ORNL/TM-10443

ornl

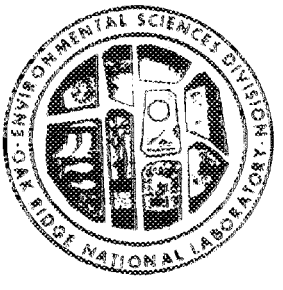
OAK RIDGE NATIONAL LABORATORY

MARTIN MARIETTA

A Brief Summary of the OSHA Interim Final Rule on "Hazardous Waste Operations and Emergency Response" and Implications for Federal Facilities

Charles F. Baes III
John E. Mrochek
Tim E. Aldrich
Cindy L. Glatthaar

Environmental Sciences Division
Publication No. 2912



OPERATED BY
MARTIN MARIETTA ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
DEPARTMENT OF ENERGY

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
NTIS price codes—Printed Copy: A04; Microfiche A01

ORNL/TM-10443

ENVIRONMENTAL SCIENCES DIVISION

A BRIEF SUMMARY OF THE OSHA INTERIM FINAL RULE ON "HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE" AND IMPLICATIONS FOR FEDERAL FACILITIES

Charles F. Baes III
John E. Mrochek[1]
Tim E. Aldrich[2]
Cindy L. Glatthaar[3]

[1]Chemical Technology Division
[2]Health and Safety Research Division
[3]Maxima Corporation

Environmental Sciences Division
Publication No. 2912

Date Published - August 1987

Prepared for
Department of Energy
Office of Environmental Guidance and Compliance
Washington, D.C. 20585

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

CONTENTS

ACRONYMS AND DEFINITIONS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also known as Superfund Act)
CFR	Code of Federal Regulations
DHHS	U.S. Department of Health and Human Services
DOE	U.S. Department of Energy
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
EMS	Emergency medical system
EPA	U.S. Environmental Protection Agency
ERP	Emergency response plan
FR	Federal Register
ICS	Incident command system
IDLH	An air concentration of a chemical immediately dangerous to life and health equal to a maximum concentration above which one could not escape within 30 min without any escape-impairing symptoms or any irreversible health effects (NIOSH 1985b)
NIOSH	National Institute for Occupational Safety and Health
OEGC	Office of Environmental Guidance and Compliance
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
PEL	Permissible exposure limit: the 8-h time-weighted average concentrations set by OSHA in 29 CFR 1910(Z)
PPE	Personal protective equipment
ppm	Part per million
RCRA	Resource Conservation and Recovery Act of 1976
SARA	Superfund Amendments and Reauthorization Act of 1986
SCBA	Self-contained breathing apparatus
TSDF	Hazardous waste treatment, storage, and disposal facilities
USCG	U.S. Coast Guard

EXECUTIVE SUMMARY

This report was prepared for the U.S. Department of Energy (DOE) Office of Environmental Guidance and Compliance (OEGC) and is intended as a short "briefing" document to help OEGC in (1) understanding the scope and provisions of the Occupational Safety and Health Administration's (OSHA's) interim final rule for protection of workers engaged in operations involving hazardous waste, (2) assessing the rule's impact on hazardous waste operations conducted by the DOE and its contractors, and (3) preparing guidance to DOE field offices for compliance with the rule. However, because the OSHA rule covers employees engaged in both emergency response actions and hazardous waste operations conducted at the federal, state, and private levels, this summary and analysis of the OSHA rule is expected to be useful to a wider audience.

Under Sect. 126(e) of the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Secretary of Labor was directed to promulgate an interim final rule for the protection of the health and safety of employees engaged in hazardous waste operations. The rule, "Hazardous Waste Operations and Emergency Response; Interim Final Rule," was published in the Federal Register on December 16, 1986. It is effective immediately and remains in effect until a final rule is promulgated by October 17, 1988 (two years after passage of SARA). The new rule amends the OSHA standards for hazardous materials by adding a new section containing employee protection requirements for workers engaged in hazardous waste operations, including emergency response to hazardous substance incidents.

The interim rule is patterned after and based on (1) the Environmental Protection Agency (EPA) manual (EPA 1981) "Health and Safety Requirements for Employees Engaged in Field Activities," (2) existing standards under the Occupational Safety and Health Act of 1970 found in 29 CFR 1926(C), and (3) the document, "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities," prepared jointly by OSHA, the EPA, the U.S. Coast Guard (USCG), and the National Institute for Occupational Safety and Health (NIOSH). Coverage includes employees involved in (1) cleanup of hazardous waste sites covered by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (CERCLA or "Superfund"), (2) certain hazardous waste operations conducted under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, and (3) emergency response to incidents involving the handling, processing, and transportation of hazardous substances. Workers handling domestic (nonhazardous) wastes or who are not exposed to hazardous wastes (e.g., construction workers) are not covered by the rule.

The rule includes provisions for site characterization, analysis, and control; employee training and medical surveillance; and engineering controls, work practices, and personal protective equipment (PPE). Workers engaged in hazardous waste activities are to receive 40 h of classroom training and 3 d of field training before working at hazardous waste sites. Additional training is required for workers exposed to unique or special hazards and managers and supervisors directly responsible for hazardous waste site operations. Annual review training also is required for both employees and managers.

Other requirements in the rule pertain to site characterization, protective clothing, decontamination, medical surveillance, exposure monitoring, emergency planning, and related topics. Medical surveillance is to be provided to employees (1) who are exposed to hazardous substances above established permissible exposure limits (PELs), (2) who wear respirators, (3) whose duties are physically taxing, or (4) who have symptoms indicating possible overexposure to hazardous substances. The rule also requires that the employer keep a written record of the physician's opinions and the employee's medical complaints related to exposure to hazardous substances for the period that the employee is hired plus 30 years.

The interim final regulation will affect all hazardous waste handling, processing, and transportation operations conducted at the federal, state, and private levels. It is not clear, however, whether a federal facility, itself, or its contractor must train contract workers, although the rule indicates that such training must occur before hazardous substance and waste handling operations commence. For purposes of confidentiality, any training or medical records retained by a facility for purposes of compliance with the rule should be maintained separate from other employee personal records. Also, 25 states or territories have their own OSHA-approved occupational safety and health plans, and these states are now compelled to develop "comparable" standards by June 19, 1987. Because these states may enact more stringent standards, facilities engaged in hazardous waste operations should follow closely the development of these state standards in order to anticipate any state requirements that might exceed the federal standard.

1. INTRODUCTION

On December 19, 1986, the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor (DOL) published the interim final rule, "Hazardous Waste Operations and Emergency Response," in the Federal Register (51 FR 45654). The rule amends the OSHA standards for hazardous materials in subpart H of Title 29 Code of Federal Regulations Part 1910 [29 CFR 1910(H)] by adding a new Sect. 1910.120 that contains employee protection requirements for workers engaged in hazardous waste operations, including emergency response to hazardous substance incidents. Coverage includes employees involved in hazardous waste cleanup responses covered by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or "Superfund"), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and certain hazardous waste operations conducted under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The interim final rule was mandated under Sect. 126 of SARA and became effective immediately.

This brief report has been prepared by staff at Oak Ridge National Laboratory (ORNL) to assist the U.S. Department of Energy (DOE) Office of Environmental Guidance and Compliance (OEGC) in understanding and complying with the provisions of this rule and in assessing its impact on hazardous waste operations conducted by the DOE and DOE contractors. Section 2 gives a brief background for the rule and its major provisions as outlined in SARA. Section 3

describes the major provisions of the rule, using the format in the rule. In Section 4 we briefly discuss the implications of the rule for federal facilities and their contractors. Finally, in Appendix A the interim final rule, as it appeared in the Federal Register, is reproduced.

2. BACKGROUND

The Superfund Amendments and Reauthorization Act of 1986, which extends and amends CERCLA, was signed into law by President Reagan on October 17, 1986. The new law increases the role of the Environmental Protection Agency (EPA) at hazardous waste sites managed by federal facilities and their contractors, and among other things, sets forth standards in Sect. 126 for protection of workers engaged in hazardous waste cleanup. Section 126(a) of SARA directs the Secretary of Labor to promulgate, within a year of enactment of SARA, standards for "the health and safety protection of employees engaged in hazardous waste operations." Section 126(b) requires that the standards include, but not be limited to, provisions for site analysis, training, medical surveillance, protective equipment, engineering controls, maximum exposure limits, informational programs, handling requirements, new technology, decontamination procedures, and emergency response. Under Sect 126(c), the final regulations will take effect one year after the date that they are promulgated. Section 126(d) provides for specific training requirements, including:

- a minimum of 40 h of initial instruction off-site and 3 d of actual field experience for general site workers;
- at least an additional 8 h of specialized training on managing hazardous waste operations for on-site managers and supervisors directly responsible for hazardous waste operations;
- provisions for certifying the training of general site workers, on-site managers, and supervisors and prohibiting untrained workers from engaging in hazardous waste operations; and
- training of emergency response personnel.

Finally, Sect. 126(e) requires within 60 d after enactment of SARA the following:

> The Secretary of Labor shall issue interim final regulations which shall provide no less protection under this section for workers employed by contractors and emergency response workers than the protections contained in the Environmental Protection Agency manual (1981) "Health and Safety Requirements for Employees Engaged in Field Activities" and existing standards under the Occupational Safety and Health Act of 1970 found in subpart C of part 1926 of title 29 of the Code of Federal Regulations. Such interim final regulations shall take effect upon issuance and shall apply until final regulations become effective under subsection (c).

The interim final rule was published by OSHA in the Federal Register on December 19, 1986 (51 FR 45654). As provided in Sect. 126(e) of SARA, the rule is effective immediately and remains effective until one year after issuance of the final OSHA standard. While implementation is to commence immediately, OSHA recognizes that for some provisions full implementation cannot be completed immediately. For these provisions, various start-up dates are enumerated in paragraph p of the interim standard.

Pertinent references for the interim rule include the EPA manual, "Health and Safety Requirements for Employees Engaged in Field Activities (EPA 1981), and "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" (NIOSH 1985a), prepared jointly by OSHA, the EPA, the U.S. Coast Guard (USCG), the U.S. Department of Health and Human Services (DHHS), and the National Institute for Occupational Safety and Health (NIOSH).

3. MAJOR PROVISIONS OF THE RULE

The major provisions of the interim final rule include (1) scope, applications, and definitions; (2) general requirements; (3) site characterization and analysis; (4) site control; (5) training; (6) medical surveillance; (7) engineering controls, work practices, and personal protective equipment (PPE); (8) monitoring; (9) informational programs; (10) handling drums and containers; (11) decontamination; (12) emergency response; and (13) start-up dates. Each of these provisions is discussed below.

3.1 SCOPE, APPLICATIONS, AND DEFINITIONS

OSHA has defined the scope of the standard to include five areas:

1. hazardous substance response operations under CERCLA, including initial investigations at CERCLA sites before the presence or absence of hazardous substances has been ascertained;
2. major corrective actions taken in cleanup operations under RCRA;
3. operations involving hazardous waste treatment, storage, and disposal facilities (TSDF) regulated under 40 CFR Parts 264 and 265 of RCRA, (except for small quantity generators and employers with less than 90 d accumulation of hazardous waste as defined in 40 CFR 262.34;
4. hazardous waste operations sites that have been designated for cleanup by state or local governmental authorities; and
5. emergency response operations for releases, or substantial threats of releases, of hazardous substances and postemergency response operations to such releases.

Thus, the interim rule covers hazardous waste cleanup operations at CERCLA sites, RCRA sites, emergency response sites, and those sites designated by state or local governments. It also covers many other operations related to storage, disposal, and treatment of hazardous waste at RCRA-permitted facilities. It does not, however, apply to employers who have less than 90 d of hazardous waste accumulation on-site and to solid waste disposal operations that do not involve hazardous waste. Sanitary landfills (municipal and otherwise) that handle domestic wastes also are not covered. Construction operations where there is no exposure to on-site hazardous substances are covered by the OSHA standards in 29 CFR 1926. States with their own OSHA-approved occupational safety and health plans must develop a comparable standard applicable to both private and public (state and local government) employees by June 19, 1987 (six months from the publication date of the interim final rule), or show OSHA why there is no need for action (e.g., a standard exists). The rule states that an existing state standard must be "as least as effective" as the interim final standard. Until a state promulgates its own standard, federal OSHA will provide interim enforcement assistance, as appropriate.

Training and protection requirements are specifically set forth for work conducted by emergency response personnel such as fire fighters, emergency medical system (EMS) employees, and police when they respond to emergency hazardous substance incidents. Most of the provisions of the interim rule, however, apply to cleanup activities of hazardous substances or wastes at CERCLA sites, corrective actions at

RCRA sites, and cleanup operations involving hazardous substances at sites of emergency incidents after emergency response personnel have concluded their duties.

The employer must also comply with the OSHA standards in 29 CFR 1910 and 1926, as well as with the requirements specifically covered in this interim rule. If there is a conflict or overlap, the more protective provisions are to apply.

Under the rule, a "hazardous substance" is

1. any substance defined under Sect. 101(14) of CERCLA, which, in turn, references (a) Sect. 102, 307(a), and 311(b)(2)(A) of the Federal Water Pollution Control Act, (b) Sect. 3001 of the Solid Waste Disposal Act, (c) Sect. 112 of the Clean Air Act, and (d) any substance or mixture on which the EPA Administrator has taken action pursuant to Sect. 7 of Toxic Substances Control Act;
2. any biological agent and other disease-causing agent defined in Sect. 104(a)(2) of CERCLA;
3. any substance listed by the U.S. Department of Transportation (DOT) and regulated as hazardous materials under 49 CFR 172.101 and appendices; or
4. any "hazardous waste."

A "hazardous waste" is a waste or combination of wastes as defined in 40 CFR 261.3 or in 49 CFR 171.8. A "hazardous waste operation" means any operation involving employee exposure to hazardous substances, hazardous wastes, or combination of hazardous wastes and substances that is within the scope of the interim final rule. Finally, a "hazardous waste site" is any facility or location at which a hazardous waste operation takes place.

3.2 GENERAL REQUIREMENTS

Each general requirement calls for employer action and directs the employer to the specific paragraph of the interim rule that contains the requirements in greater detail. Based on their interpretation of Congressional direction, OSHA states that engineering controls; maximum exposure limits; monitoring, handling, and decontamination procedures; and emergency response are relevant for the interim regulation. Employers are required to develop a safety and health program for hazardous waste operations so that hazards are assessed and control programs are systematically laid out. Excavation activity is covered by 29 CFR Part 1926(P), and the interim rule singles out this activity as requiring compliance because of the extensive excavation activity that occurs at hazardous waste sites. Employers are required to notify contractors and subcontractors of the hazards they have identified at hazardous waste sites. This provision assists the contractor in becoming aware of the risks so that the contractor's employees may be better protected.

3.3 SITE CHARACTERIZATION AND ANALYSIS

Site characterization provides the information needed to identify hazards and to select employee protection methods so that the employer can develop and implement effective control measures. According to OSHA, site characterization is a continuous process and generally proceeds in three phases. First, a preliminary evaluation of the

site's characteristics should be conducted. That is, prior to site entry, information should be gathered away from the site, reconnaissance from the site perimeter should be conducted, and off-site characterization should be made. All suspected conditions that may pose inhalation or skin adsorption hazards immediately dangerous to life or health (IDLH) or other conditions that could result in serious harm or death must be identified during the preliminary survey. Second, on-site surveys should be conducted. Site entry during this phase is limited to reconnaissance personnel. Finally, once the site has been determined to be safe for commencement of other activities, monitoring should continue to provide updated information about site conditions. The rule specifically requires continuous monitoring for ionizing radiation and IDLH conditions.

The rule specifies that the following descriptive information must be obtained by the employer before allowing employees to enter a hazardous waste site:

- location and size of the site,
- description of the task to be performed,
- expected duration of the activity,
- site topography,
- site accessibility by air and roads,
- possible pathways of contaminant dispersion,
- status and capabilities of available emergency response teams, and
- hazardous substances and their chemical and physical properties and expected health hazards.

3.4 SITE CONTROL

OSHA requires the employer, as a part of his safety and health plan, to minimize potential contamination of employees by developing a program to control the activities and movements of employees and equipment at hazardous waste sites. The site control program should be established in the planning stages of a project and modified as new information is developed from site characterization and assessment.

3.5. TRAINING

The interim final rule includes specific provisions for initial and review training of employees before they are permitted to engage in hazardous waste operations that could expose them to safety and health hazards. Specific provisions for basic and advanced training are mandated. Training for employees is to include a minimum of 40 h of initial instruction off-site and a minimum of 3 d of actual field experience (at the time of job assignment) under the direct supervision of a trained and experienced supervisor. The employee should be trained to recognize safety, health, and other hazards on-site. Appropriate work practices, engineering controls, and equipment to minimize hazards also should be demonstrated to the employee. Additionally, the employee should be well trained in the use of respirators and other forms of PPE and should be able to recognize symptoms and signs that might indicate exposure to hazardous substances. Managers and supervisors directly responsible for hazardous waste site operations are to receive the same training as their employees and at least an additional 8 h of specialized training on managing hazardous waste operations.

The interim rule also states that employees shall receive 8 h of retraining annually in relevant matters such as health hazards and use of PPE. A less detailed training provision is provided for employees working at routine operations on RCRA sites. According to OSHA, RCRA sites will have more stable working conditions and the hazards will be better identified and more carefully controlled. OSHA specifies 24 h for the required training of employees working at routine operations at RCRA sites. This level of training is based on the EPA manual, which specifies 24 h of training for most routine field activities. In all areas of training, the level of training is to be consistent with the worker's job function and responsibilities.

3.6 MEDICAL SURVEILLANCE

The interim final rule includes specific provisions for both baseline and periodic medical examinations. The examinations must be provided to those routinely exposed to hazardous substances, to those whose duties are physically taxing, to those who routinely wear respirators, and to those who complain of symptoms of hazardous substance exposure. Medical surveillance must be provided to employees who have been, or are expected to be, exposed to hazardous substances or to health hazards above established permissible exposure limits (PELs) for 30 or more days in a 12-month period or who wear respirators any part of 30 d during the year. If a worker is exposed to several different hazardous substances above their respective PEL, and each exposure is for less than 30 d, but all exposures total more than 30 d per year, then medical surveillance is also required.

The rule requires that the employer give the physician a copy of the interim final rule and information on the employee's anticipated exposures, PPE, and duties. The physician must then determine the appropriate medical protocol in terms of specific tests and examinations. Chapter 5 of the DHHS (NIOSH) Publication No. 85-115 (NIOSH 1985a) provides guidance on specific medical examination protocols, and this manual should be provided to the physician.

The physician must be informed of the type of respirator and PPE an employee is likely to wear. The medical examination must include appropriate tests to evaluate the employee's ability to wear respirators and PPE. Examinations must also be provided when the employee brings to the employer's attention signs or symptoms indicating possible overexposure to hazardous substances. The rule also requires that the employer keep a written record containing the physician's written opinions and the employee's medical complaints related to exposure to hazardous substances. The record is to be retained by the employer for the period specified in 29 CFR 1910.20, which is the duration of employment plus an additional 30 years.

Finally, the employer must pay any cost associated with medical examinations and medical surveillance. In addition, the employee must not be discouraged from taking the examination.

3.7 ENGINEERING CONTROLS, WORK PRACTICES, AND PPE

The purpose of engineering controls, work practices, and PPE is to shield or isolate individuals from the chemical, physical, and biological hazards that may be encountered at a hazardous waste site.

The rule reaffirms existing OSHA regulations in 29 CFR 1910(Z), which requires exposures to toxic and hazardous substances to be controlled with engineering controls, if feasible, or if not, then with PPE. It states that to attain established permissible exposure limits for substances not regulated by OSHA, employers may use appropriate combinations of engineering controls, work practices, and PPE.

Examples of engineering controls are pressurized cabs on materials-handling equipment and pressurized control rooms in materials-handling areas. The selection of PPE must be based on the information obtained during the site characterization and analysis. Once an estimate of the types of hazards and their potential concentration has been obtained, the proper respirators and protective clothing should be selected based on the performance characteristics of the PPE relative to the site hazards and work conditions. Proper PPE selection, as mandated by this standard, involves choosing PPE to prevent breakthrough of hazardous substances by permeation and penetration, or to reduce exposures to a safe level during the employee's duration of contact.

PPE has been divided into four categories (A-B-C-D) based on the degree of protection afforded. Each level incorporates the requirements of the lower levels and adds new requirements as follows:

Level D: This level requires a work uniform that affords low-level, minimal protection. Body protection includes coveralls (to minimize loose clothing) and hard hats. Safety glasses,

gloves, and safety shoes would be worn when warranted by site conditions. This level of protection should be used when contact with hazardous chemicals is not expected and when the atmosphere contains no unknown gases.

Level C: This level affords moderate protection. Full-face or half-mask air-purifying respirators (with canisters) are worn as dictated by site hazards. Clothing includes, as appropriate, hooded chemical-resistant suits, splash suits, or fire-resistant coveralls. Inner and outer chemical-resistant gloves are required. Escape mask and two-way radios are optional. The EPA guideline (EPA 1981) states that level C is appropriate if the concentration of unknown gases in the atmosphere is less than 5 ppm and direct contact with hazardous chemicals will not adversely affect or be absorbed through exposed skin.

Level B: This level affords the highest level of respiratory protection, but only a moderate level of skin absorption protection. A full face-piece, self-contained breathing apparatus (SCBA) with positive pressure demand is required. A hooded suit is required, as are chemical-resistant boots or boot covers. The EPA guideline (EPA 1981) states that level B is appropriate for unknown gas concentrations of 5 to 500 ppm. Level B is also appropriate for IDLH concentrations of hazardous substances that do not present a severe hazard by skin contact.

Level A: This level affords the highest level of respiratory and skin protection. Totally encapsulating suits capable of maintaining positive air pressure to help prevent inward leakage of hazardous substances and capable of preventing inward gas leakage of more than 0.5% of the suit's volume are mandated. Level A protection is appropriate for IDLH concentrations of hazardous substances that are harmful to or may be absorbed by skin.

A PPE program is mandated for hazardous waste operations. The PPE program must address the following elements:

- site hazards,
- PPE selection,
- PPE use,
- work mission duration,
- PPE maintenance and storage,
- PPE decontamination,
- PPE training and proper fitting,
- PPE donning and doffing procedures,
- PPE inspection,
- PPE in-use monitoring,
- evaluation of the effectiveness of the PPE program, and
- limitations during temperature extremes.

3.8 MONITORING

Airborne contaminants can present a significant threat to employee safety and health. Thus, identification and quantification of these contaminants through air monitoring are essential components of a safety and health program at a hazardous waste site in order to implement the correct PPE, engineering controls, and work practices. Ionizing radiation, IDLH conditions, and other dangerous situations must be identified. According to OSHA, as a minimum, periodic monitoring shall be conducted when (1) work begins on a different portion of the site, (2) contaminants other than those previously identified are being handled, (3) a new operation is being initiated, or (4) employees are handling leaking drums or containers or are working in areas with obvious liquid contamination (e.g., a spill or lagoon).

3.9. INFORMATIONAL PROGRAMS

OSHA requires employers to develop and implement a site-specific safety and health plan for each hazardous waste operation site as a part of their safety and health program. This plan is to include

1. the names of those responsible for ensuring that safe and healthful practices and procedures are followed on the entire site,
2. risk analysis or systems analysis for specific work tasks or operations on the site,
3. employee training assignments both off-site and on the job,

4. the list of required PPE needed for each work task and operation on-site,
5. the employer's medical surveillance program for the site,
6. the methods for identifying and characterizing safety and health hazards on the site, including the monitoring procedures that will be done throughout the work on-site,
7. site control measures, including those for establishing work zones on the site,
8. decontamination procedures, which are matched to the kinds of anticipated contaminants to be removed from employees and equipment,
9. standard operating procedures to be used by employees on-site, and
10. the contingency plan for emergencies and confined space entry procedures.

Safety meetings and briefings and site inspections must also be mentioned in the plan, as well as the procedures to be followed in changing or modifying the plan.

3.10 HANDLING DRUMS AND CONTAINERS

The rule discusses the handling of drums and containers and includes provisions for drum and container specifications, moving drums, spills and spill cleanup, opening drums, drums containing shock-sensitive and radioactive wastes, opening and handling laboratory waste packs, sampling drums and containers, shipping and transporting drums, and tank and vault procedures. Drums and containers used during

cleanup must meet the appropriate DOT, OSHA, and EPA regulations for the wastes that they contain. They should be treated in accordance with the level of hazard posed by their contents, not by the container's size. Unlabeled drums and containers should be considered to contain hazardous substances and handled accordingly until the contents are identified. Fire extinguishing equipment meeting the requirements of 29 CFR 1910(L) must be on hand and ready to use to control small fires. Drums and containers containing radioactive wastes should not be handled "until such time as their hazard to employees is properly assessed."

3.11. DECONTAMINATION

The interim standard requires that a decontamination plan be developed and implemented before any employees or equipment may enter areas on-site where potential for exposure to hazardous substances exists. Decontamination procedures and areas must minimize employee exposures to hazardous substances while equipment and PPE are being decontaminated. The standard also requires that all employees, clothing, equipment, and decontamination fluids and equipment be decontaminated before leaving a contaminated area. The employer must supply showers, changing rooms, and laundry as appropriate. Equipment that cannot be decontaminated must be disposed of.

3.12. EMERGENCY RESPONSE

OSHA requires employers who are involved in hazardous waste operations to develop and implement an emergency response plan (ERP) as

part of their on-site contingency plan. The ERP should be available for use before work begins on the site and will be part of the site safety and health plan. The elements of the ERP should include:

- o recognition and prevention of emergencies;
- o methods and procedures for alerting employees on-site;
- o evacuation procedures and routes to safe distances or places of refuge away from the danger area;
- o means and methods for emergency medical treatment and first aid;
- o personnel roles, lines of authority, training, and communication;
- o use of PPE and emergency equipment;
- o on-site decontamination procedures;
- o site security and control; and
- o means and methods for evaluating and revising the plan.

Employers must also have an emergency response plan for employees who will be responding from their regular work location or duty station (e.g., fire department, fire brigade, or emergency medical service) to emergency incidents involving hazardous substances. These employees may, as a part of their regular duties, respond to both on-site and off-site emergencies. The senior officer responding to off-site incidents involving hazardous wastes should establish an "incident command system" (ICS) or chain of command through which all appropriate communications and responses are coordinated. Where available, emergency response plans of state and local governments should be utilized in developing the ICS and the ERP to ensure compatibility with the other agencies or employers responding to the

emergency. OSHA mandates that employers such as fire departments, emergency medical and first-aid squads, and fire brigades conduct monthly training sessions for their employees. Each employee is to receive at least 24 h of training annually.

3.13 START-UP DATES

Section 126(e) of SARA directs that the interim final regulations take effect upon issuance. However, immediate, complete compliance for some provisions is not feasible. For these provisions, implementation must commence immediately and full compliance is required as soon as feasible, but in no case later than December 19, 1987. Start-up and full implementation dates are given in Table 1.

Table 1. Start-up dates for provisions of the OSHA interim final rule

Provision	Start-up date[a]	Full implementation[b]
Training and medical	December 19, 1986	March 16, 1987
Safety and Health Program	ASAF[c]	March 16, 1987
Engineering controls, work practices, PPE[d] for substances regulated by OSHA		December 19, 1986
Engineering controls, work practices, PPE for substances not regulated by OSHA	ASAF	March 16, 1987
Site safety and health plan	ASAF	February 16, 1987
Implementation of other RCRA requirements		March 16, 1987
Any other requirements		December 19, 1987
Operations initiated after March 16, 1987		Start of operation

[a]Implementation of these provisions should commence on this date.
[b]Implementation of these provisions must commence by this date.
[c]As soon as feasible.
[d]Personal protective equipment.

4. IMPLICATIONS FOR FEDERAL FACILITIES

Neither Sect. 126 of SARA nor the interim final rule specifically addresses whether federal employees are covered by the new OSHA worker protection standards. However, Sect. 120(a) of SARA amends Title I of CERCLA by stating that "each department, agency, and instrumentality of the United States ... shall be subject to, and comply with, this Act in the same manner and to the same extent, both procedurally and substantively, as any nongovernmental entity ...." Therefore, based on Sect. 120 of SARA, the interim final regulation appears to affect all federal employees involved in hazardous waste operations. Certainly, the rule applies to all contractors at federal facilities involved in cleanup of hazardous wastes under CERCLA, hazardous waste operations under RCRA authorization, and emergency response to incidents involving the handling, processing, and transportation of hazardous substances.

Twenty-five states or territories have their own OSHA-approved occupational safety and health plans. These states and territories are Alaska, Arizona, California, Connecticut, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. They are now directed to develop a standard comparable to the interim final federal standard by June 19, 1987. By "comparable," OSHA means "as least as effective as." Some of these OSHA-approved states (e.g., California) have in the past developed standards more stringent than similar federal standards. All facilities engaged in hazardous waste

operations should follow the development of standards in these 25 states and territories in order to institute training and medical supervision programs that comply with the existing federal standards and any (more stringent) state standards that may be enacted.

As discussed in Sect. 3.6, the interim final rule requires that the employer keep a written record containing the physician's written opinions and the employee's medical complaints related to potential exposure to hazardous substances. This record is to be retained for the time that the employee is hired plus 30 years, as specified in 29 CFR 1910.20. For purposes of confidentiality, it would likely be in a facility's best interest to retain such medical files in a system separate from that of an employee's other medical and personnel records. Examiners for OSHA should not have access to personnel files unrelated to compliance with the OSHA interim final rule.

The requirements of the interim final rule are reasonable, appropriate, and within the bounds of existing capabilities of industry and the federal government in general (much of the rule is extracted directly from other existing regulations and position documents). However, considerable technical and economic resources will be required to comply with the training and medical surveillance provisions. Larger federal facilities should already have the medical and educational resources to comply with the rule, but smaller federal facilities may need to acquire (additional) medical and training staff or institute cooperative programs with larger federal facilities or other state or local organizations. At a minimum, each facility involved in hazardous waste operations should conduct a review of

existing medical and educational resources and capabilities. Additionally, interaction, coordination, and cooperation with those states that have, or are developing, their own standards are recommended.

Special actions will be associated with the training of hazardous waste workers, yet these actions should not require major additional resources at federal facilities beyond existing training programs. Whether a federal agency, itself, must take responsibility for and extend training efforts to its contract workers or whether such training is the contractor's responsibility is unclear. However, the OSHA rule indicates that such training must occur before hazardous substance and waste handling operations commence. It is important that this issue of responsibility for employee training be resolved on both state and federal levels.

To comply with the OSHA interim final rule, information related to current RCRA training activities is needed. Such information should be available from RCRA compliance officers at most federal facilities. Also needed are projections for the scale of cleanups and remedial actions anticipated by a facility. These estimates will aid the facility in planning the scope of training activities necessary for compliance. In addition to planning training activities, the requirements of the interim final rule are specific and important enough that they should be included in any appropriate federal orders pertaining to handling, processing, or transportation of hazardous waste (e.g., the DOE CERCLA Order 5480.14) (DOE 1985).

5. REFERENCES

DOE. 1985. Comprehensive Environmental Response, Compensation, and Liability Act Program. DOE Order 5480.14. U.S. Department of Energy, Washington, D.C.

EPA. 1981. Health and safety requirements for employees engaged in field activities. Environmental Protection Agency Order 1440.2. U.S. Environmental Protection Agency, July 12, 1981.

NIOSH. 1985a. Occupational safety and health guidance manual for hazardous waste site activities. National Institute for Occupational Safety and Health, Occupational Safety and Health Administration, U.S. Coast Guard, and Environmental Protection Agency, DHHS (NIOSH) Publication 85-115, October 1985.

NIOSH. 1985b. NIOSH pocket guide to chemical hazards. U.S. Department of Health and Human Services, DHHS (NIOSH) Publication 85-114, September 1985.

APPENDIX A. THE INTERIM FINAL RULE

The Interim Final Rule "Hazardous Waste Operations and Emergency Response; Interim Final Rule," is reproduced on the following pages.

Federal Register

Friday
December 19, 1986

Part IV

Department of Labor

Occupational Safety and Health Administration

29 CFR Part 1910

Hazardous Waste Operations and Emergency Response; Interim Final Rule

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1910

[Docket No. S-760]

Hazardous Waste Operations and Emergency Response

AGENCY: Occupational Safety and Health Administration; Labor.

ACTION: Interim final rule.

SUMMARY: This interim final rule amends the Occupational Safety and Health Administration (OSHA) standards for hazardous materials in Subpart H of 29 CFR Part 1910 by adding a new § 1910.120 containing employee protection requirements for workers engaged in hazardous waste operations including emergency response to hazardous substance incidents.

Coverage includes employees involved in responses covered by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended (CERCLA or "Superfund" Act) [Pub. L. 96-510, 42 U.S.C. 9601 *et seq*, 94 Stat 2767] such as clean-up of hazardous waste sites, certain hazardous waste operations conducted under the Resource Conservation and Recovery Act of 1976 as amended (RCRA) [Pub. L. 94-580, 42 U.S.C. 6901 *et seq*, 90 Stat 2795], and emergency response to incidents involving the handling, processing and transportation of hazardous substances.

The issuance of this interim final rule is mandated by section 126(e) of the "Superfund Amendments and Reauthorization Act of 1986" (SARA) [Pub. L. 99-499]. The interim final rule will regulate employee safety and health at hazardous waste operations and during emergency response to hazardous substance incidents until a final standard, also mandated by section 126 of SARA, is issued by OSHA and becomes effective. The final OSHA standard also mandated by section 126 of SARA is the subject of a Notice of Proposed Rulemaking which will be published shortly.

DATES: Interim rule effective December 19, 1986; various start-up dates have been established in paragraph (p) of the standard. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of December 19, 1986.

FOR FURTHER INFORMATION CONTACT: Mr. James F. Foster, U.S. Department of Labor, Occupational Safety and Health Administration, Division of Consumer Affairs, Room S-4220, 200 Constitution Avenue, NW., Washington, DC 20210, 202-523-8151.

This interim final rule was prepared by Michael B. Moore and Chappell D. Pierce, Directorate of Safety Standards, Office of Fire Protection Engineering and Systems Safety Standards, (202) 523-7225.

SUPPLEMENTARY INFORMATION:

I. Background

On October 17, 1986, the President signed into law the "Superfund Amendments and Reauthorization Act of 1986" (SARA) [Pub. L. 99-499]. As part of SARA the Secretary of Labor ("Secretary") is directed to issue an interim final rule within 60 days after the date of enactment, which is to provide no less protection for workers engaged in covered operations than the protections contained in the Environmental Protection Agency's (EPA), "Health and Safety Requirements for Employees Engaged in Field Activities" manual (EPA Order 1440.2) dated 1981 and the existing OSHA standards under Subpart C of 29 CFR Part 1926. SARA also directs the Secretary to issue, within one year, a final standard under section 6(b) of the Occupational Safety and Health Act of 1970 for the health and safety of employees engaged in hazardous waste operations. SARA further indicates that certain specific areas of employee protection (i.e. medical surveillance, personal protective equipment, training, and others) contained in section 126(b) are relevant to protect employees engaged in hazardous waste operations.

The interim final rule issued today becomes effective immediately and will remain in effect until one year after issuance of the final OSHA standard, which will be proposed shortly. Congress has clearly directed in section 126(e) that these interim final rules become effective upon issuance and the standard provides this. Implementation is to commence immediately, however, various start-up dates are set forth in paragraph (p) of the standard which recognize that full implementation cannot be completed immediately for some provisions. In addition OSHA will, of course, recognize greater feasibility constraints in the first three months of the standard and take those constraints into account in enforcement.

This interim final rule has been adopted from the language of the EPA manual entitled "Health and Safety Requirements for Employees Engaged in Field Activities" (1981) and the language of OSHA's safety and health standards in Subpart C of 29 CFR Part 1926. The interim final rule also contains language taken from various documents issued either jointly or solely by the EPA, OSHA, the U.S. Coast Guard, and the National Institute for Occupational Safety and Health (NIOSH). OSHA has specifically used the joint OSHA/EPA/USCG/NIOSH document entitled, *"Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities"* (Preamble Reference 6), as an outline in preparing this interim rule. This four agency manual has been developed as a result of the collaborative efforts of professionals representing the four agencies. These professionals, who are knowledgeable in hazardous waste operations, worked with over 100 experts and organizations in the development of the criteria contained in this manual. The manual was published in October 1985 and is public information. The manual is a guidance document for managers responsible for occupational safety and health programs at inactive hazardous waste sites. The manual is intended for use by government officials at all levels and contractors involved with hazardous waste operations. The manual provides general guidance and is intended to be used as a preliminary basis for developing a specific health and safety program for hazardous waste operations. Further the major subject areas listed in SARA section 126(b) are nearly identical to these major chapters listed in the manual.

Congress indicated that reasonably comprehensive protection was intended for employees at hazardous waste operations, as discussed below, covering more than the minimum requirements specified in the EPA manual (EPA Order 1440.2) and Subpart C of 29 CFR Part 1926. In light of the short period of time Congress directed for issuance of this standard, OSHA's utilization of recognized sources of guidance which have been created by experts in the area and utilizing the resources of relevant agencies is appropriate.

In view of the brief period given for the issuance of this document, it may be necessary to issue minor corrections in the near future.

II. Summary and Explanation of the Standard

Paragraph (a)—Scope, Application, and Definitions

In paragraph (a)(1), *Scope*, OSHA has defined the scope of the standard to include:

(i) Hazardous substance response operations under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980

as amended (CERCLA) including initial investigations at CERCLA sites before the presence or absence of hazardous substances has been ascertained;

(ii) Major corrective actions taken in clean-up operations under the Resource Conservation and Recovery Act of 1976 as amended (RCRA);

(iii) Operations involving hazardous waste storage, disposal and treatment facilities regulated under 40 CFR Parts 264 and 265 pursuant to RCRA except for small quantity generators and those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34;

(iv) Hazardous waste operations sites that have been designated for clean-up by state or local governmental authorities; and

(v) Emergency response operations for releases of or substantial threats of releases of hazardous substances and post-emergency response operations to such releases.

Thus this standard will cover hazardous waste clean-up operations at CERCLA sites, RCRA sites, emergency response sites and those sites designated by State or local governments. It will also cover other hazardous waste operations, such as storage, disposal or treatment of hazardous waste at RCRA facilities.

OSHA believes that Congress intended the interim rule to have a broad scope and application. This is indicated by the legislative intent as reflected in the language of SARA. The language of section 126(e) explicitly states that the Secretary "shall issue interim final regulations *under this section. . .*" (emphasis supplied). "Under this section" refers to the entire section 126 of SARA. And, as previously noted, section 126(a) mandates safety and health standards for the protection of employees engaged in hazardous waste operations. Thus, OSHA believes Congress intended the interim final rule to mirror section 126 and provide protective provisions to employees engaged in hazardous waste operations.

The argument is buttressed further by the fact that section 126(e) states that the interim final rule shall provide *no less* (emphasis added) protection for workers employed by contractors and emergency response workers than the protection contained in the Environmental Protection Agency Manual "Health and Safety Requirements for Employees Engaged in Field Activities" and exiting standards under Subpart C of 29 CFR Part 1926. The two sources cited in section 126(e) are not a limitation on the scope of the interim rule. Rather, this language establishes the minimum amount of protective provisions, with the broad parameters of employee protection delineated by the remainder of section 126.

This interpretation is reinforced because SARA is a freestanding statutory provision and not an amendment to CERCLA. The clear Congressional intent then is to provide protection to employees whenever they deal with hazardous wastes.

The hazards an employee faces at a RCRA, CERCLA, or emergency response site are the same hazards. The risk of exposure is to the same types of hazardous substances. The scope of the regulation fulfills the Congressional mandate: to effectively provide for employee health and safety at hazardous waste operations and emergency response incidents.

As indicated in the application provisions, different provisions of the standard apply to clean-up operations, regular hazardous waste operations and emergency response to take into account relevant differences.

Further the term "hazardous waste operation" is used in section 126(a) of SARA. "Hazardous waste" is also a term used in RCRA and there is no indication from SARA or its legislative history that RCRA facilities were to be excluded from coverage by this interim rule. This is a further reason why OSHA has included RCRA hazardous waste operations under the coverage of this interim final rule. However, small quantity generators; employers who have less than 90 days of hazardous waste accumulation; and solid waste disposal operations which do not involve hazardous waste are not covered by this interim final rule. Also, employees at hazardous waste sites who will not be exposed or do not have the potential to be exposed to hazardous substances are not covered by this interim final rule.

Emergency response employees who respond or will respond to incidents involving hazardous substances are covered by this interim final rule. Public employees of states that have agreements with OSHA under section 18 of the OSH Act must issue regulations at least as effective as these to protect public employees.

Municipal or other sanitary landfills that handle domestic wastes are not covered. Similar waste paper or scrap metal operations are generally not covered because of the type of wastes they handle. But they could be covered if they have clean-ups for or handle hazardous wastes meeting the scope provisions of the standard.

Operations with no exposure to on-site hazardous substances, i.e., road building for site access, construction of on-site or the setting up of temporary facilities in the clean zone or the closure of a RCRA site involving the building of a clay cap over hazard wastes, are considered to be construction activities covered by the standards in 29 CFR Part 1926.

The scope and application provisions carry out the intent of Congress and are consistent with good occupational safety and health policy. Employees performing clean-up operations under CERCLA, RCRA (corrective actions) and post emergency response, generally those employees likely to have the highest exposures to hazardous substances over a longer period, are covered by virtually all the provisions of the rule. Employees exposed to hazardous wastes in routine RCRA hazardous waste operations, who are regularly exposed to hazardous wastes but in a more controlled environment, are covered by the more limited requirements of paragraph (o) of the interim final rule. Emergency response workers, exposed usually for short periods to often unknown but possibly high levels of hazardous substances, have specific provisions directed towards this situation.

In paragraph (a)(2), *Application*, OSHA designates the requirements which apply to the specific work activities covered by this interim final rule. The requirements set forth in paragraph (1) of this section specifically apply to the work conducted by emergency response personnel, such as fire fighters, emergency medical system (EMS) employees and police, when they respond to hazardous substance incidents.

The requirements set forth in paragraph (o) of this section specifically apply to the hazardous waste operations at RCRA sites which are involved in disposal, treatment, storage and handling of hazardous waste. The exclusion of small quantity operators and less than 90-day accumulators excludes from coverage by the interim rule operators such as dry cleaners and gas stations which come within the purview of RCRA but are not hazardous waste operators in the normal meaning of the term. The approximately 4,000 RCRA sites where reasonably large quantities of hazardous wastes are regularly handled, treated and stored are covered by the rule. This reflects the legislative intent, meets the normal meaning of hazardous waste operations and covers the type of safety and health hazards that this regulation is designed to control.

Most of the requirements of the interim rule apply to clean-up activities of hazardous substances or hazardous wastes at CERCLA sites, corrective actions at RCRA sites, and clean-up operations of hazardous substances at emergency incidents after emergency response personnel have concluded their duties.

The employer must also comply with the standards in 29 CFR Parts 1910 and 1926, as well as with the requirements specifically covered in this interim rule. If there is a conflict or overlap, the more protective provisions are to apply. Since this interim rule does not cover all of the hazards present at hazardous waste operations, other OSHA standards in Parts 1910 and 1926 apply also. Other OSHA standards cover many other hazards, and OSHA wants to make clear that the other standards continue to apply. Also, hazardous waste operators who are not within the scope of this standard are covered by the Parts 1910 and 1926 standards.

In paragraph (a)(3), *Definitions*, OSHA has defined various terms used in this rulemaking. The definitions for hazardous substances and hazardous wastes have been taken from the U.S. Environmental Protection Agency (EPA) and U.S. Department of Transportation (DOT) regulations. This has been done to assure consistency and compatibility between this interim rule and the rules and regulations of the EPA and DOT. The remaining definitions have been taken for the most part from SARA, the four agency manual (Reference 6) or existing OSHA standards.

The term "established permissible exposure limit" is defined to give direction as to the appropriate degree of protection needed to be achieved by personal protective equipment and other similar purposes.

Paragraph (b)—General Requirements

In paragraph (b), *General requirements*, OSHA sets forth for the most part a summary of requirements which are specified in detail in later paragraphs. The preamble discussion for later paragraphs sets forth the reasons for the various provisions. Many of these requirements are part of the minimum requirements which Congress directed OSHA to issue in section 126(e) of SARA. The EPA manual (EPA Order 1440.2) referenced in section 126(e) requires extensive training and medical surveillance programs. Subpart C of 29 CFR Part 1926, also referenced, requires, in addition, accident prevention programs (§ 1926.20(b)), use of appropriate personal protective equipment (§ 1926.28), sanitation and illumination requirements (§§ 1926.26 and 1926.27), provisions on safe handling of toxic substances (§ 1926.21 (b)(5)), precautions in confined spaces (§ 1926.21(b)(6)) and similar provisions. Congress also directed additional provisions for the proposed regulation, which are considered relevant for the interim regulation. These include engineering controls, maximum exposure limits and monitoring, handling requirements, decontamination procedures and emergency response. Based on this comprehensive statutory direction OSHA believes that the intent of Congress is to have employers implement a safety and health program that will address the recognized serious hazards to employees involved in hazardous waste operations. Therefore, OSHA has incorporated the more important elements of section 126(b), along with the mandatory provisions of section 126(e) of SARA, into this rule. Each general requirement in paragraph (b) calls for employer action and directs the employer to the specific paragraph of this rule that contains the duties in greater detail.

OSHA believes that these requirements are necessary to assure adequate employee protection to the known hazards faced by employees. The language used in these requirements has been adapted from the various documents listed in the Reference section of this preamble.

Three of the subparagraphs in paragraph (b) do not reference other paragraphs in the regulation. Paragraph (b)(1) requires the employer to develop a safety and health program for hazardous waste operations. Such programs are part of the requirements mandated by SARA for the interim rule. Thus, Subpart C of 29 CFR Part 1926 requires such a program in § 1926.20(b) and EPA Order 1440.2 requires training in "safety plan development" (pg. 5). OSHA's experience also establishes that a safety and health program is necessary to protect employees so that hazards are assessed and control programs are systematically laid out. Prior OSHA section 6(b) health standards require a compliance plan to set forth a health program to protect employees from the hazard.

Paragraph (b)(14) requires compliance with Subpart P of 29 CFR Part 1926 which covers excavation. OSHA considers that these provisions already apply, but they are singled out because they are particularly important to monitor since much excavation activity occurs on hazardous waste sites.

Paragraph (b)(15) requires employers to notify contractors and subcontractors of the hazards identified by the employer at hazardous waste operations. Sections 126(b)(2) and (e) of SARA indicate Congress's specific interest in protecting employees of contractors and in involving contractors in the safe operation of hazardous waste sites. This provision assists the contractor to become aware of the risks so that the contractor's employees may be better protected.

Paragraph (c)—Site Characterization and Analysis

For an effective safety and health program, which Congress clearly intends for employees, the employer needs to know the hazards faced by employees in order to develop and implement effective control measures. Site characterization provides the information needed to identify site hazards and to select employee protection methods. The more accurate, detailed, and comprehensive the information available about a site, the more the protective measures can be tailored to the actual hazards that the employees may encounter. Congress clearly intended that such a requirement be included. Subpart C of 29 CFR Part 1926 referenced in section 126(e) of SARA requires "frequent and regular inspections of the job site" (29 CFR 1926.20(b)(2)). Also section 126(b)(1) of SARA provides for site analysis. Also item #9 of the EPA manual (EPA Order 1440.2) addresses this practice.

Site characterization generally proceeds in three phases:

1. Prior to site entry, gather information away from the site, conduct reconnaissance from the site perimeter and conduct offsite characterization.

2. Conduct onsite surveys. During this phase, restrict site entry only to reconnaissance personnel.

3. Once the site has been determined safe for commencement of other activities, continue monitoring to provide an updated source of information about site conditions.

It is important to recognize that site characterization is a continuous process. At each phase of site characterization, information shall be obtained and evaluated to define the potential hazards of the site. This assessment shall be used to develop a safety and health plan for the next phase of work. In addition to the formal information gathering that takes place during the phases of site characterization described here, all site personnel should be constantly alert for new information about site conditions. Other requirements of this section have been adopted from reference 8.

Paragraph (d)—Site Control.

As part of the employers' site safety and health plan, this paragraph requires the employer to consider site control to minimize potential contamination of employees. Several items need to be considered, such as establishing work zones, so that employees know the hazards in different areas and will keep out of hazardous areas where the employees' presence is not required. Use of a buddy system and good site communications will assist in rescue of employees who become unconscious, trapped or otherwise seriously disabled on site.

Site control is especially important in emergency situations. Paragraph (d) describes the basic components of a program to control the activities and movements of employees and equipment at a hazardous waste site.

Several site control procedures can be implemented to reduce employee exposure to chemical, physical, biological, and safety hazards. The degrees of site control necessary depends on site characteristics, site size, and the surrounding community. The site control program should be established in the planning stages of a project and modified based on new information and site assessments developed during site characterization. The appropriate sequence for implementing these measures should be determined on a site-specific basis. In many cases, it will be necessary to implement several measures simultaneously.

The text used in this paragraph has been adapted from Reference 6. Item 9 of the EPA manual (Order 1440.2) indicates the need for this. In addition Subpart C of 29 CFR Part 1926 provides for regular inspection of job sites so hazards on the site can be controlled.

Paragraph (e)—Training.

The interim final rule includes specific provisions for initial and review training of employees before they are permitted to engage in hazardous waste operations that could expose them to safety and health hazards. Both the EPA manual and 29 CFR 1926.21 and 1926.22 referred to in section 126(e) of SARA have training and information requirements. The EPA manual has specific provisions for basic, intermediate and advanced training. It requires 40 hours training for employees managing uncontrolled hazardous waste sites, 24 hours for employees engaged in routine activities and 32 hours for intermediate activities. Additionally, section 126 generally has requirements for extensive training programs. The clear congressional intent of the interim final rule training provisions is to provide employees with the knowledge and skills necessary to perform hazardous waste clean-up operations with minimal risk to their safety and health.

The provisions for employees include a minimum of 40 hours of initial instruction off the site, and a minimum of 3 days of actual field experience under the direct supervision of a trained and experienced supervisor, at the time of job assignment. This amount of training is specifically directed by Congress for the interim final rule by its reference to the EPA manual which basically requires this amount of training for hazardous waste operators and Congress has specifically imposed these hour and day requirements under section 126(d) of SARA for the proposed final standard. There are slight differences between the EPA manual and section 126(c) of SARA. But they are sufficiently slight so that OSHA believes it appropriate to make the interim final rule consistent with what Congress directs for the proposed final rule so that employers need not make minor modifications to their training programs after two years.

In addition there are often many hazards at a waste site. The employee needs to be trained to recognize the hazards and appropriate work practices to minimize those hazards. The employee also needs to be well trained in the use of respirators and other forms of PPE. Without training those may not be used effectively and will not provide adequate protection. An extensive training program is necessary to achieve these objectives. The paragraph specifies these and the other items needed for effective training to avoid hazards.

Managers and supervisors directly responsible for hazardous waste site operations are to receive the same training as that of employees and at least eight additional hours of specialized training on managing hazardous waste operations. Since these people are responsible for directing others, it is necessary to enhance their ability to provide guidance and to make informed decisions. Both the EPA manual and section 126(e) of SARA direct eight hours of additional training for supervisors and managers.

The provisions also state that employees shall be retrained on an annual basis on relevant matters such as review of health hazards and use of personal protective equipment. Employees at hazardous waste operations face serious health and safety risks. Reminders are needed of this and of work practices to avoid hazards. Personal protective equipment provides much of their protection. If there is no retraining in the use, care and maintenance of said equipment, such equipment is unlikely to be utilized in a manner to provide adequate protection. The regulation provides for eight hours of annual retraining. The EPA manual for refresher training (item #10) requires this amount of training.

In all areas of training, whether it be for general site employees, on-site supervisors or for the use of specific equipment, the level of training provided needs to be consistent with the worker's job function and responsibilities. The training information should be presented clearly and, as a further safeguard, refresher training should be supplied to reemphasize the initial training and to update employees on any new policies or procedures.

A less detailed training provision is provided for employees working at routine operation on RCRA sites. Those sites will have more stable working conditions and the hazards will be better identified and more carefully controlled. Therefore OSHA believes not as extensive training is needed for those employees for the interim rule. OSHA specifies 24 hours for the required training based on the EPA manual which specifies this as the basic level of training for most routine field activities. OSHA in the proposal document will request comment whether this or a greater amount of training is appropriate for the permanent rule.

Paragraph (f)—Medical Surveillance

The interim final rule both includes specific provisions for baseline and periodic medical examinations. The EPA manual referred to in section 126(e) of SARA has requirements for both initial or baseline and periodic medical examinations. The examinations are to be provided to those routinely exposed to hazardous substances, to those whose duties are physically taxing and those who routinely wear respirators. In addition section 126(b) provides that routine medical examinations are to be provided to workers engaged in hazardous waste operations. Although the language is slightly different, the clear intent is to provide a comprehensive medical surveillance program for employees engaged in hazardous waste operations where it is medically prudent.

The paragraph states medical surveillance is to be provided to employees who have been or are expected to be exposed to hazardous substances or health hazards above established permissible exposure limits

for 30 or more days in a 12-month period or who wear respirators 30 days during the year. These are the employees who will be at greater health risk and employees who wear respirators need to be examined to determine whether they can safely do so as a routine matter. Some dividing line is needed, because employees who might be present on a hazardous waste site only a few days a year or working in areas such as offices or the periphery where exposures are low would not normally benefit from medical surveillance as their likely cumulative exposures to toxic chemicals would be very low probably not significantly higher than the general population. The EPA manual indicates some dividing line is appropriate because it directs medical surveillance only for employees "routinely" exposed

Wearing respirators for any part of each of 30 days will require medical surveillance because it indicates routine exposure to toxic chemicals. There is no requirement that there be 240 hours of respirator use before medical surveillance is required. Similarly being exposed over established safe levels to several chemicals each for less than 30 days but totalling more than 30 days per year requires medical surveillance. This indicates routine exposures to hazardous substances and also combinations of chemicals may cause synergistic effects creating greater health hazards than an individual chemical.

OSHA has based many of the details of medical surveillance on its experience in issuing health standards under section 6(b) of the OSH Act and as directed by section 8(b)(7) of the Act. Congress would be knowledgable that medical surveillance requirements in these standards represent OSHA's expert judgement of what is an appropriate medical surveillance program.

The appropriate medical tests and examinations depend on the substances an employee is exposed to and whether the employee wears a respirator. As employees on hazardous waste sites will be exposed to differing substances, the paragraph can not specifically state the required tests. Consequently the paragraph states that the employer provide to the physician information on exposures, respirator use, and duties on the site. The physician is then to determine the appropriate medical surveillance protocol in terms of specific tests and examinations. By the employer specifying duties the physician also can judge whether the employee can handle the arduousness of the work.

In situations where most of the employees on the site have similar exposures the protocol may be similar for all employees. Where different groups of employees on the site have substantially different exposures, several different protocols may be appropriate for the site's workers depending on exposures.

There are a number of sources for guidance on specific medical examination protocols. Chapter 5 of Reference 6 provides such guidance by groups of chemicals likely to be present on a site. It references other authorities. The manual should be supplied to the physician. It is also a basis for the medical surveillance program required by this paragraph. In addition, the EPA medical monitoring program guidelines referenced by the EPA manual provides guidance on specific protocols.

The paragraph requires an initial or baseline medical examination either prior to the start up date for employees who are currently working at hazardous waste sites or prior to initial assignment to an area where medical examinations will be required. The purpose is to take a detailed medical history and where possible develop a health baseline prior to any exposures so as to be able to evaluate changes which may be connected to hazardous substance exposures. In addition the initial examination will permit evaluation of whether the employee can appropriately wear respirators and whether the employee has preexisting conditions which would make exposure to hazardous substances inappropriate. An initial examination has been required by other OSHA health standards and is recommended in Reference 6.

The physician must be informed of what type of respirators and personal protective equipment an employee is likely to wear. The medical examination is to include appropriate tests to evaluate the employee's ability to wear respirators and PPE.

The physician will also specify the protocol of the periodic examinations. These may be different from the initial examination, for example, only an updated medical history would be required. The periodic examinations are required yearly. OSHA's experience in other health standards has been that this is an appropriate period and it is also recommended by Reference 6. EPA's medical monitoring program guidelines cross referenced in the EPA manual recommends baseline annual examination generally and a termination examination. It is reasonable to determine periodically whether exposures have brought medical changes and to identify conditions caused by chemicals at an early stage to permit more effective treatment. In some circumstances, the physician may advise more frequent examinations.

Examinations are also to be provided when the employee brings to the employer's attention signs or symptoms indicating possible overexposure to hazardous substances. The employee is to be trained in recognizing what symptoms may indicate substances to which the employee is exposed. Examples may be dizziness or rashes. Examinations are also required, when medically appropriate, during emergencies when exposure to higher levels is possible. For example, a urinary phenol test is appropriate for employees exposed to high levels of benzene in an emergency.

Finally, a medical examination is required for employees who have been required to have medical examinations upon termination of employment or reassignment to an area where medical examinations are not required. This is to detect conditions which have developed prior to departure and is recommended by the EPA program.

The medical examination is to be provided under the supervision of a licensed physician, i.e., the person must be qualified to make medical judgements. As provided by section 6(b)(7) of the OSH Act, the employer is to pay the cost of the examination. In addition provisions are included so that the employee is not discouraged from taking the examination. The exam is to be given at a reasonable time and place. If given during regular working hours the employee shall receive the employer's normal pay for that time. If the exam is given outside regular working hours, the employee shall be paid his regular wages for the time spent taking and waiting for the examination.

The physician shall make a report to the employer of medical conditions which may make the employee at increased risk to work at the site and any recommendations on limitations on use of respirators and other PPE as a result of the medical conditions. This will provide guidance for the safe employment of the employee at the site. The physician shall not reveal diagnoses or conditions unrelated to employment, but shall inform the employee directly of those conditions and any and all occupationally related conditions.

The medical paragraph requires that appropriate records be kept to assist in future evaluation of the employee's health. Secondarily, this information may assist in research on occupational related disease. Records should be kept pursuant to the provisions of 29 CFR 1910.20. Full consideration was given in

that standard to appropriate retention periods.

Paragraph (g)—Engineering Controls, Work Practices, and Personnel Protective Equipment

Anyone entering a hazardous waste site must be protected against potential hazards. The purpose of engineering controls, work practices, and PPE is to shield or isolate individuals from the chemical, physical, and biologic hazards that may be encountered at a hazardous waste site. Careful selection and use of adequate engineering controls, work practices and PPE should protect any employee from health and many other hazards including hazards to the respiratory system, skin, eyes, face, hands, feet, head, body, and hearing.

Requirements of both Subpart C of 29 CFR Part 1926 and the EPA manual mandated to be included in the standard by Congress cover the provision and use of personal protective equipment. See for example, 29 CFR 1926.28 and items 7(a), 9(a)(7) and 9(b)(2) of the EPA manual. In addition existing OSHA regulations which apply to hazardous waste operations, in 29 CFR Part 1910, Subpart Z require exposures to various toxic and hazardous substances to be controlled with engineering controls if feasible, otherwise with PPE. These requirements apply now to employers and workers on Superfund sites pursuant to EPA regulations in 40 CFR Part 300. Finally, Congress specified in section 126(b) that there should be both PPE and engineering control provisions for the permanent final standard.

Paragraph (g)(1) basically carries over the existing requirements of Subpart Z. OSHA regulated toxic and hazardous substances are to be controlled to the permissible exposure limit if feasible. If not feasible they are to be controlled with PPE.

Paragraph (g)(2) provides that to achieve established permissible exposures limits for substances not regulated by OSHA, the employer may use an appropriate combination of engineering controls, work practices, and PPE. As these are interim regulations, preference for engineering controls where not already required would not be appropriate because of the limited time frame of this regulation and the frequent inability to install such controls in a short period. In addition it is OSHA's experience that this is an appropriate approach based on the emergency temporary standards it has issued which are also in effect for a limited period. OSHA will ask for comment in these areas in the proposal documents.

Examples of engineering controls which may be feasible are pressurized cabs on materials handling equipment or pressurized control rooms in materials handling areas. However, in many cases personal protective equipment will be the only feasible means for providing protection to employees engaged in hazardous waste operations. The selection of personal protective equipment (PPE) must be based on the information obtained during the site characterization and analysis, as is required by paragraph (g)(3)(i) of this standard. Once an estimate of the types of hazards and their potential concentration has been obtained, the proper respirators and protective clothing can be selected based on the performance characteristics of the PPE relative to the site hazards and work conditions, as is required by paragraph (g)(3)(ii) of the standard. These requirements are derived from Reference 6 and are also supported by a NIOSH document, "Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide." These two document also support the requirements of paragraphs (g)(2)(iii) and (g)(2)(iv) which require positive pressure respirators with escape provisions to be used in IDLH atmospheres and totally-encapsulating chemical protective suits to be used where contact of the skin by the substance would be an IDLH situation.

Proper respirator selection, as required by this standard and 29 CFR 1910.134, involves providing a sufficient protection factor through the type of respirator used, respirator fitting, work site conditions, and respirator selection and use program. Proper protective clothing selection, as required by this standard, involves choosing protective clothing made of materials and construction which will prevent breakthrough of hazardous substances by permeation and penetration, or reduce the level of exposure to a safe level during the employee's duration of contact. Information on the performance characteristics of PPE is available in test reports and manufacturer's literature. Appendix B provides non-mandatory guidelines on classifying substance hazards as four levels (A, B, C, and D), and matching four levels of appropriate protection provided by different protective ensembles. These guidelines may be used as a basis for protective clothing selection, and the selection further refined when more information is obtained, as provided for in paragraph (g)(2)(v) of the standard. (In certain circumstances, this standard does specify the appropriate level of protection. See paragraph (c)(4)(iii)). Paragraph (g)(3)(vi) cross reference the existing requirements to select and use PPE pursuant to the requirements of 29 CFR 1910, Subpart I.

Paragraph (g)(4) requires totally-encapsulating suit materials used for Level A protection (the highest level of protection) to provide protection from the specific hazards which have been identified as requiring that level of protection. The purpose of this requirement is to be certain that the suit selected is comprised of materials which will provide the necessary protection, since no one material will provide protection from all hazards. Paragraphs (g)(4)(ii) and (g)(4)(iii) require totally-encapsulating suits to be capable of maintaining positive air pressure to help prevent inward leakage of hazardous substances, and to be capable of preventing inward gas leakage of more than 0.5 percent. These requirements, which are based on testing of totally-encapsulating suits, are included to establish a minimum level of suit performance so that their level of protection can be quantified for proper selection. The example test methods in Appendix A for totally-encapsulating chemical protective suits were taken from draft American Society for Testing and Materials committee documents.

Paragraph (g)(5) requires a PPE program to be established. This requirement is based upon reference 6, 29 CFR 1926.28, EPA manual items 4 and 7(g), and is included since, in most cases, PPE will be the only protection feasible for employee protection, and because the amount of protection afforded by PPE is dependent upon so many factors, such as selection, fit, work duration and conditions, and decontamination. The PPE program is required to insure that the level of protection afforded by PPE is sufficient and continues to be sufficient for employee safety during hazardous waste operations.

Paragraph (h)—Monitoring

It is essential that employers be provided with accurate information on employee exposures in order to implement the correct PPE, engineering controls, and work practices. Airborne contaminants can present a significant threat to employee safety and health. Thus, identification and quantification of these contaminants through air monitoring is an essential component of a safety and health program at a hazardous waste site. Reliable measurements of airborne contaminants are useful for selecting personal protective equipment, determining

whether engineering controls can achieve permissible exposure limits and which controls to use, delineating areas where protection is needed, assessing the potential health effects of exposure, and determining the need for specific medical monitoring. As mentioned above, section 126(e) of SARA mandates the use of PPE by its direction that at a minimum the requirements of the EPA manual and Subpart C be followed. Those include requirements for use of PPE. But PPE cannot be effectively used unless monitoring has identified the type of PPE to be used. This is a further reason to include this provision in the interim final rule.

The language of this paragraph was adapted from reference 6.

Paragraph (i)—Informational Programs

In paragraph (i), *Informational Programs*, OSHA is requiring employers, as part of their safety and health program, to develop and implement a site specific safety and health plan for each hazardous waste operation site.

The site safety and health plan shall be developed by the employer, utilizing the other parts of the organizational plan and the employer's safety and health program. The site safety and health plan will address the anticipated safety and health hazards of each work operation or activity and the means to eliminate the hazards or to effectively control them to prevent injury or illness.

This site safety and health plan is to include: (1) The names of those responsible for assuring that safe and healthful practices and procedures are followed on the whole site; (2) risk analysis or systems analysis for specific work tasks or operations on the site; (3) employee training assignments both off site and on-the-job-training on site; (4) the list of required personal protective equipment needed for each work task and operation on site; (5) the employer's medical surveillance program for the site; (6) the methods for identification and characterization of safety and health hazards on the site including the monitoring procedures that will be done throughout the work on site; (7) site control measures including those for establishing work zones on the site; (8) the necessary decontamination procedures which are matched to the kinds of anticipated contaminants to be cleaned from employees and equipment; (9) the standard operating procedures to be used by employees on site; and (10) the contingency plan for emergencies and confined space entry procedures. Safety meetings and briefings and site inspections shall also be mentioned in the plan as well as the procedures to be followed in changing or modifying the plan.

The site safety and health plan is necessary to protect employee health. There are many hazards at a hazardous waste operation which need to be determined and addressed. The plan provides that this will be done in a systematic manner so that hazards will not be missed and so that needed protective action will not be overlooked. The approach used has be adapted from reference 6.

Paragraph (j)—Handling Drums and Containers

The handling of drums and containers at hazardous waste sites poses one of the greatest dangers to hazardous waste site employees. Hazards include detonations, fires, explosions, vapor generation, and physical injury resulting from moving heavy containers by hand and working around stacked drums, heavy equipment, and deteriorated drums. While these hazards are always present, proper work practices can minimize the risks to site personnel. Handling and storage of hazardous substances is addressed in item (a) of the EPA manual.

Containers are handled during characterization and removal of their contents and during other operations. Many of the hazards encountered during the handling of drums occur during the handling of containers. The relative size of a container when compared to the size of a drum is no indication of the degree of hazard posed by the container. They should be treated in accordance with the level of hazard posed by their contents not by their size. The language used in this paragraph was adapted from Reference 6.

Paragraph (k)—Decontamination

As part of the care of PPE required by this standard, decontamination is a necessary practice to properly protect those employees who may be exposed to hazardous substances. Decontamination provisions protect an employee from being exposed to hazardous substances which would otherwise be on the employee's PPE when it is removed. The standard requires that a decontamination plan be developed and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

As required by the standard, decontamination procedures and areas shall be developed to minimize hazardous exposures to employees whose equipment and PPE are being decontaminated, as well as to employees who are assisting in the decontamination of workers and equipment. These measures are required since without proper procedures and decontamination areas, employees may be unknowingly exposed to hazardous substances which have contacted, or otherwise adhered to equipment and clothing. The standard also requires that all employees, clothing, equipment and decontamination fluids and equipment be decontaminated or disposed of before leaving a contaminated area. These provisions are required so that contaminated persons and materials do not leave the "hot zone" and thereby expose other employees and persons to hazardous substances.

Decontamination methods and cleaning fluids must be matched to the particular hazardous substance at the site in order for the decontamination procedures to be effective in removing the hazards from PPE and other equipment. No one decontamination fluid will be effective for all hazardous substances. As required by the standard the decontamination program must be effective and it must be monitored by the site safety and health officer to maintain its effectiveness. These requirements are included so that employees are not exposed to hazardous substances by reusing PPE and other equipment which are still contaminated.

The language used in this paragraph was adapted from reference 6.

Paragraph (l)—Emergency Response

Section 126(e) of SARA specifically discusses protecting "emergency response workers," in addition in the EPA manual under items 4 and 9 and in 29 CFR 1926.23 and 1926.24 call for preparations and planning for emergencies. Congress made its intent clear that emergency planning and response is an important part of any employer's safety and health program and indicated that it is to be addressed in the interim final rule.

In paragraph (l)(1), *Emergency Response, General*, OSHA is requiring employers covered in paragraph (a)(2)(ii), who are involved in hazardous waste operations, as part of their on-site contingency planning to develop and implement an emergency response plan. These employers are to inform all their employees on the waste site about the emergency response plan. The plan is to be available for use prior to the start of work on the site. The plan will be a part of the site safety and health plan. The elements of the emergency response plan will include: (1) Recognition of emergencies; (2) methods or procedures for alerting employees on site; (3)

evacuation procedures and routes to places of refuge or safe distances away from the danger area; (4) means and methods for emergency medical treatment and first aid; (5) line of authority for employees; and (6) on-site decontamination procedures; site control means and methods for evaluating the plan.

Employers whose employees will be responding to hazardous substance emergency incidents from their regular work location or duty station, such as a fire department, fire brigade or emergency medical service, will also be required to have an emergency response plan. These employees which may be called upon to respond to hazardous substance emergency incidents involving a railroad tank car, motor carrier tank truck or to a plant location are considered off-site emergency response activities under this section. The emergency response plan is to include the incident command system required in paragraph (l)(3) of this section.

In paragraph (l)(2), *Hazardous waste operations, on-site emergency response,* OSHA is requiring the training of on-site emergency response personnel to have the same basic training as for the other employees involved in on-site hazardous waste operations plus the training needed to develop and retain the necessary skills for anticipated emergency response activities. Also, the procedures for handling hazardous substances on-site emergency incidents are to be oriented to the specific site and made a part of the emergency response plan.

The requirement of paragraphs (l)(3) and (l)(4) apply more broadly to all employers whose employees respond to off-site emergency incidents. In paragraph (l)(3), *Off-site emergency response,* OSHA is mandating that employers, such as fire departments, emergency medical and first-aid squads, fire brigades, etc., conduct monthly training sessions for their employees totalling 24 hours annually.

Note.—OSHA does not have jurisdiction over state and local government employees. OSHA state plan states must issue regulations as effective as these to cover state and local government employees in the state.

Training activities, such as breathing apparatus use, training, hose handling and preplanning may be used as training subjects for the monthly sessions provided hazardous substance incident operations are included in the presentation, discussion or drill. These training sessions and drills must involve at least 24 hours of training on an annual basis.

The incident command system shall be established by these employers for the incidents that will be under their control and shall be interfaced with the other organizations or agencies who may respond to such an incident. The National Transportation Safety Board, as a result of its investigation of hazardous materials incidents, has consistently recommended that better state and local emergency response planning be done to reduce the loss of life and property and that a system using a command post and on-scene commander be implemented. (See *Special Investigation Report. On-scene Coordination Among Agencies at Hazardous Materials Accidents,* NTSB–HZM–79–3, September 13, 1979; and *Multiple Vehicle Collisions and Fire, Caldecott Tunnel near Oakland, California,* NTSB/HAR–83/01, National Transportation Safety Board, Washington, DC, April 7, 1982, for further information.) Where available, state and local district emergency response plans shall be utilized in developing the incident command system and the emergency response plan to assure compatability with the other emergency responding agencies or employers.

In paragraph (l)(4), *Hazardous materials teams,* OSHA is requiring employers, who utilize specially trained teams involved in intimate contact with controlling or handling hazardous substances, to provide special training for the affected employees in such areas as care and use of chemical protective clothing, techniques and procedures for stopping or controlling leaking containers and decontamination of clothing and equipment for anticipated hazardous substance incidents. The employer is to make available to each team member a physical examination by a licensed physician and to implement a medical surveillance program in accordance with the requirements of paragraph (f) of this section.

In paragraph (l)(5), OSHA is requiring employers covered in paragraphs (a)(2)(i) and (ii) of this section, who will be involved in cleaning up hazardous waste after the emergency response activities are concluded, to comply with the same requirements that apply to others involved with hazardous waste clean-up operations. These hazardous waste clean-up operations will be typically done by special contractors and not by those agencies involved in responding to the initial emergency incident.

Paragraph (m)—Illumination

OSHA is required by SARA in section 126(e) to cover lighting of the worksite. In paragraph (m), *Illumination,* OSHA requires certain minimum illumination levels for work areas that are occupied by employees. Section 126(e) of SARA requires as a minimum the inclusion of the requirements of Subpart C of 29 CFR Part 1926. Section 1926.26 of that Subpart requires the amount of illumination set forth in this paragraph.

Paragraph (n)—Sanitation for Temporary Worksites

In paragraph (n), *Sanitation for temporary worksites,* OSHA sets minimum requirements for potable and non-potable water supplies, toilet facilities, and other areas related to sanitation at temporary workplaces. OSHA is mandated by SARA in section 126(e) to include sanitation requirements in the interim final rule since it requires the incorporation of provisions of Subpart C.

Paragraph (o)—Operations Conducted Under the Resource Conservation and Recovery Act of 1976 (RCRA)

OSHA is providing a separate paragraph for operations conducted at worksites involving hazardous waste storage, disposal and treatment operating under the Resource Conservation and Recovery Act of 1976 (RCRA). This separate paragraph of requirements is appropriate because RCRA site operations, (not including major corrective actions and their associated hazards which are like CERCLA sites and are covered by the main part of the standard) generally are different from the operations and hazards found on a CERCLA clean-up site. For example, RCRA sites covered by this paragraph tend for the most part to be fixed on-going operations involving the receiving, processing, storage, treatment, and disposal of hazardous wastes or substance from outside sources. CERCLA sites on the other hand are temporary emergency clean-up operations involving often undefined and substantial quantities of hazardous substances.

Consequently hazards should be better controlled and more routine and stable for the RCRA sites covered by this paragraph and so less extensive requirements are appropriate.

Paragraph (p)—Start-up Dates

Section 126(e) of SARA directs that these interim final regulations take effect on issuance. Consequently, these regulations do become effective on issuance. However, completion of

implementation for some provisions is not feasible immediately. For these provisions, commencement of implementation must begin immediately, but completion of full compliance is required as soon as possible or feasible but in no case later than a specified date, which is no longer than three months.

It is OSHA's judgment that all provisions can be fully implemented by the periods specified. OSHA also believes that the immediate effectiveness provisions specifically apply to the mandatory requirements.

OSHA does not believe that Congress intended that work at current hazardous waste operations stop until implementation of all requirements can be feasibly completed. This paragraph so indicates. However, for new sites, these requirements can be completed in advance. It is not OSHA's intention that emergency actions necessary to protect the public safety and health be prevented because in a particular circumstance it is not feasible to carry out particular requirements of this standard in the time needed to respond to the emergency.

III. References

1. Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499.
2. Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or "Superfund"), Pub. L. 96-510, December 11, 1980, 94 Stat. 2767.
3. Resource Conservation and Recovery Act of 1976 (RCRA), Pub. L. 94-580, October 21, 1976, 90 Stat. 2795.
4. "Health and Safety Requirements for Employees Engaged in Field Activities", Environmental Protection Agency Order 1440.2, U.S. Environmental Protection Agency, July 12, 1981.
5. Subparts C and D of 29 CFR Part 1926.
6. "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.", Occupational Safety and Health Administration, Environmental Protection Agency, U.S. Coast Guard, and National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 85-115, October 1985.

IV. Regulatory Impact Analysis, Regulatory Flexibility Analysis and Environmental Impact Analysis

OSHA anticipates that this interim final standard will have a significant impact upon employers and their employees who work at CERCLA sites and at some RCRA sites; and who respond to emergency clean-ups of hazardous substance spills. OSHA has had little time since the enactment of SARA to collect information concerning these industries. As a result, the currently available information is insufficient for OSHA to use to estimate the potential benefits and costs that would occur as a consequence of compliance with this interim final rule. OSHA is collecting additional information to be used in conjunction with the information from the comments that will be received in response to publication of the proposed rule covering hazardous waste operations. This information will be sufficient for OSHA to provide a complete Regulatory Impact Analysis for the final rule that will govern hazardous waste operations.

Regulatory Flexibility Act Analysis. The requirements of the Regulatory Flexibility Act are not applicable to this interim final rule, under 5 U.S.C. 603(a), because notice and comment proposed rulemaking under the Administrative Procedures Act, or any other statute, is not required.

Environmental Impact Analysis. The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq*), as implemented by the regulations (40 CFR Part 1500) of the Council on Environmental Quality (CEQ), requires that federal agencies assess their regulatory actions to determine if there is a potential for a significant impact on the quality of the human environment and, if necessary, to prepare an environmental impact statement.

In accordance with these requirements and DOL NEPA Compliance Procedures (29 CFR Part 11, Subpart B, section 11.10(a)(4)), OSHA has determined that due to the compressed rulemaking schedule imposed by the Congress in issuing the interim regulation, no environmental impact statement will be prepared for this interim rule.

In similar situations, for example, when an emergency temporary standard (ETS) has been issued, the courts have held that NEPA does not require advance preparation of an environmental statement for an ETS (*Dry Color Manufacturing Association* v. *U.S. Department of Labor*; 486 F. 2d 98, 107 [3rd Cir. 1973]). This interim final standard is similar in nature to an ETS issued for relatively brief periods for short notice pursuant to section 6(c) of the Occupational Safety and Health Act of 1970 and section 101(b) of the Federal Mine Safety and Health Act of 1977. The DOL NEPA regulations set forth in 29 CFR Part 11, Subpart B, section 11.10(a)(4), provide that in these situations the regulations set forth in 40 CFR Parts 1500 *et seq* may not be strictly observable.

OSHA, however, will assess the environmental effects of the proposed permanent regulation of hazardous waste sites. The possibility that increased training related to employee safety and health protection will also affect and reduce inadvertent environmental releases of hazardous substances at waste sites will be analyzed. The results of this study will be available for review and comment prior to the hearing on the proposed permanent standard and will be an appropriate issue for discussion at the public hearings scheduled for the proceeding.

In the interim, OSHA welcomes any comments on any environmental effects that might occur as a result of promulgation of a rule on hazardous waste sites.

V. International Trade

OSHA has preliminarily concluded that this interim final rule will not significantly affect international trade. The firms that will be primarily affected by this interim final rule deal with hazardous waste products and are not involved in international trade. In addition, the hazardous wastes to be handled under this interim final rule are primarily by-products from previously manufactured goods and consequently, any potential costs would not be borne by the goods that are currently being traded. Nevertheless, the information that OSHA is collecting and the information that will be supplied in response to the publication of the proposed rule covering Hazardous Waste Operations will be carefully reviewed and analyzed to establish the potential impacts of the final rule upon international trade.

VI. State Plan States

This Federal Register document adds an interim final rule (section 1910.120, "Hazardous Waste Operations and Emergency Response") to existing Subpart H of 29 CFR Part 1910, OSHA's general industry standards on hazardous materials. The 25 States with their own OSHA approved occupational safety and health plans must develop a comparable standard applicable to both the private and public (State and local government employees) sectors within six months of the publication date of this interim final rule or show OSHA why there is no need for action, e.g., because an existing state standard covering this area is already "at least as effective" as the new Federal standard. These states are Alaska, Arizona, California, Connecticut (for state and local government employees only), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York (for state and local government employees

only), North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. Until such time as a state standard is promulgated, Federal OSHA will provide interim enforcement assistance, as appropriate, in these states.

List of Subjects in 29 CFR Part 1910

Containers, Drums, Emergency response, Flammable and combustible liquids, Hazardous materials, Hazardous substances, Hazardous wastes, Incorporation by reference, Materials handling and storage, Personal protective equipment, Storage areas, Training, Waste disposal.

VII. Immediate Effectiveness and Absence of Notice and Comment

Section 126(e) of SARA specifically provides that the "Secretary of Labor shall issue interim final regulations under this section within 60 days . . ." after date of enactment. The express use of the phrase "interim final regulations," which in the rulemaking context commonly describes a rule issued without notice and comment, in connection with the extremely limited time frame provided by this section, makes clear that Congress intended this rule to be issued without the time-consuming process of notice and comment. The Agency, therefore, concludes that neither the notice and comment rulemaking provisions of the OSH Act nor those of the Administrative Procedures Act are applicable to the issuance of this interim final rule. The Agency also expressly finds that "good cause" exists under 5 U.S.C. 553(b)(B) for not providing notice and comment because notice and comment procedures, under these circumstances, would be impractical and contrary to the public interest.

Section 126(e) also expressly provides that "Such interim final regulations shall take effect upon issuance. . . ." OSHA finds this specific direction of law requires the Agency to issue this rule with an immediate effective date and, further, constitutes good cause not to delay the effective date of this rule until 30 days after publication under 5 U.S.C. 553(d).

Authority

This document has been prepared under the direction of John A. Pendergrass, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue NW., Washington, DC. Pursuant to section 126(e) of the Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499), Sections 6 and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655, 657), Sections 3 and 4 of the Administrative Procedures Act (5 U.S.C. 552(a), 553), and Secretary of Labor's Order 9-83 (48 FR 35736), 29 CFR Part 1910 is amended by adding a new § 1910.120, Hazardous Waste Operations, as set forth below, effective December 19, 1986.

Signed at Washington, DC this 18th day of December 1986.

John A. Pendergrass,

Assistant Secretary of Labor.

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

1. The Authority citation for Subpart H of Part 1910 is amended by adding the following:

Authority: * * * Section 1910.120 issued under the authority of section 126(e) of the Superfund Amendments and Reauthorization Act of 1986 (Pub. L. 99-499), Sections 6 and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655, 657), sections 3 and 4 of the Administrative Procedure Act (5 U.S.C. 552(a), 533) and Secretary of Labor's Order 9-83 (48 FR 35736).

2. Part 1910 of Title 29 of the Code of Federal Regulations is amended by adding a new § 1910.120 to read as follows:

§ 1910.120 Hazardous waste operations and emergency response.

(a) *Scope, application, and definitions.*—(1) *Scope.* This section covers employers and employees engaged in the following operations:

(i) Hazardous substance response operations under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 U.S.C. 9601 *et seq*) (CERCLA), including initial investigations at CERCLA sites before the presence or absence of hazardous substances has been ascertained;

(ii) Major corrective actions taken in clean-up operations under the Resource Conservation and Recovery Act of 1976 as amended (42 U.S.C. 6901 *et seq*) (RCRA);

(iii) Operations involving hazardous waste storage, disposal and treatment facilities regulated under 40 CFR Parts 264 and 265 pursuant to RCRA, except for small quantity generators and those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34;

(iv) Hazardous waste operations sites that have been designated for clean-up by state or local governmental authorities; and

(v) Emergency response operations for releases of or substantial threats of releases of hazardous substances and post-emergency response operations for such releases.

(2) *Application.* (i) All requirements of Part 1910 and Part 1926 of Title 29 of the Code of Federal Regulations apply pursuant to their terms to hazardous waste operations (whether covered by this section or not). In addition the provisions of this section apply to operations covered by this section. If there is a conflict or overlap, the provision more protective of employee safety and health shall apply. 29 CFR 1910.5(c)(1) is not applicable.

(ii) All paragraphs of this section except paragraph (o) apply to hazardous substance response operations under CERCLA, major corrective actions taken in clean-up operations under RCRA, post-emergency response operations, and hazardous waste operations that have been designated for clean-up by state or local governmental authorities.

(iii) Only the requirements of paragraph (o) of this section apply to those operations involving hazardous waste storage, disposal, and treatment facilities regulated under 40 CFR Parts 264 and 265, except for small quantity generators and those employers with less than 90 days accumulation of hazardous wastes as defined in 40 CFR 262.34.

(iv) Paragraph (l) of this section applies to emergency response operations for releases of or substantial threats of releases of hazardous substances.

(3) *Definitions*—*"Buddy system"* means a system of organizing employees into work groups in such a manner that each employee of the work group is designated to observe the activities of at least one other employee in the work group. The purpose of the buddy system is to provide quick assistance to those other employees in the event of an emergency.

"Decontamination" means the removal of hazardous substances from employees and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

"Emergency response" means response to any occurrence which results, or is likely to result, in a release of a hazardous substance due to an unforeseen event.

"Established permissible exposure limit" means the inhalation or dermal permissible exposure limit specified in 29 CFR Part 1910, Subpart Z, or if none is specified the exposure limits in "NIOSH Recommendations for Occupational Health Standards" dated September 1986 incorporated by reference, or if neither of the above is specified, the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1986-87" dated

1986 incorporated by reference, or if none of the above is specified, a limit based upon a published study or manufacturers' safety data sheet brought to the employer's attention. The two documents incorporated by reference are available for purchase from the following:

NIOSH, Publications Dissemination, Division of Standards Development and Technology Transfer, National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, OH 45226, (513) 841-4287

American Conference of Governmental Industrial Hygienists, 6500 Glenway Ave., Building D-7, Cincinnati, OH, 45211-4438, (513) 661-7881

and are available for inspection and copying at the OSHA Docket Office, Docket No. S-760, Room N-3671, 200 Constitution Ave., NW., Washington, DC 20210.

"Hazardous substance" means any substance designated or listed under (i) through (iv) below, exposure to which results or may result in adverse effects on the health or safety of employees:

(i) any substance defined under section 101(14) of CERCLA,

(ii) any biological agent and other disease-causing agent as defined in section 104(a)(2) of CERCLA,

(iii) any substance listed by the U.S. Department of Transportation and regulated as hazardous materials under 49 CFR 172.101 and appendices, and

(iv) hazardous waste.

"Hazardous waste" means (i) a waste or combination of wastes as defined in 40 CFR 261.3, or (ii) those substances defined in 49 CFR 171.8.

Hazardous waste operation" means any operation involving employee exposure to hazardous wastes, hazardous substances, or any combination of hazardous wastes and hazardous substances that are conducted within the scope of this standard.

"Hazardous waste site" or *"site"* means any facility or location at which hazardous waste operations within the scope of this standard take place.

"Health hazard" means a chemical, mixture of chemicals or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Further definition of the terms used above can be found in Appendix A to 29 CFR 1910.1200.

"IDLH" or *"Immediately dangerous to life or health"* means any condition that poses an immediate threat to life, or which is likely to result in acute or immediate severe health effects. This includes oxygen deficiency conditions.

"Immediate severe health effects" means any acute clinical sign or symptom of a serious, exposure-related reaction manifested within 72 hours after exposure to a hazardous substance.

"Oxygen deficiency" means that concentration of oxygen by volume below which air supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

"Site safety and health officer" means the individual located on a hazardous waste site who is responsible to the employer and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.

(b) *General requirements*—(1) *Safety and health program.* Each employer shall develop and implement a safety and health program for its employees involved in hazardous waste operations. The program, as a minimum, shall incorporate the requirements of this section and be provided, as appropriate, to any subcontractor or its representative who will be involved with the hazardous waste operation. The program shall be designed to identify, evaluate, and control safety and health hazards and provide for emergency response for hazardous waste operations.

(2) *Site characterization and analysis.* Hazardous waste sites shall be evaluated in accordance with paragraph (c) of this section to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

(3) *Site control.* Site control procedures shall be implemented in accordance with paragraph (d) of this section before clean-up work begins to control employee exposure to hazardous substances.

(4) *Training.* Initial or refresher or review training meeting the requirements of paragraph (e) of this section shall be provided to employees before they are permitted to engage in hazardous waste operations that could expose them to hazardous substances, safety, or health hazards.

(5) *Medical surveillance.* Medical surveillance shall be provided in accordance with paragraph (f) of this section for employees exposed or potentially exposed to hazardous substances or health hazards or who wear respirators.

(6) *Engineering controls, work practices and personal protective equipment.* Engineering controls, work practices, personal protective equipment, or a combination of these shall be implemented in accordance with paragraph (g) of this section to protect employees from exposure to hazardous substances and health hazards.

(7) *Monitoring.* Monitoring shall be performed in accordance with paragraph (h) of this section to assure proper selection of engineering controls, work practices and personal protective equipment so that employees are not exposed to levels which exceed established permissible exposure limits for hazardous substances.

(8) *Informational program.* Employees, contractors, and subcontractors or their representative shall be informed of the degree and nature of safety and health hazards specific to the work site by using the safety and health plan outlined in paragraph (i) of this section.

(9) *Material handling.* Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, labeled, and disposed of in accordance with paragraph (j) of this section.

(10) *Decontamination.* Procedures for all phases of decontamination shall be developed and implemented in accordance with paragraph (k) of this section.

(11) *Emergency response.* Emergency response to hazardous waste operation incidents shall be conducted in accordance with paragraph (l) of this section.

(12) *Illumination.* Areas accessible to employees shall be lighted in accordance with the requirements of paragraph (m) of this section.

(13) *Sanitation.* Facilities for employee sanitation shall be provided in accordance with paragraph (n) of this section.

(14) *Site excavation.* Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped to prevent accidental collapse and conducted in accordance with Subpart P of 29 CFR Part 1926.

(15) *Contractors and sub-contractors.* An employer who retains contractor or

sub-contractor services for work in hazardous waste operations shall inform those contractors, sub-contractors, or their representatives of any potential fire, explosion, health or other safety hazards of the hazardous waste operation that have been identified by the employer.

(c) *Site characterization and analysis.* (1) A preliminary evaluation of a site's characteristics shall be performed prior to site entry by a trained person to aid in the selection of appropriate employee protection methods prior to site entry. During site entry, a more detailed evaluation of the site's specific characteristics shall be performed by a trained person to further identify existing site hazards and to further aid in the selection of the appropriate engineering controls and personal protective equipment for the tasks to be performed.

(2) All suspected conditions that may pose inhalation or skin absorption hazards that are immediately dangerous to life or health (IDLH) or other conditions that may cause death or serious harm shall be identified during the preliminary survey and evaluated during the detailed survey. Examples of such hazards include, but are not limited to, confined space entry, potentially explosive or flammable situations, visible vapor clouds, or areas where biological indicators such as dead animals or vegetation are located.

(3) The following information to the extent available shall be obtained by the employer prior to allowing employees to enter a site:

(i) Location and approximate size of the site.

(ii) Description of the response activity and/or the job task to be performed.

(iii) Duration of the planned employee activity.

(iv) Site topography.

(v) Site accessibility by air and roads.

(vi) Pathways for hazardous substance dispersion.

(vii) Present status and capabilities of emergency response teams that would provide assistance to on-site employees at the time of an emergency.

(viii) Hazardous substances and health hazards involved or expected at the site and their chemical and physical properties.

(4) Personal protective equipment (PPE) shall be provided and used during initial site entry in accordance with the following requirements:

(i) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below established permissible exposure limits for known or suspected hazardous substances and health hazards and will provide protection against other known and suspected hazards identified during the preliminary site evaluation.

(ii) An escape self-contained breathing apparatus of at least five minutes duration shall be carried by employees or kept available at their immediate work station if positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble.

(iii) If the preliminary site evaluation does not produce sufficient information to identify the hazards or suspected hazards of the site an ensemble of Level B PPE shall be provided as minimum protection and direct reading instruments shall be carried for identifying IDLH conditions. (See Appendix B for guidelines on Level B protective equipment.)

(iv) Once the hazards of the site have been positively identified, the appropriate PPE shall be selected and used in accordance with paragraph (g) of this section.

(5) The following monitoring shall be conducted during site entry when the site evaluation produces information which show the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient to rule out these possible conditions:

(i) Monitoring for hazardous levels of ionizing radiation.

(ii) Monitoring the air with appropriate test equipment for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances.)

(iii) Visually observe for signs of actual or potential IDLH or other dangerous conditions.

(6) Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified.

Note.—Risks to consider include, but are not limited to:

Exposures exceeding the appropriate Threshold Limit Values (TLVs), Permissible Exposure Limits (PELs), or Recommended Exposure Limits (RELs).

IDLH Concentrations.

Potential Skin Absorption and Irritation Sources.

Potential Eye Irritation Sources.

Explosion Sensitivity and Flammability Ranges.

(7) Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to all employees prior to the commencement of their work activities.

(8) An ongoing air monitoring program in accordance with paragraph (h) of this section shall be implemented after site characterization has determined the site is safe for the start-up of operations.

(d) *Site control.* (1) A site control program for preventing contamination of employees shall be developed during the planning stages of a hazardous waste operation clean-up.

(2) The site control program shall, as a minimum, include: A site map; site work zones; the use of a "buddy system"; site communications; the standard operating procedures or safe work practices; and, identification of nearest medical assistance.

(e) *Training.* (1) All employees (such as equipment operators and general laborers) exposed to hazardous substances, health hazards, or safety hazards shall be thoroughly trained in the following:

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

(ii) Safety, health and other hazards present on the site;

(iii) Use of PPE;

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

(v) Safe use of engineering controls and equipment on the site;

(vi) Medical surveillance requirements including recognition of symptoms and signs which might indicate over exposure to hazards; and

(vii) Paragraphs (G) through (K) of the site safety and health plan set forth in paragraph (i)(2)(i) of this section.

(2) All employees shall at the time of job assignment receive a minimum of 40 hours of initial instruction off the site, and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Workers who may be exposed to unique or special hazards shall be provided additional training. The level of training provided shall be consistent with the employee's job function and responsibilities.

(3) On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations shall receive training as provided in paragraph (e)(1) and (e)(2) of this section and at least eight additional hours of specialized training on managing such operations at the time of job assignment.

(4) Trainers shall have received a level of training higher than and including the subject matter of the level of instruction that they are providing.

(5) Employees shall not participate in field activities until they have been trained to a level required by their job function and responsibility.

(6) Employees and supervisors that have received and successfully completed the training and field experience specified in paragraphs (e)(1), (e)(2) and (e)(3) of this section shall be certified by their instructor as having completed the necessary training. Any person who has not been so certified or meets the requirements of paragraph (e)(1) of this section shall be prohibited from engaging in hazardous waste operations after March 16, 1987.

(7) Employees who are responsible for responding to hazardous emergency situations that may expose them to hazardous substances shall be trained in how to respond to expected emergencies.

(8) Employees specified in paragraph (e)(1) and managers specified in paragraph (e)(3) of this section shall receive eight hours of refresher training annually on the items specified in paragraph (e)(1) of this section and other relevant topics.

(9) Employers who can show by an employee's work experience and/or training that the employee has had initial training equivalent to that training required in paragraphs (e)(1), (e)(2), and (e)(3) of this section shall be considered as meeting the initial training requirements of those paragraphs. Equivalent training includes the training that existing employees might have already received from actual, on-site experience.

(f) *Medical surveillance*—(1) *Employees covered.* A medical surveillance program shall be instituted by the employer for:

(i) all employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limits for these substances, without regard to the use of respirators, for 30 days or more a year, or

(ii) all employees who wear a respirator for 30 days or more a year, or

(iii) HAZMAT employees specified in paragraph (1)(4) of this section while engaged in hazardous waste operations covered by this section.

(iv) The employer shall make medical examinations or consultations available to all employees who may have been exposed in an emergency situation to hazardous substances at concentrations above the permissible exposure limits.

(2) *Frequency of medical examinations and consultations.* Medical examinations and consultations shall also be made available by the employer to each employee covered under paragraph (f)(1) of this section on the following schedules:

(i) Prior to assignment or for employees covered on the effective date of this standard as specified in paragraph (p) of this section.

(ii) At least once every twelve months for each employee covered.

(iii) At termination of employment or reassignment to an area where the employee would not be covered if the employee has not had an examination within the last six months.

(iv) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards

(v) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary.

(3) *Content of medical examinations and consultations.* (i) Medical examinations required by paragraph (f)(2) of this section shall include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the work site.

(ii) The content of medical examinations or consultations made available to employees pursuant to paragraph (f) shall be determined by the examining physician.

(4) *Examination by a physician and costs.* All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(5) *Information provided to the physician.* The employer shall provide the following information to the examining physician:

(i) A copy of this standard and its appendices,

(ii) A description of the employee's duties as they relate to the employee's exposures,

(iii) The employee's exposure levels or anticipated exposure levels,

(iv) A description of any personal protective equipment used or to be used, and

(v) Information from previous medical examinations of the employee which is not readily available to the examining physician.

(6) *Physician's written opinion.* (i) The employer shall obtain and furnish the employee with a copy of a written opinion from the examining physician containing the following:

(A) The results of the medical examination and tests.

(B) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health.

(C) The physician's recommended limitations upon the employees assigned work.

(D) A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

(ii) The written opinion obtained by the employer shall not reveal specific findings or diagnoses unrelated to occupational exposure.

(7) *Recordkeeping.* (i) An accurate record of the medical surveillance required by paragraph (f)(1) of this section shall be retained. This record shall be retained for the period specified and meet the criteria of 29 CFR 1910.20.

(ii) The record required in paragraph (f)(5)(i) of this section shall include at least the following information:

(A) The name and social security number of the employee;

(B) Physicians' written opinions;

(C) Any employee medical complaints related to exposure to hazardous substances;

(D) A copy of the information which shall be provided to the examining physician by the employer, with the exception of the standard and its appendices.

(iii) The employer shall ensure that this record is retained for the period specified in 29 CFR 1910.20.

(g) *Engineering controls, work practices, and personal protective equipment for employee protection*—(1) *Engineering controls, work practices and PPE.* (i) Engineering controls and work practices shall be instituted to reduce and maintain employee exposure to or below the permissible exposure limits of those hazardous substances regulated by 29 CFR Part 1910, Subpart Z, except to the extent that such controls and practices are not feasible.

Note.—Engineering controls which may be feasible are the use of pressurized cabs or control booths on equipment, and/or the use of remotely operated material handling equipment. Work practices which may be feasible are removing all nonessential employees from potential exposure during opening of drums, wetting down dusty

operations and locating employees upwind of possible hazards.

(ii) Whenever engineering controls and work practices are not feasible, PPE shall be used to protect employees to reduce exposure to below established permissible exposure limits.

(iii) The employer shall not implement a schedule of employee rotation as a means of compliance with permissible exposure limits.

(2) *Engineering controls, work practices, and personal protective equipment for substances not regulated in Subpart Z.* An appropriate combination of engineering controls, work practices, and personal protective equipment shall be established to reduce and maintain employee exposure to or below the established permissible exposure limit for hazardous substances not regulated by 29 CFR Part 1910, Subpart Z and health hazards.

(3) *Personal protective equipment selection.* (i) Personal protective equipment (PPE) shall be selected and used which will protect employees from the hazards and potential hazards they are likely to encounter as identified during the site characterization and analysis.

(ii) Personal protective equipment selection shall be based on an evaluation of the performance characteristics of the PPE relative to the requirements and limitations of the site, the task-specific conditions and duration, and the hazards and potential hazards identified at the site.

(iii) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used in IDLH conditions.

(iv) Totally-encapsulating chemical protective suits (Level A protection) shall be used in conditions where contact of the skin by the hazardous substance may result in an IDLH situation.

(v) The level of protection provided by PPE selection shall be increased when additional information or site conditions show that increased protection is necessary to reduce employee exposure below established permissible exposure limits for hazardous substance and health hazards. (See Appendix B for guidance on selecting PPE ensembles.)

Note.—The level of protection provided may be decreased when additional information or site conditions show that decreased protection will not result in hazardous exposures to employees.

(vi) Personal protective equipment shall be selected and used to meet the requirements of 29 CFR Part 1910, Subpart I, and additional requirements specified in this section.

(4) *Totally-encapsulating chemical protective suits.* (i) Totally-encapsulating suit materials used for Level A protection shall protect employees from the particular hazards which are identified during site characterization and analysis.

(ii) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See Appendix A.)

(iii) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See Appendix A.)

(5) *Personal protective equipment (PPE) program.* A personal protective equipment program shall be established for hazardous waste operations. The PPE program shall address the following elements:

(i) Site hazards,

(ii) PPE selection,

(iii) PPE use,

(iv) Work mission duration,

(v) PPE maintenance and storage,

(vi) PPE decontamination,

(vii) PPE training and proper fitting,

(viii) PPE donning and doffing procedures,

(ix) PPE inspection,

(x) PPE in-use monitoring,

(xi) Evaluation of the effectiveness of the PPE program, and

(xii) Limitations during temperature extremes.

(h) *Monitoring.* (1) Air monitoring shall be used to identify and quantify airborne levels of hazardous substances in order to determine the appropriate level of employee protection needed on site.

(2) As a first step, air monitoring shall be conducted to identify any IDLH and other dangerous situations, such as the presence of flammable atmospheres, oxygen-deficient environments, toxic levels of airborne contaminants, and radioactive materials.

(3) As a minimum, periodic monitoring shall be conducted when:

(i) Work begins on a different portion of the site.

(ii) Contaminants other than those previously identified are being handled.

(iii) A different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling.)

(iv) Employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon.)

(4) High-risk employees, e.g., those closest to the source of contaminant generation, shall receive personal monitoring sufficient to characterize employee exposure.

(i) *Informational programs*—(1) *General.* As part of the safety and health program required in paragraph (b)(1) of this section, the employer shall develop and implement a site safety and health plan meeting the requirements of paragraph (i)(2) of this section for each hazardous waste operation.

(2) *Site safety and health plan.* The site safety and health plan, which shall be available on the site for inspection by employees, their designated representatives, and OSHA personnel, shall address the safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection.

(i) The site safety and health plan, as a minimum, shall address the following:

(A) Names of key personnel and alternates responsible for site safety and health and appointment of a site safety and health officer.

(B) A safety and health risk analysis for each site task and operation.

(C) Employee training assignments.

(D) Personal protective equipment to be used by employees for each of the site tasks and operations being conducted.

(E) Medical surveillance requirements.

(F) Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment to be used.

(G) Site control measures.

(H) Decontamination procedures.

(I) Site's standard operating procedures.

(J) A contingency plan meeting the requirements of paragraphs (1)(1) and (1)(2) of this section for safe and effective responses to emergencies including the necessary PPE and other equipment.

(K) Confined space entry procedures.

(ii) Pre-entry briefings shall be held prior to initiating any site activity and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that it is being followed.

(iii) Inspections shall be conducted by the site safety and health officer or, in the absence of that individual, another individual acting on behalf of the employer as necessary to determine the effectiveness of the site safety and health plan. Any deficiencies in the effectiveness of the site safety and health plan shall be corrected by the employer.

(j) *Handling drums and containers*—(1) *General.* (i) Drums and containers used during the clean-up shall meet the

appropriate DOT, OSHA, and EPA regulations for the wastes that they contain.

(ii) Drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of inaccessible storage conditions shall be moved to an accessible location and inspected prior to further handling.

(iii) Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled.

(iv) Site operations shall be organized to minimize the amount of drum or container movement.

(v) Prior to movement of drums or containers, all employees exposed to the transfer operation shall be warned of the potential hazards associated with the contents of the drums or containers.

(vi) U.S. Department of Transportation specified salvage drums or containers and suitable quantities of proper absorbent shall be kept available and used in areas where spills, leaks, or ruptures may occur.

(vii) Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred.

(viii) Drums and containers that cannot be moved without rupture, leakage, or spillage shall be emptied into a sound container using a device classified for the material being transferred.

(ix) A ground-penetrating system or other type of detection system or device shall be used to estimate the location and depth of drums or containers.

(x) Soil or covering material shall be removed with caution to prevent drum or container rupture.

(xi) Fire extinguishing equipment meeting the requirements of 29 CFR Part 1910, Subpart L shall be on hand and ready for use to control small fires.

(2) *Opening drums and containers.* The following procedures shall be followed in areas where drums or containers are being opened:

(i) Where an airline respirator system is used, connections to the bank of air cylinders shall be protected from contamination and the entire system shall be protected from physical damage.

(ii) Employees not actually involved in opening drums or containers shall be kept a safe distance from the drums or containers being opened.

(iii) If employees must work near or adjacent to drums or containers being opened, a suitable shield that does not interfere with the work operation shall be placed between the employee and the drums or containers being opened to protect the employee in case of accidental explosion.

(iv) Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment shall be located behind the explosion-resistant barrier.

(v) Material handling equipment and hand tools shall be of the type to prevent sources of ignition.

(vi) Drums and containers shall be opened in such a manner that excess interior pressure will be safely relieved. If pressure cannot be relieved from a remote location, appropriate shielding shall be placed between the employee and the drums or containers to reduce the risk of employee injury.

(vii) Employees shall not stand upon or work from drums or containers.

(3) *Electrical material handling equipment.* Electrical material handling equipment used to transfer drums and containers shall:

(i) Be positioned and operated to minimize sources of ignition related to the equipment from igniting vapors released from ruptured drums or containers, or

(ii) Meet the requirements of 29 CFR 1910.307 and be of the appropriate electrical classification for the materials being handled.

(4) *Radioactive wastes.* Drums and containers containing radioactive wastes shall not be handled until such time as their hazard to employees is properly assessed.

(5) *Shock sensitive wastes.*

Caution: Shipping of shock sensitive wastes may be prohibited under U.S. Department of Transportation regulations. Employers and their shippers should refer to 49 CFR 173.21 and 173.50.

As a minimum, the following special precautions shall be taken when drums and containers containing or suspected of containing shock-sensitive wastes are handled:

(i) All non-essential employees shall be evacuated from the area of transfer.

(ii) Material handling equipment shall be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

(iii) An employee alarm system capable of being perceived above surrounding light and noise conditions shall be used to signal the commencement and completion of explosive waste handling activities.

(iv) Continuous communications (i.e., portable radios, hand signals, telephones, as appropriate) shall be maintained between the employee-in-charge of the immediate handling area and the site safety officer or command post until such time as the handling operation is completed. Communication equipment or methods that could cause shock sensitive materials to explode shall not be used.

(v) Drums and containers under pressure, as evidenced by bulging or swelling, shall not be moved until such time as the cause for excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

(vi) Drums and containers containing packaged laboratory wastes shall be considered to contain shock-sensitive or explosive materials until they have been characterized.

(6) *Laboratory waste packs.* In addition to the requirements of paragraph (j)(5) of this section, the following precautions shall be taken, as a minimum, in handling laboratory waste packs (lab packs):

(i) Lab packs shall be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack according the hazards of the wastes.

(ii) If crystalline material is noted on any container, the contents shall be handled as a shock-sensitive waste until the contents are identified.

(7) *Sampling drums and containers.* Sampling of containers and drums shall be done in accordance with a sampling procedure which is part of the site safety and health plan developed for and available to employees and others at the specific worksite.

(8) *Shipping and transport.* (i) Drums and containers shall be identified and classified prior to packaging for shipment.

(ii) Drum or container staging areas shall be kept to the minimum number necessary to safely identify and classify materials and prepare them for transport.

(iii) Staging areas shall be provided with adequate access and egress routes.

(iv) Bulking of hazardous wastes shall be permitted only after a thorough characterization of the materials has been completed.

(9) *Tank and vault procedures.* (i) Tanks and vaults containing hazardous substances shall be handled in a manner similar to that for drums and containers, taking into consideration the size of the tank or vault.

(ii) Appropriate tank or vault entry procedures meeting paragraph

(i)(2)(i)(K) of this section shall be followed whenever employees must enter a tank or vault.

(k) *Decontamination.* (1) A decontamination procedure shall be developed, communicated to employees and implemented before any employees or equipment may enter areas on site where potential for exposure to hazardous substances exists.

(2) Standard operating procedures shall be developed to minimize employee contact with hazardous substances or with equipment that has contacted hazardous substances.

(3) Decontamination shall be performed in areas that will minimize the exposure of uncontaminated employees or equipment to contaminated employees or equipment.

(4) All employees leaving a contaminated area shall be appropriately decontaminated; all clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated.

(5) Decontamination procedures shall be monitored by the site safety and health officer to determine their effectiveness. When such procedures are found to be ineffective, appropriate steps shall be taken to correct any deficiencies.

(6) All equipment and solvents used for decontamination shall be decontaminated or disposed of properly.

(7) Protective clothing and equipment shall be decontaminated, cleaned, laundered, maintained or replaced as needed to maintain their effectiveness.

(8) Impermeable protective clothing which contacts or is likely to have contacted hazardous substances shall be decontaminated before being removed by the employee.

(9) Employees whose non-impermeable clothing becomes wetted with hazardous substances shall immediately remove that clothing and proceed to shower. The clothing shall be disposed of or decontaminated before it is removed from the work zone.

(10) Unauthorized employees shall not remove protective clothing or equipment from change rooms.

(11) Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment shall be informed of the potentially harmful effects of exposures to hazardous substances.

(12) Where the decontamination procedure indicates a need for showers and change rooms, they shall be provided and meet the requirements of 29 CFR 1910.141.

(l) *Emergency response*—(1) *General.* (i) An emergency response plan shall be developed and implemented to handle anticipated on-site emergencies prior to the commencement of hazardous waste operations. Emergency response activities to all other hazardous waste operations shall follow an emergency response plan meeting the requirements of this section.

(ii) *Elements of an emergency response plan.* The employer shall develop an emergency response plan for on-site and off-site emergencies which shall address, as a minimum, the following:

(A) Pre-emergency planning.

(B) Personnel roles, lines of authority, training, 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) Decontamination.

(H) Emergency medical treatment and first aid.

(I) Emergency alerting and response procedures.

(J) Critique of response and follow-up.

(K) PPE and emergency equipment.

(2) *On-site emergency response*—(i) *Training.* Training for site emergency response shall be conducted in accordance with paragraph (e) of this section.

(ii) *Procedures for handling site emergency incidents.* (A) In addition to the elements for the emergency response plan required in paragraph (l)(1)(ii) above, the following elements shall be included for site emergency response plans:

(*1*) Site topography, layout, and prevailing weather conditions.

(*2*) Procedures for reporting incidents to local, state, and federal governmental agencies.

(B) The site emergency response plan shall be a separate section of the Site Safety and Health Plan.

(C) The site emergency response plan shall be compatible and integrated with the disaster, fire and/or emergency response plans of local, state, and federal agencies.

(D) The site emergency response plan shall be rehearsed regularly as part of the overall training program for site operations.

(E) The site emergency response plan shall be reviewed periodically and, as necessary, be amended to keep it current with new or changing site conditions or information.

(F) An employee alarm system shall be installed in accordance with 29 CFR 1910.165 to notify employees of an on-site emergency situation, to stop work activities if necessary, to lower background noise in order to speed communication, and to begin emergency procedures.

(G) Based upon the information available at time of the emergency, the employer shall evaluate the incident and the site response capabilities and proceed with the appropriate steps to implement the on-site emergency response plan.

(3) *Off-site emergency response*—(i) *Training.* Training for handling emergency responses involving hazardous substances shall be conducted on a monthly basis and shall be at least 24 hours annually. The training shall include as a minimum recognition of hazards, selection, care, and use of personal protective equipment and safe operating procedures to be used at the incident scene.

(ii) *Procedures for handling off-site emergency incidents.* (A) The senior officer responding to an incident involving a hazardous substance or waste shall establish an Incident Command System (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS.

(B) The individual in charge of the ICS shall identify, to the extent possible, all hazardous substances or conditions present.

(C) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in 29 CFR 1910.156(e) when worn while performing fire fighting operations beyond the incipient stage.

(D) Self-contained breathing apparatus shall be worn at all times during emergency operations involving exposure to hazardous substances or health hazards. After October 18, 1988 only positive pressure self-contained respirators shall be used.

(E) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site to those who are actively performing emergency operations. However, operations in hazardous areas shall be performed using the buddy system in groups of two or more.

(F) Back-up personnel shall be standing by with equipment ready to

provide assistance or rescue. Qualified basic life support personnel, as a minimum, shall also be standing by with medical equipment and transportation capability.

(G) The individual in charge of the ICS shall designate a safety officer, who is knowledgeable in fire fighting or rescue operations and hazardous substance handling procedures, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

(H) When activities are judged by the safety officer to be unsafe and/or to involve an imminent danger condition, the safety officer shall have the authority to alter, suspend, or terminate those activities. The safety officer shall immediately inform the individual in charge of the ICS of any actions taken to correct these hazards at an emergency scene.

(I) After emergency operations have terminated, the individual in charge of the ICS shall implement appropriate decontamination procedures.

(4) *Hazardous materials teams (HAZMAT).* (i) Employees who are members of the HAZMAT team, employees designated by the employer to plug, patch or otherwise temporarily control or stop leaks from containers which hold hazardous substances or health hazards shall be given training in accordance with paragraph (l)(3) of this section that includes the care and use of chemical protective clothing and procedures to be followed when working on leaking drums, containers, tanks, or bulk transport vehicles.

(ii) Members of HAZMAT teams shall receive an annual physical examination by a licensed physician and be provided medical surveillance as required in paragraph (f) of this section.

(iii) Personal protective clothing and equipment to be used by HAZMAT team members shall meet the requirements of paragraph (g) of this section.

(iv) Approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet U.S. Department of Transportation and National Institute for Occupational Safety and Health criteria.

(5) *Post-emergency response operations.* Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards and materials contaminated with them such as contaminated soil or other elements of the natural environment, then such operations shall meet all the requirements of paragraphs (b) through (n) of this section.

(m) *Illumination.* Work areas shall be lighted to not less than the minimum illumination intensities listed in Table H-102.1 while any work is in progress:

TABLE H-102.1.—MINIMUM ILLUMINATION INTENSITIES IN FOOT-CANDLES

Foot-candles	Area or operations
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas; (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading.
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.
30	First aid stations, infirmaries, and offices.

(n) *Sanitation at temporary workplaces.*—(1) *Potable water.* (i) An adequate supply of potable water shall be provided on the site.

(ii) Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.

(iii) Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.

(iv) Where single service cups (to be used but once) are supplied, both a sanitary container for the unused cups and a receptacle for disposing of the used cups shall be provided.

(2) *Nonpotable water.* (i) Outlets for nonpotable water, such as water for industrial or firefighting purposes shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

(ii) There shall be no cross-connection, open or potential, between a system furnishing potable water and a system furnishing nonpotable water.

(3) *Toilets facilities.* (i) Toilets shall be provided for employees according to Table H-102.2.

TABLE H-102.2.—TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One.
More than 20, fewer than 200	One toilet seat and 1 urinal per 40 employees.
More than 200	One toilet seat and 1 urinal per 50 employees.

(ii) Under temporary field conditions, provisions shall be made to assure not less than one toilet facility is available.

(iii) Hazardous waste sites, not provided with a sanitary sewer, shall be provided with the following toilet facilities unless prohibited by local codes:

(A) Privies;

(B) Chemical toilets;

(C) Recirculating toilets; or

(D) Combustion toilets.

(iv) The requirements of this paragraph for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(4) *Food handling.* All employees' food service facilities and operations shall meet the applicable laws, ordinances, and regulations of the jurisdictions in which they are located.

(5) *Temporary sleeping quarters.* When temporary sleeping quarters are provided, they shall be heated, ventilated, and lighted.

(6) *Washing facilities.* The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite, within controlled access work zones and shall be so equipped as to enable employees to remove hazardous substances.

(o) *Certain Operations Conducted under the Resource Conservation and Recovery Act of 1976 (RCRA).* Employers conducting operations specified in paragraph (g)(2)(iii) of this section shall:

(1) Implement a hazard communication program meeting the requirements of 29 CFR 1910.1200;

(2) Implement a medical surveillance program meeting the requirements of paragraph (f) of this section;

(3) Develop and implement a safety and health program for employees involved in hazardous waste operations. The program shall be designed to identify, evaluate and control safety and health hazards and provide for emergency response to their facilities for the purpose of employee protection;

(4) Develop and implement a decontamination procedure in accordance with paragraph (k) of this section, and

(5) Develop and implement a training program for employees involved with hazardous waste operations to enable each employee to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for 24 hours and refresher training shall be for eight hours annually.

(p) *Start-up dates*—(1) *Training and medical provisions.* Initial training and medical surveillance as specified by paragraph (e) and (f) of this section shall be commenced on the effective date of this standard, and be fully implemented as soon as possible but no later than March 16, 1987. Employees may continue in their work assignments until March 16, 1987 though training and medical examinations have not been completed so long as all feasible training and examinations have been completed.

(2) *Safety and health program.* The employer shall develop and implement a safety and health program as required by paragraph (b)(1) of this section as soon as is feasible and have it completed and implemented no later than March 16, 1987.

(3) *Engineering controls, work practices, and personal protective equipment.* (i) The engineering controls, work practices and personal protective equipment required by paragraph (g)(2) of this section shall be implemented as soon as feasible and implementation shall be completed no later than March 16, 1987.

(ii) The engineering controls, work practices and personal protective equipment required by paragraph (g)(1) of this section are existing requirements of other OSHA standards and continues to be required from the effective date of this standard.

(4) *Site safety and health plan.* The site safety and health plan required by paragraph (i)(2) of this section shall be completed as soon as feasible but no later than February 16, 1987.

(5) *Certain operations conducted under RCRA.* The requirements specified by paragraph (o) of this section shall be instituted by March 16, 1987.

(6) *Other requirements.* Requirements of this standard which do not have a separate start-up date and have not been required by other OSHA standards shall be carried out from the effective date of this standard.

(7) *New operations.* Operations covered by this section which are started after March 16, 1987, shall be in compliance with this section from the start of their operation.

Appendices to § 1910.120—Hazardous Waste Operations and Emergency Response

Note.—*The following appendices serve as non-mandatory guidelines to assist employees and employers in complying with the appropriate requirements of this section.*

Appendix A—Personal Protective Equipment Test Methods

This appendix sets forth the non-mandatory examples of tests which may be used to evaluate compliance with paragraphs 1910.120(g)(4) (ii) and (iii). Other tests and other challenge agents may be used to evaluate compliance.

A. Fully-Encapsulated Suit Pressure Test

1.0—Scope

1.1 This practice measures the ability of a gas tight totally-encapsulating chemical protective suit material, seams, and closures to maintain a fixed positive pressure. The results of this practice allow the gas tight integrity of a total-encapsulating chemical protective suit to be evaluated.

1.2 Resistance of the suit materials to permeation, penetration, and degradation by specific hazardous substances is not determined by this test method.

2.0—Description of Terms

2.1 Totally-encapsulated chemical protective suit (TECP suit)—A full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, gloves, and boots.

2.2 Protective clothing material—Any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

2.3 "Gas tight"—for the purpose of this practice the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

2.4 "Shall"—This term indicates a mandatory requirement.

2.5 "Should"—This term indicates a recommendation or that which is advised but not required.

2.6 "May"—This term is used to state a permissive use or an alternative method to a specific requirement.

3.0—Summary of Practice

3.1 The TECP suit is visually inspected and modified for the test. The test apparatus is attached to the suit to permit inflation to the pre-test suit expansion pressure for removal of suit wrinkles and creases. The pressure is lowered to the test pressure and monitored for three minutes. If the pressure drop is excessive, the TECP suit fails the tests and is removed from service. After leak location and repair the test is repeated.

4.0—Required Supplies

4.1 Source of compressed air.

4.2 Test apparatus for suit testing including a pressure measurement device with a sensitivity of at least ¼ inch water gauge.

4.3 Vent valve closure plugs or sealing tape.

4.4 Soapy water solution and soft brush.

4.5 Stop watch or appropriate timing device.

5.0—Safety Precautions

5.1 Care shall be taken to provide the correct pressure safety devices required for the source of compressed air used.

6.0—Test Procedure

6.1 Prior to each test, the tester shall perform a visual inspection of the suit. Check the suit for seam integrity by visually examining the seams and gently pulling on the seams. Ensure that all air supply lines, fittings, visor, zippers, and valves are secure and show no signs of deterioration.

6.1.1 Seal off the vent valves along with any other normal inlet or exhaust points (such as umbilical air line fittings or face piece opening) with tape or other appropriate means (caps, plugs, fixture, etc.). Care should be exercised in the sealing process not to damage any of the suit components.

6.1.2 Close all closure assemblies.

6.1.3 Prepare the suit for inflation by providing an improvised connection point or the suit for connecting an airline. Attach the pressure test apparatus to the suit to permit suit inflation from a compressed air source equipped with a pressure indicating regulator. The leak tightness of the pressure test apparatus should be tested before and after each test by closing off the end of the tubing attached to the suit and assuring a pressure of three inches water gauge for three minutes can be maintained. If a component is removed for the test, that component shall be replaced and a second test conducted with another component removed to permit a complete tests of the ensemble.

6.1.4 The pre-test expansion pressure (A) and the suit test pressure (B) shall be supplied by the suit manufacturer but in no case shall they be less than; A = 3 inches water gauge and B = 2 inches water gauge. The ending suit pressure (C) shall be no less than 80% (⅘) of the test pressure (B); i.e., the pressure drop shall not exceed 20% (⅕) of the test pressure (B).

6.1.5 Inflate the suit until the pressure inside is equal to pressure "A", the pre-test expansion suit pressure. Allow at least one minute to fill out the wrinkles in the suit. Release sufficient air to reduce the suit pressure to pressure "B", the suit test pressure. Begin timing. At the end of three minutes, record the suit pressure as pressure "C," the ending suit pressure. The difference between the suit test pressure and the ending suit test pressure (B − C) shall be defined as the suit pressure drop.

6.1.6 If the suit pressure drop is more than 20 percent (⅕) of the suit test pressure B during the three minute test period, the suit fails the test and shall be removed from service.

7.0—Retest Procedure

7.1 If the suit fails the test check for leaks by inflating the suit to pressure A and brushing or wiping the entire suit (including

seams, closures, lens gaskets, glove-to-sleeve joints, etc.) with a mild soap and water solution. Observe the suit for the formation of soap bubbles, which is an indication of a leak. Repair all identified leaks.

7.2 Retest the TECP suit as outlined in Test procedure 6.0.

8.0—Report

8.1 Each TECP suit tested by this practice shall have the following information recorded.

8.1.1 Unique identification number identifying brand name, date of purchase, material of construction, and unique fit features; e.g., special breathing apparatus.

8.1.2 The actual values for test pressures, A, B, and C shall be recorded along with the specific observation times. If the ending pressure (C) is less than 80% of the test pressure (B) the suit shall be identified as failing the test. When possible, the specific leak location shall be identified in the test records. Retest pressure data shall be recorded as an additional test.

8.1.3 The source of the test apparatus used shall be identified and the sensitivity of the pressure gauge shall be recorded.

8.1.4 Records shall be kept for each pressure test even if repairs are being made at the test location.

Caution

Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

B. Fully-Encapsulated Suit Qualitative Leak Test

1.0—Scope

1.1 This practice semi-qualitatively tests gas tight totally-encapsulating chemical protective suit integrity by detecting inward leakage of ammonia vapor. Since no modifications are made to the suit to carry out this test, the results from this practice provide a realistic test for the integrity of the entire suit.

1.2 Resistance of the suit materials to permeation, penetration, and degradation is not determined by this test method.

2.0—Description of Terms

2.1 Totally-encapsulated chemical protective suit (TECP suit)—A full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, gloves, and boots.

2.2 Protective clothing material—Any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

2.3 "Gas tight"—for the purpose of this practice the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

2.4 "Shall"—This term indicates a mandatory requirement.

2.5 "Should"—This term indicates a recommendation or that which is advised but not required.

2.6 "May"—This term is used to state a permissive use or an alternative method to a specific requirement.

2.7 Intrusion Coefficient—A number expressing the level of protection provided by a gas tight totally-encapsulating chemical protective suit. The intrusion coefficient is calculated by dividing the test room challenge agent concentration by the concentration of challenge agent found inside the suit. The accuracy of the intrusion coefficient is dependent on the challenge agent monitoring methods. The larger the intrusion coefficient the greater the protection provided by the TECP suit.

3.0—Summary of Recommended Practice

3.1 The volume of ammonia solution required to generate the test atmosphere is determined using the directions outlined in 6.1. The suit is donned by a person wearing the appropriate respiratory equipment (normally a self-contained breathing apparatus) and worn inside the enclosed test room. The ammonia solution is taken by the suited individual into the test room and poured into an open plastic pan. A two-minute evaporation period is observed before the test room concentration is measured using a high range ammonia length of stain detector tube. When the ammonia reaches a concentration of between 1000 and 1200 ppm, the suited individual starts a standardized exercise protocol to stress and flex the suit. After this protocol is completed the test room concentration is measured again. The suited individual exits the test room and his stand-by person measures the ammonia concentration inside the suit using a low range ammonia length of stain detector tube or other more sensitive ammonia detector. A stand-by person is required to observe the test individual during the test procedure, aid the person in donning and doffing the TECP suit and monitor the suit interior. The intrusion coefficient of the suit can be calculated by dividing the average test area concentration by the interior suit concentration. A colorimetric indicator strip of bromophenol blue is placed on the inside of the suit face piece lens so that the suited individual is able to detect a color change and know if the suit has a significant leak. If a color change is observed the individual should leave the test room immediately.

4.0—Required Supplies

4.1 A supply of concentrated ammonia (58 percent ammonium hydroxide by weight).

4.2 A supply of bromophenol/blue indicating paper, sensitive to 5–10 ppm ammonia or greater over a two-minute period of exposure.

4.3 A supply of high range (0.5–10 volume percent) and low range (5–700 ppm) detector tubes for ammonia and the corresponding sampling pump. More sensitive ammonia detectors can be substituted for the low range detector tubes to improve the sensitivity of this practice.

4.4 A plastic pan (PVC) at least 12":14":1" and a half pint plastic container (PVC) with tightly closing lid.

4.5 Volumetric measuring device of at least 50 milliliters in volume with an accuracy of at least ±1 milliliters.

5.0—Safety Precautions

5.1 Concentrated ammonia is a corrosive volatile liquid requiring eye, skin, and respiratory protection.

5.2 Since the threshold limit value for ammonia is 25 ppm, only persons wearing the appropriate respirator protection shall be in the chamber. Normally only the person wearing the total-encapsulating suit will be inside the chamber. A stand-by person shall have a self-contained breathing apparatus, or equivalent breathing apparatus, available to enter the test area should the suited individual need assistance.

5.3 A method to monitor the suited individual must be used during this test. Visual contact is the simplest but other methods using communication devices are acceptable.

5.4 The test room shall be large enough to allow the exercise protocol to be carried out and ventilated to allow for easy exhaust of the ammonia test atmosphere after the test(s) are completed.

5.5 Individuals shall be medically screened for the use of respiratory protection and checked for allergies to ammonia before participating in this test procedure.

6.0—Test Procedure

6.1.1 Measure the test area to the nearest foot and calculate its volume in cubic feet. Multiply the test area volume by 0.2 milliliters of ammonia per cubic foot of test area volume to determine the approximate volume of ammonia required to generate 1000 ppm in the test area.

6.1.2 Measure this volume from the supply of concentrated ammonia and place it into a closed plastic container.

6.1.3 Place the jar, several high range ammonia detector tubes and the pump in the clean test pan and locate it near the test area entry door so that the suited individual has easy access to these supplies.

6.2.1 In a non-contaminated atmosphere, open a presealed ammonia indicator strip and fasten one end of the strip to the inside of suit face shield lens where it can be seen by the wearer. Care shall be taken not to contaminate the detector part of the indicator paper by touching it. A small piece of masking tape or equivalent should be used to attach the indicator strip to the interior of the suit face shield.

6.2.2 If problems are encountered with this method of attachment the indicator strip can be attached to the outside of the respirator face piece being used during the test, assuming the face piece is worn within the TECP suit.

6.3 Don the respiratory protective device normally used with the suit; and then don the TECP suit to be tested. Check to be sure all openings which are intended to be sealed (zippers, gloves, etc.) are completely sealed. DO NOT, however, plug off any venting valves.

6.4 Step into the enclosed test room such as a closet, bathroom, or test booth, equipped with an exhaust fan. No air should be exhausted from the chamber during the test because this will dilute the ammonia challenge concentrations.

6.5 Open the container with the pre-measured volume of ammonia within the enclosed test room, and pour the liquid into the empty plastic test pan. Wait two minutes to allow for adequate volatilization of the ammonia. A small mixing fan can be used near the evaporation pan to increase the evaporation rate of ammonia.

6.6 After two minutes a determination of the ammonia concentration within the chamber should be made using the high range colorimetric detector tube. A concentration of 1000 ppm ammonia or greater shall be generated before the exercises are started.

6.7 To test the integrity of the suit the following four minute exercise protocol should be followed:

6.7.1 Raising the arms above the head with at least 15 raising motions completed in one minute.

6.7.2 Walking in place for one minute with at least 15 raising motions of each leg in a one-minute period.

6.7.3 Touching the toes with a least 10 complete motions of the arms from above the head to touching of the toes in a one-minute period.

6.7.4 Deep knee bends with at least 10 complete standing and squatting motions in a one-minute period.

6.8 At any time during the test should the colorimetric indicating paper change colors the test should be stopped and section 6.10 and 6.12 initiated.

6.9 After completion of the test exercise, the test area concentration should be measured again using the high range colorimetric detector tube.

6.10 Exit the test area.

6.11 The opening created by the suit zipper or other appropriate suit penetration should be used to determine the ammonia concentration in the suit with the low range length of stain detector tube or other ammonia monitor. The internal TECP suit air should be sampled far enough from the enclosed test area to prevent a false ammonia reading.

6.12 After completion of the measurement of the suit interior ammonia concentration the test is concluded and the suit is doffed and the respirator removed.

6.13 The ventilating fan for the test room should be turned on and allowed to run for enough time to remove the ammonia gas.

6.14 Any detectable ammonia in the suit interior (5 ppm NH_3 or more for the length of stain detector tube) indicates the suit fails the test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass fail criteria.

6.15 By following this practice an intrusion coefficient of approximately 200 or more can be measured with the suit in a completely operational condition.

7.0—Retest Procedures

7.1 If the suit fails this test check for leaks by following the pressure test in test A above.

7.2 Retest the TECP suit as outlined in the test procedure 6.0.

8.0—Report

8.1 Each gas tight totally-encapsulating chemical protective suit tested by this practice shall have the following information recorded.

8.1.1 Unique identification number identifying brand name, date of purchase, material of construction, and unique suit features; e.g., special breathing apparatus.

8.1.2 General description of test room used for test.

8.1.3 Brand name and purchase date of ammonia detector strips.

8.1.4 Brand name, sampling range, and expiration date of the length of stain ammonia detector tubes. The brand name and model of the sampling pump should also be recorded. If another type of ammonia detector is used, it should be identified along with its minimum detection limit for ammonia.

8.1.5 Actual test results shall list the two test area concentrations, their average, the interior suit concentration, and the calculated intrusion coefficient. Retest data shall be recorded as an additional test.

8.2 The evaluation of the data shall be specified as "suit passed" or "suit failed" and the date of the test. Any detectable ammonia (5 ppm or greater for the length of stain detector tube) in the suit interior indicates the suit fails this test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass fail criteria.

Caution

Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

Appendix B—General Description and *Discussion* of the Levels of Protection and Protective Gear

This appendix sets forth information about personal protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

Selection of the appropriate PPE is a complex process which must take into consideration a variety of factors. Key factors involved in this process are identification of the hazards, or suspected hazards, their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE *materials* (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations, or the exposure after breakthrough must not pose a hazardous level.

Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, in relation to the employee's tasks must be considered. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and co nditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation and re-selection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

Part A. Personal protective equipment has been divided into four categories based on the degree of protection afforded and are as follows (See Part B of this appendix for further explanation of Levels A, B, C, and D hazards):

1. *Level A*—To be selected when the greatest level of skin, respiratory, and eye protection is required.

Level A equipment; used as appropriate

1. Pressure-demand, full face-piece self-contained breathing apparatus (SCBA), or *pressure-demand supplied air respirator with* escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).
2. Totally-encapsulating chemical-protective suit.
3. Coveralls.*
4. Long underwear.*
5. Gloves, outer, chemical-resistant.
6. Gloves, inner, chemical-resistant.
7. Boots, chemical-resistant, steel toe and shank.
8. Hard hat (under suit)*
9. Disposable protective suit, gloves and boots (Depending on suit construction, may be worn over totally-encapsulating suit).
10. Two-way radios (worn inside encapsulating suit).

*Optional, as applicable.

II. *Level B*—The highest level of respiratory protection is necessary but a lesser level of skin protection is needed.

Level B equipment; used as appropriate

1. Pressure-demand, full-facepiece self-contained breathing apparatus (SCBA), or pressure-demand supplied air respirator with escape SCBA (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one or two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*.
4. Gloves, outer, chemical-resistant.
5. Gloves, inner, chemical-resistant.
6. Boots, outer, chemical-resistant steel toe and shank.
7. Boot-covers, outer, chemical-resistant (disposable)*.
8. Hard hat.
9. Two-way radios (worn inside encapsulating suit).
10. Face shield.*

*Optional, as applicable.

III. *Level C*—The concentration(s) and type(s) of airborne substance(S) is known and the criteria for using air purifying respirators are met.

Level C equipment; used as appropriate

1. Full-face or half-mask, air purifying, canisterequipped respirators (NIOSH approved).
2. Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).
3. Coveralls*.
4. Gloves, outer, chemical-resistant.
5. Gloves, inner, chemical-resistant.
6. Boots (outer), chemical-resistant steel toe and shank*.
7. Boot-covers, outer, chemical-resistant (disposable)*.
8. Hard hat
9. Escape mask*
10. Two-way radios (worn under outside protective clothing).
11. Face shield*

*Optional, as applicable.

IV. *Level D*—A work uniform affording minimal protection: used for nuisance contamination only.

Level D equipment; used as appropriate

1. Coveralls.
2. Gloves*
3. Boots/shoes, chemical-resistant steel toe and shank.
4. Boots, outer, chemical-resistant (disposable)*.
5. Safety glasses or chemical splash goggles*.
6. Hard hat.
7. Escape mask*.
8. Face shield*.

*Optional, as applicable.

Part B. The types of hazards for which levels A, B, C, and D protection are appropriate are described below:

I. Level A—Level A protection should be used when:

1. The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin,
2. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible, or
3. Operations must be conducted in confined, poorly ventilated areas and the absence of conditions requiring Level A have not yet been determined.

II. Level B protection should be used when:

1. The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection.

Note.—This involves atmospheres with IDLH concentrations of specific substances that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

2. The atmosphere contains less than 19.5 percent oxygen, or
3. The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

III. Level C protection should be used when:

1. The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin,
2. The types of air contaminants have been identified, concentrations measured, and a canister respirator is available that can remove the contaminants, and
3. All criteria for the use of air-purifying respirators are met.

IV. Level D protection should be used when:

1. The atmosphere contains no known hazard, and
2. Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

Note.—As stated before combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

Appendix C—Compliance Guidelines

1. *Occupational Safety and Health Program.* Each hazardous waste site clean-up effort will require a site specific occupational safety and health program headed by the site coordinator or the employer's representative. The program will be designed for the protection of employees at the site. The program will need to be developed before work begins on the site and implemented as work proceeds. The program is to facilitate coordination and communication among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed safety and health training and job orientation of employees, who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator.

Each site safety and health program will need to include the following: (1) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health officer or manager and staff; (2) means or methods for the development of procedures for identifying and controlling workplace hazards at the site; (3) means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures and practices that pertain to individual employees and supervisors; (4) the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner; (5) means to anticipate and prepare for emergency situations and; (6) information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

Accidents on the site should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any reoccurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site activities is also a feedback mechanism that needs to be used effectively to improve the program and may serve in part as an evaluative tool(s).

2. *Training.* The employer is encouraged to utilize those training programs that have been recognized by the National Institute of Environmental Health Sciences through its training grants program. These training and educational programs are being developed for the employees who work directly with hazardous substances. For further information about these programs contact: National Institute of Environmental Health Sciences, P.O. Box 12233, Research Triangle Park, NC 27709.

Training programs for emergency service organizations are available from the U.S. National Fire Academy, Emittsburg, MD and the various state fire training schools. The

International Society of Fire Service Instructors, Ashland, MA is another resource.

3. *Decontamination.* Decontamination procedures should be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in Appendix D may be used for guidance in establishing an effective decontamination program.

4. Emergency response plans. States, along with designated districts within the states, will be developing or have developed emergency response plans. These district and state plans are to be utilized in the emergency response plans called for in this standard. Each employer needs to assure that its emergency response plan is compatible with the local plan. In addition, the CAER program of the Chemical Manufacturers' Association (CMA) is another helpful resource in formulating an effective emergency response plan. Also the current Emergency Response Guidebook from the U.S. Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook should be used as resources as well.

Appendix D—References to Appendix

The following references to the Appendix may be consulted for further information on the subject of this notice:

1. OSHA Instruction DFO CPL 2.70—January 29, 1986, *Special Emphasis Program: Hazardous Waste Sites.*

2. OSHA Instruction DFO CPL 2–2.37A—January 29, 1986, *Technical Assistance and Guidelines for Superfund and Other Hazardous Waste Site Activities.*

3. OSHA Instruction DTS CPL 2.74—January 29, 1986, *Hazardous Waste Activity Form, OSHA 175.*

4. *Hazardous Waste Inspections Reference Manual,* U.S. Department of Labor, Occupational Safety and Health Administration, 1986.

5. Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency, *Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies.* December 18, 1980.

6. *National Priorities List,* 1st Edition, October 1984; U.S. Environmental Protection Agency, Revised periodically.

7. *The Decontamination of Response Personnel,* Field Standard Operating Procedures (F.S.O.P.) 7; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

8. *Preparation of a Site Safety Plan,* Field Standard Operating Procedures (F.S.O.P.) 9; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

9. *Standard Operating Safety Guidelines;* U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

10. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities,* National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

11. *Protecting Health and Safety at Hazardous Waste Sites: An Overview,* U.S. Environmental Protection Agency, EPA/625/9–85/006; September 1985.

12. *Hazardous Waste Sites and Hazardous Substance Emergencies,* NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

13. *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide;* U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

14. *Fire Service Emergency Management Handbook,* Federal Emergency Management Agency, Washington, DC, January 1985.

15. *Emergency Response Guidebook,* U.S. Department of Transportation, Washington, DC, 1983.

[FR Doc. 86–28471 Filed 12–16–86; 12:57 am]

BILLING CODE 4510–26–M

INTERNAL DISTRIBUTION

1-5. T. E. Aldrich
6-20. C. F. Baes III
21. T. W. Burwinkle
22. N. H. Cutshall
23. L. D. Eyman
24-28. C. L. Glatthaar
29. S. G. Hildebrand
30. F. J. Homan
31. C. G. Jones
32. R. Jordan
33. H. L. King
34. J. T. Kitchings
35. E. H. Krieg, Jr.
36. I. L. Larsen
37. L. C. Lasher
38. J. F. McBrayer
39. L. E. McNeese
40. L. J. Mezga
41. W. M. Moreland
42-46. J. E. Mrochek
47. T. E. Myrick
48. C. E. Nix
49. D. C. Parzyck
50. R. M. Reed
51-52. D. E. Reichle
53. C. R. Richmond
54. P. S. Rohwer
55. T. H. Row
56. T. F. Scanlan
57. F. E. Sharples
58. L. E. Stratton
59. J. R. Trabalka
60. R. G. Wymer
61. G. T. Yeh
62. Central Research Library
63-77. ESD Library
78-79. Laboratory Records Dept.
80. Laboratory Records, ORNL-RC
81. ORNL Patent Section
82. ORNL Y-12 Technical Library

EXTERNAL DISTRIBUTION

83. Robert Barber, Director, Office of Nuclear Safety, EH-33, U.S. Department of Energy, Washington, DC 20585
84. John Barker, Office of Environmental Audit, EH-24, U.S. Department of Energy, Washington, DC 20585
85. R. P. Berube, Office of Environmental Guidance and Compliance, EH-23, U.S. Department of Energy, Washington, DC 20585
86. C. M. Borgstrom, Director, Office of NEPA Project Assistance, EH-25, U.S. Department of Energy, Washington, DC 20585
87. J. Thomas Callahan, Associate Director, Ecosystem Studies Program, Room 336, 1800 G Street, NW, National Science Foundation, Washington, DC 20550
88. Ken Farber, Office of Environmental Guidance and Compliance, EH-23, U.S. Department of Energy, Washington, DC 20585
89. G. J. Foley, Office of Environmental Process and Effects Research, U.S. Environmental Protection Agency, 401 M Street, SW, RD-682, Washington, DC 20460
90. C. R. Goldman, Professor of Limnology, Director of Environmental Studies, University of California, Davis, CA 94616
91-100. T. C. Harms, Office of Environmental Guidance and Compliance, EH-231, U.S. Department of Energy, Washington, DC 20585

101. J. W. Huckabee, Manager, Ecological Studies Program, Electric Power Research Institute, 3412 Hillview Avenue, P.O. Box 10412, Palo Alto, CA 94303
102. George Y. Jordy, Director, Office of Program Analysis, Office of Energy Research, ER-30, G-226, U.S. Department of Energy, Washington, DC 20545
103. C. J. Mankin, Director, Oklahoma Geological Survey, The University of Oklahoma, 830 Van Vleet Oval, Room 163, Norman, OK 73019
104. Helen McCammon, Director, Ecological Research Division, Office of Health and Environmental Research, Office of Energy Research, MS-E201, ER-75, Room E-233, Department of Energy, Washington, DC 20545
105. Kitty Taimi, Office of Environmental Guidance and Compliance, EH-232, U.S. Department of Energy, Washington, DC 20585
106. Leonard H. Weinstein, Program Director of Environmental Biology, Cornell University, Boyce Thompson Institute for Plant Research, Ithaca, NY 14853
107. Raymond G. Wilhour, Chief, Air Pollution Effects Branch, Corvallis Environmental Research Laboratory, U.S. Environmental Protection Agency, 200 SW 35th Street, Corvallis, OR 97330
108. Ted Williams, Office of Environmental Analysis, EH-22, U.S. Department of Energy, Washington, DC 20585
109. Frank J. Wobber, Ecological Research Division, Office of Health and Environmental Research, Office of Energy Research, MS-E201, Department of Energy, Washington, DC 20545
110. M. Gordon Wolman, The Johns Hopkins University, Department of Geography and Environmental Engineering, Baltimore, MD 21218
111. Office of Assistant Manager for Energy Research and Development, Oak Ridge Operations, P. O. Box E, U.S. Department of Energy, Oak Ridge, TN 37831
112-141. Technical Information Center, Oak Ridge, TN 37831