The purpose of respiratory protection.

The basic elements of a respiratory program.
Basic respirator selection criteria.
* Air Purifying Respirators.
* Supplied Air Respirators.
* Self Contained Breathing Apparatus.
Basic familiarity with terms such as IDLH, protection factor, oxygen deficiency.
Proper fit testing procedures.

Methods for protection of each route of entry.
Selection criteria and limitations of PPE.
* Basic understanding of Permeation, Penetration and Degradation
* Limitations of test methods. (Minority recommendation)
* Definition of breakthrough time.
EPA definitions, differences and limitations of levels of protection.
Criteria for choosing protective equipment (task, chemical used, amount, etc.)
Appropriate methods for donning and doffing PPE
Proper procedures for inspection, maintenance and storage of PPE.
Describe the signs and symptoms of heat stress.
Demonstrate appropriate communication signals while wearing PPE.

i. Work practices that will minimize employee risk from incidents

Describe safe work practices that will minimize employee risk that are appropriate to each industry.
Describe and demonstrate (when possible) work practices to minimize employee risk from emergency incidents, that are specific to the worksite. For example:
* Proper materials handling and loading of hazardous substances.
* Avoiding direct contact with hazardous materials.
* Proper housekeeping.
* Segregation and separation of hazardous materials.

j. Hands-on field exercises and demonstrations

Necessity to use the buddy system.
Safe use and ability to check out a self contained breathing apparatus.
Safe donning and doffing of an SCBA.
Proper wearing of protective suits, gloves and boots.
Proper taping techniques.
Practice of field techniques.
Proper decontamination procedures.
Evaluation and critique of actual hands-on exercise.
* For example video taping.
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 function within an assigned role in the Incident Command System.

k. Emergency response planning and response, including first aid

Describe the major elements of an emergency response plan.
Review of standard operating procedures and termination procedures.
Be familiar with and be able to discuss community emergency response plans.
Relation between exposures within the workplace and in the community.

Be able to function within an assigned role in an Incident Command System.
Know how to implement an emergency response plan.
How to evaluate a site emergency response plan.
Describe which actions can and can not be safely taken.
Basic elements of self rescue.

l. Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances

Basic sections of Paragraph F of the HAZWOPER standard
Benefits and limitations of medical surveillance programs.
Review of routes of entry, target organs, chronic and acute symptoms.

Minority view was to include the role of pre-existing medical conditions in the ability to function as an emergency responder.

m. Decontamination programs and procedures

See section (j) above.
Operational definitions of clean zone, transition or decontamination zone, work or hot zone.
Basic job tasks within each zone.
Proper disposal of field equipment.
Removal of gross contamination.
Proper procedure to remove PPE.
Protection of decontamination workers.
Disposal of waste water and used equipment.
Requirements of OSHA 1910.120 (k).

n. Safe use of engineering controls and equipment

Participants should be knowledgeable of the hierarchy of controls.
Relationship of pre-planning and engineering controls to prevent and/or minimize potential exposures.

o. Sources of reference, efficient use of relevant manuals, and knowledge of hazard coding systems

Describe the DOT system of placarding.
Recognize the DOT placards, labels and describe the hazards represented.
Describe the DOT Emergency Guide given the DOT number.

Describe the common labeling systems such as the NFPA 704 marking system, HMIS, etc.
Basic familiarity with MSDSs.
Basic familiarity with the NFPA Guide to Hazardous Materials and at least one other chemical resource.
Limitations of resource materials.
Site specific references and resources.
Be familiar with other basic references such as ACGIH, CHRIS, RTECS.

Basic familiarity with information provided in the NIOSH Pocket Guide and the New Jersey Fact Sheets.

3. Specific Course Content: Technician/Specialist Level (as taken from 1910.121[h][1]). Specific Course Content: Technician/Specialist Level (as taken from 1910.121[h][1])

The following section is intended for Hazardous Materials Technicians. The HAZWOPER standard {(q)(6)(iii)} defines this level of response as:

> "individuals who respond to releases or potential releases of hazardous substances for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance.

Hazardous material technicians shall have sufficient training in the following areas {from 1910.120(q)(6)(ii)}:

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

Workers performing emergency response at this level will need to be fully trained at the Awareness and Operations level as well as under other standards (such as Confined Space and Lock Out/Tag Out, etc.). This curriculum is NOT meant to take the place of such training. The following list is recommended guidelines for Hazardous Materials Technician training. This list of recommended topics for technician level training is a minimal list and will need to be expanded based on the

industry and job titles of the participants in each particular class.

The workshop committee determined that specialist level training was beyond the expertise of the group, should be left open for further comment and the work of the Public and Facility workshop should be examined.

> At a minimum, the training courses required for the technician/specialist level for emergency response shall include the following topics where they are applicable to the job to be performed:

The committee emphasized that these topics need to be included "where they are applicable to the job to be performed" as stated in the original Minimum Criteria document.

a. Overview of the applicable paragraphs of 29 CFR 1910.120

See paragraphs b, l, and m in Section 2.2 above.

b. Effect of chemical exposures to hazardous substances (i.e., toxicity, carcinogens, irritants, sensitizers, etc.)

See paragraphs d and f in Section 2.2 above.

c. Effects of biological and radiological exposures

See paragraphs d and f in Section 2.2 above.

d. Fire and explosion hazards (i.e., flammable and combustible liquids, reactive materials)

See paragraphs f in Section 2.2 above.

e. General safety hazards, including electrical hazards, powered equipment hazards, walking-working surface hazards, and hazards associated with hot and cold temperature extremes

See paragraphs f in Section 2.2 above.

f. Confined space, tank and vault hazards, and entry procedures

Definition of confined spaces.
Dangers that confined spaces present.
Describe preliminary steps for safe entry.
Major components of a confines space entry training program.

This is only awareness training. If workers could work/respond in confined space areas, they need full confined space training as mandated by 1910.146.

g. The incident command system including the assignment of

responsibility for the health and safety of emergency responders

See paragraph k in Section 2.2 above.

h. Specific safety, health, and other hazards that are to be addressed at an incident and in the general safety and health plan for incidents

i. Use of personal protective equipment and the implementation of the personal protective equipment program

See paragraph i in Section 2.2 above.

j. Work practices that will minimize employee risk from incident hazards

See paragraphs j in Section 2.2 above.

Techniques for minimizing exposure during an emergency response.
Advanced control, containment, and/or confinement operations.
Regular drills to the worst possible case scenarios.
Drills (if no response has occurred) should take place at least quarterly.

k. Safe use of engineering controls and equipment and any new relevant technology or procedure

See paragraphs m in Section 2.2 above.
Review 1910.120(o) on new technology.

l. Content of the medical surveillance program and requirements, including the recognition of signs and symptoms of overexposure to hazardous substances

See paragraphs l in Section 2.2 above.

m. The contents of a model safety and health plan for incidents

See paragraphs k in Section 2.2 above.

n. Use of monitoring equipment with hands-on practice

See paragraphs e in Section 2.2 above.

o. Implementation and use of an informational program

p. Drum and container handling procedures and the elements of a spill containment program

Basic drum emergency techniques (such as plugging, patching, drum roll etc.)

See paragraphs i in Section 2.2 above.

q. Selection and use of material handling equipment

r. Methods for assessment of risk and handling of radioactive wastes

Basic radiation monitoring instruments and their limitations.
See paragraphs f in Section 2.2 above.

s. Methods for handling shock-sensitive wastes

t. Laboratory waste pack handling procedures.

u. Container sampling procedures and safeguards

v. Safe preparation procedures for shipping and transport of containers

Latest DOT regulations shall be reviewed.

w. Decontamination program and procedures

See paragraphs m in Section 2.2 above.

x. Emergency response plan and procedures, including first aid

See paragraphs k in Section 2.2 above.

y. Safe site illumination levels

z. Site sanitation procedures and equipment for employee needs

aa. Review of the applicable appendices to 29 CFR 1910.120

All appendices should be reviewed.
Appendix (a) - Personal Protective Equipment Test methods
Appendix (b) - General Description and Discussion of the Levels of Protection and Protective Gear
Appendix (c) - Compliance Guidelines
Appendix (d) - References

ab. Sources of reference, additional information, and efficient use of relevant manuals and hazard coding systems

See paragraphs o in Section 2.2 above.

ac. Principles of toxicology and biological monitoring

See paragraphs d in Section 2.2 above.

ad. Employee rights and responsibilities under OSHA and CERCLA as amended.

See paragraphs a and b in Section 2.2 above.

VII. GUIDELINES FOR ACCREDITATIONVII. GUIDELINES FOR ACCREDITATION

A. **Introduction**A. **Introduction**

When Congress passed the worker protection standards of SARA it intended that employers be required to provide their employees with minimally adequate training in occupational safety and health and in the nature of hazardous materials. In order to ensure technically sound and comprehensive programs, training should be provided only by OSHA-accredited programs.

The primary purpose of accreditation is to identify programs of study that meet established standards of educational quality. When properly conducted, accreditation requires faculty and staff to conduct a regular self-evaluation that is peer reviewed by external experts.

OSHA should follow standard accreditation processes currently employed by institutions of higher education and nontraditional accrediting agencies that require that the accrediting process

1. be coordinated by OSHA;

2. include applicant self-study that addresses NIEHS criteria for a hazardous waste training program;

3. make extensive use of professional judgment and expertise of peers;

4. incorporate representatives of the affected public into its procedures.

B. **Purpose**B. **Purpose**

The purpose of the following guidelines is to establish minimally adequate procedures to ensure that training providers are able to meet the training requirements of 29 CFR 1910.120.

C. **Accreditation Guidelines**C. **Accreditation Guidelines**

Programs wishing to be accredited should meet criteria at least as

comprehensive as those established by the inter-agency task force for the NIEHS hazardous waste worker training grant program, and should be subjected to a review process at least as rigorous as that by which the NIEHS grants were awarded.

1. We propose that the assistant secretary review and subsequently establish a review panel consisting of 12 members equally representing union, government, academia, and private industry. These 12 individuals should possess experience in the field of hazardous waste including emergency response, TSD/RCRA, and hazardous waste sites. Furthermore, individuals on the panel should have experience in worker training, health and safety (including education and technical aspects), and program evaluation.

2. The board will solicit nominations of qualified peer reviewers by area of expertise. Acceptable reviewers will be added to a list of professionals available for evaluating applications, conducting site visits, and preparing written reports and recommendations to the board.

3. Applications received by the assistant secretary will be reviewed by staff for completeness. Completed applications will be distributed by staff to peer review teams.

4. The board will make recommendations on accreditation to the assistant secretary based on the recommendations of the peer review teams and staff and the application materials.

5. Full accreditation will be granted by the assistant secretary for up to five years for applicants that meet all the application criteria, are currently conducting training, and undergo a successful site visit.

6. Preliminary accreditation will be granted by the assistant secretary for up to nine months for programs that have met all the criteria of the application process but are not currently training. Full accreditation will be granted upon a successful site visit.

7. The board will meet quarterly to review applications and the peer review team reports and recommend follow-up actions as appropriate.

8. An application fee will be charged to cover the cost of the peer review process.

D. **Comments on Proposed Standard (29 CFR 1910.121)**D.**Comments on Proposed Standard (29 CFR 1910.121)**

1. (a)(3) Definitions
Applicant means. . , or consortia capable of

2. (b)(3)(i)(M) a description of the training facilities including number,

type, and dimensions of classrooms, audio-visual equipment, and a complete listing of quantity and types of personal protective equipment necessary to meet curriculum needs.

3. (c)(2)(i) . . . Staff, facilities, and equipment

4. (c)(3)(i) . . . accreditation for a period not to exceed nine months

5. Public comments do not appear to be appropriate in either the approval or denial process.

VIII. CONCLUSIONVIII. CONCLUSION

A technical workshop on training quality was held on March 22 S 24, 1990. The purpose of the meeting was to identify, evaluate, and make recommendations on the minimum criteria for worker health and safety training for hazardous waste operations and emergency response. Meeting participants represented a broad range of technical skills and organizational interests. There were representatives from management, labor, academia, and government. Workshop topics included general criteria; general hazardous waste operations; RCRAStreatment, storage, and disposal; emergency response; and accreditation process.

Participants generally agreed in a number of areas. They agreed that the topics required to be covered could not be adequately addressed in a quality training program in the minimum hours specified under 1910.120. There was also agreement that emergency response training should be included in the accreditation standard 1910.121. Participants were in almost complete agreement that more detail was needed before recommendations could be made with regard to quality training for the category of "occasional" workers at cleanup sites. There was general agreement that OSHA-required refresher and supervisor training should be accredited and should be believed only by training providers whose core program is accredited. Participants agreed that hands-on training is essential and should fill at least one-third of the training program hours.

Consistent quality among worker health and safety training programs for hazardous waste operations and emergency response is essential in order to more fully ensure the protection of both workers and the public. This workshop and its findings represent an organized and comprehensive attempt toward achievement of this challenging goal.

REFERENCESREFERENCES

The following serve as background references for these criteria:

1. Salvendy, Ed., Handbook of Human Factors, chapters 8.2, "Concepts of Training," and 8.3, "The Relationship of Training Goals and Training Systems."

2. 29 CFR 1910.120 Interim OSHA Regulations.

3. 29 CFR 1910.120 Final OSHA Regulations.

4. 29 CFR 1926.59 Hazard Communication OSHA Regulations for Construction.

5. 29 CFR 1910.1030 Proposed Rule Governing Occupational Exposure to Bloodborne Pathogens (OSHA) (54 FR 23042, May 30, 1989).

6. A Curriculum Guide for Public Safety and Emergency-Response Worker (HBV/HIV). NIOSH Publication No. 89-108.

7. Training Requirements in OSHA Standards and Training Guidelines. OSHA 2254 (Revised), 1987.

8. Massachusetts Deleading Regulations. (454 CMR 22.00, November 25, 1988).

9. Standard for Professional Competence of Responders to Hazardous Materials Incidents. NFPA 472. 1989 Edition.

10. McDavid, Rubin, "Evaluating Courses," Asbestos Issues 89, May 1989.

11. NIEHS Worker Training and Education Grant Request for Applications (January 1990).

12. Appendix C to Subpart ESEPA Model Contractor Accreditation Plan (Asbestos-Containing Materials in Schools) 52 FR 15876, April 30, 1987.

13. Ebel, R.L., Measuring Educational Achievement, Englewood Cliffs, New Jersey: Prentice Hall, 1965.

14. Merrill, Michael, Deficiencies of the Proposed OSHA Standard on the Accreditation of Training Programs for Hazardous Waste Operations. Labor Education Center, Cook College, New Brunswick, New Jersey, 1989.

15. OSHA Hazard Communications Regulations Applicable to General Industry (29 CFR 1910.1200) and Construction (29 CFR 1926.59).

16. Occupational Safety and Health Guidance Manual for Hazardous Waste-Site Activities, NIOSH/OSHA/USHA/USCG/EPA, October 1985.

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