OCCUPATIONAL SAFETY & HEALTH REPORTER

A weekly review of occupational safety and health developments

Volume 10, Number 16 THE BUREAU OF NATIONAL AFFAIRS, INC. September 18, 1980

HIGHLIGHTS OF CURRENT REPORT

A REQUEST FOR A STAY of the Occupational Safety and Health Administration's access to medical and exposure records rule is denied by the U.S. Court of Appeals for the Fifth Circuit. The brief order by the court gives no reason for denying the petition by the Louisiana Chemical Association (p. 397).

THE ARSENIC STANDARD should be remanded to OSHA in light of the Supreme Court's ruling on the benzene standard, according to petitions filed with the U.S. Court of Appeals for the Ninth Circuit. Industry attorneys argue that the standard does not meet the "significant risk" criterion set by the Supreme Court (p. 397).

AN ALLEGED STERILIZATION policy draws a proposed penalty of $10,000 in a willful citation issued to Bunker Hill Company, Kellogg, Idaho. One of four citations carrying a total proposed penalty of over $82,000, the OSHA notice asserts that Bunker Hill required women employees to undergo sterilization to work in certain areas of a lead smelting plant. The company says it maintains a written policy that it will not employ women in areas where they would be exposed to lead, but it denies the sterilization charge (p. 397).

REVISED FIRE PROTECTION regulations are published by OSHA, and draw praise from the International Association of Fire Fighters as a "major advance" in efforts to reduce deaths and injuries in the U.S. fire service. The Oil, Chemical and Atomic Workers International Union, which argued in hearings that OSHA should not permit employers to require employee service on fire brigades, says it will "reserve comment" on the standard for the present (p. 398) . . . Text of preamble to the revised standard (p. 411).

A REPUBLICAN ADMINISTRATION under Ronald Reagan would bring safety and health regulation to a "halt," Assistant Labor Secretary Eula Bingham charges. According to the OSHA administrator, a Reagan presidency would result in a "backoff of enforcement," and possibly a moratorium on new standards. Reagan campaign chairman Paul Laxalt calls Bingham's charges false and "a clear abuse of a nonpartisan office" (p. 398).

LEGAL MEANS may be studied by OSHA to require that all data on a hazardous substance are submitted to the agency during rulemaking, according to Eula Bingham. The OSHA administrator cites news accounts that Dow Chemical Company withheld studies on benzene from the agency during rulemaking on the substance (p. 399).

A RESPIRATOR PROGRAM must give employees "some say" in the selection of devices to be used, in order to be effective, a United Steelworkers of America official tells a conference sponsored by the National Institute for Occupational Safety and Health. The official asserts that workers generally view respirators as a "burden," and that giving the employees some input and choice will make the use of the devices "more acceptable" (p. 400).

A 'VAST IMPROVEMENT' in the U.S. safety and health program in the past three or four years is asserted by Eula Bingham in testimony before a House oversight hearing. The stability in top management that has occurred during her tenure has helped OSHA become "more competent and better able to fulfill its responsibilities" in the areas of standards-setting, enforcement, training, education, and employer assistance, she says (p. 400).

REVIEW OF CHALLENGES by industry and labor to the OSHA carcinogens policy will be undertaken by the U.S. Court of Appeals for the Fifth Circuit. The review will consolidate challenges filed in four circuit courts of appeal (p. 401).

In this issue . . .

TOPICAL SUMMARY

This issue of Occupational Safety & Health Reporter consists of three sections: Section 1, Current Report; Section 1a, Current Report Index; and Section 3, Decisions.

OCCUPATIONAL SAFETY & HEALTH REPORTER

Published at Washington, D.C., every Thursday except the year-end issue by The Bureau of National Affairs, Inc., Washington, D.C. 20037. Telephone: 452-4200 (Area Code 202)

First year subscription rate (payable in advance) $327, renewal $316 per year.

Correspondence concerning editorial content should be directed to the managing editor.

Second Class postage paid at Washington, D.C., and at additional mailing offices.

Code: ISSN 0095-3237

Current Report

Litigation

FIFTH CIRCUIT COURT DENIES REQUEST FOR STAY OF OSHA RECORDS ACCESS RULE

A chemical industry association's request for a stay of the Occupational Safety and Health Administration's access to medical and exposure records rule was denied September 15 by the U.S. Court of Appeals for the Fifth Circuit.

In *Louisiana Chemical Association v. Eula Bingham* (No. 80-3724), the 63-member association, representing some of the largest U.S. chemical companies, September 8 requested a stay of two sections of the rule (Current Report, September 11, p. 381).

The court gave no reason in its brief order for denying the request. The denial was made before the date OSHA was to submit its brief in opposition to the request. The court, however, did not rule on stay requests submitted by four individuals who are involved in the case, although all requests were submitted simultaneously.

The OSHA rule (Reference File, 31:4501) took effect for LCA September 4 and is currently in effect for all other industries except contract constructors and flavor and fragrance manufacturers.

In other action on the rule, LCA September 15 asked the Appeals Court for the District of Columbia Circuit to retransfer another LCA case back to the Fifth Circuit, or to stay proceedings in the D.C. Circuit until jurisdiction questions are resolved concerning a case brought in a federal district court (Current Report, September 4, p. 357)

The Louisiana Chemical Association July 21 asked the Fifth Circuit to review the OSHA rule, while it also brought action in the district court. The Fifth Circuit case (No. 80-3580), however, was transferred to the District of Columbia Circuit because an earlier challenge to the rule had been filed there by the AFL-CIO (Current Report, May 29, p. 1203).

Litigation

'SIGNIFICANT RISK' QUESTION RAISED IN RENEWED ACTION ON ARSENIC RULE

The inorganic arsenic standard issued by the Occupational Safety and Health Administration in 1978, legal challenges to which still are pending, should be remanded to OSHA in light of the Supreme Court's ruling on benzene, industry contended in renewed action on the standard.

In motions filed with the U.S. Court of Appeals for the Ninth Circuit, industry attorneys said the standard does not meet the 'significant risk' test required by the Court in its July 2 benzene ruling (8 OSHC 1586). Although OSHA originally was to respond to industry's claims by September 4, the agency requested a four-week extension in which to prepare its brief.

The arsenic standard, issued by OSHA in May 1978 (Reference File, 31:8351), was challenged in court by a number of companies involved in smelting or producing arsenic.

One challenge was filed by five smelting companies, led by American Smelting and Refining Company (ASARCO), in the Ninth Circuit in May 1978 (No. 78-1959). The court decided, however, in March 1979, not to rule on the challenge until after the Supreme Court ruled on benzene (Current Report, April 5, 1979, p. 1626).

Other challenges to the standard were filed in July 1978 in different circuits by five other companies, including Kennecott Copper Company and Anaconda Company (Current Report, July 13, 1978, p. 213.) The challenges eventually were transferred to the Ninth Circuit.

Both ASARCO and Anaconda asked the Ninth Circuit to vacate the standard in light of the benzene ruling.

According to briefs filed with the court, ASARCO suggested that if the court did not vacate the standard, two alternatives might be taken. The court could request resubmission of the case and ask for supplemental briefs, ASARCO said.

The other alternative would be for the court to further delay a ruling until the Supreme Court ruled on yet another OSHA standard, covering coke oven emissions. However, since the filing of ASARCO's brief, the American Iron and Steel Institute has withdrawn its request to the Court for review of the coke oven standard (Current Report, September 4, p. 358).

Enforcement

OSHA CITES BUNKER HILL SMELTER FOR ALLEGED STERILIZATION POLICY

The Occupational Safety and Health Administration charged in a citation issued September 11 that Bunker Hill Company of Kellogg, Idaho, willfully adopted and administered a corporate policy requiring women employees to undergo sterilization "in order to be eligible to work in areas of the [lead smelting] plant where they would be exposed to lead

The alleged general duty clause violation, with a proposed penalty of $10,000, came in one of four citations carrying a total of $82,765 in proposed penalties against the company a subsidiary of Gulf Resources and Chemical Corporation resulting from an April followup of a late-1978 inspection Included with the four-item willful citation were a 92-item serious, a four-item repeated, and an eight-item nonserious citation, according to OSHA.

In its announcement of the citations, OSHA noted that studies have linked lead exposures in workers to defects in their offspring, but the agency stated that, in its view the Bunker Hill Company could not under the Occupational Safety and Health Act seek to eliminate the hazard to women employees from excessive lead exposure by compelling them to choose between their jobs and sterilization, thereby incurring serious and irreversible impairment to their reproductive systems."

OSHA spokeswoman Susan Fleming declined to comment on how the existence of the policy was determined during the inspection, and stated that the agency "is not looking specifically for this sort of thing." She noted, however that if employees are made aware that OSHA considers such a policy to be a violation of the Act, they may come forward with complaints in the future.

Fleming noted that the citation did not specify how many employees were affected by the policy or the areas of the plant posing the exposure danger, since the company was cited for the policy in general and not for any specific hazards to the reproductive systems of particular employees.

Allegation Denied

Gene Baker, Gulf Resources vice-president for environmental affairs, denied the sterilization policy allegation, stating that the Houston-based company's Bunker Hill subsidiary "absolutely" does not maintain such a policy. He said that, although the company has a written policy that it will not employ women capable of bearing children in areas where they would be exposed to lead, that policy "does not mention sterilization anywhere."

He added that there are areas in the Idaho plant where women are employed, but these, he said, do not include areas where the employees would be exposed to lead.

Jack W. Kendrick, company president, stated that Bunker Hill will "vigorously contest" the sterilization policy citation and proposed penalty and that "other alleged violations cited by OSHA also will be contested."

Kendrick asserted in the statement, "No such policy has ever existed at Bunker Hill, and OSHA knows it. Since 1975, Bunker Hill has had a policy of not utilizing women in our lead smelter who are capable of bearing children. This policy is based on medical information discovered five years ago which indicated that lead exposure might cause fetal complications."

He added, "We have continued this policy as a safeguard to avoid any possibility of such complications regardless (of) how remote the chances."

Tom Tennent, a Bunker Hill spokesman, noted that "there are women employed in the smelter not capable, for one reason or another, of bearing children." He said that OSHA had inspected the company annually for the past nine years, which he commented "was pretty common for our industry."

OSHA Fully Briefed

He told OSHR, however, that the company asserts that "OSHA representatives conducting the inspection were fully briefed as to the actual policy, that the policy was entirely legal, does not violate any OSHA regulations, and has been generally implemented throughout the industry for several years."

The company's alleged sterilization policy is the second such general duty clause violation cited by OSHA, the first coming in October 1979 against American Cyanamid Company. That citation was vacated by an administrative law judge this summer on technical grounds in a decision which has been directed for review before the full Occupational Safety and Health Review Commission (Current Report, September 11, p. 384).

Other alleged willful violations cited by OSHA included 1910.1025(i)(4)(i) for failure to provide eating facilities free of excess lead exposure, 1910.1025(*j*)(2)(i)(*b*) for failure to make available periodic blood-lead level examinations to eight employees previously determined to be overexposed to lead, and 1910.1025(j)(2)(ii) for failure to make available followup examinations to 28 employees tested for blood lead.

The four alleged willful violations carried proposed penalties of $25,400. The 92-item serious citation carried proposed penalties of $50,100; the four-item repeated citation, $7,000; and the eight-item nonserious citation, $265.

The citations included violations of standards concerning lead, arsenic, and cadmium exposure, biological monitoring, recordkeeping, and respiratory protection.

Fire Protection

REVISED RULE ISSUED BY OSHA, HAILED BY FIRE FIGHTERS UNION

The Occupational Safety and Health Administration published September 12 its final revision of the workplace fire protection standards (45 FR 60656).

Originally proposed in 1978 (Current Report, December 28, 1978, p. 1217), the revised regulations take effect December 11, except for a few provisions, and apply to all places of employment covered by the agency except for the maritime industry, construction, and agriculture.

Secretary of Labor Ray Marshall and Assistant Secretary Eula Bingham announced the new regulations September 9. Bingham said the revised rules replace "confusing, complicated and often property-oriented rather than worker-oriented standards" (Current Report, September 11, p. 381).

Fire Fighters Praise Standard

W. Howard McClennan, president of the International Association of Fire Fighters, termed the revised standards "a major advance in our continuing effort to reduce death and injuries in the American fire service."

McClennan said it is "especially noteworthy" that the "standard is unique in requiring the employer to furnish this equipment at no cost to the firefighter." The final rule covers protective equipment for feet and legs, body, hands, head, eyes, and face as well as the respiratory protection devices.

The IAFF official promised that his union would "continue to pursue its intensive efforts to improve firefighter equipment and to persuade those states which have not already done so to adopt proper and effective occupational health and safety standards for firefighters." He noted that there are 24 states which have enacted state occupational health and safety plans and that two states have OSHA plans for public employees.

OCAW Reserves Comment

Steve Wodka, international representative of the Oil, Chemical and Atomic Workers International Union said that OCAW would "reserve comment" on the new standard for the present. During public hearings on the proposed standard, OCAW took the position that OSHA should require employers to permit employees to refuse fire brigade duties (Current Report, September 13, 1979, p. 342).

Under the final standard, employers are not required to establish fire brigades, but if they do, the members must be properly trained, informed of hazards involved, and provided with proper protective clothing and equipment.

The new fire protection standard also includes requirements for the design and installation of portable and fixed fire extinguishers, specification of fire alarm testing requirements and action plans, elimination of a large number of property protection provisions, and amendments relating to hazardous materials and means of egress as well as use of alternative employee alarm systems.

The preamble to the revised standard appears in the Full Text section of this Current Report. The complete text of the revision will appear in a future Reference File supplement.

General Policy

BINGHAM SAYS JOB SAFETY PROGRAMS WOULD DIMINISH OR HALT UNDER REAGAN

The federal government's role in occupational safety and health protection would be likely to decrease under a Ronald

0095-3237/80/$00.50

Reagan presidency, the head of the Occupational Safety and Health Administration charged September 11.

"I guess it will just come to a halt. It will be no government," Eula Bingham, assistant secretary of labor, told a "newsmakers breakfast" in Washington, D.C., sponsored by the National Press Club.

Citing a "basic difference in philosophy as to what the Occupational Safety and Health Act is all about," Bingham said a Republican administration likely would "move to make it a free-market economy Act." Such a move would result in a "back off of enforcement" and possibly a moratorium on new regulations.

"I'm tempted to say it will be a consultative agency, yet I'm not even sure it will be that," Bingham said, adding that although the Ford Administration claimed to provide consultation, it was available in only 15 states, while it now is available in every state.

Bingham's remarks drew almost immediate criticism from Senator Paul Laxalt (R-Nev.), chairman of the Reagan campaign, who charged at a September 11 press conference that Bingham's accusations were false and were a "clear abuse of a non-partisan office."

Bingham's remark that a Reagan Administration would "back off" on OSHA inspections was criticized as "clearly orchestrated and coordinated by the White House for political campaign purposes."

Laxalt said the intent of Bingham's remarks was to "grossly misrepresent and indeed falsify Governor Reagan's commitment to the government's proper role in protecting the safety and health of the working men and women of this nation."

Workers' Rights Stance

"We have pushed workers' rights," Bingham said of her administration of the agency since 1977, but added that under a Reagan Administration, "there is a possibility that workers will not play the role they have for the last 3-1/2 years."

Bingham said that one of the big differences between the Republican and Democratic platforms is in the attitude towards regulation, with the Republicans generally calling for less government regulation. But she said that in her conversations with workers around the U.S., she has heard requests for more regulation of safety and health hazards.

Bingham also cited a survey done for Union Carbide Corporation which she said found that although many people want "less big government and less regulation" also found that people want more regulations protecting them from safety and health or environmental hazards, particularly cancer.

Bingham chided critics of the agency who say OSHA is pushing for a perfectly safe, risk-free environment. "I would challenge anyone to walk the floors of American workplaces and say they are risk-free," she said.

Bingham said she has not yet decided whether she will remain at OSHA if President Carter is reelected. "I'm thinking very seriously whether I should stay around," or return to the University of Cincinnati where she is on leave from a teaching position, she said.

General Policy

OSHA MAY SEEK MEANS TO REQUIRE SUBMISSION OF DATA FOR RULEMAKINGS

The Occupational Safety and Health Administration may look for legal means to require that all data on a hazardous substance is submitted to the agency during a rulemaking, OSHA Administrator Eula Bingham said September 11, referring to news accounts that a chemical company in 1977 withheld studies on benzene from OSHA.

Bingham told reporters at a Washington, D.C., meeting that the Supreme Court's July 2 ruling on OSHA's 1978 benzene standard (8 OSHC 1586) will require the agency to gather "additional data" before setting standards to show that a significant risk exists that a standard will reduce.

"We will have to take a harder look at data that is withheld from the agency," Bingham said, and when asked for an example, cited news accounts that Dow Chemical Company withheld data on benzene from OSHA during the benzene rulemaking.

The news stories, first reported in 1978, concerned a study of workers at Dow's Freeport, Tex., complex, by Dante Picciano, a former Dow employee who resigned to protest what he called Dow's refusal to make the studies public.

Picciano said he found a twofold increase in broken chromosomes, and a tenfold increase in broken chromosomes and chromosome rearrangements, among the white blood cells of 52 workers exposed to benzene at levels ranging from 0.01 parts per million parts of air to 5 ppm (Current Report, June 15, 1978, p. 59). The OSHA standard for benzene, struck down by the Court, would have limited exposure to 1 ppm, rather than the pre-1978 level of 10 ppm, once again in effect.

However, Dow officials claimed in 1978 that Picciano's study was incomplete and therefore could not be submitted to OSHA. Picciano, however, later charged that Dow submitted the study to the Environmental Protection Agency in virtually the same form in March 1978, one month after OSHA issued its benzene standard.

According to Peter Infante, director of OSHA's office of carcinogen identification and formerly with the National Institute for Occupational Safety and Health, repeated attempts were made by NIOSH in 1977 to obtain the study for use in OSHA's rulemaking. Dow officials denied the requests, again stating the studies were incomplete, Infante said.

Data Barred from Court

Following the Supreme Court's ruling, Sidney Wolfe, director of the Public Citizen Health Research Group, charged that because the Dow study was withheld from OSHA, the Court could not consider its importance in deciding the benzene case.

Dow officials disagree with that interpretation. A Dow spokesman told OSHR September 16 that OSHA had "plenty of time" to consider the Dow study even after it was submitted to EPA.

OSHA reopened the record on the benzene standard in May 1978, while the standard was stayed by a court, to consider whether the standard should exempt workplaces where workers were exposed to benzene in liquid mixtures of containing 1 percent or less of the chemical (Current Report, June 1, 1978, p. 11).

OSHA could have included the new data before issuing an amended benzene standard on June 27 (Current Report, June 29, 1978, p. 99) but "either lost it or chose not to include it," Dow spokesman Richard Long said.

Subpoena Power

According to OSHA officials, the agency as yet has taken no action and made no decision on seeking legal means to require submission of data.

A Department of Labor attorney stated that both OSHA and NIOSH have subpoena powers under the Occupational Safety and Health Act of 1970. He noted, however, that the

MCD 000013847

advantage of obtaining information might be outweighed by longer, more complicated rulemakings.

The attorney also noted that under a February 1980 decision by the U.S. District Court for the Eastern District of Pennsylvania, OSHA has the authority to subpoena employer records that are relevant to the Secretary of Labor's function in promulgating standards. In *Marshall v. American Olean Tile Company, Inc.* (8 OSHC 1136), the court ruled that OSHA has statutory authority to issue subpoenas seeking records dealing with employee exposure to lead and silica, and that the investigation need not be limited to enforcement purposes.

Respirators

EMPLOYEE INPUT ON DEVICES NEEDED FOR EFFECTIVE PROGRAM, CONFERENCE TOLD

To be effective, a workplace respirator program must give employees "some say" in the selection of devices to be used, Mary-Win O'Brien, United Steelworkers of America assistant general counsel, asserted September 9.

Speaking in Morgantown, W.Va., at an international conference by the National Institute for Occupational Safety and Health on respirator research needs, O'Brien said that workers generally resist the use of respirators. They view the units as "burdens that interfere with work routines and require changes in habits or personal preferences," she commented.

Permitting "some employee input and choice" can make the program "more acceptable" to workers, according to O'Brien.

Considerations about employee choice generally are "not built into professional guidelines or regulations" on respiratory protection, O'Brien told the conference. Probably, she added, this is because "it would never occur to the people charged with drafting that type of material that employees would be denied a choice if it appeared reasonable."

O'Brien indicated that further research is needed on respirators for workers exposed to coke oven emissions. Manufacturers have failed to design "sophisticated" devices that will "provide protection from the total environment in a manner that is also as comfortable as possible," she stated.

A three-day reusable respirator was approved by NIOSH in 1977 for use against coke oven emissions, but even though this device filters out particulates, it does not screen out gases and vapors, the Steelworkers official said.

"In short, the coke oven problem is still unresolved and may even be going backwards," she declared.

According to O'Brien, two issues are raised by a provision at 29 CFR 1910.134(b)(10) which prohibits the assignment of employees to tasks requiring the use of respirators unless the workers are "physically able" to do these tasks. These issues are (1) how to determine whether an employee is able to wear a respirator, and (2) how to deal with the employee if he cannot wear the device.

On the first point, basic research is needed to correlate indicators of cardiac or pulmonary insufficiency with respirator usage, to see if these measures can be used to predict problems with respirators, O'Brien recommended. Also, combined factors such as stress and heat exposure should be evaluated to see what impact they may have on the health of a respirator user, she continued.

The second issue involves the "societal responsibility" of not discarding otherwise able workers just because they cannot wear respirators, and of compensating those workers who are disabled, O'Brien stated. One of the Steelworkers' collective bargaining goals is to secure earnings protection for employees with work-related disabilities who must be transferred to lower-paying jobs, she observed.

Respirator Design

Morton Corn, director of the division of environmental health engineering, Johns Hopkins University School of Hygiene and Public Health, told the meeting that major improvements are needed in respirator components and design. For example, he asserted, a "systematic approach" should be mounted on the problem of adapting the physical dimensions of half mask and full face respirators to cover the full variety of male and female facial configurations.

Development of components to indicate cartridge saturation and pressure drop build-up also was recommended by Corn. This should not be an "insurmountable research task," despite certain economic constraints, he asserted.

Behavioral research is needed to give a better understanding of why some workers refuse to wear protective equipment, Corn maintained. From personal experience, Corn said he surmised such refusal is "linked to attitudes toward work, to authority, and perhaps an image of self."

Oversight

'VAST IMPROVEMENT' IN OSHA ASSERTED BY BINGHAM BEFORE HOUSE SUBCOMMITTEE

There has been a "vast improvement in our national job safety and health program" in the past three to four years which has been "widely acknowledged in all but a few quarters," according to Eula Bingham, assistant secretary of labor for occupational safety and health.

This contrasts with the Occupational Safety and Health Administration's early experience where it "more often than not found itself an object of criticism," Bingham told the House Education and Labor Subcommittee on Health and Safety at a September 16 oversight hearing on OSHA activities.

While there still is much to be done, Bingham said that the stability in top level management that has occurred during her tenure has resulted in the agency being "more competent and better able to fulfill its responsibilities" in the areas of standards-setting, enforcement, training, education, and employer assistance programs.

Specifically, Bingham noted that in the past 3-1/2 years, the agency "has published seven major new health standards" covering benzene, DBCP, inorganic arsenic, cotton dust, acrylonitrile, lead, and access to employee medical and exposure records, which "represents more than double the number issued in the agency's first six years."

OSHA's 'Commonsense' Policy Approach

Further evidence of OSHA's "commonsense" approach to its policies, the OSHA official continued, can be found in the following improvements:

- Simplification and consolidation of its safety standards.
- "Enhancement of professional expertise" within the agency.
- "Implementation of an effective high-hazard targeting policy" that directs 95 percent of all scheduled inspections to industries presenting the greatest risk to workers.
- Consideration of the problems of small business employers by "administering the program flexibly with their special needs and concerns in mind."
- Providing consultation, education and information sources to promote cooperative abatement of hazards.
- Reducing the paperwork burden for all employers.

State Programs Controversial

Bingham acknowledged that the role of state programs in protecting worker safety and health "has long been controversial" — a factor noted in observations and questions by both Subcommittee Chairman Joseph M. Gaydos (D-Pa) and Representative Mickey Edwards (R-Okla).

The OSHA official reiterated some of the complicating legal situations that have developed over the last 10 years, noting that "much of the dissatisfaction that has been voiced can be attributed to the thwarted expectations deriving from this confluence of events."

While OSHA intends to "continue to encourage those states willing and able to provide effective programs," Bingham asserted that it also is "absolutely essential to take some positive action" to deal with states running defective programs.

Bingham went on to explain some of the specific actions that have been taken in connection with inappropriate provisions in plans adopted by Indiana, Virginia, Wyoming, and South Carolina, added that the key element is making sure that workers under state plans "have no less protection" than under the federal program and that employers "have no fewer obligations."

Monitoring and Evaluation

Bingham told the subcommittee that its monitoring and evaluation system "has been seriously reduced" by the Hayakawa-Byron rider to its 1980 appropriation bill which "restricts OSHA's capacity to evaluate state performance in identifying workplace hazards."

She urged Congress "to reject future attempts to add this restrictive language to our [fiscal 1981] appropriations legislation" which is pending before the Senate Appropriations Committee (Current Report, September 4, p. 357).

Bingham acknowledged that the achievement of benchmarks, which establish a criteria for states in providing compliance personnel, "will be a costly undertaking and one that must be made within the context of national budgetary policy." She added that the "workplace penetration rates on which the benchmarks are based do not reflect an excessive or unreasonable amount of coverage."

Litigation

CHALLENGES TO OSHA CANCER POLICY TO BE HEARD BY FIFTH CIRCUIT, COURT SAYS

Industry and labor challenges to the Occupational Safety and Health Administration's cancer policy will be reviewed by the U.S. Court of Appeals for the Fifth Circuit, that court ruled September 15.

The court's decision in *American Petroleum Institute, et al v. Occupational Safety and Health Administration et al* (No. 80-3018) that various challenges to the policy should be consolidated in the Fifth Circuit was called "appropriate" and "encouraging" by industry spokesmen who had sought review in the Fifth Circuit immediately after the policy was announced January 16 (Current Report, January 17, p. 763). The Fifth Circuit forum was described by some industry spokesmen as a more favorable court in light of its earlier ruling on OSHA's benzene standard, a decision appealed by OSHA to the Supreme Court (8 OSHC 1586).

Other challenges to the policy were filed, some simultaneously with the industry appeals, in the Third, Seventh and District of Columbia Circuits. The Fifth Circuit, in its ruling, said it was "sure" that the District of Columbia Circuit would transfer an AFL-CIO challenge to the Fifth Circuit, and that the other courts would follow suit.

The decision, written by Circuit Court judges Robert A. Ainsworth, Jr., Reynaldo G. Garza, and Samuel D. Johnson, Jr., said that the entire cancer policy case should be consolidated in the Fifth Circuit for several reasons, one being that the court must decide an appeal of a district court ruling on the cancer policy (8 OSHC 1789). The court also must decide if challenges to the policy filed January 9, before OSHA's official announcement, are premature.

"For these reasons, and for the preservation of judicial time, venue should be retained in the Fifth Circuit," the court said. It directed OSHA to certify the cancer policy record to the Fifth Circuit.

Ronald Lang, executive director of the American Industrial Health Council, one of the leading industry associations in the case, said the ruling does not settle the question on appeal from the district court. That question, whether the policy is a regulation or a standard, will determine whether the merits of the case will be decided by a district court or by the appeals court in the Fifth Circuit.

This ruling will appear in a future Decisions issue.

Litigation

STRIKING EMPLOYEES HAVE NO RIGHT TO PARTICIPATE IN OSHA INSPECTION

An employer cannot be held in contempt for refusal to comply with an Occupational Safety and Health Administration inspection warrant which authorizes entry of a representative of striking employees, the U.S. District Court for the Southern District of Texas, Galveston Division, ruled September 9.

This decision in *Amoco Oil Company v. Marshall and OSHA* (Civil Action No. G-80-45) also quashed the previously issued inspection warrant which compelled the employer to permit an authorized union representative of striking employees to participate in the OSHA inspection of the employer's plant (Current Report, March 20, p. 965).

The case arose out of the attempted inspection of the employer's Texas City, Texas, oil refinery following an explosion and fire that killed two employees of a contractor which was performing work for the employer. At the time of that accident and subsequent attempt at inspection, the normal workforce at the oil refinery was on strike against the employer.

When the Secretary attempted to conduct an inspection of the worksite accompanied by an authorized employee representative of the Oil, Chemical and Atomic Workers International Union, which represents the striking employees, the employer refused. The employer also refused to comply with the subsequently issued OSHA inspection warrant which purportedly authorized the union representative to accompany the OSHA inspector.

The employer successfully argued, at the contempt proceedings, that the Secretary was without authority to seek a warrant commanding entry of an employee-representative of striking employees, who were not on the employer's premises either at the time of the accident that gave rise to the inspection or at the time of the inspection itself. According to the court's opinion, the legislative history of the Occupational Safety and Health Act clearly indicated that employees were to take part in safety inspections because they were familiar with the pre-accident worksite and would be able to point out its hazards and conditions that precipitated the accident under investigation.

Since the employees, in this case, were on strike at the time of the accident, they would not be able to assist in the accident's investigation, the court reasoned.

Accordingly, the court held that the facts of this case were sufficiently distinguished "from those situations envisioned in the legislative history to place the warrant's command beyond the scope of regulations currently in force and effect."

This opinion written by U.S. District Judge Hugh Gibson will appear in a future Decisions issue.

Enforcement

WAYS TO RESPOND TO MEDIA INQUIRIES ON INVESTIGATIONS OUTLINED BY OSHA

Guidelines for responding to news media inquiries about workplace investigation cases in which criminal charges may be filed were transmitted September 5 by the Occupational Safety and Health Administration to agency field personnel.

According to OSHA Notice CPL 4, OSHA personnel should make no comment to the media on a case prior to the filing of criminal charges, other than to report that an investigation is in progress, and to state the general scope of the investigation.

In an "unusual case," where there is "legitimate evidence of continuing danger to the public," agency personnel may make "a cautionary statement advising of the potential danger," the notice stated.

When criminal charges are brought, information such as the identities of the accused and the fact an arrest has been made "may properly be disclosed," the notice said. However, it added, while criminal litigation is in progress, Government representatives should make no statements to the media on the evidence in the case or "the merits of any claim of defense," unless there is "no reasonable likelihood" that such comments would interfere with a fair trial.

In any matter that has been referred by OSHA to the Department of Justice, no response to any media inquiry should be made until the "substance of the response" has been reviewed by the Justice Department's criminal division, the notice further instructed.

Dissemination of prejudicial publicity in the early stages of an investigation "may irreparably damage the reputation of a person or company" if no charges subsequently are brought, the notice asserted. Further, it maintained, "such publicity can adversely affect the ability of investigators to collect evidence, thus impairing the prosecution of an otherwise viable case."

In addition to OSHA compliance officers, area and regional office personnel, and state designees, the notice also was distributed to National Institute for Occupational Safety and Health regional program directors.

Legislation

SMALL BUSINESS GROUP ACCUSES LABOR OF 'STRONG-ARM LOBBYING' ON OSHA REFORM

The AFL-CIO and other organized labor groups have engaged in "congressional harassment and strong-arm lobbying tactics" in an "out-and-out" effort to block legislation exempting certain small businesses from routine Occupational Safety and Health Administration safety inspections, according to an official of the National Federation of Independent Business.

James D. McKevitt, NFIB's director of federal legislation, leveled the charges in a September 12 statement. He termed labor's actions "the most severe harassment by labor groups ever witnessed on Capitol Hill."

At the same time, McKevitt praised legislators who recently have voted for OSHA reform "in spite" of labor's efforts. One such measure was attached unsuccessfully as a nongermane rider by Senator David Boren (D-Okla) to a bill (HR 3904) to amend the Employee Retirement Income Security Act (Current Report, August 28, p. 342).

This provision generally would have exempted small businesses with better than average lost workday rates from routine safety inspections.

During floor debate on the fiscal 1981 appropriations bill for OSHA, Representative Beverly Byron (D-Md) proposed an amendment similar to Boren's rider. The Byron amendment passed on the floor by a 225 to 178 vote (Current Report, September 4, p. 357).

Besides Boren and Byron, the NFIB official also commended other legislators who he said support OSHA reform, including Senators Richard S. Schweiker (R-Pa) and Frank Church (D-Idaho) as well as Representatives John N. Erlenborn (R-Ill), John M. Ashbrook (R-Ohio) and Charles W. Stenholm (D-Texas).

McKevitt asserted that there is an "overwhelming sentiment" in the Senate to make the changes proposed in the OSHA amendment, thus putting organized labor in a position of leaving "no stone unturned in its push to kill the amendment."

Reform Would Aid Workers

"I'm appalled by the methods and tactics used by labor — trying to scuttle and put a stranglehold on this attempt by Congress to revise OSHA," McKevitt declared. Calling labor's opposition to this revision "patently political," he maintained that labor "actually agrees with the goals of the proposed language, but is afraid of losing face if there is even a slight change in the law."

According to McKevitt, the legislation actually would "aid labor and the working person." Since the measure does not provide a blanket exemption from OSHA inspections, McKevitt declared that the smaller workplaces would be dropped from OSHA inspection, thus leaving the inspectors to "concentrate on the truly unsafe workplaces and provide health as well as safety inspections which they can not adequately perform now because of limited staff."

McKevitt predicted that the Senate "will reaffirm its past votes on this issue before this Congress is over."

Legislation

BILL TO REQUIRE FLEXIBILITY IN RULES FOR SMALL BUSINESSES PASSED BY HOUSE

The House approved a bill (S 299) September 9 that would require the Occupational Safety and Health Administration and other federal agencies, in conducting a rulemaking proceeding, to analyze the anticipated impact the proposed rule would have on small businesses.

The measure was approved by the Senate August 6 (Current Report, August 14, p. 289) and now goes to President Carter.

Termed the "Regulatory Flexibility Act," it is intended to create procedures by which agencies can pursue "more flexible regulatory approaches for small entities."

Under S 299, every federal agency would have to publish a semi-annual regulatory flexibility agenda describing those rules it anticipates promulgating which can be expected to have a significant economic impact on a substantial number of small entities. Agencies also would have to provide notice of a proposed rulemaking in addition to the Federal Register to assure that small businesses would have adequate notice.

Under the House-passed measure, an initial regulatory analysis would be published in the Federal Register stating the reason for the rule, its objective and purposes, an estimate of the number of small entities to which the rule would apply, and a description of the anticipated compliance requirements.

0095-3237/80/$00.50

Promulgation of a final rule would have to be accompanied by a statement of the issues raised during the review process, the agencies' assessment and response thereto, a description of each of the significant alternatives to the rule as issued which were considered and the reason each was rejected.

Agencies also would be required to review all existing and new rules within 10 years. In conducting the review, agencies would be required to consider the continued need for the rule and changes which have occurred since its original adoption.

In addition, S 299 would require the Small Business Administration's chief counsel for advocacy to monitor agency compliance with the bill's requirements and file an annual report with Congress. Any federal court reviewing a rule would be required to grant the chief counsel's application to appear amicus curiae.

Contracts

STUDIES ON COMPONENT PLANT RISKS, RESPIRATOR EFFECTIVENESS ANNOUNCED

A study of hazards in the electronic component manufacturing industry will be undertaken by Research Triangle Institute, Research Triangle Park, N.C., under a $102,829 contract to the National Institute for Occupational Safety and Health.

Data are to be gathered at 15 manufacturing facilities across the U.S., through walk-through industrial hygiene surveys, according to the terms of the agreement.

NIOSH specified that the surveys be performed by professional industrial hygienists under the direct supervision of an industrial hygienist certified by the American Board of Industrial Hygiene. Each survey is to take one day.

The report developed from each survey should include data on the nature of the operations at the facility involved, and the number of workers exposed to potentially hazardous substances there, the contract said. Work practice controls, ventilation systems, and industrial hygiene practices used at the facilities should be described, according to the agreement.

"Obvious safety and health hazards" that could pose an imminent danger to workers should be reported to the NIOSH project officer, the contract said.

The agreement, which also requires Research Triangle Institute to conduct a literature search and select the establishments for the walk-through surveys, extends to September 1, 1981.

Respirator Study

Development of one or more methods for monitoring respirator-equipped workers' exposure to toxic gases and vapors is called for in an $80,043 contract awarded by NIOSH to Moleculon Research Corporation, Cambridge, Mass.

Objectives of the task, NIOSH stated, are to examine emergency and maintenance operations to determine where monitoring methods are needed; examine the state of the art in personal sampling to determine which techniques may be adaptable for use in respirator masks; and develop two validated methods for measuring personal exposure in respirator masks.

The contract calls for Moleculon to consider monitoring for various types of compounds and develop analytical systems for each contaminant. The sampling systems developed should be devised to detect contaminants admitted into the mask through both leaks and mask breakthrough, the contract stated.

Further, according to the agreement, the systems should yield "unbiased results" that are within 25 percent of the "true exposure concentration" 95 percent of the time.

NIOSH specified that the sampling device used be capable of providing either direct read-out of findings, or data that can be analyzed in the field. The contractor's description of the sampling methods, the agreement noted, should be compatible with the format found in the NIOSH Manual of Analytical Methods.

The contract is scheduled to expire October 30, 1981.

Meetings

WORKPLACE TOXIC SUBSTANCES MONITORING TOPIC OF DECEMBER INTERNATIONAL SEMINAR

Two U.S. safety and health agencies will join with the Commission of the European Communities in presenting a seminar on ambient and biological monitoring of toxic substances in the workplace December 8 through 12 in Luxembourg.

The Occupational Safety and Health Administration, National Institute for Occupational Safety and Health, and CEC seminar will discuss the role of monitoring in the general context of protecting workers' health. Specific discussions are planned on issues including standardization, good laboratory practice, and quality control; the legislative approach to the concept and use of monitoring; education of workers and management; and current use of monitoring for specific toxic agents.

The preliminary agenda also includes discussion of the role of various professionals or groups in monitoring, including the industrial hygienist, nurse, physician, epidemiologist, economist, lawyer, labor inspector, chemist, trade unions, and industry.

Tentatively scheduled to speak at the seminar are OSHA and NIOSH Administrators Eula Bingham and Anthony Robbins; Anthony Mazzochi, vice-president of the Oil, Chemical and Atomic Workers International Union; and David Rall, head of the National Institute of Environmental Health Sciences.

Although presentations and participation at the seminar are by invitation only because of limited space, several spaces will be reserved for individuals interested in attending. There will be no reservation or conference fee.

Requests for more information or attendance may be addressed to Ralph E. Yodaiken, NIOSH, Parklawn Building, 5600 Fishers Lane, Rockville, MD, 20852, telephone (301) 443-6377; or to Alex Berlin, CEC, Batiment Jean Monnet, Plateau du Kirchberg, Luxembourg, telephone 4301-2731.

0095-3237/80/$00 50

ACTIVITY OF OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

This Section includes —

Review Commission Decisions: Decisions and orders of the full commission.
Judges' Reports Ordered Reviewed: Date ordered reviewed, judge's report, and issues on review.
Court Cases: Filings and dispositions of appeals from commission decisions in the federal courts.
Notices of Contest: Notices of contest to Labor Department citations.

REVIEW COMMISSION DECISIONS

National Steel and Shipbuilding Company, 8/29/80 — case is remanded to judge to allow parties opportunity to provide proof of service of settlement proposal and to conduct further proceedings in accordance with Commission Rule 100(c); review was directed on question of whether judge erred in approving settlement agreement containing provision that violation being affirmed could not become basis of a future repeat violation; after issuance of judge's decision, commission held that settlement agreement containing exculpatory language will be approved by commission if agreement otherwise meets requirements in *Dawson Brothers-Mechanical Contractors*, 1 OSHC 1024 (1972) and Commission Rule 100, even though that language may cast doubt as to whether violation may be used in future proceedings against employer.

Agreement includes motion by Secretary to withdraw specified items of citation, and establishes specific abatement date; promise to pay penalty is not required since no penalty will be assessed; but, record fails to demonstrate that copy of settlement agreement was served upon affected employees in manner prescribed for notices of contest as required by Commission Rule 100(c) (No. 77-929).

Weldship Corporation, 8/29/80 — judge's order approving settlement agreement is set aside and case remanded; settlement agreement fails to meet requirements of Commission Rules 100(b) and (c); employer contested two citations and their proposed penalties but later entered into settlement agreement; settlement agreement does not indicate whether employer has abated or will abate violations and does not indicate whether agreement was served upon affected employees; settlement agreement includes provision stating that employer does not admit liability but is paying penalties to avoid litigation expenses.

Secretary requested that case be remanded because settlement agreement does not specifically provide for prospective enforcement of commission's order; employer argued that Secretary's agreement to settlement should be tantamount to finding that agreement is within purposes of Occupational Safety and Health Act because Secretary is solely responsible for policy and enforcement under OSH Act, and that commission's role is limited to adjudication of disputes between parties in contested cases; employer's argument, that commission lacks authority to disapprove settlement agreements to which Secretary has consented, is rejected; commission has authority to review settlement agreements to assure that they are consistent with provisions and objectives of OSH Act.

Agreement must include statement that abatement is completed or date by which it will be completed and proof that proposed settlement agreement has been served upon represented, and unrepresented, affected employees; although employer contended that it does not have to include assurances in settlement concerning abatement because it does not admit violating OSH Act, employer agreed in settlement to withdraw its notice of contest and such withdrawal of contest constitutes agreement to allow citations to be affirmed; although employer maintains that abatement has been completed and that affected employees received notice of settlement proposal by posting of settlement agreement at same location where citation was posted, it is not clear on basis of record that posting constitutes sufficient notice under facts of this case; on remand, judge should determine appropriate method of employee notice under Commission Rules 100(c) and 7(f)-(j); exculpatory language does not preclude commission approval of settlement agreement (No. 77-3769).

JUDGES' REPORTS ORDERED REVIEWED

Asbestos Textile Company, 8/26/80 — employer was cited for 14 violations of asbestos standard 1910.1001 at North Brookfield, Mass., plant where brake-linings are manufactured; judge affirmed 10 items as serious violations and assessed a $500 penalty; four items were vacated, including citation item alleging noncompliance with 1910.1001(d)(4)(ii) because employer provided adequate lockers but did not require employees to use them; requirement of separate lockers seems to be more for protection of employee's family and others with whom he might come in contact than for employee; since there is split of authority on whether "provide" includes "and require the use of" even when standard is for benefit of employees at jobsite, it would seem that there is even less reason to hold employer to such a interpretation when standard's benefits are primarily for non-employees or an employee away from jobsite; therefore, it was employees' responsibility to use lockers.

Conditions described in citation exposed employees to serious or fatal harm because of hazard of lung damage or cancer from over-exposure to asbestos dust; violations were serious but not willful; Secretary's contention that violations were willful is based on prior citations and decisions or rulings by judges involving same standards, and reference to letter from employer's insurance carrier, which apparently suggested something concerning asbestos or monitoring and safety, and employer's knowledge that asbestos was being used at jobsite; prior history of violation of identical standards does not alone establish "willful" violation; "willful" connotes reckless or utter disregard of employees' safety, or an intentional act, or conduct that constitutes something more than mere negligence, ignorance, or stupidity; although employer's management knew asbestos was being used, that does not mean they knew there was a violation of asbestos standards; plant manager testified that it was his first experience with asbestos and that he was putting safety suggestions into effect.

Employer's contention that some or all of inspection was illegal because employer's representative was not allowed to be present at interviews that compliance officer conducted with individual employees, is rejected; when compliance officer indicated that she would not interview employees if employer's representative on walkaround remained within hearing distance, he withdrew until each interview ended; interviews did not constitute sufficient interference with walkaround to render it illegal; although employer also contended that its representative was excluded from closing conference that compliance officer had with its employees, there is nothing improper or illegal about so-called closing conference with employees; if Review Commission finds some impropriety or illegality in inspection, it is not prejudicial to employer (Furcolo, Judge).

Issues on review: whether judge erred in affirming eight violations of asbestos standard, 1910.1001, as "serious" rather than "willful" violations; whether judge erred in vacating a citation alleging noncompliance with 1910.1001 (d)(4)(ii) on grounds that employer met its responsibility under that standard by "providing" adequate lockers even though it did not require employees to use them (No. 79-3831).

The Babcock & Wilcox Company, 8/22/80 — employer's motion to suppress evidence gained from inspection conducted pursuant to *ex parte* warrant is granted and citations and proposed penalties are vacated; after receiving warrant application based primarily upon written complaint signed by employee, Occupational Safety and Health Administration officials obtained *ex parte* warrant for inspection of employer's East Works Department in Beaver Falls, Pa., facility that led to issuance of three citations against employer for failure to comply with various general industry safety standards; employer's complaint challenging legality of search was dismissed by U.S. District Court for failure to exhaust administrative remedies and decision was affirmed by appellate court.

In *Cerro Metal Products v. Marshall*, 8 OSHC 1196 (1980), Third Circuit held that Secretary is not authorized to seek an inspection warrant *ex parte* under regulations in view of U.S. Supreme Court's comments in *Marshall v. Barlow's, Inc.*, 6 OSHC 1571 (1978); employer's argument that *Cerro* is binding here is accepted; Third Circuit also ruled that 29 CFR 1903.4 as amended, which provides that compulsory process includes an *ex parte* application for an inspection warrant, is invalid because notice of amendment and opportunity for comment were not provided before it was put into effect; Secretary's labeling of 1978 amendment to regulation as interpretive rule exempt from formal rulemaking was not accorded deference because amendment was not contemporaneous with regulation interpreted, was not consistent with Secretary's prior interpretation, and not longstanding.

Decisions in *Cerro* and *Babcock & Wilcox* left unanswered question of whether exclusionary rule applies to OSHA proceedings, although court in *Cerro* acknowledged employer's privacy interest in its place of employment; in *Savina Home Industries v. Secretary of Labor*, 7 OSHC 1154 (1979), Tenth Circuit ruled that exclusionary rule would be applicable to OSHA proceedings involving inspections violative of warrant requirements in *Barlow's* because even if warrant protections of *Barlow's* are retroactively applicable to pre-*Barlow's* OSHA inspections, conclusion that inspection violated Fourth Amendment would be of no practical significance in absence of an exclusionary sanction and such application would be consistent with *Mapp v. Ohio*, 367 U.S. 643 (1961); conclusion makes unnecessary any discussion as to whether probable cause existed to conduct wall-to-wall inspection since essential facts related to latter issue have been discussed (DeBenedetto, Judge)

Issues on review: whether judge erred in concluding that Secretary is without authority to seek *ex parte* inspection warrant; whether judge erred in concluding that *Cerro* decision is controlling in this case; whether judge erred in concluding that exclusionary rule is applicable in commission proceedings; whether judge erred in granting employer's motion to suppress evidence and in vacating citations and proposed penalties issued on November 6, 1978; whether probable cause existed for a "wall-to-wall" inspection under facts of this case (No. 78-5825).

General Dynamics Corporation, Electric Boat Division, 8/25/80 — citation for violation of 1910.132(a) for failure to provide and require use of spats or other foot protection to prevent employee contact with molten metal, is vacated upon granting of employer's motion for summary judgment; employer's argument, that cited standard was improperly promulgated, is found to be persuasive; Secretary's amendment of standard in 1970 to include requirement that equipment be used, as well as provided and maintained, had not been done pursuant to rulemaking procedures prescribed under Administrative Procedure Act (APA), 5 USC 551 *et seq.*; Secretary argued unsuccessfully that standard had been promulgated properly pursuant to Section 6(a) of Occupational Safety and Health Act since amendment to standard was contained within standard adopted under Walsh-Healey Act, 41 USC 35 *et seq.* and therefore was an "established Federal standard" with respect to which APA rulemaking procedures did not apply; amendment at issue constituted a substantive change and therefore fell within rulemaking procedures prescribed by APA; accordingly, amendment to standard is invalid since it was not promulgated properly; furthermore, citation's allegation that employer failed to provide protective equipment does not constitute a valid charge; commission decision in *The Budd Company* 1 OSHC 1548 (1974) held that cited standards does not impose duty on employers to provide protective equipment (DeBenedetto, Judge).

Issues on review: whether judge erred in determining that personal protective equipment standard at 1910.132(a) imposes no duty on employer to provide necessary equipment; whether judge erred in vacating citation item alleging noncompliance with 1910.132(a) on basis that cited standard was invalidly promulgated because word "used" was added to standard without adherence to rulemaking procedures of Administrative Procedure Act, 5 USC 551 *et seq.* (No. 78-4850).

Lutz, Daily & Brain — Consulting Engineers, 9/3/80 — citations for violating 1910.1001(f)(3)(i) and 1910.1001(g)(1)(i), for failure to sample airborne concentrations of asbestos fibers and failure to post caution signs where levels of airborne asbestos fibers may be excessive, are vacated; Secretary argued that employer, contracted to provide Board of Public Utilities of Kansas City, Kan., with

MCD 000013853

engineering services for design of two electrical power generation stations, carried out project management functions including design, administration and coordination of construction, and that it was therefore subject to Occupational Safety and Health Administration standards intended to protect any employee working on the project; contractors in charge of yard piping and electric power and lighting at Nearmen Creek Project were responsible for installing Transite electrical duct, made with asbestos, along ground; contractor at Kaw Valley Project in charge of installing filtration baghouses and breeching designed by employer first needed to remove old breeching and asbestos insulation; Secretary argued that exposure to asbestos from these operations requires employer to monitor asbestos levels and post notices of hazardous conditions; employer argued that it did not supervise jobs, but only had control over finished product; in addition, that neither the employer nor employees had notice of hazard, and that they could not have noticed hazard with reasonable diligence at the Nearmen Creek Project and that necessary precautions for protection from airborne asbestos fibers were taken at Kaw Valley Project, by avoiding dangerous area and wearing respirator mask.

Evidence established that asbestos hazard at Nearmen Creek Project was confined to one area where Transite electrical duct is cut and that only debris along ground where cutting had apparently occurred was observed by compliance officer; no tests were ever taken by either OSHA officials or employer to determine amount of asbestos, if any, in air at Nearmen Creek Project; citation for violations at Nearmen Creek Project is vacated since Secretary failed to prove access of employees to area where alleged hazardous condition was created, and failed to prove that employer had or could have had notice of hazard with reasonable diligence, and failed to prove existence of hazard at all since there was no evidence of excessive levels of asbestos fibers in air; evidence established that asbestos hazard at other jobsite was created by demolition work on existing breeching and insulation being done 260 feet from employer's field office and that contractors were advised by employer to follow proper procedures to protect against asbestos hazard; measurement of asbestos levels taken by OSHA officials at Kaw Valley Project revealed only one-tenth of a fiber per cubic centimeter on eight hour time-weighted average, rather than prohibited level of two fibers per cubic centimeter under 1910.1001(b); citation for violations at Kaw Valley Project is vacated since warning signs are only required if concentrations of asbestos may be in excess of exposure limits, which Secretary failed to prove; avoidance of demolition site and wearing of respirator mask by employees was reasonable alternative to literal compliance with regulations that required testing of asbestos levels and posting of warning signs; insofar as employee engineers were on work site merely to ensure that project conformed to plans and not to observe demolition, they were not within zone of danger; private testing agency showed no hazardous asbestos levels, and testing requirement could only be violated if employer could reasonably have believed that two fiber limit had been exceeded; there is no proof of excessive levels at either project (Riehl, Judge).

Issues on review: whether credible evidence shows exposure of any employee to safety or health hazard by noncompliance with asbestos standards 1910.1001(f)(3)(i) and (g)(1)(i); whether employer was absolved of duty to monitor for asbestos because private testing agency showed no hazardous levels; whether there can be violation of cited standards in absence of proof that exposure limits of 1910.1001(b) were exceeded; whether employer can be held liable for failure to monitor or post caution signs under *Anning-Johnson Company* (4 OSHC 1193); and whether commission should grant Secretary's motion to amend citation and complaint to allege noncompliance with 1910.1001(f)(1) rather than 1910.1001(f)(3) (No. 79-4080).

Raybestos Friction Materials Company, 9/8/80 — settlement agreement executed by parties is approved and citations for violations of Occupational Safety and Health Act are affirmed as serious and *de minimis* with total penalties of $400 assessed (Cutler, Judge).

Issues on review: whether judge erred in approving settlement agreement in absence of proof of service of agreement upon employees and where agreement provided with respect to abatement: "Both Complainant and Respondent understand that the actions and/or procedures agreed to by Respondent herein *shall not be binding* upon the Respondent or on the Complainant or have any precedential effect in any other matter between the Complainant and any other party nor shall such action be deemed to constitute a waiver of any defenses which could be asserted by Respondent in any other proceeding related to the subject-matter of the Citation herein or constitute an admission by Respondent that it violated the provisions of the Occupational Safety and Health Act." (Emphasis added) (No. 80-2793).

Standard Oil Company (Indiana), Amoco Chemicals Corporation, and Oil, Chemical & Atomic Workers International Union, 8/27/80 — citation issued to Standard Oil Company of Indiana for violating Section 5(a)(1) of OSH Act by its failure to provide a safe workplace for at least one of its employees and 29 CFR 1904.2(a) for failing to record an occupational illness on proper OSHA forms, is vacated; citation issued to Amoco Chemicals Corporation for committing identical violations is affirmed.

Employers' contention that provisions of Section 9(c) of OSH Act bar enforcement of citations is rejected, absent showing of prejudice by employers and considering ongoing nature of violation; employers argue that violations occurred, if at all, when records were not properly kept and when employee was not told of his condition; commission held in *Yelvington Welding Service* (6 OSHC 2013) that these types of violations are by their nature ongoing breaches of employer's duty; although employers argued that citations must be vacated because Secretary should have found and cited alleged violations at start of inspection and because inspection was longer than six-month limitation period, employers offered no evidence of prejudice resulting from length of inspection and investigation; question is whether employers should have complied with regulations.

Standard Oil is not proper party to the action; Secretary admitted that only allegation against Standard Oil was that it monitored medical practices used by its wholly owned subsidiary, Amoco, at Amoco's New Castle, Del., plant; Standard Oil and Amoco were separate and distinct corporate entities, Standard Oil acted only as a consulting firm might have, and it did not employ any employees involved; no testimony substantiated a finding of violation by Standard.

Amoco had knowledge of potential hazard to one of employees at New Castle plant whose X-ray showed a pleural effusion but did not inform him of his condition or restrict his employment to prevent possibility of degeneration of his health; but for development of benign growth rather than malignant one, employee may have been suffering from terminal illness, and Amoco's attitude may have contributed to that condition.

0095-3237/80/$00.50
MCD 000013854

Employer contends that it was not required to report instances of asbestos disease or asbestosis among employees because there was no "diagnosis" of asbestosis, that without confirmed diagnosis it was impossible to establish that illness was occupationally related, and that 29 CFR 1904.2 requires that only occupational illness be recorded on OSHA forms; however, employer's physicians had obtained all information essential to diagnosis of asbestosis but did not diagnose it, label it as an occupational illness suffered by its employees, or record it on appropriate OSHA forms.

Amoco's violations were "willful"; Review Commission has held that violation is willful when action is conscious, intentional, voluntary, and deliberate, regardless of venal motives, in *Georgia Electric Company* (5 OSHC 1112); Amoco's reliance on *Frank Irey, Jr., Inc. v. OSHRC & Brennan*, (2 OSHC 1283) is inappropriate in light of court's decision in *Babcock & Wilcox Company v. OSAHRC*, (8 OSHC 1317) where court noted that intentional disregard of OSHA requirements differs little from obstinate refusal to comply and there is not much to distinguish defiance from intentional disregard; Amoco knew of its employee's pleural thickening and knowingly made decision not to inform him about his condition or restrict his employment so as to prevent possible worsening of this condition; Amoco had all information necessary to make diagnosis of asbestos disease or asbestosis, but intentionally omitted all information from appropriate OSHA forms; Amoco evidenced an intentional disregard for employee's health and safety (Usher, Judge).

Issues on review: whether administrative law judge erred in ruling that citations are not barred by Section 9(c) of OSH Act; whether judge erred in failing to dismiss citations for lack of particularity; whether judge erred in affirming a 1904.2 violation for failure to record a case of occupational illness; whether judge erred in affirming violation of Section 5(a)(1) for employer's failure to restrict work activities of an employee diagnosed as having a serious medical condition; whether judge erred in affirming violation of Section 5(a)(1) for employer's failure to provide an employee diagnosed as having a serious medical condition with any information concerning his physical condition; whether judge erred in concluding that violations were "willful" within meaning of Section 17 of Act (Nos. 78-248 and 78-250).

COURT CASES

Continental Oil Company, affirmed, 9/2/80, 6th Cir., No. 78-3445 (RevComm: No. 1829, 6 OSHC 1814).

NOTICES OF CONTEST

Abex Corporation, an IC Industries Company, Friction Products Division, Winchester, Va., is contesting a five-item serious citation and a $2,800 penalty, including 1910.1025(c)(1) for failure to ensure that employees were not overexposed to lead, 1910.1025 (d)(8)(i) for failure to notify employees of lead monitoring results within five days of receipt, and 1910.1025 (g)(1) for failure to provide appropriate protective work clothing to employees overexposed to lead (No. 80-4263).

Allen Products Company, Inc., Pennsylvania Division, Allentown, Pa., is contesting a willful citation and a $4,900 penalty for 1910.212(a)(1) for failure to guard machinery rotating parts.

The company also is contesting a serious citation and a $3,000 penalty for Section 5(a)(1) for failure to provide conveyers with emergency stop devices to be used during cleaning and maintenance, for failure to ensure that emergency stops on conveyer control panels could not be overridden from other locations, and for failure to provide lockout mechanisms for conveyers, and 1910.24(b) for failure to provide fixed stairs where required.

The company also is contesting a repeated citation and a $1,400 penalty for 1910.23(c)(3) for failure to guard areas adjacent to dangerous equipment (No. 80-4394).

Ball & Socket Plastics, Inc., Waldoboro, Maine., is contesting a five-item serious citation and a $2,100 penalty, including 1910.106(e)(2)(iii) for failure to separate a flammable-liquids mixing area from other operations in the building, 1910.106(e)(2)(iii) for failure to provide adequate ventilation in a flammable liquid mixing area, and 1910.106(e)(7)(i)(*a*) for failure to install electrical wiring according to specifications for Class I, Division I areas (No. 80-4424).

C.A. Barletta, Inc., Norwood, Mass., is contesting a $200 penalty for a serious citation for 1926.400(h)(2) for failure to use an assured equipment grounding conductor program for temporary wiring and 1926.401(j)(2) for failure to equip temporary light wiring with heavy duty cords (No. 80-4422).

Celanese Fibers Company, Celco Plant, Narrows, Va., is contesting a willful citation and a $9,000 penalty for Section 5(a)(1) for failure to ensure that the reset device on a conveyer circuit breaker was not held in the operating position by means of a piece of wood (No. 80-4262).

Colfax Creosoting Company, Pineville, La., is contesting a serious citation and a $1,260 penalty for Section 5(a)(1) for failure to protect employees against oxygen deficiency and release of toxic or combustible vapors in confined spaces and 1910.95(b)(1) for failure to reduce noise (No. 80-4254).

Combustion Engineering, Inc., Windsor, Conn., is contesting a willful citation and a $9,000 penalty for 1926.550(a)(1) for failure to comply with the manufacturer's specification for crane operation (No. 80-4467).

Connors Steel Company, Huntington, W.Va., is contesting a serious citation and a $1,400 penalty for 1910.179(f)(6) [illegible] for failure to provide cab-operated cranes with bridge brakes, 1910.179(c)(2) for failure to provide safe access to crane cab walkways, and 1910.179(f)(6)(i) for failure to ensure that a cab-operated crane hydraulic brake cylinder was not removed.

The company also is contesting a repeated citation and an $800 penalty for 1910.22(a)(1) for failure to keep workplaces clean and orderly.

The company also is contesting a five-item nonserious citation, including 1910.179(b)(5) for failure to mark each crane hoisting unit with rated loads, 1910.179(c)(3) for failure to equip a crane cab with a fire extinguisher and 1910.179(e)(6)(i) for failure to guard exposed moving parts of a crane (No. 80-4362).

Conoco, Inc., Billings, Mont., is contesting a serious citation and a $1,260 penalty for Section 5(a)(1) for failure to ensure that a gasoline-operated crane was not used where electrical, fuel, and exhaust systems could act as sources of ignition of flammable liquids and gases and 1910.178(c)[illegible] for failure to ensure that industrial trucks were safeguarded against igniting flammable liquids and gases.

The company also is contesting a nonserious citation for 1910.151(c) for failure to provide suitable quick drench [illegible] facilities for employees exposed to corrosive materials and 1910.252(e)(2)(i)(*a*) for failure to ensure welders [illegible] helmets or handshields during welding operations (No. 80-4462).

MCD 000013855

B. H. Craig Construction Company, Inc., Florence, Ala., is contesting a serious citation and a $560 penalty for 1926.300(b)(1) for failure to equip power-operated tools with guards and 1926.401(b) for failure to ground plug- and cord-connected equipment.

The company also is contesting two items of a four-item nonserious citation for 1903.2(a)(1) for failure to post a notice informing employees of their rights and obligation under the Occupational Safety and Health Act and 1926.450(a)(2) for failure to ensure that employees did not use defective ladders (No. 80-4396).

Crane Construction Company, Inc., Northbrook, Ill., is contesting a repeated citation and a $1,260 penalty for 1926.28(a) for failure to ensure employees' use of appropriate personal protective equipment.

The company also is contesting a serious citation and a $420 penalty for 1926.501(b) for failure to guard stairways.

The company also is contesting a nonserious citation for 1926.350(a)(9) for failure to secure compressed gas cylinders in an upright position. (No. 80-4428).

Crown Cork & Seal Company, Inc., Philadelphia, Pa., is contesting a $2,450 penalty for eight items of a 10-item serious citation, including Section 5(a)(1) for failure to provide dead-man controls on a stationary trash compactor, 1910.23(c)(1) for failure to guard open-sided ramps, and 1910.178(p)(1) for failure to withdraw defective powered industrial trucks for service.

The company also is contesting two items of a 10-item serious citation and a $700 penalty for 1910.29(a)(3)(i) for failure to ensure proper scaffold height and 1910.28(a)(12) for failure to provide safe access to a scaffold.

The company also is contesting a 20-item nonserious citation, including 1910.110(f)(7) for failure to provide gas container storage areas with fire extinguishers, 1910.178(a)(6) for failure to maintain markings for powered industrial trucks in a legible condition, and 1910.178(g)(10) for failure to prohibit smoking in battery-charging areas (No. 80-4347).

ESB, Inc., a/k/a Exide, Automotive Division, Fairfield, Conn., is contesting a seven-item serious citation and a $4,720 penalty, including 1910.176(b) for failure to ensure that stacked materials were secure and stable, 1910.178(p)(1) for failure to withdraw defective powered industrial trucks from service, and 1910.212(a)(1) for failure to guard machinery nip points.

The company also is contesting 12 items of a 34-item nonserious citation and a $345 penalty, including 1910.309(a) for failure to ensure that lighting fixtures in forming room were approved for Class I, Division I locations, 1910.132(a) for failure to ensure that protective equipment was used and maintained in a sanitary and reliable condition, and 1910.22(a)(2) for failure to keep workplaces clean and orderly (No. 80-4329).

Frog Switch and Manufacturing Company, Carlisle, Pa., is contesting a serious citation and a $1,800 penalty for 1910.134(d)(2)(ii) for failure to situate a compressor so as to avoid entry of contaminated air into the system and 1910.1000(a)(2) for failure to ensure that employees were not overexposed to iron oxide.

The company also is contesting a nonserious citation for 1910.1000(c) for failure to ensure that employees were not overexposed to total or nuisance dust (No. 80-4349).

R.E. Froshee Company, Inc., Cincinnati, Ohio, is contesting a serious citation and an $880 penalty for 1926.400(a) for failure to construct attachment plugs properly and 1926.450(a)(9) for failure to ensure minimum ladder siderail extension over a landing.

The company also is contesting a repeated citation and an $800 penalty for 1926.100(a) for failure to ensure employees' use of protective helmets (No. 80-4084).

General Excavating Company, Sioux Falls, S.D., is contesting a serious citation and an $800 penalty for 1926.152(e)(1) for failure to ensure that flammable-liquid transfer operations were separated from other operations, 1926.550(b)(2) for failure to ensure that employees were not permitted to ride the wrecking ball of a crane, and 1926.850(g) for failure to protect wall openings in a structure being demolished.

The company also is contesting a nonserious citation for 1926.100(a) for failure to ensure employees' use of protective helmets, 1926.550(a)(2) for failure to conspicuously post rated load capacities and other information on a crane, and 1926.550(a)(6) for failure to maintain hoisting machine inspection records (No. 80-4464).

Globe-Union Inc., Milwaukee, Wis., is contesting a nonserious citation for 1910.134(a)(1) for failure to ensure employees' use of appropriate respirators when effective engineering controls were not feasible or while they were being instituted (No. 80-4351).

Gulf Marine Services, Inc., New Orleans, La., is contesting a seven-item serious citation and a $1,920 penalty, including Section 5(a)(1) for failure to equip a crane with a positive locking device and for failure to equip a crane with boom-stops to limit the angle of the crane at the highest position, and 1910.134(b)(1) for failure to establish written operating procedures governing the selection and use of respirators.

The company also is contesting a nonserious citation for 1910.180(d)(6) for failure to provide monthly dated and signed inspection records and reports for crawler crane items. (No. 80-4398).

Harrington Manufacturing Company, Inc., Albany, Ga., is contesting a serious citation and a $560 penalty for 1910.21(b) for failure to anchor fixed-location machines and 1910.252(a)(2)(ii)(b) for failure to store compressed gas cylinders in locations protected against physical contact (No. 80-4472).

Hart Graphics, Inc., Austin, Tex., is contesting an eight-item serious citation and a $480 penalty, including Section 5(a)(1) for failure to equip gas-fired burners with an automatic emergency shutoff valve, 1910.212(a)(1) for failure to guard machinery, and 1910.212(a)(3)(ii) for failure to guard machinery points of operation.

The company also is contesting a nonserious citation for 1910.22(d)(1) for failure to post load capacity signs, 1910.132(a) for failure to ensure employees' use of personal protective equipment, 1910.242(b) for failure to ensure that compressed air used for cleaning purposes was reduced to less than 30 psi, and 1910.309(a) for failure to ground fixed equipment (No. 80-4253).

House of Ornamental, Inc., Pompano Beach, Fla., is contesting a serious citation and a $500 penalty for 1910.107(c)(6) for failure to ensure that electrical wiring located within a spraying area was approved for such a location and 1910.217(c)(1)(i) for failure to guard mechanical power press points of operation.

The company also is contesting a nonserious citation for 1910.22(d)(1) for failure to post the approved floor load limit where required (No. 80-4475).

John R. Hughes Construction, Inc., Austin, Tex., is contesting a willful citation and a $4,480 penalty for 1926.652(c) for failure to ensure sloping adequate to soil conditions in the absence of shoring.

0096-3237/80/$00.50

The company also is contesting a serious citation and a $480 penalty for Section 5(a)(1) for failure to guard scissors points on a skid steer load.

The company also is contesting a repeated citation and a $160 penalty for 1926.450(a)(2) for failure to ensure that defective ladders were not used by employees (No. 80-4354).

Industrial First, Inc., Cleveland, Ohio, is contesting a serious citation and a $500 penalty for 1926.28(a) for failure to ensure employees' use of appropriate personal protective equipment (No. 80-4338).

Inland Wood Products, Marietta, Ohio, is contesting a serious citation and a $350 penalty for 1910.95(b)(1) for failure to reduce noise (No. 80-4379).

Interlake, Inc., Riverdale, Ill., is contesting a willful citation and a $20,000 penalty for 1910.1025(d)(8)(i) for failure to notify employees of lead monitoring results within five days of receipt and 1910.1025(k)(1)(i)(a) for failure to remove an employee from his job after being found to be overexposed to lead (No. 80-4427).

International Chimney Corporation, Buffalo, N.Y., is contesting a serious citation and a $630 penalty for 1926.500(d)(1) for failure to guard open-sided platforms (No. 80-4330).

Jay Dee Joint Venture, Livonia, Mich., is contesting a serious citation and a $360 penalty for Section 5(a)(1) for failure to test the atmosphere in a control vault before entry (No. 80-4417).

Lafayette Steel Erector, Inc., Scott, La., is contesting a nine-item serious citation and a $4,880 penalty, including Section 5(a)(1) for failure to ensure a balanced load for employees unloading plywood sheets for a suspended skit box, 1926.401(c) for failure to ensure a permanent, continuous grounding path from equipment, and 1926.350(a)(9) for failure to secure compressed gas cylinders in an upright position (No. 80-4403).

Laquila Construction, Brooklyn, N.Y., is contesting a serious citation and a $200 penalty for 1926.100(a) for failure to ensure employees' use of hardhats (No. 80-3942).

Leroy Westbrook Steel Form Erection Company, Dallas, Tex., is contesting a nonserious citation for 1926.28(a) for failure to ensure employees' use of personal protective equipment (No. 80-4343).

Lowen Company, Inc., Hutchinson, Kan., is contesting nine items of a 26-item nonserious citation, including 1910.212(a)(1) for failure to guard machinery rotating parts, 1910.212(a)(2) for failure to ensure that machine guards were not so installed as to create hazards in themselves, and 1910.212(a)(3)(ii) for failure to guard machinery points of operation (No. 80-4033).

McWad, Inc., Wausau, Wis., is contesting a serious citation and a $280 penalty for 1926.451(d)(10) for failure to guard a scaffold adequately.

The company also is contesting a nonserious citation for 1926.500(b)(8) for failure to guard floor holes and 1926.500(d)(1) for failure to guard an open-sided floor adequately (No. 80-4420).

Monsanto Chemical Company, Sauget, Ill., is contesting a serious citation and a $350 penalty for 1910.1000(a)(2) for failure to ensure that employees were not overexposed to chlorine (No. 80-4375).

Mountaire of Delmarva, Inc., Selbyville, Del., is contesting two items of a five-item serious citation and a $660 penalty for 1910.212(a)(3)(ii) for failure to guard machinery points of operation and 1910.309(a) for failure to guard live parts of electrical equipment (No. 80-4348).

Murray Walter, Inc., Binghampton, N.Y., is contesting a $4,400 penalty for a six-item serious citation, including 1926.451(a)(10) for failure to ensure that scaffold planks did not exceed the permissible span, 1926.451(d)(10) for failure to guard a scaffold, and 1926.500(b)(1) for failure to guard floor openings.

The company also is contesting a $730 penalty for a repeated citation for 1926.25(a) for failure to keep work areas clear of debris, 1926.152(e)(4) for failure to protect gasoline dispensing containers, and 1926.400(h)(1) for failure to use an assured equipment grounding conductor program for temporary wiring (No. 80-4415).

National Cargo Bureau, Inc., New York, N.Y., is contesting a serious citation and a $120 penalty for Section 5(a)(1) for failure to prohibit an employee from climbing an elevated tank to inspect it (No. 80-4363).

Neenah Brass & Aluminum Foundry, Inc., Neenah, Wis., is contesting a serious citation and $200 penalty for 1910.219(d)(1) for failure to guard pulleys.

The company also is contesting a nonserious citation for 1910.22(a)(1) for failure to keep a workplace clean and orderly, 1910.309(b) for failure to protect conductors against physical damage, 1910.309(b) for failure to close an opening on an outlet box, and 1910.309(b) for failure to protect a flexible cord against damage from falling objects (No. 80-4413).

Neillsville Foundry, subsidiary of Barclay Foundry Industries, Inc., Neillsville, Wis., is contesting a $12,000 additional penalty for failure to correct violations of 1910.212(a)(1) for failure to guard machinery crushing points and rotating parts and 1910.219(d)(1) for failure to guard pulleys.

The company also is contesting a willful citation and a $9,000 penalty for 1910.22(a)(1) for failure to keep workplaces clean.

The company also is contesting an eight-item repeated citation and an $8,600 penalty, including 1910.22(a)(1) for failure to keep workplaces clean, 1910.133(a)(1) for failure to ensure employees' use of face protection, and 1910.212(a)(1) for failure to guard machinery crush and nip points.

The company also is contesting a serious citation and a $2,600 penalty for Section 5(a)(1) for failure to lock out electric power from machinery during adjustment and for failure to ensure that molten metal and water did not come in contact with one another, 1910.22(c) for failure to guard pits, and 1910.219(c)(2)(i) for failure to enclose shafting.

The company also is contesting a nonserious citation for 1910.22(c) for failure to cover floor openings, 1910.242(b) for failure to ensure that compressed air used for cleaning purposes was less than 30 psi, and 1910.309(b) for failure to protect conductors against physical damage (No. 80-4143).

New Era Milling Company, Arkansas City, Kan., is contesting a repeated citation and a $1,120 penalty for 1910.95(b)(1) for failure to reduce noise (No. 80-4460).

Northern States Steel Builders, Inc., Pekin, Ill., is contesting a nonserious citation for 1903.16(a) for failure to post Occupational Safety and Health Administration citations (No. 80-4068).

Olman Heath Company, Inc., Norman, Okla., is contesting a serious citation and a $320 penalty for 1910.95(a) for failure to protect employees against the effects of noise.

The company also is contesting a nonserious citation for 1903.2(a)(1) for failure to post a notice informing employees of their rights and obligations under the Occupational Safety and Health Act and 1904.2(a) for failure to maintain a log of occupational injuries and illnesses as required (No. 80-4352).

P & V Construction, Inc., Woodbury, N.Y., is contesting a $700 additional penalty for failure to correct a violation of 1926.150(e)(1) for failure to establish an emergency alarm system and 1926.150(e)(2) for failure to post an alarm code or reporting instructions (No. 80-3856).

P-V-T, Inc., Houston, Tex., is contesting a willful citation and a $1,620 penalty for 1910.134(a)(1) for failure to ensure employees' use of appropriate respirators when effective engineering controls were not feasible or while they were being instituted (No. 80-4391).

Packaging Systems, Inc., Subsidiary of National Can Corporation, Itasca, Ill., is contesting a serious citation and a $1,000 penalty for 1910.95(a) for failure to protect employees against the effects of noise (No. 80-4233).

Paisan Construction Company, Houston, Texas, is contesting a serious citation and a $120 penalty for 1926.400(h)(1) for failure to use an assured equipment grounding conductor program for temporary wiring (No. 80-4364).

Paisan Construction Company, Houston, Texas, is contesting a serious citation and a $480 penalty for Section 5(a)(1) for failure to ensure that panels mounted over employees followed proper engineering and architectural design (No. 80-4365).

Penn Dixie Steel Corporation, Kokomo, Ind., is contesting a serious citation and a $2,560 penalty for Section 5(a)(1) for failure to ensure that employees were not required to stand without fall protection on the upper rings of ladles and for failure to ensure that a crawler loader was not left unattended with the motor running, 1910.22(b)(1) for failure to keep aisleways clear, and 1910.23(c)(1) for failure to guard open-sided platforms (No. 80-4416).

Pheney Construction Company, Detroit, Mich., is contesting a serious citation and a $280 penalty for 1926.500(d) for failure to guard an open-sided platform (No. 80-4461).

Power Division, Brown & Root, Inc., Redfield, Ark., is contesting a serious citation and a $900 penalty for Section 5(a)(1) for failure to protect employees against the hazard of fire or explosion caused by the release of welding or cutting fuel gas (No. 80-4197).

Producers Grain Corporation, Corpus Christi, Texas, is contesting a serious citation and a $640 penalty for Section 5(a)(1) for failure to inspect an elevator in accordance with ANSI standards (No. 80-4355).

Progress Lighting, subsidiary of Walter Kidde & Company, Inc., Philadelphia, Pa., is contesting a serious citation and a $900 penalty for Section 5(a)(1) for failure to ensure that doors permitting access to live parts of electrical equipment could not be opened unless all power was disconnected (No. 80-4345).

Semco Metals Company, Dundee, Ohio, is contesting a $4,000 additional penalty for failure to correct a violation of 1910.212(a)(3)(ii) for failure to guard machinery points of operation.

The company also is contesting a serious citation and a $50 penalty for 1910.178(m)(9) for failure to fit industrial trucks with overhead guards, 1910.212(a)(3)(ii) for failure to guard machinery points of operation, and 1910.217(c)(1)(i) for failure to guard mechanical power press points of operation (No. 80-4335).

Sims Landmark Fertilizer Plant, Landmark, Inc., Columbus, Ohio., is contesting a serious citation and a $630 penalty for 1910.134(a)(2) for failure to establish and maintain a respiratory protection program as required (No. 80-4336).

Slaymaker Lock Company, division of American Home Products Corporation, Lancaster, Pa., is contesting a repeated citation and a $1,200 penalty for 1910.133(a)(6) for failure to ensure that eye protection met ANSI standards.

The company also is contesting a serious citation and a $1,040 penalty for 1910.176(a) for failure to keep an aisleway in good repair, 1910.217(c)(2)(iii) for failure to attach a fixed barrier guard on a mechanical power press securely, 1910.219(b)(2) for failure to guard connecting rod pinch points, and 1910.219(c)(3) for failure to enclose vertical shafting.

The company also is contesting a nonserious citation for 1910.176(a) for failure to keep an aisle clear, 1910.178(a)(6) for failure to ensure that a powered industrial truck name plate was in place, 1910.212(b) for failure to anchor a fixed-location machine, and 1910.219(h)(1) for failure to ensure that a setscrew did not protrude from a flywheel (No. 80-4264).

TRO Mechanical, Inc., Hollywood, Fla., is contesting a serious citation and a $340 penalty for 1926.25(a) for failure to keep a construction area clear of lumber with protruding nails, 1926.500(b)(1) for failure to guard floor openings, 1926.500(e)(1)(ii) for failure to guard an open-sided stairway, and 1926.651(j) for failure to barricade an excavation (No. 80-4477).

Texaco, Inc., Petrochemical Department, Port Arthur, Texas, is contesting a repeated citation and a $1,200 penalty for 1910.22(a)(1) for failure to keep a workplace clean and orderly.

The company also is contesting a nonserious citation for 1910.23(d)(1)(iii) for failure to guard an open-sided stairway (No. 80-4247).

Threaded Steel Products Company, Beaumont, Tex., is contesting a $1,280 penalty for a repeated citation for 1910.95(b)(1) for failure to reduce noise (No. 80-4258).

Tunnel Electric Construction Company, McCook, Ill., is contesting a serious citation and a $600 penalty for Section 5(a)(1) for failure to test the atmosphere of an unventilated vault before employees' entry and 1926.21(b)(2) for failure to train employees adequately in the hazards of entry into confined spaces (No. 80-4418).

U.S. Aluminum Corporation of Pennsylvania, Marietta, Pa., is contesting a 12-item serious citation and a $3,360 penalty, including 1910.309(a) for failure to ground plug- and cord-connected equipment, 1910.252(b)(3)(iii)(*a*) for failure to provide disconnect and protection means for portable arc welder outlets, and 1910.178(k)(4) for failure to prevent railroad cars from being moved while bridgeplates were in place.

The company also is contesting a nonserious citation for 1910.22(a) for failure to keep workroom floors dry, 1910.176(c) for failure to keep storage areas clear of accumulated materials, 1910.178(p)(1) for failure to withdraw defective powered industrial trucks from service, and 1910.252(d)(2)(xv) for failure to ensure that cutting and welding was permitted only in fire-safe areas (No. 80-3768).

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION PREAMBLE TO FINAL STANDARD ON FIRE PROTECTION

[45 FR 60656, September 12, 1980]

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1910

Occupational Safety and Health Standards—Fire Protection; Means of Egress; Hazardous Materials

AGENCY: Occupational Safety and Health Administration, U.S. Department of Labor.

ACTION: Final rule.

SUMMARY: In these final standards, the Occuaptional Safety and Health Administration (OSHA) is revising a major portion of its safety standards dealing with fire protection requirements necessary to protect employees from unwanted fire in the workplace. These standards provide general design and installation requirements for portable fire suppression equipment (portable fire extinguishers and standpipe and hose systems), fixed suppression systems (automatic sprinkler systems and various other fixed extinguishing systems), fire detection systems, and local fire and emergency alarm signaling systems. The standards also provide specific criteria for fire brigade equipment and training. In addition, certain portions of the OSHA standards relating to hazardous materials and means of egress are also amended to be consistent with the revisions to the fire protection requirements.

The standards are intended to minimize employee exposure to hazardous situations involving fire in the workplace and to provide for fire protection equipment and services for the safe evacuation or rescue of employees endangered by unwanted workplace fires. The standards will replace the applicable standards previously promulgated under section 6(a) of the Occupational Safety and Health Act and represent another step in the ongoing process of reviewing OSHA's standards and promulgating updated, mainly performance-oriented, requirements.

EFFECTIVE DATE: The standards promulgated by this final rule become effective on: December 11, 1980.

FOR FURTHER INFORMATION CONTACT: Standard development inquiries: Mr. Michael B. Moore or Mr. Glen E. Gardner, Occupational Safety and Health Administration, Room N-3463, U.S. Department of Labor, Washington, D.C. 20210, (202) 523-7225.

Compliance inquiries: Mr. William Simms, Occupational Safety and Health Administration, Room N-3106, U.S. Department of Labor, Washington, D.C. 20210, (202) 523-8124.

For additional copies of these standards, contact: OSHA Office of Publications, Room S1212, U.S. Department of Labor, Washington, D.C. 20210, (202) 523-6138.

SUPPLEMENTARY INFORMATION:

I. History

In 1970, Congress directed OSHA, under section 6 of the Occupational Safety and Health Act of 1970 (84 Stat. 1590, 29 U.S.C. 651 et seq.) (the Act), to promulgate safety and health standards which would implement the Congressional policy of assuring, so far as possible, every working man and woman in the Nation safe and healthful working conditions. Congress further required that any standards initially promulgated under section 6(a) of the Act be taken from existing national consensus standards and established Federal standards.

On May 29, 1971, OSHA promulgated its first set of general industry occupational safety and health standards as 29 CFR Part 1910 (36 FR 10466). Among other requirements, these standards contained regulations covering means of egress (Subpart E), hazardous materials (Subpart H), and fire protection (Subpart L).

After the initial standards were promulgated, OSHA amended certain provisions of these standards, pursuant to section 6(b) of the Act. For example, on January 9, 1974, at 39 FR 1437, Table L-3 in Subpart L was amended to permit 12-year hydrostatic test intervals for fire extinguishers with aluminum shells and § 1910.158(b)(3) was changed to extend the maximum lengths of fire hose which could be used on standpipe systems. These changes reflected the continued up-dating of the consensus standards by the various standards groups and the continued advancement in the technical state-of-the-art which provided more flexible means of compliance not permitted by the original OSHA standards. OSHA, therefore, began amending its standards to reflect acceptable alternatives to the requirements in the standards.

During this period of time, OSHA received petitions calling for further changes in the standards. The majority of these petitions called for the recognition of national consensus standards other than those already contained in OSHA's standards and for the amendment of the safety standards to delete provisions not directly related to occupational safety and health.

As part of the process of deciding whether and how to revise Supart L, OSHA gave employers and employees an early opportunity to suggest how the standards should be revised, to submit information, and to comment on several general and specific issues. This notice was published in the Federal Register on April 23, 1976 (41 FR 17255).

In addition, the agency scheduled and invited public participation at three separate public meetings in San Francisco, Dallas, and Boston during June, 1976. The purpose of the meetings was to afford the public an opportunity to present oral testimony as well as submit written comments concerning the issues raised in the April 23, 1976 Federal Register notice. The written comments received and the transcripts of those meetings have been entered into the OSHA record of this rulemaking.

Upon completion of the public meetings and the close of the comment period, OSHA reviewed all the data presented and determined that a major revision of Subpart L was necessary.

On December 22, 1978, OSHA published its proposed revisions to

Published by THE BUREAU OF NATIONAL AFFAIRS, INC., WASHINGTON, D.C. 20037

Subpart L in the **Federal Register** (43 FR 60048). OSHA also proposed certain revisions to Subparts E and H of Part 1910 which were necessary to complement the revisions proposed for Subpart L. The notice requested that comments on the proposed revisions be submitted by March 16, 1979. The comment period was subsequently extended to April 16, 1979 (44 FR 17757). When the comment period closed, a total of 195 comments had been received by OSHA.

In the proposal, OSHA also invited requests for public hearings on any issues raised by the proposal. Several commenters requested that a public hearing be held on certain aspects of the proposed section for fire brigades, § 1910.165.

On June 1, 1979, OSHA published in the **Federal Register** (44 FR 31670) a "Notice of Public Hearing and Request for Written Comments" (Ex. 21). The issues for the public hearing were listed as follows:

1. (a) Whether positive-pressure breathing apparatus should be the only acceptable respirator for interior structural fire fighting?

(b) What protection factor should be provided by respirators to be used for interior structural fire fighting? How should it be measured?

2. (a) Whether OSHA should require employers to permit employees to refuse to perform fire brigade duties in any workplace?

(b) Whether employers should be required to ensure that brigade members, who are expected to perform interior structural fire fighting, are physically capable of performing the duties assigned to them? If so, how should "physically capable" be defined? What physical test requirements are appropriate for part-time or full-time fire brigade members?

(c) What would be the economic impact if OSHA did permit employees to refuse to perform fire brigade duties? How many employees are now required to join fire brigades as a condition of employment? Are these employees subject to discharge if they become physically unable to continue fire brigade duties or if they refuse to perform these duties? How often does this occur?

In addition, OSHA raised a third issue related to personal protective equipment for fire brigade members and requested written information and comments to assist the agency in resolving certain questions related to the use of this equipment. The close of the written comment period on that issue was September 14, 1979, and over 15 written comments were received.

Hearings on the proposed fire brigade standard were held in Washington, D.C. (August 28–30, 1979), Houston, Texas (September 5–6, 1979), and San Francisco, California (September 10–11, 1979). A substantial amount of information, data, and views concerning the second hearing issue was generated both in testimony presented at the hearings and in post-hearing comments which were received and placed in the record.

The Administrative Law Judge presiding at the hearings allowed until October 12, 1979, for the submission of post-hearing comments and until October 31, 1979, for filing arguments and briefs relating to the hearing issues. The Administrative Law Judge certified the record of the hearings to the Assistant Secretary of Labor for Occupational Safety and Health on November 16, 1979.

II. Background

(1) *Purpose and philosophy.*

The basic objective of OSHA's involvement in fire protection is to prevent personal injury and loss of life due to unwanted fire in the workplace. The effects of fire in the workplace can be measured in pain, suffering, and death. An understanding of the control of fire has been aided by the development of fire protection technology. The application of this technology in the workplace will enhance the protection of employees.

Industrial fires over the years have caused many injuries and deaths. Notable among the innumerable workplace related fires is the March 25, 1911, Triangle Shirtwaist Co. fire which involved three floors of the Asch Building in New York City. In that fire, within 30 minutes, about 150 people burned to death or died jumping to sidewalks below. At that time, New York City had no laws requiring fire drills, fire escapes, or sprinklers in factories. The fire and loss of life precipitated a nation-wide discussion of the question of adequate methods of egress from buildings.

The following year, on January 9, 1912, the Equitable Building fire in New York City resulting in the loss of six lives also showed that the problem of fire in the workplace needed serious examination.

In the latter part of the 1960's and early 1970's, the proliferation of high-rise buildings added to the complexities of protecting employees and fighting fires in the workplace. Fires occurred at an alarming frequency, sometimes trapping people, with consequent loss of life. For example, in Chicago, a fire broke out in the 110 story Sears Tower while under construction, trapping and killing four workmen. The problems associated with fires in tall buildings, increase the importance of early fire detection and adequate exits with safe routes of egress.

The fire problem in the United States is still a matter of major concern aggravated by the manufacturing, shipment and storage of new materials produced in our rapidly changing technological society, and by a failure to apply basic principles of fire safety. The safety of employees requires an end to conditions which present unnecessary and avoidable possibilities of destructive fire. Compared with the industrial buildings of the early twentieth century, the modern industrial complex places a larger number of employees in an increasingly hazardous environment.

A significant risk of injury and death from fire to employees and to employees who fight fires is supported by data in the record concerning fires occurring in workplaces. For example, a report by the U.S. Fire Administration (Ex. 19) shows that in 1977 an estimated 140,800–165,000 fires occurred in workplaces in the United States. These fires resulted in about 2,220 injuries and 124 deaths among the work-force. Nine out of ten injuries were burns and/or asphyxia. More than one half of the victims were injured in the course of fire fighting in the workplace. The fires also resulted in 1.3 to 2.0 billion dollars in direct property loss. These figures represent only those fires which were actually reported to fire departments.

In July 1976 the National Association of Fire Equipment Distributors (NAFED) conducted a fire extinguisher use survey (Ex. 8: 260) of industrial workplaces. The study showed that 94.2 percent of workplace fires were extinguished by employees without notification of or assistance from a public fire department.

In 1978 NAFED conducted a more comprehensive study of fire extinguisher effectiveness which confirmed the results of the first study. Data from these incidents were not included in national data reporting systems.

Another study covered fires occurring at Bell Systems facilities during 1971 through 1977 (Ex. 9). This study estimates that 80 percent of their fires were either not reported to a fire department or were reported to a fire department but the fire department provided no assistance.

The NAFED and Bell studies confirm that there are many fires occurring in workplaces which are not reflected in the U.S. Fire Administration report and other national data reporting systems. It is reasonable to assume that since the U.S. Fire Administration's estimate of total workplace fires is less than those actually occurring, the number of injuries caused by workplace fires indicated in the Fire Administration data is probably also an underestimation.

The U.S. Fire Administration report also does not include data with respect to chronic health effects to employees resulting from fire fighting activity. However, other studies in the record suggest an increased incidence of respiratory and cardiovascular disease among employees in fire fighting activities (Ex. 8: 248; 249; 250; 259). These studies are based on the experiences of municipal fire fighters. Although the frequency of fire fighting may differ, employees who fight fires in industry are exposed to the same hazards as municipal fire fighters. OSHA believes that the long-term effects associated with fire fighting in the workplace present a definite hazard to employees. When these chronic effects are added to the immediate hazards of serious injury or death from fighting fires as discussed above, a significant risk of harm from fire in the workplace clearly exists.

The provisions of this final standard are directed at protecting employees from certain of the major workplace fire hazards to which they are exposed. These provisions are reasonably necessary and appropriate to reduce the significant risks which exist. The preamble discusses in detail the relationship of the standards requirements to the reduction of some of the major hazards.

The basis for these revised standards is OSHA's recognition of the problems associated with the present fire protection standards, particularly with regard to their specificity and their orientation in some instances towards property protection and public safety instead of workplace safety. The Secretary of Labor and the Assistant Secretary of Labor for Occupational Safety and Health have expressed their commitment to a regulatory policy for the development of safety standards which focus directly on the most significant workplace hazards, and which provide employers as much flexibility as possible in meeting these requirements. The revised standards published today serve these dual objectives.

In achieving these dual objectives, OSHA has improved the basic criteria for the design, installation, testing and maintenance of portable and fixed fire protection equipment and systems for those workplaces covered by Part 1910. Subparts E, H, L and R now have requirements for fire protection equipment and systems which must be provided in accordance with Subpart L.

Subpart L will serve as the resource standard for the requirements for the fire protection equipment and systems which relate to employee safety from fire in the workplace. In the future, as OSHA revises various subparts within Part 1910, the standards in Subpart L will be referenced in the other subparts for the specific criteria necessary to assure proper design, installation, testing and maintenance of required portable and fixed fire protection equipment. The training and education of maintenance personnel, fire brigade members and other employees are also covered in Subpart L.

The standards in Subpart L relate to the rest of Part 1910 in the following manner. Subpart L covers three general areas: portable fire protection equipment, fixed fire protection systems and fire brigades. The requirements for portable fire extinguishers apply in general to all workplaces covered by Part 1910 except those that rely on the exemptions provided for in § 1910.157. However, when another subpart in Part 1910 specifically requires that portable extinguishers be provided, then the exemption in § 1910.157 is not available as the exemption would be in conflict with the specific language of another standard. For example, paragraph 1910.180(i)(5) requires the installation of a portable fire extinguisher in the cab or vicinity of a crane. It does not provide for the exemptions allowed in § 1910.157.

The fixed fire protection systems requirements in Subpart L will be invoked when they are referenced by another OSHA standard. For example, paragraph 1910.109(i)(7) prohibits the storage of more than 2,500 tons of bagged ammonium nitrate in a building or structure unless the building is equipped with an automatic sprinkler system installed in accordance with Subpart L, § 1910.159. In this example, the employer who wishes to store more than 2,500 tons of bagged ammonium nitrate in a building or structure would have to provide a sprinkler system and refer to § 1910.159 to determine how to design and install the system. OSHA's intent in using this approach is to eliminate the need for repeating all of the design and installation standards for a required system each time the system is required in the standards.

The fire brigade requirements apply when the employer decides to establish and organize a fire brigade. The requirements contain the criteria for protective equipment and training which the employer must provide employees who have been selected to serve on company fire brigades. It is OSHA's intention that § 1910.156 will not be referenced in other subparts.

The most important factors to consider in providing adequate employee safety in a fire situation are the availability of proper exit facilities to assure ready access to safe areas, and the proper education of employees as to the actions to be taken in a fire emergency.

The standards promulgated in this final rule regulate those areas of fire protection and prevention and employee protection that OSHA believes are necessary to assure safety from unwanted fire. Provisions are included in this final rule for employee emergency action plans; the application of certain fire protection systems to the storage and use of hazardous materials; the design, installation and testing of various fire protection and prevention systems and equipment, and fire brigades.

Requirements are also established in certain areas where employee protection has been inadequate or non-existent in the past. For example, personal protective equipment is required during interior structural fire fighting operations and training and education about fire protection and prevention must be provided to employees.

A considerable proportion of fire casualties occur where occupants of buildings are unaware of a fire until it is too late to safely evacuate or escape. Automatic fire detection and alarm systems are capable of providing employees with early warning of a fire situation or other emergency and thereby give them time to safely escape. When automatic detection and alarm systems are included with automatic fixed extinguishing systems such as automatic sprinkler systems, employee safety can be greatly enhanced. According to the National Fire Protection Association (NFPA) (Ex. 8: 212):

> NFPA records show that the loss of life by fire in buildings equipped with automatic sprinkler systems has been almost negligible. The few deaths that have occurred have been under unusual circumstances . . .

OSHA recognizes the outstanding record of fixed automatic fire suppression systems in preventing loss of life and believes that the use of such systems with automatic detection and alarm systems can effectively reduce personal injury and loss of life due to fire in the workplace.

There will be cases where the use of fixed fire protection equipment or systems is precluded for some reason. In these instances, the employer may find it necessary to rely upon portable fire suppression equipment in the form of portable fire extinguishers or small hose. When this becomes necessary, the employee has become involved in one of the most hazardous facets of fire in the workplace—employee fire fighting. The direct exposure of an employee to fire fighting operations puts the employee in a position of increased risk of personal injury or loss of life. In many cases this increased risk can be alleviated by providing the employee with the necessary training and personal protective equipment to reduce the hazards associated with direct exposure to the fire.

OSHA discussed the two contrasting points of view concerning fire fighting in the workplace in the notice of proposed rulemaking at 43 FR 60049.

Basically, the first point of view is that fire fighting is hazardous and that if OSHA permits employees to fight fires, it is exposing employees to a hazardous situation contrary to the purposes of the Act. Proponents of this theory believe that fire fighting is better left to the municipal or county fire fighters and that all employees should be evacuated.

The second point of view is that some fire fighting by trained employees is necessary for the welfare of the employee, the employer and the economy. The supporters of this view believe that since fire fighting is necessary to protect life and property, it should be regulated so that the tools and equipment are maintained, installed, and used in a safe and reliable manner.

OSHA acknowledges that there is a definite life safety hazard associated with fire fighting in the workplace. However, OSHA also recognizes that there is a need for employees to fight fires in the workplace, especially where no public fire protection service is available or where available service is inadequate. OSHA also believes that employer and employee efforts to keep small unwanted fires in the workplace from spreading and becoming large fires enhances the occupational safety of all employees.

It is, therefore, one of the purposes of this revision to regulate equipment and training provided by employers, and to assure the safety and health of employees who may become involved with fighting or escaping from workplace fires. The standard is primarily directed to fixed and portable fire suppression equipment and is intended to assure the reliability of such equipment when it is needed. The portion of the standard directed to fire brigades is intended to assure that employees who must fight fires are provided with adequate personal protective equipment, training and leadership to assure their safety and health during fire fighting and rescue operations.

OSHA wishes to clarify some misconceptions concerning employer fire fighting responsibilities that arose during the comment period for the proposed revision. OSHA does not require employers to establish fire brigades or require employees to fight fires. If the employer elects to totally evacuate all employees from the workplace at the time of a fire, the employer may do so. However, if the employer elects to have some or all of the employees fight fires, then some kind of personal protective equipment or training or both will be necessary depending upon the degree of fire fighting the employees will be doing.

OSHA does not require employers to provide employees fighting incipient stage fires with the same equipment which must be provided for employees fighting interior structural fires. The extent of education or training and equipment provided by the employer is to be consistent with the employee's exposure to fire fighting hazards.

(2) *Format.*

In the December 22, 1978, Federal Register Notice of Proposed Rulemaking OSHA (43 FR 60048) two general issues were raised relating to the nature and type of safety and fire protection standards to be promulgated. These issues concerned whether the existing standards needed to be simplified or clarified, and whether specification or performance-oriented standards should be adopted. Some of the comments (Ex. 7: 43; 98; 34) suggested that the standards needed clarification and also that OSHA should use performance language to provide as much flexibility as possible in complying with the standards. Many commenters supported the use of clear, concise and simple language in the revised standards. American Cyanamid Company (Ex. 7: 43 p. 1) suggested:

> Cyanamid feels that if Subpart L is retained by OSHA the greater flexibility provided by performance standards is much more desirable than specification standards. Performance standards would enable us to provide employee protection in unique locations which specification standards could not address adequately. Further, it would allow us to use new technology as it becomes available.

The General Motors Corporation (Ex. 7: 98 p. 2) maintained:

> . . . the standards should have simple and clear requirements. The inclusion of the proposed appendix material will greatly assist in clarifying the requirements. The appendix should address all provisions that have questionable application.

Sperry Flight Systems (Ex. 7: 34 p. 1) stated: "We favor regulations which provide the employer with the maximum possible flexibility."

Organization Resources Counselors, Inc. (ORC) (Ex. 7: 94 p. 4) indicated:

> This approach assures that where an innovative approach to safety is developed it can be applied, and yet the ultimate responsibility of the employer has not changed; the safety of the employee must come first.

ORC further maintained:

> Man and his environment are in constant change, and a standard aimed specifically at the solution of today's problem will very likely to inadequate for tomorrow's. The ways and means necessary to achieve a goal must of necessity change with changing technology and organization, but the goals themselves need not.

In light of the overwhelming support for the use of simple performance-oriented language, OSHA has adopted a format which contains performance-oriented standards supplemented by non-mandatory appendices for guidance in compliance. There is also a list of reference sources in the appendix which contain information and data to further supplement the performance standard. OSHA believes that this new approach will provide employers with the necessary flexibility to meet the standard in different workplace situations and yet will provide other employers who want them with specific guidelines in the appendices for compliance with the standard.

The new format which OSHA proposed received considerable praise from interested parties. The overall support for performance-oriented standards followed by a non-mandatory appendix of compliance guidelines has led OSHA to use this format for Subpart L, and suggests that the same approach should be used in other standards to be developed in the future.

In addition to the two appendices to Subpart L contained in the proposal, OSHA is adding three additional appendices. One of them contains a cross-reference table of OSHA standards and applicable NFPA standards, in response to comments received from NFPA (Ex. 7: 161). This material was incorporated in Appendix B of the proposal. This new appendix will be entitled "Appendix B—Subpart L National Consensus Standards." It is important to understand OSHA's intent in adopting this new appendix. Compliance with an applicable NFPA standard will be considered to be one means of compliance with the performance criteria in the OSHA standard. For example, if an employer wishes to follow the standards established in NFPA 10, Portable Fire Extinguishers, then OSHA would consider the employer to be in compliance with § 1910.157 which regulates portable fire extinguishers. However, not adhering to the NFPA standard does not necessarily constitute non-compliance with the OSHA standard.

Certainly other alternative methods of compliance may be available. In construing the meaning of the performance language in the standards in circumstances where the employer chooses not to comply with the specific provisions of the guidelines, OSHA will look at the specific guidelines among

MCD 00001386[illegible]

other things to determine whether the employer has complied with the standards' performance requirements.

The second new appendix, Appendix D, contains information concerning the availability of publications incorporated by reference into the standard.

The third new appendix, Appendix E, contains test methods for determining if protective clothing affords the required level of protection.

The appendices do not create any additional obligations or detract from any obligations otherwise contained in the final standard. They are intended to provide useful, explanatory material and information to employers and employees to aid in understanding and complying with the standard. In view of the nature of the appendices, changes can subsequently be made to the appendices without rulemaking.

(3) *Metric Conversion Policy.*

English measurement values given in this standard are followed by an equivalent International System (SI) metric measurement value, usually in parentheses. The first stated value is the requirement; the second value may only be an approximation. The SI units as employed are in accordance with the American National Standard for Metric Practice, ANSI/ASTM E380.

It is OSHA's policy to use this method, known as a "soft conversion", to facilitate metrication activities under guidelines published by the Federal Interagency Committee on Metric Policy. These guidelines were published in the Federal Register at 45 FR 1840 on January 8, 1980. OSHA's metrication policy was established through a memorandum to the Assistant Secretary of Labor for Policy, Evaluation and Research from the Assistant Secretary of Labor for Occupational Safety and Health dated January 19, 1977.

(4) *Secretary's Statement under Section 6(b)(8).*

Section 6(b)(8) (84 Stat. 1596) of the Occupational Safety and Health Act of 1970 mandates:

> Whenever a rule promulgated by the Secretary differs substantially from an existing national consensus standard, the Secretary shall, at the same time, publish in the Federal Register a statement of the reasons why the rule as adopted will better effectuate the purposes of this Act than the national consensus standard.

The final requirements promulgated by this notice differ from existing national consensus standards in several areas. The differences are based on the agency's efforts to eliminate standards not specifically directed to employee safety and to develop performance-oriented standards rather than the specification type of standard used in some national consensus standards. Several national consensus standards that were the original basis of Subpart L were written to apply to public safety and property protection as well as to employee safety.

OSHA believes that these final standards will better effectuate the purposes of the Act because performance standards provide greater flexibility for compliance and set goals that employers and employees can achieve through various alternative methods. The use of alternative methods for compliance will encourage technological development and improvement in safety engineering techniques and thereby improve working conditions for employees. Further, elimination of requirements specifically directed to property protection and public safety will permit compliance efforts to be concentrated toward those hazards which directly affect employee safety.

(5) *Delayed Effective Dates.*

The proposed delayed effective dates in certain standards were based on a projected date of publication for this final rule. The proposed delays were included to permit employers time to purchase equipment needed to comply with the final rule or to "grandfather" certain fire protection systems designed or installed before the publication of the final rule.

Some of the effective dates contained in the proposal have been changed in order to give sufficient time and notice to employers from the promulgation of this final standard to come into compliance with its requirements. The effective dates for certain final paragraphs are shown below:

Final paragraph	Proposed date	Effective date
1910.156(e)(1)(i)	1/1/80	7/1/81
1910.156(f)(2)(i)	1/1/80	7/1/81
1910.158(c)(3)(ii)	1/1/80	1/1/81
1910.158(c)(3)(iii)	1/1/80	1/1/81
1910.158(e)(1)(ii)	1/1/80	1/1/81
1910.159(c)(3)	1/1/80	1/1/81
1910.164(c)(3)	1/1/80	1/1/81
1910.165(d)(4)	1/1/80	1/1/81

All other dates for compliance will remain as proposed because OSHA believes that sufficient time and notice for compliance is available to employers.

III. SUMMARY AND EXPLANATION OF FINAL RULE

This section includes an analysis of the record evidence and the policy considerations underlying the decisions as to the various provisions of the standard.

OSHA has made various changes to the proposed language in the final standard. Rather than provide a detailed discussion for each paragraph, OSHA has decided to provide a general discussion of certain changes at this point. This approach will make the detailed explanation of changes shorter and easier to read.

First, in many of the proposed revisions to Subpart L, OSHA used the opening language, "The employer shall * * *", to emphasize the employer's ultimate responsibility for compliance with the standards. Some commenters (Ex. 7: 40; 50), however, interpreted the proposed language to preclude the employer from allowing outside contractors or other persons to perform testing or other requirements under the standard. This was not OSHA's intent. The proposed language was used only to emphasize that the employer has the ultimate responsibility for safe working conditions.

However, in response to comments, OSHA has decided to use the language, "The employer shall assure that * * *", in place of, "The employer shall * * *" where necessary to clarify OSHA's intent that while the employer has the ultimate responsibility, persons other than the employer may perform required duties.

Second, for some proposed revisions OSHA received no substantive comments suggesting a change to the proposed language. In most such cases, OSHA has decided to adopt the proposed language as the final standard. Throughout the following discussion OSHA has identified the specific paragraphs receiving no substantive comment by stating only that the proposed language is adopted as the final standard, without noting the lack of substantive comment.

Third, some proposed requirements have been deleted from the final standard because of the overwhelming arguments for deletion in the comments. The deletions have made it necessary to renumber many of the proposed requirements as they appear in the final standard. OSHA has provided a table at the beginning of the discussion of changes for each individual section to show the final numbering. The individual requirements are identified in the discussion by the paragraph numbers used in the proposal.

Fourth, OSHA has cited the Subpart L record by identifying exhibits with parentheses. Comment numbers follow the exhibit in which they are contained. If more than one comment within an exhibit is cited, the comment numbers are separated by semicolons. For example, (Ex. 7: 4; 5; 6) means exhibit 7, comment numbers 4, 5, and 6. The page number of a comment which has been cited is abbreviated by a "p." For example (Ex. 7: 9 p.5) means exhibit 7, comment number 9, page 5. OSHA has cited the transcript of the hearings by page number. For example, (Tr. 10, 11, 12) means transcript pages 10, 11, and 12.

Fifth, editorial and grammatical corrections are made throughout the final standard which do not alter the specific intent or purpose of the proposed requirements. In most instances, these minor changes are not discussed in the preamble. The preamble primarily focuses on substantive issues and revisions.

Section 1910.35 Definitions

OSHA is adding two definitions to § 1910.35, to define new terms used in the final § 1910.38.

Emergency action plan: Paragraph (i). In paragraph (i), OSHA proposed to define "emergency action plan" as a plan which describes the workplace life safety hazards and the actions employees must take in such emergency. OSHA received several comments (Ex. 7: 38; 64; 74; 94; 123; 168) directed to the language used in the proposal. One commenter (Ex. 7: 94) suggested that OSHA include the phrase "or parts thereof" after "workplace" because some large plant facilities have developed separate emergency action plans for the various parts of complex workplaces. OSHA agrees with the commenter and recognizes the problems associated with maintaining a single elaborate plan for large complex facilities. Therefore, OSHA has added the phrase, "or parts thereof," to this definition.

Another commenter (Ex. 7: 168) suggested that the last sentence of paragraph (i) be deleted because it added nothing to the definition. OSHA proposed the last sentence to give examples of actions which may be included in the emergency action plan. After considering the commenter's remarks, OSHA had decided to delete the sentence.

OSHA has also deleted the phrase, "the employee life safety hazards are and what actions," and has replaced it with the word "procedures" because the proposed language would have required too much detail in the plan by requiring the listing of potential hazards.

OSHA has made other changes to the proposed language of the first sentence to clarify the definition of an emergency action plan. OSHA believes that the definition should more generally describe what is covered in the plan.

Emergency escape: Paragraph (j). In paragraph (j), OSHA proposed to define "emergency escape" as the route that employees would follow to evacuate a workplace. In the proposed language OSHA recognized windows as an acceptable means of emergency escape. One commenter (Ex. 7: 123) was critical of OSHA on this point. The FPE Group stated (Ex. 7: 123 p.4):

> Suggesting the use of 'external wall opening such as a window' does not appear to be good fire life safety practice. The use of windows may require a degree of agility not appropriate to fire emergencies. The criteria for ease and method for opening windows and the elevation of the window above grade is not addressed. Windows are not recognized exits under building codes unless leading to a fire escape ladder.

OSHA is aware of the fact that windows are not traditionally considered acceptable for emergency egress; however, OSHA believes that if a window is available and it offers the only tenable means of egress from a fire area, the employee should use it. In light of the comment, OSHA has decided to use the phrase "alternative emergency egress" instead of the proposed language which refers specifically to windows. This change will allow the use of windows in emergencies, and indicates the flexibility in selection of alternative methods of egress. OSHA believes that employers and employees are capable of planning routes of emergency escape which would be acceptable.

Another commenter (Ex. 7: 168) suggested that OSHA use the term "emergency escape route" or "emergency evacuation route" rather than the proposed term "emergency escape." The commenter suggested that the term "emergency escape" implies an action to be taken by employees and not a route to be followed. OSHA agrees with the commenter and has decided to change the term to "emergency escape route," to clarify OSHA's intent that the proposed language define a route to be taken.

Section 1910.37 Means of egress, general.

Fire alarm signaling systems: Paragraph (n). In this paragraph OSHA proposed to delete the existing testing and maintenance requirements for alarm and fire protection systems and substitute a cross-reference to proposed § 1910.164a (renumbered § 1910.165 in the final standard).

Several commenters (Ex. 7: 49; 60; 66; 173) suggested other editorial and grammatical changes or questioned the scope of the paragraph. OSHA will consider these suggestions when Subpart E of Part 1910 is totally revised.

Section 1910.38 Employee emergency plans and fire prevention plans.

OSHA has found it necessary to change the section heading for § 1910.38 from "Employee emergency plans" to "Employee emergency plans and fire prevention plans." OSHA has determined that a fire prevention plan is not really an employee emergency plan but a hazard prevention plan. Therefore, OSHA is including fire prevention plan as part of the section's heading to clarify that the section contains requirements addressing a plan other than an employee emergency plan.

Emergency action plan: Paragraph (a). Paragraph (a) establishes the requirements for emergency action plans that have been developed by employers to assure employee safety during fires or other emergencies. The purpose of an emergency action plan is to facilitate and organize employer and employee actions during workplace emergencies.

In paragraph (a)(1) OSHA defines the scope and application of the section. The section applies to all emergency action plans which may be required by a particular OSHA standard. However, the section does not, by itself, require the employer to establish an emergency action plan. The section contains only the criteria to be followed in establishing emergency plans which are or which will be required by other specific OSHA standards. For example, an employer can obtain certain exemptions from the requirements of § 1910.157, Portable Fire Extinguishers, if an emergency action plan is established in accordance with the requirements of this section. Further, in § 1910.160 (c)(1), the employer is required to provide an emergency action plan in accordance with § 1910.38 for areas where total flooding fire extinguishing systems use agent concentrations exceeding maximum safe levels.

One commenter (Ex. 7: 34) suggested that a listing of the provisions where emergency action plans are required should be included. OSHA does not believe that such a list of specific requirements is appropriate. The terminology, "required by a particular OSHA standard" as found in this section is also used throughout Subpart L. OSHA's intention is to use internal cross-references within Part 1910 wherever such references are necessary.

Copperweld Steel Company stated (Ex. 7: 64 p.4):

> The idea that plans consist of and address *all* designated actions is not [at] all realistic. Recognizing the sizes of business establishments and the difference in types of business and the creation of this requirement for all business to have an emergency action plan is an inappropriate plan and would be difficult to enforce.

OSHA agrees that requiring the plan, as proposed, to "consist of and address *all* designated actions" may not be practical. In order to make the requirement more practical, OSHA revised the proposed language by deleting the phrase "all actions" and by replacing the deleted language with the words "those designated actions" because it is necessary that the plan adequately describe the actions each employee and the employer must take in an emergency. While it is not necessary to cover all actions in a single plan, OSHA believes that each employee should be able in advance of any emergency to read the plan to determine what is expected to be accomplished at the time of an emergency. OSHA believes the changes made to the proposed language will permit employers to develop less voluminous plans. This change will also reduce the burden on small business by eliminating the need for extensive plans where simple, less complex plans can adequately provide for employee safety.

OSHA's changes to the proposed language were further supported by other commenters (Ex. 7: 66; 94; 98; 123) who expressed similar concerns about the broadness of the coverage for emergency action plans.

Paragraph (a)(2) contains the minimum specific elements to be covered in emergency action plans. OSHA proposed several specific elements addressing procedures, assignments, and actions that would have to be included in a plan. Several commenters (Ex. 7: 40; 54; 73; 98; 168) identified problems associated with requiring specific elements to be included in workplace plans where such elements may be unnecessary. The Sun Oil Company indicated (Ex. 7: 40 p. 4):

> The scope and application of the emergency action plan should be stated but the specific elements of the plan should be omitted from the standard and incorporated as guidelines in the appendix.

The Motor Vehicle Manufacturers' Association (MVMA) suggested (Ex. 7: 168 p. II–2) that OSHA limit the list of elements to the proposed elements (i), (iii), (v), and (vii).

OSHA believes that the minimal list of elements is necessary because they are fundamental to effective emergency action plans. Therefore, OSHA has retained the list of elements, with some amendments to the language, in the final § 1910.38(a)(2). As noted below, the amendments reflect suggested changes which will clarify the requirement or provide greater flexibility for compliance.

In paragraph (a)(2)(i) OSHA proposed that emergency escape procedures and assignments must be included in the plan. These would include emergency duties of employees related to safe evacuation. OSHA has decided to add the phrase "emergency escape route assignments" to the proposed language. This will assure that employees can find what emergency route assignment they have and can become familiar with the path to follow.

Paragraph (a)(2)(ii) provides that the plan must contain those procedures to be followed by employees who must remain inside the workplace, after initial evacuation, to operate or shut down critical plant operations.

In paragraph (a)(2)(iii) OSHA proposed that the plan include those actions necessary to account for all employees after emergency evacuation has been completed. One commenter, J. I. Case Company, remarked (Ex. 7: 74 p. 4):

> Absenteeism, transfers, shift changes, employees on errands, etc. render this requirement impractical and even impossible. We know of no practical way we could account for all of our employees after evacuation by holding a muster.

OSHA believes that it is possible to determine if all employees working on a particular day when an emergency occurs have made it to safety. Front line supervisors should be aware of the locations of those employees or fellow employees. Further, accounting for employees will aid the plant fire brigade or the local responding fire departments in determining whether rescue efforts are necessary. For these reasons, OSHA has decided to retain this requirement in the final list of elements.

In paragraph (a)(2)(iv) OSHA proposed that the rescue and medical first aid duties of employees be included in the plan. OSHA is deleting the reference to "first aid". OSHA believes this change will enhance employee safety by providing that medical duties in addition to first aid will be covered in the plan.

In paragraph (a)(2)(v) OSHA proposed that the preferred means of reporting fire emergencies and the acceptable back-up methods for notifying appropriate persons be included in the emergency action plan. OSHA has changed the proposed language by deleting the language relating to alternative back-up methods. OSHA believes the requirement for alternative back-up methods need not be stated under this requirement because it is adequately covered by § 1910.165 which is referenced in § 1910.38(a)(3) which regulates alarm systems.

In paragraph (a)(2)(vi) OSHA proposed that the plan include the emergency duties of all employees when the alarm sounds. OSHA has deleted this paragraph because the requirement to include employer and employee actions or duties in the plan is adequately covered by paragraph (a)(2)(i) of the final § 1910.38.

In paragraph (a)(2)(vii) OSHA proposed that the names of persons to be contacted regarding emergency procedures be listed in the emergency plan. Both the MVMA (Ex. 7: 168) and the U.S. Department of Defense (Ex. 7: 143) suggested that OSHA permit the listing of a job title for persons to be contacted in an emergency in paragraph (a)(2)(vii). OSHA agrees with the comments and believes that the listing of regular job titles as an alternative is appropriate, particularly in places of employment where employee turnover may be a common occurrence.

In paragraph (a)(3) OSHA proposed that the employer establish an alarm system in accordance with § 1910.164a (now designated § 1910.165).

Two commenters (Ex. 7: 98; 168) suggested that OSHA differentiate between the fire brigade alarm and the employee evacuation alarm. General Motors Corporation stated (Ex. 7: 98 p. 9) "There should be a definite delineation between a fire brigade alerting system and the employee evacuation alarm."

In a related issue, OSHA raised a question in the notice of proposed rulemaking (Issue 19, 43 FR 60051) concerning the feasibility of adopting a universal fire alarm signal.

Most of the commenters (cf. Ex. 7: 33; 66; 97; 160) who addressed the issue of a universal standardized fire alarm signal stated that it is not feasible to require such an alarm at this time. Problems identified by the commenters included the economic burden of retro-fitting existing systems and the selection of a suitable alarm signal pattern.

OSHA believes that, while a universal alarm signal may not be necessary or appropriate at this time, a distinctive alarm capable of identification as a signal to evacuate is necessary. Where alarm signals have similar sounds and are used for purposes other than to signal evacuation they can be confused with the fire alarm signal and either be ignored or cause overreaction. Therefore, OSHA is revising the proposed language to include a new requirement. If the employee alarm system is used to summon the fire brigade, or for other emergency messages, then it must have a distinctive signal for each purpose. The requirement for distinctive signals does not mean different signaling systems for each purpose. OSHA will recognize a single system with coded signals or voice communication as satisfying the requirement.

Paragraph (a)(4) requires that employers establish the types of evacuation to be used in emergencies. OSHA had proposed that the employer state in the emergency action plan whether immediate and total evacuation or delayed and partial evacuation is planned. Several comments (Ex. 7: 11; 49; 60; 74; 87; 121) suggested that the proposed language was too specific and

Published by THE BUREAU OF NATIONAL AFFAIRS, INC., WASHINGTON, D.C. 20037

limited evacuation to one of two plans. M&M Protection Consultants stated (Ex. 7: 11 p. 3):

> The wording in this paragraph is poor, since it limits the alternatives for evacuation to two: Immediate and total or delayed and partial. There may also be a need for a delayed total evacuation or an immediate partial evacuation. This paragraph should be reworded.

OSHA has decided to delete the phrases "immediate and total evacuation or delayed and partial evacuation" from the proposed language because they are too specific and limit the alternative methods of evacuation available to employees and employers. The purpose of this requirement is to assure advance planning for evacuations in fires and other emergencies.

Paragraph (a)(5)(i) contains a training requirement for persons who will be assisting in emergency evacuations. OSHA proposed that a sufficient number of employees be trained to assist in evacuations. One commenter (Ex. 7: 123) questioned the meaning of "sufficient number of employees." OSHA believes that the employer must determine the number based upon the employer's knowledge of the workplace. In some cases it may be one employee and in others it may involve a team of fire wardens. Therefore, the standard provides flexibility for this determination through use of performance language. OSHA is providing guidance on what constitutes a "sufficient number" in the appendix.

Paragraph (a)(5)(ii) contains the requirements for reviewing the emergency action plan with all employees covered by the plan, including those assisting in emergency evacuations. OSHA proposed that employee responsibilities under the plan be reviewed with them when the plan is developed and whenever it changes. The State of Michigan (Ex. 7: 60) suggested that OSHA revise the proposed wording so that employers need review the plan with employees only when the employee's specific duties change rather than when any part of the plan changes. OSHA agrees that if a review was required every time the plan is changed, in any respect, the review process would be unnecessarily burdensome to employers and would not help employees whose duties did not change. Therefore, OSHA is setting three times when the plan must be reviewed with employees: initially when the plan is developed; before a change in the employee's responsibilities under the plan; and whenever the plan is changed such that the employee's duties change.

Another commenter (Ex. 7: 60) suggested that OSHA designate in the final rule when the training should be provided. OSHA has revised the proposed language in paragraph (a)(5)(i) to require the employer to train employees before they are expected to perform any duties under the plan.

In paragraph (a)(5)(iii) OSHA proposed that the employer give a copy of the emergency action plan to each employee upon initial employment and that the plan must be posted in the workplace for review. OSHA also proposed that employers with 10 or fewer employees may orally convey the plan to employees instead of posting it. Several commenters (cf. Ex. 7: 34; 38; 96; 113; 150) remarked that the proposed language requiring the plan to be distributed to every employee and then to be posted would be burdensome and unnecessary, and would serve no purpose for improving employee safety.

It was not OSHA's intent to require the posting and distribution of the entire corporate plan. OSHA has decided, in light of the comments, to change the proposed language to require that an employer shall review with each employee upon initial assignment those parts of the plan that the employee must know in order to be protected in the event of an emergency. OSHA has also changed the proposed language to permit the plan to be available in the workplace rather than require that it be posted. Employers with 10 or fewer employees may orally communicate the plan to employees. OSHA believes the changes to the final requirement will reduce the burden of compliance and improve the value of the training by eliminating the need to provide employees with emergency information that is not relevant to them.

In paragraph (a)(5)(iv) OSHA proposed that employers review the emergency action plan with employees when that employee's job duties change. As noted above the language of paragraph (a)(5)(iii) of the final standard incorporates such a review requirement. Therefore, proposed paragraph (a)(5)(iv) has been deleted from the final standard.

Fire prevention plan: Paragraph (b). Paragraph (b) of this section contains the requirement pertaining to fire prevention plans. The purpose of this paragraph is to provide employers and employees with the criteria for establishing and implementing fire prevention plans in workplaces where such plans are required by other OSHA standards. Fire prevention plans also encourage pre-fire planning. This paragraph does not require the employer to establish a plan; it only contains the criteria to follow when such a plan is to be established.

The requirement for the establishment of a plan is found in other OSHA standards. For example OSHA provides an exemption from the fire extinguisher standard in § 1910.157(b)(2) for those employers who establish an emergency action plan and a fire prevention plan in accordance with § 1910.38.

Paragraph (b)(1) states that the requirements in paragraph (b) apply to all fire prevention plans required by a particular OSHA standard. OSHA is adopting the proposed language as the final standard.

In paragraph (b)(2) OSHA establishes the elements to be covered, at a minimum, in a fire prevention plan. OSHA proposed several specific elements, and several commenters (Ex. 7: 49; 87; 121; 160) suggested changes to or deletions from the list.

In paragraph (b)(2)(i) OSHA proposed that the plan contain a list of the major potential fire hazards and ignition sources, and the types of fire protection equipment or systems that can be used to control fires in the workplace.

United States Steel Corporation (Ex. 7: 66 p. 2) suggested deleting the paragraph because: "It is impossible to make a list of *all* the major potential fire hazards * * *." DuPont maintained (Ex. 7: 93 p. 2): "(This paragraph) would require listing potential ignition sources. This would be time consuming and pointless." The MVMA stated (Ex. 7: 168 p. II–4): "The safety value to an employee of such an all-encompassing list as would be required by the present proposal is extremely questionable."

After reviewing the comments OSHA agrees that an all-encompassing list of all potential fire hazards could be unduly voluminous and unnecessary. OSHA believes that such a detailed list of all fire hazards is not necessary nor is it required by the language of the standard which refers to "major" hazards. OSHA believes that a list of significant hazards is essential for both effective pre-fire planning and for orientation of new employees and employees who have changed job assignments. OSHA has also included examples of potential ignition sources.

In paragraph (b)(2)(ii) OSHA proposed that the method of contacting the plant fire brigade or public fire department be one of the elements of a fire prevention plan. OSHA has decided to delete paragraph (b)(2)(ii) because the requirement is adequately covered by revised paragraphs (a)(2)(v) and (a)(3).

Paragraph (b)(2)(iii) of the proposal required the listing of personnel designated to maintain equipment and systems used to prevent ignitions or fires. One commenter (Ex. 7: 168) identified the problem of listing specific names particularly in plants with high employee turnover rates. OSHA has decided to amend the proposed language by permitting regular job titles to be listed as an alternative to employee names. OSHA believes this change will provide further flexibility in identifying the persons responsible for maintaining equipment and systems and will eliminate the need to update plans when employees change job positions.

Paragraph (b)(2)(iv) of the proposal required employers to list the personnel designated to control fuel source hazards. OSHA has amended this paragraph by permitting employers to list either regular job titles or employee names. As stated above, this change provides additional flexibility in identifying employees and it eliminates the burden of updating lists every time a designated person changes job positions.

Paragraph (b)(3) contains a housekeeping requirement that must be included in the written fire prevention plan. OSHA proposed that all workplaces be kept free of accumulations of hazardous waste materials and residues. Several commenters (Ex. 7: 11; 50; 160) questioned the need for housekeeping requirements in the fire protection standard. M&M Protection Consultants stated (Ex. 7: 11 p. 3):

> We do not understand how this paragraph fits in with the fire prevention plan and/or the emergency action plan * * * (and) It should be part of the general standard.

Other commenters (Ex. 7: 74; 94; 98; 168) believed there is a need for such a requirement in this standard, but thought that the proposed language was too restrictive. ORC recommended (Ex. 7: 94 p.A–4) the insertion of the word "relatively" before the word "free" in the paragraph.

The J. I. Case Company said (Ex. 7: 74):

> This requirement would preclude the storing of shredded paper in an office shredder or paper in a wastebasket until emptied by the janitor.

General Motors suggested (Ex. 7: 98) that the trash be removed on a scheduled basis. "A better guideline would be to use the criteria of a one-day or one-shift accumulation * * *"

OSHA recognizes that it is impractical to keep workplaces *totally free* of flammable and combustible waste materials *at all times*. It was not OSHA's intent to require that all workplaces be kept "broom-swept and clean" at all times. Therefore, OSHA has revised proposed paragraph (b)(3) to require the employer to "control" accumulations of flammable and combustible waste materials so that they do not contribute to a fire emergency. As a guideline for "control," OSHA suggests in the appendix that the accumulations be removed from the workplace at least on a daily (24-hour) basis. The employer must know when wastes have accumulated to the point where they may constitute a fire hazard. Before this condition arises, the accumulation must be removed.

Paragraph (b)(4) contains the training requirements for employees covered by the plan. Several commenters (Ex. 7: 11; 49; 51; 66; 160) suggested changes or deletions to the proposed language.

In paragraph (b)(4)(i) OSHA proposed that the employer train employees in recognizing potential fire hazards involving workplace materials and processes. After reviewing the comments, OSHA has decided that the first sentence of the proposed language, which would have required the employer to train employees how to recognize fire hazards, should be deleted. The second proposed sentence, which states that employees shall be apprised of the fire hazards of the materials and processes to which they are exposed, adequately covers employee training. Therefore, OSHA is adopting the second sentence alone as paragraph (b)(4)(i) of the final standard to assure that employees are provided sufficient training concerning workplace fire hazards.

In paragraph (b)(4)(ii) OSHA proposed that the employer review the plan with employees who have duties under the plan. OSHA has decided to consolidate this requirement with that of paragraph (b)(4)(iii), because both paragraphs contain requirements which address employee review and awareness of the plan.

Several commenters (Ex. 7: 11; 51; 66; 160) argued that the proposed posting and distribution requirements were unnecessarily burdensome. This was particularly true for the proposed posting requirement for the entire plan in paragraph (b)(4)(iii). The commenters (Ex. 7: 11; 51; 66; 160) further suggested that requiring the employer to give each person a copy of the entire plan would serve no purpose in furthering employee safety but would increase the cost. OSHA's purpose in proposing this requirement was to assure that employees had access to the plan, or to that part of the plan, which affected their work areas and their safety. It was not OSHA's intent to require that every employee be given copies of an entire corporate plan.

In light of the comments, paragraph (b)(4)(ii) of the final standard requires that employers review only that part of the plan applicable to each employee. The written plan is to be maintained at the workplace where employees can review it when necessary. OSHA is also deleting the posting and distribution requirements because they are unnecessary as long as employees are trained about the plan and given access to the plan's contents.

Paragraph (b)(5) contains the maintenance requirements for equipment and systems installed to prevent ignitions and requires that they be included in the written fire prevention plan. The purpose of this requirement is to assure the reliability of such equipment. Some comments (Ex. 7: 49; 73) suggested that there was some confusion as to what equipment OSHA was regulating and as to whether this paragraph addresses maintenance of fire protection equipment. OSHA emphasizes that paragraph (b)(5) does not address the maintenance of fire suppression systems and equipment. The maintenance of fire protection systems and equipment is covered in the individual sections for such equipment in Subpart L. In paragraph (b)(5), OSHA is regulating those systems or equipment installed on heat producing equipment to prevent accidental ignition of a combustible material. For example, a temperature limit switch may be installed in a deepfat fryer to shut off the heat source when the liquid has reached a temperature near its flash point. It is the purpose of this paragraph to require that temperature limit switches and other such equipment are kept in operating condition.

Subpart H Hazardous Materials

OSHA is changing the language in several sections in Subpart H of 29 CFR Part 1910. The changes are primarily editorial in nature and do not change the technical substance of the specific requirements. The changes eliminate the incorporation by reference of outdated national consensus standards and reference the appropriate sections of Subpart L in their place. The following table lists these changes in cross-referencing:

Subpart H.—*Cross-Reference Table*

1910 Standard	Old reference	New reference
.107(f)(1)	NFPA 13–1969	1910.159
.106(g)(1)	NFPA 10–1970	1910.157
.106(g)(2)	NFPA 15–1969	1910.163
.106(g)(3)	NFPA 11–1970	1910.163
.106(g)(4)	NFPA 12–1968	1910.162
.106(g)(5)	NFPA 17–1969	1910.161
.109(i)(7)(i)	NFPA 13–1969	1910.159
.109(i)(7)(ii)	NFPA 10–1970	1910.157

Subpart H.—*Cross-Reference Table*—Continued

1910 Standard	Old reference	New reference
.109(i)(7)(ii)	NFPA 14-1970	1910.158

OSHA believes the changes to the Subpart H standards will make it easier for employers to comply with the OSHA standards by eliminating the need to refer to an outside standard which was incorporated by reference.

For example, in § 1910.107(f)(1) OSHA required sprinkler systems to comply with NFPA No. 13–1969. This was the NFPA standard for automatic sprinkler systems originally incorporated by reference by OSHA in its standards. Rather than making the employer obtain a copy of NFPA 13–1969 to know what the OSHA standard requires, OSHA has decided to eliminate this incorporation by reference in Subpart H and, instead, to reference the appropriate sections on automatic sprinkler systems in Subpart L. This change will simplify compliance with the standards. Since compliance with appropriate NFPA standards is recognized by OSHA as an acceptable method of complying with the provisions of Subpart L, there should be no reduction in employee safety as a result of this revision.

There were no substantive comments which addressed OSHA's approach to eliminating outdated consensus standards. Some commenters suggested technical changes to the Subpart H standards. However, such changes are outside the scope of this rulemaking, and will be considered in a future rulemaking proceeding on Subpart H.

Subpart L Fire Protection

OSHA is making extensive changes to the requirements of its fire protection standards. OSHA has added a new § 1910.155 containing the scope, application and definitions applicable to the subpart. There has also been a renumbering of the other sections to permit the addition of the new section on fire brigades.

OSHA has slightly changed the order of the standards as published in the proposal. This change is necessary since the proposed rule contained a section identified as § 1910.164a, which has been eliminated.

A list of the renumbered sections is as follows:

§ 1910.155—Scope, application and definitions.
§ 1910.156—Fire brigades.
§ 1910.157—Portable fire extinguishers.
§ 1910.158—Standpipe and hose systems.
§ 1910.159—Automatic sprinkler systems.
§ 1910.160—Fixed extinguishing systems, general.
§ 1910.161—Fixed extinguishing systems, dry chemical.
§ 1910.162—Fixed extinguishing systems, gaseous.
§ 1910.163—Fixed extinguishing systems, water spray and foam.
§ 1910.164—Fire detection systems.
§ 1910.165—Employee alarm systems.
Appendix—Subpart E. Means of Egress.
Appendix A—Subpart L. Fire Protection.
Appendix B—Subpart L. National Consensus Standards.
Appendix C—Subpart L. References.
Appendix D—Subpart L. Availability of Publications Incorporated by Reference in Section 1910.156 Fire Brigades.
Appendix E—Subpart L. Test Methods for Protective Clothing.

Section 1910.155 Scope, application and definitions applicable to this subpart.

Scope: Paragraph (a). Paragraph (a) contains the scope statement for the subpart. All portable or fixed fire suppression systems, fire detection equipment, and fire or employee alarm systems required to be installed by this or other subparts in the OSHA standards are covered in Subpart L.

The Subpart also covers fire brigades including their personal protective equipment. Systems or equipment which may be installed to supplement what OSHA requires or which are installed solely to comply with other regulatory agency fire codes are not covered by these requirements. OSHA is not regulating such systems because it believes that adequate regulation is provided by local fire code enforcement agencies and insurance carriers.

Application: Paragraph (b). Paragraph (b) states that "general industry" is covered by the requirements of Subpart L. As proposed, the final standard exempts maritime, construction, and agriculture from coverage. It is OSHA's policy to develop vertical standards for these industries where possible.

Several commenters (Ex. 7: 87; 121; 164) suggested that over-water structures such as off-shore drilling platforms not be covered by Subpart L. OSHA standards do not apply to those working conditions in over-water structures for which the U.S. Coast Guard exercises authority to prescribe or enforce standards or regulations affecting occupational safety or health under the Outer Continental Shelf Lands Act, Pub. L. 95–372 (92 Stat. 629).

Definitions: Paragraph (c). Paragraph (c) contains the definitions of terms as they are used in the Subpart.

Because several proposed definitions have been deleted from the final standard, it is necessary to renumber the proposed paragraphs as follows:

Proposal	Final	Proposal	Final
(c)(1)	(c)(1)	(c)(23)	(c)(22)
(c)(2)	(c)(2)	(c)(24)	(c)(23)
(c)(3)	(c)(3)	(c)(25)	(c)(24)
(c)(4)	(c)(4)	(c)(26)	(c)(25)
(c)(5)	(c)(5)	(c)(27)	(c)(26)
(c)(6)	(c)(6)	(c)(28)	(c)(27)
(c)(7)	(c)(7)	(c)(29)	(c)(28)
(c)(8)	(c)(8)	(c)(30)	(c)(29)
(c)(9)	(c)(9)	(c)(31)	(c)(30)
(c)(10)	(c)(10)	(c)(32)	(c)(31)
(c)(11)	(c)(11)	(c)(33)	(c)(32)
(c)(12)	([1])	(c)(34)	(c)(33)
(c)(13)	(c)(12)	(c)(35)	([1])
(c)(14)	(c)(13)	(c)(36)	(c)(34)
(c)(15)	(c)(14)	(c)(37)	(c)(35)
(c)(16)	(c)(15)	(c)(38)	(c)(36)
(c)(17)	(c)(16)	(c)(39)	(c)(37)
(c)(18)	(c)(17)	(c)(40)	(c)(38)
(c)(19)	(c)(18)	(c)(41)	(c)(39)
(c)(20)	(c)(19)	(c)(42)	(c)(40)
(c)(21)	(c)(20)	(c)(43)	(c)(41)
(c)(22)	(c)(21)	(c)(44)	(c)(42)

[1] Deleted.

In paragraph (c)(1) OSHA defines the term "after-flame" as the time a test specimen continues to flame after the flame source has been removed.

In paragraph (c)(2) OSHA is defining "aqueous-film-forming-foam (AFFF)." OSHA is recognizing the use of this agent for the first time. (See § 1910.157.) Some commenters (Ex. 7: 10; 120) addressed the proposed language and cited examples where misinterpretations could occur. For example, National Foam (Ex. 7: 10 p. 1) suggested that OSHA clarify the final definition.

> With respect to the definition of AFFF, it does *not* form an aqueous film or a film of any significance on water soluble flammable liquids or on all hydrocarbons. Without qualification, subject paragraph is misleading.

OSHA recognizes that AFFF will form only a temporary barrier on the surface of some hydrocarbon fuel surfaces and is revising the final language to reflect this limitation.

Paragraph (c)(3) contains a definition for "approved". Previously in Subpart L, OSHA limited testing laboratory approvals to Underwriters' Laboratories, Inc. (UL) and Factory Mutual Research Corporation (FM). OSHA has expanded the definition of "approved" to recognize alternative means of approval which are consistent with Subpart S (electrical standards) of Part 1910 and acceptable to OSHA.

These alternatives include approval granted by other Federal agencies, and self-certification for certain custom-made equipment. The language of the revised definition is essentially the same as that used in the definition of "approved" found in 29 CFR Part 1910, Subpart S. This definition was selected because it provides as much flexibility as possible consistent with adequate assurance of the use of safe equipment. Several commenters (Ex. 7: 46; 49; 119;

120) supported the change in the definition because it is not as restrictive as the previous definition.

Paragraph (c)(5) defines "automatic fire detection device." OSHA proposed to define the term as any device designed to detect the presence of fire by any of various products and effects of combustion. OSHA further proposed a list of definitions for specific types of detectors.

OSHA has decided to eliminate the term "effects" and to use the more recognized phrase "products of combustion" to describe what these devices detect. "Products of combustion" such as heat, light, smoke and flame trigger the majority of detectors. OSHA has also decided to delete the list of specific types of detectors because those terms are not used in the final standard.

In paragraph (c)(6) OSHA defines "buddy-breathing device" as an accessory for self-contained breathing apparatus which permits a second person to share the same air supply.

In paragraph (c)(7) OSHA defines "carbon dioxide" to describe the physical characteristics of the gas as it is used as a fire extinguishing agent.

Paragraph (c)(8) of the proposal defined "Class A fire" as one involving ordinary combustible materials such as paper, wood, cloth, rubber and many plastics. One commenter, (Ex. 7: 65) noted that some rubber and plastic materials exhibit Class B fire properties. In light of this comment, OSHA has changed the proposed definition to indicate that Class A fires may occur in "some rubber and plastic materials" rather then in "rubber and many plastic materials."

Paragraph (c)(9) as proposed defined "Class B fire" as one that involves flammable or combustible liquids, flammable gases, greases and similar materials.

OSHA has changed the proposed definition of Class B fires to recognize, as noted above, that some rubber and plastic materials may exhibit Class B properties.

In paragraph (c)(10) OSHA defines "Class C fire" as a fire which requires an electrically non-conductive agent. This recognized definition is adopted as proposed.

Paragraph (c)(11) of the proposal defined the term "Class D fire" as one involving certain metals including those listed as examples. M&M Protection Consultants suggested that the term "certain" be deleted because "a combustible metal, if not specifically listed in the regulations, does not come under the regulations, if the word 'certain' is left in the definition." (Ex. 7: 11 p. 5). OSHA has deleted the term "certain" from the proposed language to avoid any possible misunderstanding which might limit the number of metals covered by the definition.

Proposed paragraph (c)(12) defined the term "discharge alarm." OSHA has deleted the proposed definition because it is no longer used in the final revision to Subpart L.

Paragraph (c)(13) of the proposal defined the term "dry chemical" as a compound composed of small particles of various specific chemicals. One commenter, M&M Protection Consultants stated (Ex. 7: 11 p. 5), "By (listing the agents), you exclude any dry chemicals which may be developed in the future." OSHA agrees with the commenter and has amended the final definition (paragraph (c)(12)) by inserting the phrase "such as" before the list of chemicals to make it clear that these are just examples.

Paragraph (c)(14) of the proposal (final paragraph (c)(13)) defines the term "dry powder" as a compound used to extinguish or control a Class D fire, to differentiate it from "dry chemical."

Paragraph (c)(15) of the proposal (final paragraph (c)(14)) defines "education" as the process of imparting knowledge or skill through systematic instruction.

In paragraph (c)(16) of the proposal OSHA defined "enclosed structure" as a structure with a roof or ceiling which may present similar fire hazards as buildings which have four sides. Two commenters, Gulf Oil Corporation and the American Petroleum Institute (Ex. 7: 87; 121), suggested that the definition be changed by inserting the word "combustible" before the word "roof."

OSHA does not believe the addition of the term "combustible" is appropriate in the definition because the definition addresses the hazard of accumulated heat, smoke and toxic gases rather than whether the structure itself is combustible. OSHA believes that accumulations can occur in any type of construction provided the structure is enclosed.

Mobil Oil Corporation stated (Ex. 7: 148 p.2):

> There is little similarity between an enclosed building and a structure with only a roof and *no sides*. The escape fire fighting techniques, salvage, etc. between the two is very different and should not be included under structure fire protection requirements.

OSHA does not intend the definition to apply to structures without any sides. The entire concept of the definition is directed to the hazards involved when employees are inside of enclosed structures where the dangers due to the accumulation of smoke, heat, and toxic gas are increased. OSHA agrees with the Mobil Oil comment that there is a significant difference between an enclosed structure or building and a structure with a roof but no walls. The products of combustion are not likely to be trapped inside a building with no sides. However, where employees are involved in fire fighting operations inside of enclosed structures with at least two walls, the hazards associated with containment of smoke, heat and toxic gases increase.

After considering the comments, OSHA has decided to revise the definition (final paragraph (c)(15)) to "a structure with a roof or ceiling and at least two walls which may present fire hazards, such as accumulations of smoke, toxic gases and heat, similar to those found in buildings.

In paragraph (c)(17) of the proposal, OSHA defined the term "extinguisher classification." The proposed definition defined the term as the letter classification given an extinguisher to designate the class or classes of fires on which an extinguisher is effective. Underwriter's Laboratories, Inc. (Ex. 7: 120) stated that OSHA's proposed definition is different from the one normally recognized in the fire protection and equipment industries. The fire protection and equipment industries recognize the NFPA 10 committee's format of fire extinguisher rating and classification. For example, a common extinguisher in industry would be labeled 4A:10B:C. The letters (classificaton) indicate the types of fires for which the extinguisher is effective. In the example given, the extinguisher is classified for use on Class A, B, and C fires. The numbers (rating for specific classes) indicate the extinguishing potential of the extinguisher for that class based on a standard fire test for each class. The greater the numerical rating, the greater the extinguishing potential of the extinguisher on the particular class of fire. In Subpart L, OSHA is specifically treating extinguisher classification and extinguisher rating as two different concepts. OSHA believes the two terms will aid in better understanding the numerical and letter designations used in classifying extinguishers.

The definitions for both terms (final paragraphs (c)(16) and (c)(17)) are consistent with the NFPA 10 committee's explanation of extinguisher rating, as found in paragraph 1–3.2 of NFPA 10–1978. OSHA has changed the proposed definition of "extinguisher classification" by deleting the last sentence which gives an example of fire extinguisher classifications, because it is

Published by THE BUREAU OF NATIONAL AFFAIRS, INC. WASHINGTON, D C 20037

unnecessary to the definition, and by deleting the word "control" from the proposed definition because rating and classification tests are based on the concept of an average person extinguishing, not controlling, a fire.

Final paragraph (c)(17) defines the term "extinguisher rating" as that numerical designation given to a fire extinguisher to indicate the relative extinguishing potential of an extinguisher based on standardized tests developed by Underwriters' Laboratories, Inc.

Paragraph (c)(19) of the proposal defined the term "fire brigade" as an organized group of employees who are knowledgeable, trained and skilled in fire fighting operations. Several commenters (Ex. 7: 73; 74; 90; 160; 168) suggested that OSHA clarify the definition further because of the many terms used in industry to identify groups organized to perform fire fighting duties. OSHA is utilizing the term "fire brigade" as a general term to define any group which is expected to perform basic fire fighting. While employers may call the group by another name, OSHA will consider any group performing duties related to organized fire fighting as a "fire brigade" rather than try to list the different titles given to such groups. OSHA has changed the definition (final paragraph (c)(18)) by adding the phrase "at least basic fire fighting operations" to clarify that, even employees engaged only in incipient stage fire fighting will still be considered a fire brigade if they are organized in that manner.

In paragraph (c)(20) of the proposal (final paragraph (c)(19)) OSHA defines the term "fixed extinguishing system" as a permanently installed fire extinguishing system that either extinguishes or controls a fire at the location of the system.

Paragraph (c)(21) of the proposal (final paragraph (c)(20)) defines the term "flame resistance" as the property of a material to retard ignition and restrict the spread of flame.

In paragraph (c)(22) of the proposal OSHA defined the term "foam" as a stable aggregation of small bubbles which flow freely to form a rigid, air-excluding blanket which is used to extinguish fires. Several commenters (Ex. 7: 10; 93; 94; 120; 168) addressed the proposed definition. National Foam commented (Ex. 7: 10 p.2):

> Foam does not form a rigid air excluding blanket. In reality, and according to the National Fire Code definition, foam forms a "coherent" blanket. It also prevents the reignition of flammable vapors.

In light of the comments, OSHA is changing the proposed definition (final paragraph (c)(21)) by deleting the phrase "rigid, air-excluding" and substituting the word "coherent" to describe the type of blanket formed by foam. This change in language is consistent with the definition of the term in NFPA Standard No. 11.

In paragraph (c)(23) of the proposal OSHA defines the term "gaseous agent" as an extinguishing agent of low density and vapor pressure which changes volume according to pressure and temperature and which diffuses rapidly and uniformly. The DuPont Company stated (Ex. 7: 93 p.3) "Most gaseous agents (CO_2, Halon 1211, and Halon 1301) do not have low vapor densities. This part of the definition should be deleted." OSHA agrees with this comment and has deleted the term "low density" from the language of the definition (final paragraph (c)(22)). OSHA has also changed the proposed paragraph by inserting the sentence, "Gaseous agent is a fire extinguishing agent which is in the gaseous state at normal room temperature and pressure," because some gaseous agents may be stored as liquids although they are in a gaseous state very shortly after agent discharge.

In paragraphs (c)(24) and (c)(25) of the proposal (final paragraphs (c)(23) and (c)(24)) OSHA defines the terms "Halon 1211" and "Halon 1301" by describing the physical properties of the agents.

In paragraph (c)(26) of the proposal (final paragraph (c)(25)) OSHA defines the term "helmet" as a rigid shell with various accessories intended to be worn for protection of the head from various hazards.

In proposed paragraph (c)(27) OSHA defined the term "incipient stage fire" as a fire that is in its beginning or initial stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus. One commenter, Western Electric, stated (Ex. 7: 96 p.2):

> The present wording is overly specific in its reference to Class II standpipe systems. Other accepted sources of water for fire hose lines include sprinkler system piping or other components of a piping system used for fire protection. The use of these alternate supplies of water will not reduce the integrity of the over-all fire protection system.

OSHA agrees that the proposed language is too specific particularly since, in the final standard, OSHA is recognizing various sizes of small hose as acceptable alternatives to portable fire extinguishers. Therefore, OSHA has deleted the specific reference to Class II standpipe systems. In its place the final standard (final paragraph (c)(26)) refers to standpipe systems and hose stations connected to a sprinkler system (in accordance with § 1910.159) since such systems are capable of providing extinguishing capability equivalent to portable units.

In proposed paragraph (c)(28), (final paragraph (c)(27)), OSHA defines the term "inspection" as a visual check of fire protection systems and equipment to ensure that they are in place, charged, and ready for use in the event of a fire.

In proposed paragraph (c)(29), (final paragraph (c)(28)), OSHA defines the term "interior structural fire fighting" as the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage.

In paragraph (c)(30) of the proposal (final paragraph (c)(29)), OSHA defines the term "lining" as the material permanently attached to the inside of the outer shell of a garment for the purpose of thermal protection.

In paragraph (c)(31) of the proposal (final paragraph (c)(30)), OSHA defines the term "local application system" as a fixed system with a supply of agent designed to discharge the extinguishing agent directly onto the burning material usually in a machine or piece of equipment.

In paragraph (c)(32) of the proposal OSHA defined the term "maintenance" as the performance of services on fire protection equipment and systems including physical disassembly to assure that they will perform as expected in the event of a fire. However, one commenter indicated that physical disassembly is not always a part of maintenance. DuPont stated (Ex. 7: 93 p.3):

> Not all maintenance requires even a partial physical breakdown. For example, weighing of CO_2 or Halon 1211 extinguisher does not involve a breakdown. The final sentence of this definition should be deleted.

OSHA agrees with the comment and has deleted the sentence from the definition (final paragraph (c)(31)).

In paragraph (c)(33) of the proposal (final paragraph (c)(32)) OSHA defines the term "multipurpose dry chemical" as an agent that can be used on Class A, Class B, and Class C fires.

Paragraph (c)(34) of the proposal (final paragraph (c)(33)) defines "outer shell" as the exterior layer of material on a fire coat or protective trousers which forms the outermost barrier between the fire fighter and the environment.

In paragraph (c)(35) of the proposal OSHA defined the term "pipe schedule design." This term is not used in the final standard: OSHA has therefore deleted the proposed definition.

In paragraph (c)(36) of the proposal, OSHA defined the term "positive-pressure breathing apparatus" as self-contained breathing apparatus in which the pressure inside the full facepiece is positive in relation to the immediate environment. OSHA has corrected this definition (final paragraph (c)(34)) by changing the phrase "inside the full facepiece" to "in the breathing zone" because positive-pressure breathing apparatus may have a hood or helmet instead of a full facepiece.

In paragraph (c)(37) of the proposal OSHA defined the term "pre-action or pre-discharge alarm" as an alarm which sounds prior to a fire extinguishing system's discharge so that the employees may evacuate the area. In the final standard (final paragraph (c)(35)) OSHA has changed the term to "pre-discharge employee alarm." OSHA is making the change because there are different types of pre-discharge alarms which serve purposes other than signaling employees to evacuate or seek a safe area. OSHA is only concerned here with those pre-discharge alarms used to alert all employees in the protected area that the fire extinguishing system is about to discharge its agent.

In paragraph (c)(38) of the proposal (final paragraph (c)(36)) OSHA defines the term "quick-disconnect valve" as a device which starts the flow of air by the insertion of the hose into the regulator of a self-contained breathing apparatus and stops the flow of air by disconnection of the hose from the regulator.

In paragraph (c)(39) of the proposal (final paragraph (c)(37)) OSHA defines "sprinkler alarm" as an approved audible device which signals waterflow through a sprinkler system equal to or greater than that of a single sprinkler.

In paragraph (c)(40) of the proposal (final paragraph (c)(38)) OSHA defines the term "sprinkler system" as a system of piping designed in accordance with acceptable fire protection engineering standards and installed to control or extinguish fires.

In paragraph (c)(41) of the proposal OSHA defined Class II and Class III systems. OSHA has decided to add defintions for Class I and small hose standpipe systems (final paragraph (c)(39)). In the proposal, OSHA did not define Class I systems. However, OSHA does use the term "Class I system" in § 1910.158(a)(2), which exempts that particular class of system from the standard. OSHA believes a definition of the term is necessary since it is used in the final standard. OSHA is defining a "Class I system" as a 2½" (6.3 cm) hose system for use only by those trained in handling heavy fire streams.

OSHA is also defining the term "small hose system" in the final standard to recognize the use of small hose of ⅝", up to, but not including 1½" in diameter as an acceptable substitute for portable fire extinguishers under certain conditions. Traditionally, the term "small hose" has been used to refer to "Class II standpipe systems" because "Class II system" hose was smaller in diameter than the 2½" hose found in Class I systems. (Class I systems were referred to as "large hose systems.") OSHA believes that the term "small hose" should be used to define hose which has a diameter of ⅝" up to, but not including 1½". OSHA will continue to recognize 1½" hose systems but rather than refer to them as "small hose," OSHA will refer to them specifically as Class II systems. OSHA believes this change will clarify what size hose systems OSHA is referring to when it uses the term "small hose" or "Class II" standpipe systems.

In paragraph (c)(42) of the proposal (final paragraph (c)(40)) OSHA defines the term "total flooding system" as an extinguishing system which discharges a predetermined concentration of agent into an enclosed or confined space for the purpose of extinguishment or control. A commenter, M&M Protection Consultants (Ex. 7: 11), suggested that the word "concentration" be changed to "amount." They contended that concentrations are difficult to maintain especially when there is agent leakage from the room. OSHA believes that total flooding systems must be designed to provide the concentration of agent necessary to extinguish anticipated fires. System designers should require the appropriate amount of agent necessary for the desired concentration to be provided in the area. For the system to achieve its designed function, a specific concentration must be discharged into the room. If leakage is a problem, then the employer must correct the problem or account for it in determining the design concentration necessary to extinguish or control a fire.

In paragraph (c)(43) OSHA proposed to define the term "training" as the process of making proficient through instruction and practice. Training includes hands-on training of industrial fire brigades or emergency action teams in the duties they are expected to perform.

One commenter, the J. I. Case Co. (Ex. 7: 74) noted that the term "emergency action team" was used in the proposed definition but not defined. OSHA has decided to simplify the definition (final paragraph (c)(41)) by deleting the second sentence and revising the first sentence to indicate that the term "training" as used in this Subpart always includes hands-on practice in the operation of equipment that is expected to be used and in the performance of assigned duties. In brief, the term "training," as used in this subpart, refers to hands-on training.

In paragraph (c)(44) of the proposal (final paragraph (c)(42)) OSHA defines "vapor barrier" as the material used to prevent or inhibit the transfer of liquids and vapors from outside through the garment onto the wearer's body.

Section 1910.156 Fire brigades.

Prior to this revision, Subpart L contained a section reserved for fire brigades, 1910.164. As a result of the revision to Subpart L, requirements for fire brigades are contained in new § 1910.156.

Scope and application: Paragraph (a). The fire brigade standard does not require an employer to establish a fire brigade. However, whenever fire brigades are established, the requirements of this section apply.

Paragraph (a)(1) of the final standard defines the scope of the fire brigade standard, which covers requirements for the organization, training, and personal protective equipment for fire brigades.

Paragraph (a)(2) specifies that the fire brigade standard applies to employers who have employees who are members of fire brigades, industrial fire departments, and to private or contractual type fire departments.

The proposal did not make it clear that requirements for personal protective equipment apply only to fire brigades expected to perform interior structural fire fighting. This resulted in several commenters (Ex. 7: 103; 108; 124; 132; 151; 178) misinterpreting the applicability of the standard. Therefore, changes have been made in the application statement to clarify that requirements for personal protective equipment apply only to fire brigades expected to perform interior structural fire fighting.

This standard does not apply to volunteer fire fighters or fire departments operated by the United States, or any state or political subdivision thereof unless covered by a State Plan under Section 18 of the Act. Additionally, the fire brigade standard does not address the hazards of, nor does it apply to, forest fire fighting or airport "crash-rescue" type operations. The requirements of this standard would not be appropriate because of the specialized nature of these types of fire fighting operations.

Organization: Paragraph (b). Paragraph (b)(1) of the proposal required the employer to prepare and maintain a statement or written policy which established the existence of a fire brigade and which described the functions that the fire brigade is to perform at the workplace. The proposal required that the organizational statement be available for inspection by the Assistant Secretary or by employees or their designated representatives.

The organizational statement is intended to be a tool to aid employees in understanding their responsibilities as fire brigade members as well as helping the compliance officer in determining if the level of training is consistent with the functions the fire brigade is expected to perform.

Three comments OSHA received (Ex. 7: 75; 153; 176) discussed the value of having a written policy or procedure in regard to training. They supported the concept that the type, amount, and frequency of training be specified in the organizational statement. OSHA believes that these comments have merit. Specifying the level of training in the organizational statement, will make it easier to determine if the level of training fire brigade members receive is consistent with those functions they are expected to perform.

Accordingly, the type, amount, and frequency of training that fire brigade members are to receive has been added as an element to be specified in the organizational statement.

The organizational statement is a very important document since it describes the type and expected size of the fire brigade, the organizational structure and the functions to be performed, as well as the level of training to be provided. It is necessary that the organizational statement be available for inspection by the Assistant Secretary, employees, or their designated representatives.

Paragraph (b)(2) of the proposal addressed the concept that fire brigade members who are expected to do interior structural fire fighting must be physically capable of performing the duties assigned to them during emergencies or other operations. The proposal also specified that the employer shall not permit employes with known heart disease, epilepsy, or emphysema to participate in fire brigade emergency activities unless permitted by a certificate from a licensed physician.

This paragraph was one of the most controversial subjects of the proposed standard for fire brigades. OSHA received comments ranging from those who, at least in concept, agreed with the requirement (Ex. 7: 57; 73; 75; 129; 153; 158; 168) to those who strongly disagreed with the requirement as proposed (Ex. 7: 76; 82).

Mr. Gerald Reyenga (Ex. 7: 76) of Local 4-228, Oil Chemical and Atomic Workers International Union (OCAW), expressed concern that the proposed requirement could be used by employers to disqualify employees from a job which they were, in all other respects, physically qualified to do; could result in demotion of employees to lower paying jobs; could result in discrimination against older employees; and could result in an adverse effect on retirement and/or pension plan benefits. Mr. Reyenga requested a hearing on this issue.

In another comment (Ex. 7: 82 p.2), Mr. Steven Wodka, international representative of OCAW, expressed concerns similar to those of Mr. Reyenga. Mr. Wodka stated, in part:

> We are not opposed to OSHA requiring that fire fighters be physically fit. But for the first time OSHA is proposing to make such fitness requirements mandatory without considering the impact of such requirements on workers with various physical ailments who currently hold jobs that also require them to be fire fighters. In many instances these are older workers who would have a very difficult time in finding another job at comparable pay. Moreover, if these workers had to take lower paying jobs, their pension or retirement benefits would also suffer. Therefore, if OSHA is going to make physical fitness requirements mandatory, then OSHA must also promulgate a medical removal protection benefits system.

In a later comment (Ex. 7: 167 p.1), Mr. Wodka said that additional thought and consideration was given to this issue and stated:

> It is now our position that employers in high hazard industries, namely oil refining and petrochemical, must be required to establish full time, professional in-plant fire brigades who would be properly equipped and highly trained. It is our belief that the current industry practice (particularly in oil refining) of assigning fire brigade duties to workers who are regular full time production or maintenance workers can never be made safe to a reasonable degree.

Mr. Wodka reiterated a request for a public hearing limited to these issues and to the issues of medical surveillance, training, clothing, and equipment for industrial fire brigades.

There were other requests for a public hearing on the proposed fire brigade standard. These other requests for a public hearing (Ex. 7: 61; 172) pertained to the proposed requirement that only positive-pressure self-contained breathing apparatus be allowed to be worn by the fire brigade members while performing interior structural fire fighting.

Based on these requests for a public hearing, OSHA decided to schedule a public hearing to resolve these issues. While in the process of identifying the specific issues to be addressed at the public hearing, OSHA received an additional comment (Ex. 7: 194 p. 1) from OCAW which stated in part:

> In earlier correspondence dated March 13, and April 16, 1979, we requested a hearing on several aspects of the fire brigade proposals. We now would withdraw those requests for a hearing if we are provided with a hearing on the heart of our concern: that is, the right of an employee, who is not hired by the employer to be a full time professional fire fighter, to refuse the duties assigned to fire fighting teams or fire brigades. If OSHA were to issue this type of a rule as part of a fire brigade standard, then it would be unnecessary to hold a hearing on our previously mentioned concerns of medical surveillance, training, clothing, and equipment for industrial fire brigades. It is our view, and one which we could support through substantial evidence that could be presented in a hearing, that it is an extreme safety and health hazard to require regular production and maintenance workers to fight fires, particularly in the oil refining and petrochemical industries. Such fire fighting should be performed by full time professional fire brigades.

This latest comment described the most important concern of OCAW, that is, that employees should have the right to refuse to perform fire brigade duties. Even though this issue was not directly addressed in the proposed standard for fire brigades, OSHA believed it was necessary to resolve this issue and to identify its relevance and impact on the fire brigade standard. Therefore, OSHA decided to include the broader issue of an employee's right to refuse fire brigade duties as one of the issues to be addressed at the public hearing on fire brigades, as well as the question of employees being physically capable of performing the duties assigned to them.

During the hearings, Mr. Wodka and eight OCAW members from different facilities, discussed the problems and "real life" situations associated with fire brigades at their respective facilities.

Important among the OCAW concerns were problems associated with the lack of adequate training, lack of fire fighting equipment for use by fire brigade members, and lack of maintenance of the fire fighting equipment. OCAW contended that these problems could be alleviated by a voluntary fire brigade system.

In his testimony (Tr. 504-505), Mr Wodka stated:

> A full time professional fire brigade is most desirable. However, we are well aware of the problems that such are proposal would create. Therefore, we recommend that OSHA

promulgate a regulation that states that all industrial fire brigades be staffed on a voluntary basis. This simple rule would by itself resolve all the current shortcomings that our people will testify about today.

First, a voluntary brigade sets up a performance standard for industry on the issue of training. Sufficient training that addresses the particular risks in each plan will be an incentive for workers to volunteer for the brigade.

Likewise, the fire fighters would be better equipped and such equipment better maintained under such a performance standard. Also, the need for rate retention for those failing the physical exam will be eliminated because of the self-selecting nature of a voluntary brigade.

In further testimony (Tr. 505–506) Mr. Wodka remarked:

* * * we are not advocating that voluntary means that each worker decides as a fire is burning as to whether or not he or she will fight the fire. No one, particularly the OCAW, wants its people placed in that kind of jeopardy.

Instead, a reasonable lead time could be built into the standard to allow industry time to beef up their fire fighting equipment and fire brigade training program. Then, at the time of the effective date, an orderly changeover could take place from the mandatory system to the voluntary brigade.

In support of the right to refuse issue, OCAW members discussed the shortcomings of the mandatory system with respect to the lack of adequate training and equipment as well as discussing the benefits and effectiveness of a voluntary fire brigade system now in use at one corporation's facilities.

The following portions of OCAW testimony describe their experiences with inadequate training and equipment provided to mandatory fire brigades.

Mr. Pittman (OCAW Local 4–23) stated (Tr. 511) that:

* * * employees are assigned to fire fighting because they are convenient, not because they are properly trained as fire fighters. Employees feel they are being forced to perform a duty and we have the right to refuse.

In further testimony, Mr. Pittman said that training is almost non-existent when related to the potential danger confronted by fire brigade members (Tr. 511). As an example, he stated (Tr. 512) that fire brigade members receive little training in the use of respiratory equipment. He also added (Tr. 512): "* * * training usually consists of one or two hours a year. Some employees may go for years without training in this area."

Mr. Le Blanc (OCAW Local 4–23) commented (Tr. 520):

* * * we feel that the training and equipment is inadequate and poses danger to our members. OSHA should release our members from the mandatory requirements of participating in a fire fighting organization. Fire fighting should be left to persons trained and qualified (for) the hazards that fire fighting may entail.

Mr. Breaux (OCAW Local 4–23) remarked that there is no continuity to the people available for brigade training because of brigade member vacations, days off, sickness, etc. (Tr. 525). In further testimony (Tr. 516) Mr. Breaux stated:

The big spiel has been that the people in the plant know how to fight the fire and if people in the area know how to fight the fire and what's there, they would be the most valuable. But when you have a man with six months or less in a refinery in the fire brigade, he doesn't know any more about that particular area probably than anybody who could volunteer from in the plant.

Mr. Fuselier (OCAW Local 4–500) commented (Tr. 529):

I have had the opportunity to observe for several years fire drills with its continuous change of young and totally inexperienced participants. These young men and women are not knowledgeable of overall unit operations, its products, its flash points, or fire potential, much less how to fight it or what equipment to use on certain fires.

In further testimony, Mr. Fuselier described his experience with inadequate fire fighting equipment and inadequate maintenance of fire fighting equipment (Tr. 533–535, 538). As an example, he stated (Tr. 533):

I have fought along with others major fires and numerous potentially explosive fires and have yet to see a bunker coat, fireman's boot, face shields, hats, or any other personal equipment.

Mr. Naquin (OCAW Local 4–447) stated (Tr. 541, 544):

In the area of fire training for instance employee training is either nonexistent or very minimum. Training classes in my plant for instance, have not been held for at least three years and perhaps four (or) more. Lack of training like this is not unusual in all of our plants.

Shift supervisors at my plant are sent to Texas A & M for fire training or Louisiana State University School for Fire Fighting for anywhere from two days upwards to five days. They come back to the plant with all this new knowledge, and it must be a secret because they keep it to themselves. They hold no further classes for their men and it is even conceivable that the supervisors who have received this training could end up all on the same shift. In other words, there is no guarantee that the supervisor on shift at the time of a fire has had any extensive training at all.

Mr. Naquin also asserted in his testimony that plant fire fighting equipment is not kept in good operating condition. He described instances where fire hoses had been rolled up in such a manner that they could not be readily unrolled. In some cases they were not located where they were supposed to be located because of being removed by a cleaning crew or because they were used elsewhere and not replaced.

Mr. Naquin described an instance in one plant where a fire cart had been placed in operation but no one knew how to use it and some employees did not even know of its existence (Tr. 542).

Mr. Rome (OCAW Local 4–522) stated that during his first years at the plant, on a voluntary fire brigade, the training provided was very good. However, after 8 or 10 years, fire brigade training became less important to the company (Tr. 549–550).

Mr. Rome thought that voluntary fire brigades had not worked in the past because the company failed to provide the training needed. As a result, the volunteers resigned from the fire brigade (Tr. 551).

In his testimony (Tr. 550), Mr. Rome suggested that OSHA set up a Federal regulation of fire brigade duties which could be refused due to personal reasons: "No one should be forced to do a job for which they fear their health and safety (sic) no matter where employed."

In comparison to testimony describing instances of inadequate training and equipment in mandatory fire brigades, Mr. Greenwell (OCAW Local 4–16000) described the positive attributes of a voluntary fire brigade program at the Ethyl Corporation. Mr. Greenwell stated (Tr. 555) that the union together with company management developed a voluntary fire brigade program to the effect that:

Those who volunteer for this program will be given thorough training, updated equipment, and incentives which in a small way represent the respect and thanks due these volunteers from all who work at the plant. From those who volunteer, we expect good health, agility, a high degree of interest and a dedication which will make our fire brigade second to none in this area.

The details of the Ethyl Corporation program include the following (Tr. 555–556):

Training is conducted both on and off the plant. On-plant training consists of classroom sessions, plant tours to familiarize members with all areas and their associated hazards, and field exercises.

This is accomplished on an overtime basis with a minimum of 12 hours per year and that minimum I'm sure is a strict minimum because there is much more from what I have observed.

Off-plant training is conducted at Texas A & M University and consists of two days of field exercises. The entire brigade will be scheduled for this training and will receive

MCD 000013873

refresher training at least once every three years.

Fire fighting equipment is continuously surveyed and updated new. Personal protective equipment will be provided for brigade members and will be located throughout the plant for use in emergencies. This is the bunker coats with the boots and everything and everyone has one of their own.

Mr. Greenwell commented that there are incentives that companies can provide to voluntary fire brigades to make this kind of system work if companies want it to work (Tr. 561). He described some of the incentives provided to members of the voluntary fire brigade at the Ethyl Corporation. These incentives included distinctive colored clothing, identifying shoulder patches, ball caps, yearly banquets, and special fire fighter's insurance (Tr. 557).

In summary, proponents of the position of giving employees the right to refuse fire brigade duties contend that the "real world" conditions of mandatory fire brigades result in inadequate training, inadequate fire fighting equipment, and poor maintenance of the fire fighting equipment. These proponents further contend that a voluntary fire brigade would alleviate these conditions, and given proper training, adequate fire fighting equipment, and incentives, voluntary fire brigades can, and do, work.

Several of those opposed to the position of giving employees the right to refuse fire brigade duties questioned OSHA's statutory authority to mandate such a provision (Tr. 152–153, 387–389, 675, 686–687, 804–805, 862), (Ex. 93), (Ex. 96), (Ex. 97). For reasons which are discussed in detail later, the final standard does not incorporate a right to refuse provision; hence, the question of OSHA's authority to promulgate such a provision need not be addressed here.

Those opposed to the position of giving employees the right to refuse fire brigade duties contended that injury and fatality data show no substantial or undue safety hazard involved in performing such duties. (Tr. 148, 589–590, 686), (Ex. 47), (Ex. 84), (Ex. 85), (Ex. 96), (Ex. 8). The Texas Chemical Council, for example, reported that 84 fire brigades responded to 5,000 alarms over the last eight and one-half years. There were eight lost-time injuries and no fatalities (Tr. 638). Upjohn's La Porte plant reported no injuries over the last nine years (Tr. 667). DuPont reported four minor injuries over the past eight years (Tr. 169). Celanese had 5.359 calls over the past ten years and reported four minor injuries (Tr. 282). The Chemical Manufacturers' Association (CMA) surveyed its membership with sixty-nine member companies responding. Those companies reported that during an eight year period, 1971 through 1978, there were no fatalities to fire brigade members, twenty-five lost-time injuries, and eighty-nine other OSHA recordable injuries. The total of 114 injuries represents injury to less than one percent of the number of employees serving on fire brigades at these companies (Ex. 84).

OCAW contended that the petroleum industry is a "high hazard" industry and, because of the possible risks involved in fighting fires in such industries, employees should be permitted to refuse to perform fire brigade duties. Those opposed to the right to refuse alleged that the characterization of the petroleum industry as a high hazard industry is not supported by statistical comparisons of industrial safety data for different industries (Ex. 97). Data compiled by the Bureau of Labor Statistics for 1977 show that employees in the refining and chemical industries have among the lowest injury rates for manufacturing establishments. It was contended that these workplaces are safer than 90 percent of all other manufacturing establishments (Tr. 643, 665), (Ex. 64: attachment II), (Ex. 97).

Those opposed to the position of giving employees the right to refuse fire brigade duties also contended that there should be several options available to the employer with respect to the type of fire brigade chosen for individual workplaces (Ex. 95), (Ex. 97), (Tr. 151, 155). Such options include mandatory fire brigades, voluntary fire brigades, full-time fire brigades, or reliance on municipal or local fire departments to provide fire fighting services. In a post-hearing comment (Ex. 97, p. 1), the American Petroleum Institute (API) stated:

> The inclusion of a right-of-refusal in the final fire brigade standard would effectively delete one very important option—the mandatory industrial fire brigade—and impair the ability of employers to fight fires in their facilities.

It is further contended by those opposed to the position of giving employees the right to refuse fire brigade duties, that if the option of mandatory fire brigades is eliminated, the other options (voluntary fire brigades, full-time fire brigades, or reliance on fire fighting facilities outside the plant) would not be feasible, would reduce employee safety at the workplace, and would be extremely costly.

Witnesses suggested several reasons why an all volunteer fire brigade system would not be feasible. First, there may be problems with recruitment of volunteers. Several witnesses stated that if employees were given the right to refuse fire brigade duties, fire brigade participation would be severely reduced (Tr. 311, 389, 641–642, 647). There was also some doubt on the part of one OCAW witness as to the number of employees who would volunteer to serve on a fire brigade, regardless of the training, equipment, and incentives provided (Tr. 578–579).

Second, with a volunteer fire brigade, a full complement of volunteers might be unavailable during each shift, thus creating a shortage of fire brigade members available for fire fighting activities. This shortage, or imbalance, would be impossible to remedy with other than full-time fire fighters (Tr. 133, 311, 357, 389, 825–826, 827, 861). In order to avoid a shortage of fire brigade members, employers argued that they must be able to retain the discretion to fill the balance of the positions on a mandatory basis (Tr. 647, 666, 671).

Third, a related problem is the employer's inability to control the operating units from which fire brigade members are drawn. Conversion to volunteer fire brigades would eliminate the employer's ability to select fire brigade members according to the importance of their regular duties. In a post-hearing comment (Ex. 97, p. 8) API remarked:

> Companies may not arbitrarily assign specific employees to perform fire brigade service because of the need to ensure that the continued safe operation of other operating units uninvolved in the fire is not jeopardized.

Additionally, Mr. O'Neal of Texaco (Tr. 684) stated:

> Fire brigades are composed of people who can safely leave their routine work assignments in the event of a fire call. Brigade members normally have jobs that do not require constant monitoring, may be monitored by others who are at the work site, or can be readily and safely shut down.

Testimony and post-hearing comments (Tr. 639, 653), (Ex. 47) also suggested that fire brigades are normally composed of operating and maintenance personnel with specialized knowledge of plant layout and operations. This specialized knowledge significantly enhances the fire suppression efforts of the fire brigade. If the right to refuse to perform fire brigade duties were permitted, employers would not have the flexibility to assign employees with this specialized knowledge to the fire brigade.

An alternative to a volunteer fire brigade is a full-time in-plant fire

MCD 000013874

brigade. Those opposed to giving employees the right to refuse fire brigade duties contended that this alternative also has many shortcomings.

First, there would be substantial costs involved in establishing and maintaining full-time fire brigades. The costs expected to result from the establishment of such fire brigades were described in both testimony and in post-hearing comments (Tr. 150, 173, 184, 289, 292, 359, 360, 392, 393, 337, 491–492, 592, 640, 667–668, 689–690, 827–828, 857–858), (Ex. 47), (Ex. 84), (Ex. 85), (Ex. 87), (Ex. 98). Even when considering a reduction in lost production time and training costs that might result from the establishment of full-time fire brigades, one commentor (Ex. 98) estimated that the expected cost impact of full-time fire brigades would be in excess of one billion dollars.

Second, full-time in-plant fire brigades would not be cost-effective. Witnesses contended that for the majority of facilities, only a small percentage of a fire brigade's time is spent responding to emergencies (Tr. 684–685, 827). As an example, Mr. Richardson stated (Tr. 86): "probably only one to five percent of a fire brigade's time is actually spent on emergency operations." Since only a small percentage of time is spent responding to emergencies, it would not be cost-effective to have a full-time in-plant fire brigade when such fire fighting could be safely performed by full-time production or maintenance personnel with part-time duties as fire brigade members.

Third, reliance upon full-time brigades may cause delays in response time to fires as well as a reduction in fire fighters' familiarity with plant processes (Tr. 489, 654, 828), (Ex. 97). It is contended that the fastest response time in the event of a fire is accomplished by operators in each plant who are familiar with hazards of the plant and trained to respond to fires (Ex. 93 pp. 4–5). These employees are the first-line defense against small fires. Having a centrally located full-time fire brigade could increase response time, thus allowing small fires to become larger.

In summarizing the hearing testimony, Standard Oil of Indiana stated in its post-hearing comment (Ex. 96 pp. 11–12):

> A full-time force would not be familiar with plant processes, the safety consciousness of the employees would be lowered, prevention effectiveness would suffer because fire prevention and fighting would no longer be an integral part of the job, and there may very well not be sufficient professional fire fighters available to staff these full-time brigades.

The other alternative to a voluntary fire brigade is reliance on off-plant fire fighting organizations. It is contended that this alternative also would present many problems. First, off-plant fire departments are hampered in their efforts to respond quickly both by distance from the site of the fire, and unfamiliarity with the layout of the plants. These departments usually lack the specialized equipment and training necessary to combat industrial fires such as those at refineries and chemical plants (Tr. 642, 654, 672–673, 820).

Second, some plants are located in areas where there are no off-plant fire departments. Accordingly, employers in these areas would have to organize a volunteer fire brigade or a full-time fire brigade with the resulting problems outlined above.

It is contended that reliance on off-plant fire departments is the least desirable alternative (Ex. 97 p. 12). Factors such as unavailability of off-plant fire departments, increased response time, and unfamiliarity with plant layout and processes, would increase risk to employees rather than enhancing their safety.

In summary, in addition to questions concerning statutory authority, those opposed to the position of giving employees the right to refuse fire brigade duties contended that the fire brigade duties can be performed without substantial or undue hazard to employees. Additionally, employers argued that if the standard provided for a right to refuse, they would have to rely on less satisfactory alternatives such as volunteer fire brigades, in-plant full-time fire brigades, or off-plant fire departments.

Those opposed to giving employees the right to refuse believe that it is imperative that employers have the flexibility to choose the type of fire brigade which will best meet the needs of their individual workplaces.

After careful examination of the record, OSHA believes that the safety of fire brigade members does not depend on their right to refuse to perform fire brigade duties. Accordingly, the final standard for fire brigades does not address the issue of the right to refuse to perform fire brigade duties. It is the position of OSHA that, given proper training and fire fighting equipment, fire brigade duties can be performed by physically capable employees without undue hazard to their safety.

OSHA is mandating specific requirements in the final standard to assure that brigade members are physically capable of performing duties assigned during emergencies, that proper training is given to brigade members and that properly maintained fire fighting equipment is available for their use.

A basic issue in this regard involves employees' physical capability to perform the fire brigade duties which they are assigned.

Several commenters supported the "physically capable" requirement as proposed by OSHA. For example, one commenter (Ex. 7: 129 p. 3) stated:

> To insure the physical capability of fire brigade personnel, it would be advisable to have a certificate from a licensed physician annually, to provide safety for emloyees who are expected to perform such duties.

In another comment (Ex. 7: 158 p. 1) it was stated: "I agree that the fire brigade member should be physically fit to perform his duties."

Another commenter (Ex. 7: 75 p. 3) remarked:

> We agree with the intent and the manner in which OSHA has resolved the physical capability requirement for fire brigade members. The performance requirement that the employer shall ensure that employees who are expected to do interior structural fire fighting are physically capable, will result in appropriate criteria or tests, coupled with medical judgment which considers the type of exertion which may be required on that particular brigade. The additional requirement of a certificate from a licensed physician to permit certain employees to engage in fire brigade emergency activities, is also appropriate.

As discussed previously, those persons opposed to the physical capability requirement were concerned that such a requirement may result in employees being transferred to lower paying jobs and/or having their benefits adversely affected.

This certainly was not OSHA's intent. OSHA only wants to assure that fire brigade members who perform interior structural fire fighting are physically able to perform the duties assigned to them so that they will not endanger themselves or other employees. Employees who cannot meet the physical capability requirement may still be members of the fire brigade if such employees do not actually perform interior structural fire fighting.

These brigade members can be assigned less stressful and physically demanding fire brigade duties, such as certain types of training, recordkeeping, fire prevention inspection and maintenance, and fire pump operations. Performance of these kinds of duties would still enable such employees to be members of the fire brigade but would prevent them from placing themselves in situations which they might not be physically able to handle.

MCD 000013875

Several witnesses supported this concept (Tr. 86, 597, 693, 806, 863). For example, one witness (Tr. 86) remarked:

The wise management will recognize all the tasks which must be performed during an emergency and see to it that there are people capable and trained to perform them. Experienced people within the workplace do not have to be excluded from the fire brigade's activities. Long years of fire brigade experience and knowledge are utilized by wise managers by assigning older personnel to positions of support and staff assistance.

During the actual emergency, older members can be used for some of the following tasks which are also vital parts of the fire brigade's responsibilities: Communications, supervision of fire pumps, supervision of sprinkler valves and security of the emergency scene. Senior and experienced personnel are ideal for these tasks while the more physically fit members are reserved for the actual fire fighting * * *

Another witness (Tr. 863) stated:

* * * there are many fire brigade functions to be performed that can safely be handled by less able individuals. These functions are just as vitally important to a truly effective fire protection capability, as is being the person who does the actual fire fighting.

Therefore, it is the position of OSHA that those employees assigned to the fire brigade, who are expected to perform interior structural fire fighting, must be physically capable of doing so. Additionally, this requirement would not have an adverse effect on fire brigade members who are not physically capable of performing interior structural fire fighting. Such employees can still be members of the fire brigade and perform less stressful and physically demanding duties.

The original requirement proposed by OSHA also stated:

The employer shall not permit employees with known heart disease, epilepsy, or emphysema, to participate in fire brigade emergency activities unless permitted by a certificate from a licensed physician.

There may be other diseases or physical conditions which should preclude employees from engaging in this type of activity. However, OSHA believes that a physician's certificate should be required by the standard for only the most obvious physical disorders. Other physical disorders which would impair the ability of fire brigade members to participate in emergency activities can be handled on a case by case basis with the advice of a physician who is aware of the type of duties that fire brigade members are expected to perform.

The original requirement proposed by OSHA, paragraph (b)(2), also specified that employees expected to perform interior structural fire fighting must be physically capable of performing duties assigned to them during emergencies "and other operations."

One comment OSHA received (Ex. 7: 176 p. 3) stated "We ask that the phrase 'and other operations' be deleted from this section since it is vague, ambiguous, and undefined."

OSHA agrees with this comment. The intent of the paragraph is to assure that fire brigade members are physically capable of performing the duties assigned to them during emergencies, i.e., when performing interior structural fire fighting, and not during other unspecified operations.

For the purposes of the standard, it is necessary to determine when an employee is "physically capable" of performing fire brigade duties. One commenter (Ex. 7: 176) suggested that "physically capable" be defined as being able to perform the tasks subject to the training requirements contained in § 1910.156(c). OSHA believes that this comment has merit. If fire brigade members can perform the duties to meet the training requirements, then such fire brigade members should be able to perform their assigned duties in a real fire situation.

Therefore, fire brigade members will be considered as meeting the "physically capable" requirement as stated in paragraph 1910.156(b)(2) of the final standard if they are able to perform the functions and duties subject to the training requirements specified in paragraph 1910.156(c).

An employee's physical capability to perform duties assigned can also be determined by physical performance tests, or by a physical examination when the examining physician is aware of the duties that fire brigade members are expected to perform. Several witnesses (Tr. 162, 170, 183–184, 318, 338, 646, 667, 668, 863) supported the latter concept. For example, one commenter (Tr. 863) stated:

The minimum physical capability requirements for any industry assignment including participation on the fire brigade, should be established according to functions the individual has agreed to perform and should therefore be determined by a duly licensed physician who is familiar with, knows, and understands the local conditions as well as the functions an employee is expected to perform.

Final paragraph (b)(2) requires the employer to assure that employees who are expected to do interior structural fire fighting are physically capable of performing assigned duties during emergencies. It also requires a physician's certificate of fitness for fire brigade members with known heart disease, emphysema, or epilepsy, before such members are permitted to participate in fire brigade emergency activities.

Final paragraph (b)(2) is effective on December 15, 1980, for all fire brigade members assigned on or after September 15, 1980.

OSHA presumes that current fire brigade members assigned before September 15, 1980, are presently capable of performing their assigned duties on the fire brigade. However, to assure that they maintain their present capabilities in the future, the physical capability requirements of the paragraph will apply to these members as of September 15, 1990. This additional time will allow employers sufficient time to assure the physical capability of the many employees who are currently members of fire brigades.

OSHA believes that in addition to being physically capable, fire brigade members should also remain physically fit. Even though OSHA is not mandating any specific physical fitness program for brigade members who are expected to perform interior structural fire fighting, a physical fitness program designed to maintain the physical capability of such brigade members is certainly encouraged.

The value of a physical fitness program has been identified in at least one recent study of fire fighters (Tr. 24) entitled: "A Case Study in Physical Fitness: The Alexandria Fire Department." This study concluded that a physical fitness program does have an impact on risk factors associated with heart disease and back injuries. OSHA believes that a physical fitness program could be valuable in improving the cardiovascular system and could even help to reduce the number of back injuries, strains, and sprains which are experienced by those who engage in fire fighting operations.

Training and education: Paragraph (c). Paragraph (c)(1) of the proposal required employers to provide training to employees commensurate with those functions that the fire brigade is expected to perform. This performance-type requirement was intended to provide enough flexibility so that employers could develop a training program which would best meet the needs of their particular type of fire brigade.

OSHA received comments which supported the concept that training requirements be broad and flexible in order to meet the needs of the individual type of fire brigade (Ex. 7: 75; 119; 168), (Ex. 95), (Ex. 97). For instance, a post-hearing comment (Ex. 95 pp. 1–2) stated that the performance-type training standard proposed in paragraph (c)(1):

. . . is a must for any industrial standard to be effectively applied to all types of industries or to different facilities within a given industry. Our Texas Industrial Fire Training Board found, after approximately one to one and one-half years work, that predetermined specific training requirements will not serve the best interests of the fire brigades, fire suppression/prevention, or the fire service in general. Due to the different types of possible industrial fires, process equipment, suppression equipment, and techniques involved in the different industries (and even from facility to facility within the same general industry), specific training requirements would be overrestrictive or nonapplicable for some, while being too elementary and not comprehensive enough for others.

However, other comments suggested that OSHA impose specific training requirements which would apply to all fire brigades. Some of these comments suggested that the training requirements be based on guidelines published by universities or national fire organizations (Ex. 7: 82; 153; 162; 176), (Ex. 99).

Most of the comments did agree that the type, amount, and frequency of training should reflect the type of functions and duties that fire brigade members are expected to perform. Obviously, fire brigade members who are expected to perform interior structural fire fighting will require training and education which is more comprehensive and more frequent then those fire brigade members who are expected to control or extinguish fires only in the incipient stage. Similarly, fire brigade leaders and fire brigade training instructors will require training and education which is more comprehensive than the general membership of the fire brigade.

It is appropriate to note the difference between training and education. Training means the process of making proficient through instruction and hands-on practice in the operation of equipment that is expected to be used and in the performance of assigned duties. Education means the process of imparting knowledge or skill through systematic instruction. Education can be accomplished by providing employees with written instructional material. It does not require formal classroom instruction.

An education session is not meant to have the same purpose as training. An education session may include discussion of written material, hazards in the workplace, etc., but does not require hands-on practice in the use of equipment.

OSHA wants to assure that fire brigade members are properly trained and educated in those duties they are expected to perform. However, OSHA does not want to establish the type of training program or the specific elements of the training program for all employees.

This is because the type, amount, and frequency of training will be as varied as are the purposes for which brigades are organized. Consequently, it would be extremely difficult for OSHA to mandate meaningful detailed training requirements that could be applied to fire brigades with such varied functions. OSHA believes that the employer must evaluate the particular circumstances in the workplace and functions of the fire brigade, and then design and implement an appropriate training program.

The training and education program, to be effective, must be of high quality. Accordingly, the standard uses the training programs provided by several recognized institutions as models, and requires that the employer's program be of a quality similar to those programs. Of course, the employer may send employees to these schools for appropriate training. As an alternative, training programs developed by other institutions or the employer may be used if they are of similar quality.

The organizational statement required by paragraph (b)(1) of the final standard must identify the functions that the fire brigade is expected to perform. Using this information, and in consultation with the employees where possible, the employer is required by paragraph (c)(1) to design a training program which will be consistent with the performance of these functions. There are many excellent sources of information available which may be helpful in developing a training program that meets the needs of a particular workplace fire brigade. These sources include publications, seminars, and courses offered by universities and fire training organizations, as well as information contained in the appendix to the fire brigade standard.

There are also excellent training courses offered by such facilities as Texas A and M University, Delaware State Fire School, Lamar University, and Reno Fire School, that deal with those unique hazards which may be encountered by fire brigades in the oil and chemical industry. These schools and others also offer excellent training courses which would be beneficial to fire brigades in other types of industries. These courses should be a continuing part of the training program and employers are strongly encouraged to take advantage of these excellent resources.

As discussed previously, it would be difficult for OSHA to mandate specific training requirements for all types of fire brigades. However, in order to develop a training program which will be commensurate with the functions that *the fire brigade is expected to perform* (i.e., those functions specified in the organizational statement), the following basic elements of a training program should be considered.

All fire brigade members should be familiar with exit facilities, location and emergency escape routes for handicapped workers, and the workplace "emergency action plan."

In addition, brigade members who are expected to control and extinguish fires in the incipient stage shall, at a minimum, be trained in the use of the fire extinguishers, standpipes, and other fire equipment they are assigned to use. They should also be aware of first-aid medical procedures and procedures for dealing with special hazards to which they may be exposed. Training and education will usually include both classroom instruction and actual operation of the equipment under simulated emergency conditions. Training must be conducted at least annually, as specified in § 1910.156(c)(2), but some functions should be reviewed more often. As noted earlier, the term "training", as used in Subpart L, refers to hands-on training.

In addition to the above training, fire brigade members who are expected to perform emergency rescue and interior structural fire fighting must, at a minimum, be familiar with the proper techniques in rescue and fire suppression procedures. Training and education should include fire protection courses, classroom training, simulated fire situations including "wet drills" and, when feasible, extinguishment of actual mock fires. As specified in § 1910.156(c)(2) of the final standard, the frequency of education must be at least quarterly, with training being conducted at least annually. However, some drills or classroom instruction should be conducted as often as monthly or even weekly to maintain the proficiency of fire brigade members.

The above recommendations should not be considered to include all of the necessary elements for a complete comprehensive training program. Other elements of the training program must reflect those duties the fire brigade is expected to perform as determined by the specific workplace.

As discussed previously, testimony presented at the hearings indicated that not only was existing training inadequate, but it was also affected by such factors as days-off and vacations. Because of these factors, fire brigade members often did not receive training before actually performing fire brigade emergency activities. Testimony and comments support the concept that fire brigade members must receive training *before* performing emergency activities. For instance, one commenter (Ex. 7: 26) remarked: "Mention should be made that members obtain hands-on training prior to full brigade membership." OSHA agrees with this concept. No matter how good a training program is, it is useless unless fire brigade members receive the training before they have to actually perform fire brigade emergency activities.

OSHA also received comments which suggested that fire brigade leaders and training instructors receive training which is more comprehensive than the general membership of the fire brigade (Ex. 7: 158; 162; 171; 184). For example, one commenter (Ex. 7: 171 p. 1) said:

> You spell out that training will take place, but no where (sic) do you state who (or what qualifications) will do the training. It is my recommendation that a paragraph be added that states that the trainer shall meet the minimum Level I of NFPA 1041—Professional Qualifications—Fire Service Instructor. This would provide a minimum verification that the instructor has minimum teaching skills.

Another commenter (Ex. 7: 184 p. 2) added:

> While we agree that employers shall train as outlined in this section, we feel that the individual doing the training should meet the qualifications of NFPA-1041 Level I, which is instructor training. This is to ensure that the brigade members are being trained by qualified personnel.

OSHA agrees that training instructors must receive a higher level of training and education than the fire brigade members they will be teaching. This includes being more knowledgeable about the functions to be performed by the fire brigade and the hazards involved. The instructors should be qualified to train fire brigade members and demonstrate skills in communication, methods of teaching, and motivation.

The level of training for fire brigade training instructors will vary according to the type of fire brigade in the workplace and the nature of workplace hazards. Therefore, OSHA is not mandating specific qualifications for fire brigade training instructors. However, publications from the International Fire Service Training Association, the National Fire Protection Association (NFPA-1041), the International Society of Fire Service Instructors, and other fire training organizations are excellent sources which can be consulted for recommendations.

OSHA also believes that it is imperative that fire brigades have competent leadership and supervision. It is important for those who supervise the fire brigade during emergency situations, such as fire brigade chiefs and leaders, to receive the necessary training and education for supervising fire brigade activities during these hazardous and stressful situations.

For the same reasons as noted above, OSHA is also not mandating specific qualifications or training requirements for fire brigade members with leadership responsibilities. However, these fire brigade leaders should demonstrate skills in strategy and tactics, fire suppression and prevention techniques, leadership principles, pre-fire planning, and safety practices. It is again suggested that fire service training sources be consulted for determining the kinds and level of training which are necessary for those with fire brigade leadership responsibilities.

In summary, it is the position of OSHA that training and education must be commensurate with those duties and functions that fire brigade members are expected to perform, and such training and education must be provided *before* brigade members actually perform fire brigade emergency activities. Additionally, fire brigade leaders and training instructors must be provided training and education which is more comprehensive than that provided to the general membership of the fire brigade.

Accordingly, paragraph (c)(1) of the final standard requires training and education to be provided before fire brigade members perform fire brigade emergency activities. This paragraph also requires that fire brigade leaders and training instructors be provided with training and education which is more comprehensive than that of the general membership of the fire brigade.

Paragraph (c)(2) of the proposal required that training be conducted frequently enough to assure that assigned duties and functions are performed satisfactorily and in a safe manner so as not to endanger fire brigade members or other employees. It also specified that training be conducted at least annually.

The intent of this performance type requirement was to recognize that different types of fire brigades will require different frequencies of training. For example, annual hands-on training may be adequate for those fire brigades who use extinguishers or small hose systems to extinguish fires in the incipient stage. However, for those fire brigades expected to perform interior structural fire fighting, hands-on training may need to be conducted more frequently than annually.

OSHA specified annual training to describe the absolute minimum frequency of training for the simplest fire brigade duties. In accordance with paragraph (c)(1), however, the type, amount, and frequency of training and education must also be commensurate with those duties and functions that fire brigade members are expected to perform. It was OSHA's intention that such training and education might well have to be given at intervals much shorter than one year. However, this was not clear to some commenters. For instance, OSHA received comments which stated that annual training may be adequate for some fire brigades, but not nearly frequent enough for other fire brigades. Many commenters were concerned that if the minimum frequency of training was specified as annually, then only annual training would be provided to fire brigade members, regardless of the type of fire brigade or the type of functions the fire brigade was expected to perform. From this perspective, these commenters believed that just specifying annual training as a minimum was not adequate (Ex. 7: 26; 123; 158; 161; 176; 184).

Some commenters (Ex. 7: 75; 153; 176) believed that some type of training or education should be conducted at least quarterly for those fire brigade members who are expected to perform interior structural fire fighting. The quarterly training or education may consist of hands-on training, pre-fire planning exercises, classes in the use of self-contained breathing apparatus, discussion of special hazards in the workplace, etc. OSHA agrees with these commenters. Based on the record (Ex. 7: 26; 75; 123; 153; 158; 161; 176; 184), it is OSHA's conclusion that hands-on training must be conducted at least annually for all fire brigade members and that some type of training or education session must be provided at least quarterly to those fire brigade members who are expected to perform interior structural fire fighting. Therefore, § 1910.156 (c)(2) of the final standard has been modified accordingly.

Paragraph (c)(3) of the proposal required hands-on training for fire brigade members. The definition for "training" in the final standard and final paragraph (c)(2) of § 1910.156 have been revised to clearly indicate that any requirement for training means hands-on training. Therefore, proposed paragraph (c)(3) is no longer necessary to specify hands-on training and has been deleted from the final standard.

A new paragraph (c)(3) has been added that cites training and education programs provided by several

MCD 000013878

recognized institutions as models, and requires that the employer's program be of a quality similar to those programs. These institutions' training and education programs are cited only as examples. As an alternative, training and education programs developed by other institutions or the employer may be used if they are of similar quality.

Paragraph (c)(4) of the proposal required that employers inform fire brigade members about special hazards in the workplace. Such locations as storage and use areas of flammable liquids and gases, toxic chemicals, radioactive substances, and water-reactive substances, can pose difficult problems if fire brigade members do not know of the existence of these special hazards or do not receive pre-fire instruction as to what actions to take. It is imperative that fire brigade members be trained in handling these special hazards as well as keeping abreast of any changes that occur in relation to these special hazards.

All of the comments OSHA received supported this requirement. Additionally, two commenters (Ex. 7: 153; 168) suggested that OSHA require the development and dissemination of written procedures to describe actions to be taken in situations involving these special hazards. OSHA agrees with these comments. Written procedures will make it clearer exactly what actions fire brigades members are to take with respect to these hazards during emergencies. Written procedures will also be valuable for training and pre-fire planning exercises.

Therefore, this paragraph (final paragraph (c)(4)) remains the same as that proposed with the exception that written procedures are required to be developed to describe the actions which are to be taken during emergencies involving special hazards. These written procedures are to be made available to fire brigade members and must be included in the training and education program.

Fire fighting equipment: Paragraph (d). This paragraph of the proposal required fire fighting equipment to be maintained and periodically inspected to assure the safe operational condition of the equipment. Fire fighting equipment may include protective clothing, ladders, tools, and nozzles used by fire brigade members for fire fighting purposes.

OSHA received comments (Ex. 7: 128; 176) which suggested that a time interval be specified for the inspection of fire fighting equipment. One commenter (Ex. 7: 176) stated that the term "periodically" is too vague to assure that fire fighting equipment will be adequately maintained. OSHA agrees with this comment and believes that fire fighting equipment must be inspected at least annually. Annual inspections are consistent with section 1910.158 which requires annual inspection for standpipe systems. OSHA believes that, with the exception of portable fire extinguishers and respirators which are required to be inspected monthly, annual inspection of fire fighting equipment is necessary to assure that the equipment will be adequately maintained.

Accordingly, paragraph (d) of the final standard has been changed to require fire fighting equipment to be inspected at least annually.

As discussed before, testimony given at the hearings described instances where fire fighting equipment was inadequate and/or poorly maintained. OSHA believes that these conditions must be corrected whenever they are discovered during the inspection and maintenance procedures required by this paragraph.

Another commenter (Ex. 7: 153) suggested that OSHA require fire fighting equipment which is found to be defective be removed from service.

OSHA agrees with this comment. If fire fighting equipment is found to be damaged or unserviceable, it must be removed from service and replaced to prevent fire brigade members from using unsafe equipment by mistake.

Accordingly, the following sentence has been added to paragraph (d):

> Fire fighting equipment that is in damaged or unserviceable condition shall be removed from service and replaced.

Protective clothing: Paragraph (e). This paragraph contains requirements for protective clothing to be worn by fire brigade members when performing interior structural fire fighting. Several commenters (Ex. 7: 30; 33; 64; 181) misunderstood this paragraph. They believed that the protective clothing requirements applied to all fire brigade members. That is not the intent of this paragraph. The protective clothing requirements apply only to fire brigade members performing interior structural fire fighting; the requirements do not apply to those fire brigade members who only fight fires in the incipient stage.

Therefore, paragraphs (e)(1)(i) and (e)(1)(ii) of the proposal have been consolidated as paragraph (e)(1)(i) of the final standard and minor editorial changes have been made to clarify that the requirements for protective clothing apply only to those fire brigade members who perform interior structural fire fighting. Additionally, the proposed effective date of July 1, 1980, has been changed to July 1, 1981. The additional time will permit a smoother transition to the use of the new equipment by allowing additional time for purchasing of the equipment.

Paragraph (e)(1)(iii) of the proposal required protective clothing which protects the head, body and extremities, ". . . and consists of at least the following components: foot and leg protection; hand protection; body protection; eye, face and head protection."

While some comments (Ex. 7: 119; 168) stated that this listing of specific components is redundant, OSHA has retained the phrase in paragraph (e)(1)(ii) in the final standard to make the reference to the following provisions of paragraph (e) clearer.

Paragraph (e)(2) of the proposal contained requirements for foot and leg protection. OSHA received several comments (Ex. 7: 139; 195), (Ex. 23: 231) which pertained to the 300 pounds static force penetration resistance of foot protection.

One commenter (Ex. 23: 231) supported the proposed 300 pounds penetration resistance. Another commenter (Ex. 7: 195 p. 1) stated:

> Since a fire fighter dressed in turn out gear is likely to weigh well in excess of 200 pounds, a minimum penetration resistance of 400 pounds should be required instead of 300 pounds as now specified in this paragraph. Recent testing done under contract for NIOSH demonstrated that most of the footwear specimens evaluated could easily surpass the 400 pound minimum.

The reason that OSHA specified 300 pounds penetration resistance in the proposal was to take into account the weight of a fire brigade member (approximately 200 pounds) combined with the weight of the equipment worn and carried (approximately 100 pounds). Specifying this 300 pounds penetration resistance was intended to provide protection for the feet when stepping on nails or other sharp objects. OSHA believes that 300 pounds penetration resistance is adequate as a *minimum* for providing this protection in the absence of injury data which would support a higher value.

Accordingly, the requirements contained in paragraph (e)(2) of the final standard have not been changed from those proposed. The metric equivalent for 300 pounds of static force (1300 N) has been included for informational purposes.

Paragraph (e)(3) contains requirements for body protection. OSHA proposed in this paragraph that fire-resistive coats and trousers be at least equivalent to the requirements contained in the NFPA 1971 standard (1975), "Protective Clothing for

Structural Fire Fighting", with certain permissible variations in those requirements.

All of the comments OSHA received with respect to this paragraph agreed that fire-resistive coats should be at least equivalent to those meeting the NFPA 1971 standard. However several commenters disagreed with the proposed permissible variations from the NFPA 1971 standard.

The first proposed permissible variation from the NFPA 1971 standard was:

> Liner may be detachable but the shell is not permitted to be worn without the liner while performing interior structural fire fighting.

Several commenters (Ex. 7: 45; 93; 161; 175) disagreed with this variation because they believed that if the liner is detachable, there is a possibility that the outer shell would be worn without the liner. For example, one commenter (Ex. 7: 93 pp. 8–9) asserted:

> The probability that an employee will take the time to look for and install a liner which is detached from its shell is minimal. Allowing this variation, therefore, increases the probability of employee injury.

Another commenter (Ex. 7: 161 p. 9) remarked: "If it (liner) is designed to be detachable, the outer shell will be worn without it. This could result in needless injury."

OSHA proposed this variation in order to facilitate cleaning of the fire-resistive coat. However, OSHA agrees with these commenters that allowing the liner to be detachable could result in fire brigade members wearing the outer shell of the fire-resistive coat without the liner. The liner provides a very important function of helping to protect the body from radiant heat, and it is imperative that the liner be attached to the fire-resistive coat when fire brigade members perform interior structural fire fighting.

Therefore, the proposed provision which would have allowed liners to be detachable, has been deleted from this paragraph of the final standard. However, it is permissible to permanently attach the lining to the outer shell material by stitching in one area such as at the neck. Fastener tape or snap fasteners may be used to secure the rest of the lining to the outer shell to facilitate cleaning. Additionally, "permanent lining" does not refer to a winter liner which is a detachable extra lining used to give added protection to the wearer against the effects of cold weather and wind.

The second permissible variation proposed by OSHA would have allowed ventilation openings in the fire-resistive coat in order to achieve increased ventilation of trapped body heat.

Several commenters disagreed with this variation, because they believed that ventilation openings would not significantly enhance the wearer's comfort and might adversely affect the protective capability of the garment. For example, one commenter stated (Ex. 7: 93 p. 9):

> As the protective capability of a garment is significantly reduced in ventilation areas, the size and location of such openings should be limited. Innovations for improved ventilation can be achieved within the NFPA 1971 standard guidelines without compromising the protective capability of turnout apparel.

Another commenter (Ex. 7: 161 p. 9) remarked:

> This exception should be deleted as U.S. Army Natick Lab's studies done on protective clothing have shown that openings that pierce the outer shell and vapor barrier do not aid in ventilation for the wearer's comfort unless such openings are of 50 or 60 percent of the total coat area. Also, openings into the coat can cause an additional safety hazard as they can let in super-heated air and gases.

OSHA did not recieve any information which supported the position that the use of ventilation openings would enhance a wearer's comfort. In view of these factors, OSHA has decided to delete this variation from the final standard.

The third permissible variation proposed by OSHA concerned tearing-strength of the outer shell material of fire-resistive coats. Based on the California Occupational Safety and Health (Cal-OSHA) Standards in effect at the time, OSHA proposed that the tearing-strength be a minimum of eight pounds in any direction. This varies from the NFPA 1971 standard which specifies a minimum of 22 pounds.

The NFPA 1971 standard referenced by OSHA in the proposal specified that tearing-strength be determined by ASTM Method D 2263, which is known as the Trapezoid method. One of the comments OSHA received (Ex. 7: 86) suggested that the Elmendorf method be specified for determining tearing-strength rather than the Trapezoid method. This commenter asserted that the method commonly used in the textile testing facilities is the Elmendorf method rather than the Trapezoid method. The commenter stated in part (Ex. 7: 86 p. 2):

> Specifically, our objection to this section is the designation of a test method not commonly used in textile testing to determine strength. It is necessary to point out that if the method is changed, for example, as we proposed to the Elmendorf method, consideration for redefinition of the value must be made.

OSHA also received contradictory comments with respect to the proposed tearing-strength value of eight pounds. Several commenters (Ex. 7: 45; 93; 153; 161) objected to decreasing the minimum tearing strength value from 22 pounds to eight pounds in any direction (including warp and filling direction). These comments suggested that there is no evidence to indicate that an eight pound tearing-strength would be adequate for fire fighter safety.

Data from a 1972 National Bureau of Standards (NBS) study of a fire fighter turnout coats (NBS Report 10 489) was used as a basis for many of the comments. Data from this NBS report showed that many fabrics can exceed a 30 pound tearing-strength in the warp direction and 10 pounds in the filling direction. Thus, this data has been used as the basis for arguments in favor of higher tearing-strength requirements than that proposed (Ex. 7: 93). However, tears are generally propagated along the weakest direction of a fabric. Therefore, actual fabric performance may be better gauged by the measurements in the filling direction, which is the weakest direction. Using this approach, the 10 pound limit found in the NBS report is much closer to the eight pounds proposed by OSHA than to the NFPA 22 pound limit.

One commenter (Ex. 23: 232) used data from the same NBS report to support the proposed eight pound minimum tearing-strength. This commenter stated that nothing in the NBS report was said about the coats examined being deficient in safety or performance characteristics. This commenter suggested that the data contained in the NBS report provided a valid base for determining minimum acceptable values. This commenter further stated (in attachment p. 2):

> Analysis of the data for new coats would allow setting a minimum strength of 17 lbs. in the warp and 7 lbs. in the filling direction.

In view of the contradictory comments and information received, OSHA included in the June 1, 1979, Hearing Notice (Ex. 21) a request for written comments concerning this issue. OSHA believed that further written comments might assist the the agency in clarifying and resolving this issue.

Additionally, OSHA contracted with Dr. Robert H. Barker, an expert in textile testing, to assist the agency in resolving issues related to fire-resistive coats.

This contract specified that physical test data be developed to characterize the various fabrics and other materials currently in use and accepted by the fire service as adequate for utilization in outer shells of fire-resistive coats which are to be worn by fire brigade members when performing interior structural fire fighting. Physical properties examined were tearing-strength, flame resistance, and heat resistance. The contract also specified that a comparison be made between the Elmendorf and Trapezoid test methods. Dr. Barker's report is contained in exhibit 78.

A total of 22 samples (12 fabric samples and 10 coat samples) were obtained and evaluated in the laboratory. These samples consisted of as many different materials as possible (both natural fiber and synthetic fiber) which are currently used in turnout coats and which the fire service finds to be acceptable. In addition, samples of used turnout coats were tested so that levels of protection could be evaluated in coats which have been in service for some time but which are still considered acceptable.

Measurements of tearing-strength were made in the weakest direction only. It is interesting to note that of the 12 fabric samples tested, only two met the 22 pound tearing-strength criteria specified in NFPA 1971. Dr Barker stated in his report (Ex. 78: p. 8):

> Consideration of the data in Table 1 leads further to the conclusion that not only are test results rather unpredictable, but there is also a rather wide-spread failure of both the new and used turnout coat fabrics when judged by the 22-pound requirement in the trapezoid test as specified by NFPA 1971. This coupled with the fact that each of the fabric types has a constituency among active fire fighters who consider that these fabrics are not only acceptable but actually preferable for use in turnout coats, leads to the conclusion that the 22 pound requirement is excessively high. If an eight pound requirement based on the Trapezoid test were invoked as proposed by OSHA, it would appear that less than 5 percent of the current fabric mix would be removed from use in turnout coats for industrial fire brigades. It would also appear that the minimum acceptable value could be raised slightly above eight pounds without seriously restricting the number of fabrics available for use in turnout coats, but there is no evidence that such an increase would produce any significant benefit in terms of increased safety levels.

Dr. Barker's report concluded that the 22 pound requirement (Trapezoid method) incorporated in NFPA 1971 is excessive, and the value of eight pounds (Trapezoid method) proposed by OSHA appears to be more reasonable.

Additionally, when comparing the Elmendorf test method with the Trapezoid test method, Dr. Barker found little or no correlation between the values obtained from the two test methods (Ex. 78 p. 7). It has also been asserted (Ex. 23: 238 pp. 2–3) that test reproducibility is best afforded by the Trapezoid method. Therefore, OSHA does not belive it would be meaningful to specify the Elmendorf method instead of, or in addition to, the Trapezoid method for determining tearing-strength.

After consideration of all of the comments, test data, and information received, OSHA has concluded that the minimum tearing-strength, as determined by the Trapezoid method, should be a minimum of eight pounds in any direction since this is the value which will provide the minimum level of protection needed by the wearer.

The results of Dr. Barker's report were helpful to OSHA in reviewing and evaluating the record, and reinforced the choice of the eight pound value proposed by OSHA. The final determination of eight pounds tearing-strength is supported both by Dr. Barker's report and by the additional information submitted to the record, as well as by the data available to OSHA at the time of the proposal.

It was brought to the attention of OSHA (Ex. 7: 86), (Ex. 23: 232), (Ex. 78) that the Trapezoid method, ASTM Method D2263, is no longer contained in the "Annual Book of ASTM Standards." However, the Trapezoid method is contained in Federal Test Method Standard 191, Method 5136, "Strength of Cloth, Tearing; Trapezoid Method." Instead of incorporating Federal Test Method Standard 191, Method 5136 by reference, OSHA has decided to add a new appendix (Appendix E) to contain test methods required in paragraph (e) of this section.

Accordingly, this paragraph of the final standard will permit a variation from the NFPA 1971 standard with respect to tearing-strength. This variation states:

> (A) Tearing-strength of the outer shell shall be a minimum of eight pounds in any direction when tested in accordance with paragraph (2) of Appendix E.

The fourth proposed variation from the NFPA 1971 standard concerned criteria for flame resistance. The criteria proposed by OSHA was based on the Cal/OSHA standards in effect at the time. Specifically, OSHA proposed that criteria for flame resistance be:

> Maximum after-flame—2.0 seconds.
> Maximum after-glow—4.0 seconds.
> Average char length—6.0 inches.

Criteria for flame resistance specified in the NFPA 1971 (1975) standard is:

> Char length (max.)—4.0 inches.
> After-flame (max.)—2.0 seconds.

One commenter (Ex. 7: 177), in support of the 6-inch average char length, stated that the difference between the 4-inch maximum char length and the 6-inch average char length means little in terms of the thermal protective characteristics of the fabric. This commenter also stated that a 4-inch maximum char length can be easily attained, but would require substantially more chemical treatment and production control to achieve, and such measures would not really provide any significant added protection.

There were other commenters (Ex. 7: 45; 93; 161) who objected to this variation. For example, one commenter (Ex. 7: 93 p.11) remarked:

> We see no basis for these changes from the current NFPA specifications and, furthermore, do not understand why the NFPA values were adopted in the proposed flame resistance requirements for gloves but not for outer shells. The NFPA specification for a 4-inch average char length was based on NBS recommendations. This value should be adopted for both outer shells and gloves.

The flame resistance tests performed by Dr. Barker (Ex. 78) found that all of the turnout coat fabrics, except the untreated cottons, offered good flame resistance with short char lengths. All of the fabrics were within the 4-inch maximum char length specified in NFPA 1971. Dr. Barker stated that the difference in level of protection between fabrics having char lengths of 2, 4, and 6-inches is negligible. The significant property is whether or not the fabric is self-extinguishing when tested under these conditions. The only significant safety benefit from a particularly short char length is the added confidence that removal of chemical flame retardants by wear, laundering, etc., will be less likely to convert the fabric into one which is no longer self-extinguishing.

Dr. Barker's report (Ex. 78 p.17) concluded that:

> A maximum allowable value of four inches for the char length measured by Method 5903 of Federal Test Standard 191 would appear to be reasonable on the basis of the currently used fabrics. No correlation between char length and safety exists except perhaps for treated fabrics where short char lengths indicate the presence of excess flame retarding chemicals which could offset losses which might occur during wear or laundry. However, it would appear that the four inch char length retains a significant safety margin over fabrics which are not self-extinguishing, and it is recommended that the four inch requirement from NFPA 1971 be retained in the proposed OSHA standard. The use of a six inch maximum would also be acceptable if coupled with a specification of flame retardant durability.

In light of the information contained in the record, OSHA finds it appropriate to adopt a 4-inch maximum char length.

The flame resistance criteria proposed by OSHA also specified a maximum after-glow time of four seconds. This criteria was based on the Cal/OSHA standards in effect at the time. With respect to the proposed criteria for after-glow, one commenter (Ex. 7: 93 p.11) asserted:

> Neither the NBS recommendations nor the NFPA standard have requirements for after-glow time. After-glow test results are often misleading and have little meaning in predicting hazards.

OSHA agrees with this comment to the extent that char length and after-flame criteria are more meaningful than after-glow criteria for determining the level of flame resistance afforded by a garment. Since none of the comments received supported the proposed criteria for after-glow, OSHA has decided to delete the after-glow criteria from the final standard.

Accordingly, the proposed variations from the NFPA 1971 standard concerning criteria for flame resistance have been deleted from this paragraph of the final standard. Criteria for flame resistance will be the same as specified in NFPA 1971 as follows:

> Char length, 4.0 inches (max.).
> After-flame time, 2.0 seconds (max.).

The last proposed variation from the NFPA 1971 standard concerned heat resistance. The NFPA 1971 standard does not permit charring of the outer shell material when the material is tested by placing it in a forced air laboratory oven at a temperature of 500°F for a period of five minutes.

However, some materials may start to discolor when subjected to this test. This discoloration may or may not be actual charring. The intent of the proposed variation from the NFPA 1971 standard was to permit discoloration or charring as long as the outer shell material retained its protective characteristics.

Therefore, OSHA proposed that the outer shell and lining may char or discolor, but must retain their heat resistive qualities. OSHA only intended the variation to apply to the outer shell and not to the lining because it is the outer shell which will be exposed to flame contact. The word "lining" was inadvertently contained in the proposed paragraph. Accordingly, OSHA has deleted the word "lining" from this paragraph of the final standard to correct this mistake.

Several commenters objected to this variation concerning heat resistance criteria for the outer shell (Ex. 7: 45; 86; 93; 161; 182). They especially disliked the phrase, "must retain heat resistance." These commenters stated that the term "heat resistance" was undefined and left unclear what constituted heat resistance.

OSHA agrees that the term "heat resistance" is vague unless definitive criteria are specified to explain its meaning.

OSHA received comments (Ex. 7: 93; 182) which suggested test criteria for determining heat resistance. In addition, OSHA's contract with Dr. Barker specified that a study be conducted of the "heat resistant" properties of the outer shell material of fire-resistive coats after several cycles of testing. Dr. Barker concluded (Ex. 78 p. 18):

> * * * inclusion of heat resistance criteria would be premature at this time. Instead, it is recommended that efforts be made to institute a systematic approach to the development of heat resistance test methodology which could then be used as the basis for rational heat resistance criteria.

In view of the lack of supportive information and test data, OSHA agrees that the inclusion of heat resistance criteria would be unwise at this time. Since there is no acceptable test methodology for determining heat resistance criteria, the final standard requires that the outer shell material of fire-resistive coats retain its protective characteristics, including its flame resistance properties, when subjected to the "oven test" as specified in NFPA 1971.

Accordingly, the proposed language has been revised in this paragraph of the final standard to read as follows:

> (B) The outer shell may discolor but shall not separate or melt when placed in a forced air laboratory oven at a temperature of 500°F (260°C) for a period of five minutes. After cooling to ambient temperature and using the test method specified in paragraph (3) of Appendix E, char length shall not exceed 4.0 inches (10.2 cm) and after-flame shall not exceed 2.0 seconds.

Paragraph (e)(4) contains requirements for hand protection. Paragraph (e)(4)(i) of the proposal specified that protective gloves or glove systems must allow dexterity of hand movement and sense of feel for objects.

Several commenters (Ex. 7: 22; 89; 157) stated that the criteria were subjective and qualitative, and the amount of protection was not defined.

OSHA wanted to assure that the protective gloves or glove systems provide the necessary flexibility to grasp objects. However, OSHA agrees that the proposed criteria were not sufficient to be evaluated in a consistent manner. Although dexterity is desirable, the most important attributes of gloves are protection against heat penetration, cut, and puncture.

Accordingly, the appendix to this section recommends that protective gloves or glove systems provide dexterity. However, the proposed mandatory requirement for dexterity has been deleted from this paragraph of the final standard.

Paragraph (e)(4)(ii) of the proposal required exterior material of protective gloves to provide resistance against abrasion, puncture, and absorption of liquids, but did not specify test methods to determine these attributes. Paragraph (e)(4)(iv) of the proposal specified criteria for thermal insulation of protective gloves, to be determined by using the test method contained in the NIOSH publication, "The Development of Criteria for Fire Fighters' Gloves; Vol. II: Glove Criteria and Test Methods." This NIOSH publication also contains test methods for cut and puncture criteria. Several commenters (Ex. 7: 22; 89; 157; 163) pointed out that the criteria for abrasion, puncture, and absorption of liquids are subjective unless test methods are specified for determining these attributes. OSHA agrees that these attributes cannot be quantitatively evaluated unless test methods are specified.

As stated above, it is the position of OSHA that the most important characteristics of protective gloves are protection against heat penetration, cut, and puncture. Therefore, OSHA has decided to specify criteria and test methods for protection against these hazards by modifying the proposed language, and combining proposed paragraphs (e)(4)(ii) and (e)(4)(iv) as paragraph (e)(4)(i) of the final standard. Accordingly, paragraph (e)(4)(i) of the final standard specifies criteria and refers to test methods for cut, puncture, and heat penetration that are contained in the above NIOSH publication. In an effort to reduce incorporation by reference as much as possible, final paragraph (e)(4)(i) contains the criteria for cut, puncture, and heat penetration and incorporates by reference only the test methods contained in the NIOSH publication. The test methods are being incorporated by reference in the final standard because of their detail and length.

Paragraph (e)(4)(iii) of the proposal specified fire-resistance criteria for the exterior material of protective gloves. OSHA did not receive any substantive comments with respect to this proposed paragraph. Accordingly, this paragraph is carried forward as paragraph (e)(4)(ii) of the final standard.

Paragraph (e)(4)(v) of the proposal specified that when design of the fire-resistive coat does not otherwise provide protection for the wrists, protective gloves shall have wristlets of at least 4.0 inches (10.2 cm) in length to protect the wrist area when the arms are extended upward and outward from the body. OSHA did not receive any comments pertaining to this proposed paragraph. Therefore, this paragraph remains the same as proposed and becomes paragraph (e)(4)(iii) of the *final* standard.

Paragraph (e)(5) of the proposal contained requirements for head, eye, and face protection.

Paragraph (e)(5)(i) of the proposal specified that head protective devices must meet the requirements contained in the National Fire Prevention and Control Administration (NFPCA) publication, "Model Performance Criteria for Structural Fire Fighters' Helmets."

Several commenters (Ex. 7: 66; 89; 160; 161; 174), (Ex. 23: 203; 237) disagreed with referencing the NFPCA publication. These commenters suggested, instead, that OSHA reference the new NFPA standard for helmets, NFPA 1972 (1979), "Structural Fire Fighters' Helmets." For example, one commenter (Ex. 7: 161 p. 10) remarked.

NFPA 1972 updates the NFPCA criteria and will require a helmet design that offers more protection than one produced in accordance with the NFPCA criteria. In view of this, we recommend that OSHA reference NFPA 1972 instead of the NFPCA criteria. It is a superior technical standard.

OSHA agrees that the criteria contained in the NFPA 1972 standard goes beyond that criteria proposed by OSHA. However, NFPA 1972 is a new standard, and to date OSHA is unaware of any helmets that have been tested and shown to meet its provisions.

Accordingly, this paragraph of the final standard references only the criteria contained in the NFPCA publication. However, when helmets become available that have been tested to meet the more stringent criteria of NFPA 1972, such helmets will obviously be acceptable as meeting OSHA requirements.

Paragraph (e)(5)(ii) of the final standard requires protective eye and face devices to be used by fire brigade members when performing operations where the hazards of flying or falling materials, which may cause eye and face injuries, are present.

Paragraph (e)(5)(iii) of the proposal accepted full facepieces of breathing apparatus as meeting the eye and face protection requirements if the full facepieces comply with the requirements of § 1910.134 and paragraph (f) of this section. OSHA did not receive any comments with respect to this paragraph. However, since paragraph (f)(1)(ii) of the final standard recognizes that self-contained breathing apparatus can be equipped with a full facepiece or an acceptable helmet or hood configuration, paragraph (e)(5)(iii) of the final standard has been revised by adding a reference to helmets or hoods.

Respiratory protective devices: Paragraph (f). This paragraph contains requirements for respiratory protective devices worn by fire brigade members. Paragraph (f)(1) contains general requirements which apply to all respirators. Paragraph (f)(2) contains requirements for positive-pressure respirators which apply only to those fire brigade members who perform interior structural fire fighting.

Paragraph (f)(1)(i) of the proposal specified that respiratory protective devices must meet the requirements contained in § 1910.134, the general industry requirements for respiratory protection, and the requirements of this paragraph.

One commenter (Ex. 7: 89) suggested that the following phrase be added to the proposed requirement after the word "paragraph": "and be certified under 30 CFR Part 11." OSHA agrees with this comment and believes it will clarify OSHA's intent with respect to the kinds of respirators which will be acceptable as meeting this paragraph. When OSHA uses the term "approved," it means certified under 30 CFR Part 11. Therefore, this paragraph of the final standard has been modified by adding the phrase, "and are certified under 30 CFR Part 11."

Paragraph (f)(1)(ii) of the proposal specified when self-contained breathing apparatus with full-facepiece was to be worn by fire brigade members.

OSHA received comments (Ex. 7: 95; 145) which stated that if OSHA specifies that self-contained breathing apparatus must be worn with full-facepiece, that the term "full-facepiece" could preclude the use of acceptable respirator configurations such as those which use an enclosed helmet or hood arrangement.

OSHA did not intend to exclude the use of these acceptable configurations. Therefore, this paragraph of the final standard has been modified to recognize that self-contained breathing apparatus can be worn with full-facepiece or with approved enclosed helmet or hood configuration.

OSHA also received comments (Ex. 7: 27; 45; 153; 161; 176) which questioned the wording of this paragraph. The proposal required self-contained breathing apparatus to be worn by brigade members while working inside buildings or confined spaces where there is dense smoke or an oxygen deficiency. The proposal also required that such apparatus be worn during emergency situations involving toxic substances.

The commenters were concerned that the proposed requirement was not sufficiently protective. They stated that brigade members would not be able to determine when toxic products of combustion were present, and therefore, self-contained breathing appartaus should be worn at all times during an emergency, including mop-up and overhaul operations. For example, one commenter (Ex. 7: 27 p. 1) asserted:

We do not believe this regulation is strict enough as there is no way to determine whether oxygen deficiency or toxic materials are present during the intial entry or whether the situation could deteriorate to such conditions. We recommend a mandatory mask rule requiring the use of self-contained breathing apparatus during actual fire fighting operations and during overhaul operations in interior structures.

Another commenter (Ex. 7: 161 p. 10) stated:

This section needs to be strengthened to require brigade members to wear self-contained breathing apparatus whenever products of combustion are present in the work area, including overhaul and mop-up operations; whenever working in any hazardous or toxic atmospheres, such as during chemical spills or radiation situations; or whenever products of combustion or toxic atmospheres are *likely* to be encountered. Terms such as "dense smoke" are vague and open to numerous interpretations. Brigade members will not be able to determine when oxygen deficiencies are present or when toxic levels in the atmosphere are dangerous. Therefore, brigade members must don self-contained breathing apparatus whenever products of combustion or hazardous/toxic atmospheres in whatever densities or volume, are encountered or are likely to be encountered.

OSHA agrees that the words "dense smoke" are vague. OSHA also agrees that self-contained breathing apparatus should be worn whenever toxic products of combustion or an oxygen deficiency may be present. This includes mop-up and overhaul operations where such environments are present. Therefore, this paragraph of the final standard has been modified to read as follows:

(ii) Approved self-contained breathing apparatus with full-facepiece, or with approved enclosed helmet or hood configuration, shall be worn by fire brigade members while working inside buildings or confined spaces where toxic products of combustion or an oxygen deficiency may be present. Such apparatus shall also be worn during emergency situations involving toxic substances.

Paragraph (f)(1)(iii) of the proposal concerned permissible accessories to self-contained breathing apparatus. These permissible accessories included buddy-breathing devices and quick-disconnect valves. A buddy-breathing

MCD 000013883

device is an accessory to self-contained breathing apparatus which permits a second person to share the same air supply as that of the wearer of the apparatus. These devices should only be used for emergency escape situations. A quick disconnect valve is a device which starts the flow of air by insertion of the hose (which leads from the facepiece) into the regulator of a self-contained breathing apparatus, and stops the flow of air by disconnection of the hose from the regulator.

OSHA proposed to allow the use of the buddy-breathing device so that an alternative air supply would be available for an endangered fire brigade member to make an emergency escape.

There have been instances reported where a fire fighter's air supply has been depleted because of being pinned or trapped, or as a result of a malfunction of the apparatus. A buddy-breathing device incorporated into the breathing apparatus units would allow for two facepiece hose connections. With this type of device, both facepieces are connected into a common air supply during an emergency escape situation and both fire brigade members would be benefitted by the available air. This device would avoid the need to pass the facepiece between two fire brigade members which, OSHA believes, is a less safe procedure. Some of the comments OSHA received (Ex. 7: 77; 81; 133) supported the proposed provision which would allow the use of a buddy-breathing device. For example, one commenter (Ex. 7: 81) remarked:

> The inclusion of a buddy-breathing device as ancillary equipment on breathing apparatus is an innovation that is long overdue. In rare, but not uncommon, circumstances of a fire fighter's air supply running out, the attitude has been to put your facepiece hose under your armpit and take your beating like a man. This is unnecessary, sometimes fatal, and with the availability of today's technology, it is shameful. I heartily endorse the concept of buddy-breathing devices on SCBA.

One commenter (Ex. 7: 27 p. 2), who disagreed with OSHA in permitting the use of a buddy-breathing device, discussed the results of a series of tests which were performed to determine breathing resistance or restricted air flow when a particular buddy-breathing device was used with four different makes of positive-pressure breathing apparatus. (A "positive-pressure" breathing apparatus is a breathing apparatus in which the pressure inside the full-facepiece is positive in relation to the immediate environment during inhalation and exhalation. Any facepiece leakage will be outward, thus providing protection to the wearer against inward leakage of toxic materials. "Negative-pressure" breathing apparatus (demand type breathing apparatus) is a breathing apparatus in which the pressure inside the full-facepiece is negative during the inhalation cycle.) The commenter stated that when the buddy-breathing device was used with positive-pressure breathing apparatus, all four of the respirators went to negative-pressure on inhalation. This means, of course, that protection against inward facepiece leakage would be lost due to the pressure inside of the facepiece becoming negative.

OSHA emphasizes that not all buddy-breathing devices will be permitted as accessories under paragraph (f)(1)(iii). It is clear that a buddy-breathing device such as the one tested would not meet the requirements of this paragraph because accessories which cause damage to the breathing apparatus, or restrict the air flow of the breathing apparatus, or obstruct the normal operation of the breathing apparatus when being used only by the wearer, are not permitted.

OSHA proposed to allow the use of the second accessory, the quick-disconnect valve, because this device is particularly useful for positive-pressure SCBA which do not have the capability of being switched from the demand (negative-pressure mode) to the positive-pressure mode. A quick-disconnect valve starts or stops the flow of air by insertion of the hose into the regulator; thus, it can save valuable air for positive-pressure SCBA.

One commenter (Ex. 7: 80) explained the value of a quick-disconnect valve for conserving air when it is used on positive-pressure breathing apparatus. This commenter stated that the main line valve or regulator valve is kept in the off position when the apparatus is charged, and then opened after placing the face mask on the wearer's face and before actual fire fighting operations begin. The commenter further remarked that rather than closing and opening valves under stress and tension of emergency operations, a "Schrader" or quick-disconnect valve could be used to achieve the same result.

Several commenters (Ex. 7: 27; 91; 97; 105; 176) disagreed with OSHA's proposed provision which would allow the use of either buddy-breathing devices or quick-disconnect valves on breathing apparatus. The main concern of these commenters was that these accessories would not be NIOSH/MSHA approved. For example, one commenter (Ex. 7: 27 p. 1) remarked:

> This paragraph permits the use of a buddy-breathing device or a quick-disconnect valve without NIOSH/MSHA approval. We do not believe the approval system should be by-passed in permitting these changes to be made.

Another commenter (Ex. 7: 176 pp. 5–6) added:

> The IAFF recognizes the value of self-contained breathing apparatus equipped with a buddy-breathing device or a quick-disconnect valve during emergency and escape situations. However, this section of the standard is allowing useage (sic) of these devices without NIOSH approval. We oppose the by-passing of the NIOSH approval system.

OSHA realizes that NIOSH/MSHA approval does not extend to individual components of SCBA. NIOSH/MSHA have been requested to change their certification criteria with respect to its approval of individual components which would be permissible for use on SCBA. These requests for the revision of the NIOSH/MSHA certification criteria were discussed at a public meeting concerning respirator testing and approval which was conducted by NIOSH/MSHA on November 29–December 1, 1977, as announced in a Federal Register Notice dated October 28, 1977 (Ex. 8: 138). If the certification process were changed in this manner, breathing apparatus could be provided with approved accessories which would enhance protection for the fire fighter.

As of this time, NIOSH/MSHA have not proposed revisions to their respirator certification criteria which would permit the certification of accessories such as buddy-breathing devices and quick-disconnect valves. Nonetheless, OSHA is allowing employers to deviate from the NIOSH/MSHA certification criteria because OSHA believes that these accessories are important enough to the life safety of fire brigade members that they should be allowed on SCBA as long as such accessories do not cause damage to the breathing apparatus, restrict the air flow of the breathing apparatus, or obstruct the normal operation of the breathing apparatus.

Accordingly, paragraph (f)(1)(iii) of the final standard remains essentially the same as proposed. OSHA would like to make it clear that it is *acceptable* for SCBA to be equipped with these accessories as long as they are in accordance with this paragraph. OSHA is *not* mandating that SCBA be equipped with these accessories.

OSHA proposed in paragraph (f)(1)(iv) to allow the interchangeability of compatible air cylinders. Most of the comments OSHA received supported this provision (Ex. 7: 6; 27; 95; 159; 180).

MCD 000013884

For example, one commenter (Ex. 7: 27 p. 2) remarked:

> We heartily endorse the concept of interchanging different makes of air cylinders. We have tested self-contained breathing apparatus with 2216 psi air cylinders on our breathing machine set in accordance with the NIOSH test criteria and found no changes in operation when Scott, MSA, and Survivair cylinders were interchanged.

Two commenters (Ex. 7: 91; 145) disagreed with allowing the interchangeability of air cylinders because it would void NIOSH/MSHA approval. This is because it is the policy of NIOSH/MSHA to approve breathing apparatus as one entire unit and not to approve components or subassemblies such as air cylinders. Therefore, NIOSH/MSHA approval would be voided if the air cylinder from one manufacturer were used with breathing apparatus by a different manufacturer.

Actually, fire departments have, by necessity, interchanged cylinders (which were compatible with their own apparatus) for many years. Fire departments and OSHA have requested NIOSH/MSHA to recognize the interchangeability of Department of Transportation (DOT) compressed air cylinder without voiding the approval of the breathing apparatus since all approved compressed air cylinders must meet the same basic criteria. However, NIOSH/MSHA, as of this time, have not changed the certification criteria to recognize the interchangeability of air cylinders.

OSHA believes that the interchangeability of air cylinders is important enough to the life safety of fire brigade members that it should be permitted.

Additionally, one commenter (Ex. 7: 145) suggested that the word "capacity" would be more meaningful than the word "size" when describing air cylinders. OSHA agrees with this commenter because it is a more accurate description of a cylinder's rating.

Therefore, this paragraph of the final standard permits the interchangeability of air cylinders when such cylinders are of the same capacity and pressure rating.

Paragraph (f)(1)(v) of the proposal required SCBA to have a minimum service life rating of 30 minutes. All of the comments OSHA received supported this proposed requirement. However, one commenter (Ex. 7: 145) suggested that it be clarified that this requirement does not apply to escape self-contained breathing apparatus (ESCBA). The ESCBA is a short-duration respiratory protective device which is approved for only emergency escape purposes. An ESCBA is an alternative to a buddy-breathing device for providing a secondary air supply to the wearer only for emergency escape purposes. OSHA agrees with this commenter that the requirement concerning the minimum service life rating for SCBA should not apply to ESCBA; OSHA did not intend for the proposed requirement to apply to ESCBA.

Accordingly, an exception for ESCBA has been included in the final standard.

Paragraph (f)(1)(vi) of the proposal concerned the cleaning and recharging of SCBA. Although this subject matter is already addressed in § 1910.134 which is referenced in this section, OSHA included it in the proposal for emphasis. Based on the comments submitted to the record that this repetition is unnecessary, OSHA has decided to delete this paragraph from the final standard.

Paragraph (f)(1)(vii) of the proposal required that SCBA be provided with an indicator which automatically sounds an audible alarm when the remaining service life of the apparatus is reduced to within a range of 20 to 24 percent of its rated service time.

The only comments OSHA received with respect to this paragraph (Ex. 7: 89; 91; 145), now paragraph (f)(1)(vi) of the final standard, correctly noted that the paragraph contained a typographical error; "24 percent" should have read "25 percent."

Accordingly, this typographical error has been corrected in this paragraph of the final standard.

Paragraph (f)(2)(i) of the proposal required fire brigade members to wear positive-pressure breathing apparatus when performing interior structural fire fighting.

Since this type of breathing apparatus maintains a positive-pressure inside the facepiece, it affords excellent protection against inward facepiece leakage. This is because any leakage will be outward from the facepiece, due to the positive-pressure, rather than inward into the facepiece. Several individuals and organizations (Ex. 8: 131; 123; 241; 243; 247) have described the superior protection factors afforded by the positive-pressure apparatus over the conventional negative-pressure (demand) apparatus. This superior protection against facepiece leakage is necessary because of the many different kinds of materials in use today which result in toxic smoke and gases.

Fire brigade members are being exposed to unknown concentrations of contaminants when performing interior structural fire fighting. Fire brigade members do not normally know what contaminants they are encountering, let alone the exact concentrations of the materials which may be present. Because of this uncertainty, fire brigade members must be provided with the type of respirator which affords the best protection against the unknown environments that may be encountered.

This is the reason OSHA proposed that only positive-pressure breathing apparatus be worn by fire brigade members when performing interior structural fire fighting. Most of the comments OSHA received supported this concept (Ex. 7: 107; 159; 171; 176; 179; 180), (Ex. 23: 204; 205; 210; 213; 218; 226; 227; 228; 231), (Ex. 90), (Ex. 99).

OSHA also received comments (Ex. 7: 147), (Ex. 23: 212; 214) which remarked that any SCBA (negative-pressure or positive-pressure) should be acceptable as long as it could achieve a specified protection factor. Other commenters (Ex. 7: 61; 172), (Ex. 23: 219), (Ex. 82) stated that they believed the *open-circuit* positive-pressure breathing apparatus was the safest type for interior structural fire fighting. However, they objected to any provision which would also require *closed-circuit* breathing apparatus to be of the positive-pressure type. (A "closed-circuit" SCBA is a respirator in which the air is rebreathed after the exhaled carbon dioxide has been removed and the oxygen content is restored by a compressed or liquid oxygen source or by an oxygen-generating solid. These respirators are used primarily for situations requiring a duration of 1 to 4 hours. All closed-circuit SCBA approved for 2 hours or more duration are of the negative-pressure type. An "open-circuit" SCBA is a respirator which exhausts the exhaled air to the atmosphere instead of recirculating it. These respirators are used primarily for situations requiring a duration of less than 1 hour; most open-circuit SCBA have a rated service life of 30 minutes.) Based on information submitted to the record (Ex. 7: 61), (Ex. 39), these commenters contended that certain closed-circuit negative-pressure breathing apparatus could provide equivalent protection to that afforded by open-circuit positive-pressure breathing apparatus. Two of these commenters (Ex. 7: 61; 172) also requested a hearing on the issue of whether positive-pressure breathing apparatus should be the only type allowed for interior structural fire fighting. Accordingly OSHA included this issue as issue 1 of the June 1, 1979, Hearing Notice (Ex. 22).

The hearing notice invited information and testimony on the following aspects of this issue:

MCD 000013885

a. Whether positive-pressure breathing apparatus should be the only acceptable respirator for interior structural fire fighting?
b. What protection factor should be provided by respirators to be used for interior structural fire fighting? How should it be measured?

Testimony presented at the hearing overwhelmingly supported the use of positive-pressure *open-circuit* breathing apparatus for interior structural fire fighting (Tr. 38–42, 94, 297, 405, 435, 606, 618, 620, 745, 747, 756, 758, 763, 766, 770, 772–776). There was also testimony and information submitted to the record which identified the following reasons why *closed-circuit* breathing apparatus should not be required to be of the positive-pressure type for interior structural fire fighting. First, there is a need for long-duration breathing apparatus (Ex. 82) but there are no positive-pressure breathing apparatus (open-circuit or closed-circuit) approved for more than 2 hours duration. There are breathing apparatus approved for more than 2 hours duration; however, all of these are negative-pressure types. Therefore, a requirement which would mandate the use of positive-pressure breathing apparatus would preclude the use of the only approved longer-duration breathing apparatus available.

Second, it was contended that certain negative-pressure closed-circuit breathing apparatus could achieve a protection factor equal to that of positive-pressure open-circuit breathing apparatus (Ex. 7: 61), (Ex. 39), (Tr. 202–205).

Third, it was contended that a possible hazard may exist with closed-circuit positive-pressure breathing apparatus (Tr. 200). At the Washington, D.C. hearing, a movie presentation by the Draegerwerk Company demonstrated the possible ignition of materials exposed to oxygen-enriched breathing air leaking from a positive-pressure closed-circuit breathing apparatus. Although testimony and cross-examination at the hearings did not verify any case where this occurred during an acutal fire situation, OSHA is concerned that such an occurrence is possible. Accordingly, in a letter dated September 28, 1979, OSHA officially requested NIOSH to study this possible problem and to determine if such a problem may exist with positive-pressure closed-circuit breathing apparatus.

After considering all of the information, testimony, and comments received, OSHA has concluded that as a general rule, positive-pressure breathing apparatus must be worn during interior structural fire fighting because it affords the best protection against toxic products of combustion. Therefore, paragraph (f)(2)(i) of the final standard remains the same as proposed except the proposed effective date of July 1, 1980, has been changed to July 1, 1981. The additional time will permit a smoother transition to the new equipment by allowing more time for purchase of the equipment. Additionally, OSHA recognizes that there are special instances that require the use of negative-pressure breathing apparatus which are able to provide durations that are longer than those provided by present positive-pressure breathing apparatus. Therefore, OSHA has decided to permit the use of longer-duration negative-pressure breathing apparatus under certain conditions. This will be further explained in the discussion pertaining to new paragraph (f)(2)(iii) which has been added to the final standard.

Paragraph (f)(2)(ii) of the proposal permitted the use of a combination type SCBA where the breathing apparatus can be switched from a demand to a positive-pressure mode as long as the breathing apparatus is operated in the positive-pressure mode during interior structural fire fighting. OSHA received comments which supported this concept (Ex. 7: 147; 159; 180). However, two commenters (Ex. 7: 96; 161) disagreed with this proposed provision because they believed that only positive-pressure apparatus should be used during interior structural fire fighting and that permitting a selector switch would provide an opportunity for the apparatus to be switched to the demand mode during interior structural fire fighting.

Even though OSHA agrees with these commenters that only positive-pressure breathing apparatus should be worn during interior structural fire fighting, permitting the use of a selector switch will enhance the flexibility of the breathing apparatus to conserve air by having the breathing apparatus in the demand mode during other than interior structural fire fighting operations. With a selector switch a fire brigade member can conserve air by donning the breathing apparatus without the facepiece in place and turning on the air supply before reaching a hazardous environment. With the apparatus switched to the demand mode, there will be no loss of air. In the absence of a selector switch, the fire brigade member would have to turn off the air supply to the facepiece or use a quick-disconnect valve in order to conserve air. A quick-disconnect valve would achieve the same flexibility as a selector switch for those breathing apparatus that are only positive-pressure.

Therefore, it is the position of OSHA that a selector switch should be permitted on breathing apparatus. However, the breathing apparatus must be in the positive-pressure mode during interior structural fire fighting.

One commenter (Ex 7: 91) remarked that the term "combination" type is not consistent with 30 CFR Part 11. OSHA agrees that this term is not contained in 30 CFR Part 11, and that it would be inappropriate for the final standard to contain a term which is not commonly used.

Accordingly, paragraph (f)(2)(ii) of the final standard remains the same as proposed except the term "combination type" has been deleted.

Paragraph (f)(2)(iii) of the proposal required that, effective July 1, 1985, new positive-pressure breathing apparatus must be capable of performing in termperatures down to −20° F without malfunction or loss of respiratory protection to the wearer for the duration of the equipment.

Several commenters (Ex. 7: 3; 6; 27; 95; 150; 176; 180) supported both high and low temperature criteria for breathing apparatus. However, there were other commenters (Ex. 7: 91; 145; 148; 160; 179) who disagreed with OSHA specifying respirator criteria for low temperature extremes because of the following reasons.

First, specifying the low temperature criteria of −20°F may prohibit the use of certain long-duration closed-circuit breathing apparatus.

Second, the specified temperature of −20°F may not be protective enough or may be overly conservative, depending upon local climatic conditions. Temperature criteria should be appropriate for the area in which the apparatus is being used.

Third, NIOSH, rather than OSHA, should develop criteria for temperature extremes in its certification process of breathing apparatus.

OSHA believes there are several problem areas in which research is needed with respect to self-contained breathing apparatus. One of these problem areas is the identification of appropriate criteria for temperature extremes for use in evaluating self-contained breathing apparatus. Additionally, OSHA agrees that such criteria should be developed by NIOSH, rather than OSHA.

Therefore, OSHA has requested NIOSH to develop criteria for these major problem areas, including criteria for temperature extremes, and that such criteria be included in any revision of 30 CFR Part 11.

OSHA has decided not to address the issue concerning criteria for temperature

 MCD 000013886

extremes until such criteria are developed by NIOSH since it would be inappropriate at this time and unsupported by the record. Accordingly, proposed paragraph (f)(2)(iii) has been deleted from the final standard.

As noted above, although OSHA is mandating the use of positive-pressure breathing apparatus for interior structural fire fighting, OSHA realizes that there are no approved long-duration positive-pressure breathing apparatus for use during special fire fighting situations. To date, only negative-pressure breathing apparatus have a rated service life of more than 2 hours. Therefore, OSHA has decided to permit the use of long-duration negative-pressure breathing apparatus for interior structural fire fighting under certain limited conditions.

Negative-pressure breathing apparatus will be permitted for only those situations in which the employer demonstrates that the use of long-duration apparatus is necessary, such as in tunnels and subway systems. Such breathing apparatus must have a rated service life of more than 2 hours and be able to achieve a protection factor of 5,000 or greater as determined by an acceptable quantitative fit test performed on each individual. Such negative-pressure breathing apparatus will continue to be acceptable for a maximum of 18 months after a positive-pressure apparatus with the same or longer rated service life is certified by NIOSH/MSHA. After this 18 month phase-in period, all self-contained breathing apparatus used for these long-duration situations will have to be of the positive-pressure type.

Those elements which should be included in an acceptable quantitative fit test are described in the appendix to this section. The elements identified in the appendix to this section are not meant to be a comprehensive, technical description of a quantitative fit test protocol, but do include those elements which are acceptable for determining protection factors. The procedures used by the employer for a quantitative fit test are required to be available for inspection by the Assistant Secretary or authorized representative.

Organizations such as Los Alamos Scientific Laboratory, Lawrence Livermore Laboratory, NIOSH, and American National Standards Institute (ANSI) are excellent sources for additional information concerning quantitative fit testing.

OSHA decided to specify a minimum protection factor of 5,000 because this value was recommended in testimony (Tr. 206), and a protection factor of 5,000 is the lowest value a positive-pressure breathing apparatus achieved in a number of fit testing programs (Ex. 15). OSHA believes that negative-pressure breathing apparatus should be able to achieve a protection factor at least equal to the lowest value a positive-pressure breathing apparatus can achieve. This protection factor of 5,000 represents the minimum acceptable protection to be afforded by breathing apparatus used for interior structural fire fighting.

Accordingly, paragraph (f)(2)(iii) of the final standard will permit the use of negative-pressure self-contained breathing apparatus, having a rated service life of more than 2 hours and a minimum protection factor of 5,000 for only those situations which require long-duration apparatus.

Test methods: Appendix E. Paragraph (e) of the proposal contained criteria for protective clothing which were to be determined by using specified test methods. The proposal incorporated the specified test methods by reference. OSHA has decided that it is appropriate to include several of the specified test methods as an appendix instead of incorporating them by reference. By including these test methods in Appendix E, the employer will not have to obtain a copy of these referenced test methods.

Therefore, Appendix E contains the following test methods: paragraph (1)—the puncture resistance test method for foot protection; paragraph (2)—the Trapezoid test method for determining the strength of cloth by tearing; and paragraph (3)—the test method for determining the flame resistance of cloth (vertical).

The use of the test methods in Appendix E is mandatory to determine if protective clothing affords the levels of protection specified in the following paragraphs of § 1910.156: (e)(2)(iii), (e)(3)(ii)(A), (e)(3)(ii)(B), and (e)(4)(ii).

Section 1910.157 Portable fire extinguishers.

This section contains the selection, distribution, maintenance, inspection and testing requirements for portable fire extinguishers which are provided in the workplace for employee use or which are located in the workplace and may be used by employees. The section also contains training and educational requirements for those employees expected to use portable fire extinguishers. As noted above in the general discussion of these standards, this is the only section is Subpart L that, by itself, imposes a requirement on employers to provide fire extinguishing equipment. (See § 1910.157(d)(1)). However, paragraphs (a) and (b) contain exemptions from this requirement when certain conditions are met.

Scope and application: Paragraph (a). In paragraph (a) OSHA explains when the specific requirements of this section apply and what equipment is covered. The paragraph states that the portable fire extinguisher section applies to all portable fire extinguishers provided for employee use inside of workplace buildings or enclosed structures.

OSHA proposed to cover all portable extinguishers provided for employee use inside of buildings because extinguishers are pressure vessels provided for employee use in emergency situations, and OSHA believes that some degree of control of the fire extinguishing equipment is necessary to assure that it will be available for use and operate correctly. Several commenters (Ex. 7: 11; 33; 60) did not understand why the scope of the paragraph is limited to extinguishers used inside or workplace buildings and structures. OSHA explained in the preamble to the Notice of Proposed Rulemaking (43 FR 60052) that greater protection is necessary for employees who must fight fires inside of buildings or enclosed structures because of the hazards associated with the build-up of heat, smoke, and toxic gases. In an effort to reduce the burden of execessive regulation on employers, OSHA has reduced the standards applicable to outdoor workplaces because there is a lesser hazards faced by employees fighting fires in exterior environments. For interior environments, however, more comprehensive standards are necessary because of the greater hazard presented to employees by the potential for the build-up of smoke, toxic gases, and heat. The accumulation of the products of combustion which can occur inside a building or an enclosed structure does not occur outdoors where such products can rise and dissipate. Therefore, OSHA has decided to adopt the proposed scope in the final standard.

Further, the paragraph establishes that paragraph (d) of this section does not apply to portable fire extinguishers provided for employee use on the outside of workplace buildings or structures. OSHA proposed that extinguishers provided in exterior workplaces comply with all of the standards in this section except for the distribution requirements. Less stringent distribution criteria are acceptable for exterior environments because employees have a greater opportunity to decide whether to provide incipient stage control or whether to call plant or local fire protection authorities. There is far less of a containment hazard

Published by THE BUREAU OF NATIONAL AFFAIRS, INC. WASHINGTON, D.C. 20037

associated with smoke, toxic gases, and heat, and therefore, a better chance for quick escape.

The paragraph also states that employers who must provide extinguishers, which are required by another requlatory agency, and which are not intended for employee use, need only comply with paragraphs (e) and (f) of this section, and in addition they must have an emergency action plan and a fire prevention plan which meets the requirements of § 1910.38.

OSHA believes that some regulation of extinguishers provided in the workplace, but not intended for employee use, is necessary to assure that the extinguishers receive proper maintenance and testing to prevent their unintentional failure or rupture.

Exemptions: Paragraph (b). Paragraph (b) provides for either a total or a limited exemption from the fire extinguisher standard when certain specified criteria are met.

As proposed, paragraph (b)(1) provided a total exemption from the fire extinguisher standard where the employer had established and implemented a written fire safety policy that requires total and immediate evacuation of the workplace at the time of a fire. OSHA also proposed that the evacuation be supported by an emergency action plan and a fire prevention plan meeting the requirements of § 1910.38. Some commenters (Ex. 7: 33; 12; 33; 34; 162) did not believe that OSHA should permit such a total exemption. Southwest Research Institute (SRI) (Ex. 7: 33) suggested that no employer should be encourage to totally evacuate an area rather than provide extinguishers. NIOSH (Ex. 7: 34) believed that employees should be allowed to use portable extinguishers. Two other commenters (Ex. 7: 39; 162) suggested deleting the proposed language altogether. OSHA believes that the total exemption is appropriate because employee safety from fire is best provided, in most instances, by getting employees as far from the fire as possible. OSHA further recognizes that some employers already require a total evacuation of the workplace at the time of a fire and prohibit their employees from using extinguishers on any size fire.

OSHA believes that employers who choose to evacuate the workplace rather than provide fire extinguishers for employee's use will be minimizing the potential for fire-related injuries to employees. Therefore, OSHA is adopting the language of paragraph (b)(1) as proposed.

It should be understood that this exemption does not prohibit employees from fighting fires; it provides relief from the standard for those employers who do not want to involve employees in fire fighting at any level. It also establishes the criteria for evacuation plans used to obtain the exemption so that those plans will adequately provide employee protection during evacuation.

In paragraph (b)(2) OSHA proposed an exemption from the extinguisher distribution requirements for those employers who designate and train certain employees to use extinguishers and who require all other employees to evacuate upon the sounding of a fire alarm.

When the exemption criteria are met, the employer need not comply with the distribution requirements of the section. OSHA believes that an employer using trained employees, which need not be a fire brigade, can determine the extinguisher distribution plan that would best complement the fire protection plan. OSHA believes this exemption is necessary and will reduce the need for employers to file variance requests based upon the uniqueness of their fire protection plans. Further, the trained employees will be more familiar with the locations of the units and will be able to respond quickly to any fire situation.

General requirements: Paragraph (c). Paragraph (c) contains the general performance criteria for mounting, identifying and locating of portable extinguishers. It also contains criteria for the phasing out and prohibition of certain types of extinguishers found hazardous to employees.

In paragraph (c)(1) OSHA establishes the minimum mounting, locating, and identifying criteria for portable extinguishers. The paragraph also requires the employer to provide extinguishers in the workplace. Previously OSHA was rather specific in regulating extinguisher mounting heights, locations, and identification labels or signs. This previous policy of using specification type standards for mounting heights was widely criticized. In response to the criticism, OSHA raised some issues concerning mounting heights and locations in the December, 1978 Notice of Proposed Rulemaking. The comments addressing these issues supported OSHA's policy to shift to performance criteria and to eliminate specifications. The Southwest Research Institute stated (Ex. 7: 33 P. 4) "Flexibility in mounting extinguishers is a highly desirable approach." The Weyerhauser company stated (Ex. 7: 104 p. 1), "We agree with the elimination of a specific height requirement for the placement of extinguishers. . . ." PPG Industries commented (Ex. 7: 97 p. 3) "PPG agrees with the proposal for a performance requirement that portable fire extinguishers be accessible to employees rather than a specific mounting height requirement." OSHA believes that the specific mounting height of an extinguisher is unimportant as long as the employee can quickly reach and get the extinguisher without being injured. For example, the extinguisher may be mounted above the floor, on retractable platforms or be sitting on the floor as long as it is readily accessible. However, the need to use climbing devices such as ladders or step-stools to gain access to an extinguisher is unacceptable, as that is not consdered "ready access." Climbing devices may be unstable and may cause a fall injury to an employee who is hurrying to control a fire. Further, they may not be available when needed.

During the development of the final requirement in paragraph (c)(1), some parties (Ex. 7: 24; 113) questioned the meaning of "readily accessible." This term cannot be quantitatively defined for all circumstances. However, it is noted that in granting a variance to the Caterpillar Tractor Company in 1975 (40 FR 2829) for mounting extinguishers on retractable boards, OSHA considered "readily accessible" to mean available to the employee within one minute.

In paragraph (c)(3) of the proposal, OSHA prohibited the use of carbon tetrachloride and chlorobromomethane as extinguishing agents in portable fire extinguishers. This was done because of the toxic products of decomposition generated when these agents are discharged on hot surfaces and because of the toxic effects of the basic agent when it is handled by employees. The hazards of both agents are extensively discussed in the record of this rulemaking (Ex. 6: 25; 26; 27; 28; 29; 30).

One commenter, Mr. J. Hakes, (Ex. 7: 144) objected to OSHA's proposed prohibition of carbon tetrachloride as an extinguishing agent. He suggested that the toxicity and related health hazards of carbon tetrachloride are not as great as indicated by OSHA. He stated (Ex. 7: 144 p. 16) that he personally was not aware of any injury resulting from the use of carbon tetrachloride extinguishers and that the use of carbon tetrachloride on hot metals over 1,112°F or live flame would only produce "a safe level of 3 parts per million of phosgene gas."

OSHA does not agree with Mr. Hakes. It has been overwhelmingly demonstrated in the record that carbon tetrachloride used as an extinguishing agent presents a severe and unwarranted health hazard to employees. The current permissible exposure limit for phosgene (8 hour, time-weighted average) in § 1910.1000, Table Z–1, is 0.1 ppm, significantly lower than the 3 ppm apparently considered safe by this commenter. In addition, other approved extinguishing agents, such as sodium bicarbonate and potassium bicarbonate, are as effective as carbon tetrachloride and present minimal, if any, health hazard to employees.

A further indication of the severity of the health hazard associated with carbon tetrachloride is that several states and cities have already banned the use of this agent in portable extinguishers (Ex. 8: 25). In addition, UL revoked their approval of carbon tetrachloride extinguishers in 1968.

Most commenters responding to this issue raised in the proposal (Ex. 7: 33; 41; 43; 48; 58; 97; 98; 122; 160; 173; 175) supported the prohibition of both carbon tetrachloride and chlorobromomethane as fire extinguishing agents.

Therefore, in light of the extensive support in the record, OSHA has decided to prohibit the use of carbon tetrachloride and chlorobromomethane as extinguishing agents in portable fire extinguishers.

In paragraph (c)(4) OSHA proposed that portable fire extinguishers be kept fully charged and in operable condition at all times except during use. One commenter (Ex. 7: 113) suggested that the proposed language imposing this obligation on employers precluded the use of outside contractors to perform extinguisher maintenance service. As explained previously, it is not OSHA's intent to preclude the use of outside contractors to perform services for employers.

In paragraph (c)(5) OSHA is requiring the removal from service by January 1, 1982 of all soldered or riveted shell self-generating soda acid or self-generating foam or gas cartridge water-type portable fire extinguishers which operate by inverting the unit to initiate an uncontrollable pressure generating chemical reaction to expel the agent. These types of shells are subject to excessive metal fatigue and "creep" at the seams of construction which can cause failure of the units and may injure the operator. OSHA received significant support (Ex. 7: 16; 55; 65; 119) for removing those units with riveted or soldered shells. OSHA has decided to phase-out units with riveted or soldered shells because of the known hazard (Ex. 8: 44; 78; 111) to employees created by excessive metal fatigue and "creep" at the seams of construction. This fatigue and "creep" is created over prolonged periods of time by normal pressurization of the shell during use and over shorter periods of time by overpressurization of the shell during hydrostatic testing. Environmental conditions may also contribute to the degradation of the shell integrity.

In Issue 7 (43 FR 60050) of the Notice of Proposed Rulemaking, OSHA asked whether it should phase out the use of all inverting-type extinguishers, including those which do not have soldered or riveted shells. One commenter, Mr. Hakes (Ex. 7: 144), objected to OSHA's proposed phase-out of any inverting-type extinguishers. Mr. Hakes alleged that the hazard to employees from this type of extinguisher was not as severe as indicated by OSHA in its Notice of Proposed Rulemaking and that the proposed phase-out was instituted to help market newer types of extinguishers. The record also contains considerable support (Ex. 7: 33; 34; 37; 39; 75; 105) the removal or the phase-out of all inverting-type extinguishers.

The Fire Equipment Manufacturers' Association (FEMA) suggested that all inverting-type fire extinguishers be removed from service because (Ex. 7: 175 p. 2):

(1) Their manufacture has been discontinued for more than 10 years;
(2) Underwriters' Laboratories, Inc. no longer include these types in its listing program;
(3) Replacement parts are now unavailable, resulting in nonacceptable repairs and modification being done in the field;
(4) The method of actuation is contrary to the desired and recognized method—(to operate in an upright position); and
(5) These types do not incorporate the most important safety features of current designs:
(a) shut-off nozzles,
(b) tamper indicator, or
(c) intermittent discharge capability.

As noted earlier, OSHA is phasing out the use of units with soldered or riveted shells because these units present a shell integrity problem. There is nothing to indicate, however, that inverting units of other construction present that type of hazard.

OSHA is, therefore, requiring that only those units known to be hazardous, i.e., those with soldered or riveted shells, be phased out. In light of FEMA's comments, however, employers are encouraged to consider replacement of all types of inverting units because it will standardize the method of extinguisher operation. OSHA will continue to accept inverting types with other than soldered or riveted shell construction. OSHA's position is consistent with NFPA 10–1978 (Ex. 8: 213). Employers are reminded that repairs and maintenance work done on units with approval labels, must be done in accordance with the approval label instructions if the unit is to retain its approval and remain acceptable to OSHA.

Selection and distribution: Paragraph (d). This paragraph establishes the requirements for the selection and distribution of portable fire extinguishers in the workplace. As noted, certain workplaces may be exempted from the requirements of this paragraph under exemptions provided in paragraph (a) and (b) of this section.

Paragraph (d)(1) establishes the basic performance requirement for the distribution of portable fire extinguishers. Extinguishers must be distributed throughout the workplace in a manner determined by the classes of anticipated fires and by the size or degree of hazard which contributes to fire.

In paragraph (d)(2) OSHA proposed to limit employee travel distances for Class A portable fire extinguishers to 75 feet or less. Most commenters (cf. Ex. 7: 87; 97; 121) suggested that the proposed requirement was too specific and that the proposed language was incompatible with the language in paragraph (d)(1). The Gulf Science and Technology Company stated (Ex. 7: 87 p. 5):

> . . . the travel distance limitations pose specific requirements for which compliance is very difficult to achieve in process facilities, storage tank areas, and similar open-type facilities in petroleum and petro-chemical industries.

After a review of the record however, OSHA has decided to leave the proposed langugage as the final requirement. It is noted that workplaces in exterior open-type environments are outside the scope and application of this paragraph and are not subject to its requirements. OSHA believes that sufficient flexibility for distribution within the specific maximum travel limit inside buildings and enclosed structures is provided in this paragraph. Employers preferring greater flexibility may use the exemptions provided in paragraphs (a) and (b) of this section. OSHA further believes that a maximum travel distance requirement is necessary to assure accessibility of extinguishers to all employees who may use them.

In paragraph (d)(3) OSHA proposed to permit employers to substitute uniformly spaced standpipe systems for Class A portable fire extinguishers. The comments (Ex. 7: 33; 41; 160; 175) were divided between supporting a total substitution and supporting a partial substitution of the required complement

MCD 000013889

of Class A extinguishers. Cargil's Corporate Safety Office (Ex. 7: 13) suggested that small diameter hose with nozzle pressure of at least 30 psi should be acceptable as substitutes for up to 50 percent of the required complement of Class A fire extinguishers. This position was supported by NFPA 10–1978 and by Schering-Plough Corporation (Ex. 7: 68). United States Steel stated (Ex. 7: 66 p. 2):

> OSHA should accept hose systems in lieu of portable fire extinguishers which would be consistent with their proposal on performance type standards.

OSHA believes that standpipe systems, or hose stations connected to sprinkler systems, with hose diameters as small as ⅝" can provide, when used by trained employees, a sufficient fire extinguishing capability for Class A hazards. This viewpoint was endorsed by numerous comments (cf. Ex. 7: 20; 33; 40; 43; 66; 97). OSHA believes that this capability is sufficient to permit a total substitution for the Class A portable fire extinguisher requirement rather than the limited 50 percent substitution.

Standpipe systems installed in accordance with § 1910.158, and hose connections to sprinkler systems in accordance with § 1910.159, will provide the trained employee with water supplies and pressures equal to or greater than those available from Class A portable fire extinguishers.

OSHA believes that permitting total substitution is more protective of employee safety because of the superior capability of standpipe systems and sprinkler system hose connections over portable Class A fire extinguishers in providing extended water supplies and pressure.

OSHA believes that trained employees using standpipe systems or sprinkler system hose stations can provide a greater degree of fire protection for employee safety than several Class A two-and-one-half gallon portable fire extinguishers. Therefore, OSHA is permitting a total substitution of standpipe systems for Class A portable extinguishers.

It bears emphasis that this provision does not require total substitution when substitutions are made, nor does it require that any substitution be made. It requires only that if substitution is made, only standpipe systems meeting § 1910.158 or sprinkler system hose stations meeting § 1910.159 be used and that they provide total coverage of the area they are to protect.

In paragraph (d)(4) of the proposal, OSHA limited travel distances for employees to reach Class B fire extinguishers to 50 feet from the Class B hazard area. To avoid possible misunderstanding, OSHA has decided to change the proposed language by adding the phrase "or less" after 50 feet. This change clarifies OSHA's intent to establish a maximum travel distance.

In paragraph (d)(5) of the proposal OSHA established the distribution criteria for Class C extinguishers. OSHA has changed the proposed language to clarify the requirement. A Class C fire or hazard is one which requires the extinguishing agent to be electrically non-conductive. The actual fuel of the fire may be either Class A or Class B, and OSHA believes that the locations of extinguishers with a Class C classification must be determined on the basis of the actual Class A or Class B fuel hazard. The fact that the fire itself may constitute an electrical shock hazard, if certain agents are used, should not alter travel distances based on fuel hazards. Therefore, OSHA has revised the proposed language to indicate that extinguishers with a Class C classification are to be distributed based on the Class A or Class B fuel hazard that is present.

In paragraph (d)(6) of the proposal OSHA established the distribution criteria for Class D extinguishers or containers of Class D extinguishing agent. OSHA proposed to limit the travel distances from the combustible metal working area to any Class D agent to 75 feet. OSHA has decided to change the proposed language by adding the phrase "or less" after 75 feet. This change clarifies OSHA's intent to establish a maximum travel distance.

Inspection, maintenance, and testing: Paragraph (e). Paragraph (e) contains the requirements necessary to assure that portable fire extinguishers are properly maintained. It includes the criteria for the inspection, maintenance and testing of portable extinguishers. It does not cover hydrostatic testing which is covered in paragraph (f) of this section.

Paragraph (e)(1) establishes that it is the employer's responsibility to assure that all portable fire extinguishers provided in the workplace are maintained in accordance with the requirements of this paragraph.

Paragraph (e)(2) requires the employer to conduct monthly visual inspections of fire extinguishers or fire hose used in lieu of fire extinguishers, under paragraph (d) of this section.

In paragraph (e)(3) OSHA proposed a requirement for recording monthly inspection dates on portable extinguishers. A review of previous OSHA general industry fire protection standards showed that OSHA has never before required the recording of monthly inspection dates.

The comments (Ex. 7: 41; 57; 94; 98; 160) generally opposed the new proposed recordkeeping requirements. OSHA is deleting the recording requirement because it appears that requiring inspection date recording would unnecessarily increase the cost of compliance with the standard without increasing employee safety.

In paragraph (e)(4) OSHA proposed that employers subject portable extinguishers, except for stored pressure units, to an annual maintenance check. OSHA used the NFPA 10–1975 standard during the development of the proposal. However, the National Association of Fire Equipment Distributors (NAFED) identified a serious problem with the NFPA 10–1975 document in their comment (Ex. 7: 71). The language in the NFPA 10–1975 document ("Exception No. 1 of paragraph 4–4.1") was written in a manner which would not require annual maintenance checks on stored pressure units and would permit the omission of any maintenance for 5 or 6 years. According to NAFED, the NFPA committee on Portable Fire Extinguishers reported to the Secretary of the NFPA Standards Council on February 27, 1976 that (Ex. 7: 71 p. 7):

"It has never been the intent of the Standard (NFPA 10) to totally exempt stored pressure types of extinguishers from some annual maintenance requirements." OSHA has decided to change the proposed language of this requirement in light of the comments submitted by NAFED. OSHA has changed the language of the proposal so that the final OSHA standard is consistent with the NFPA 10–1978 (Ex. 8: 213) standard. The standard adopted by OSHA (final paragraph (e)(3)) requires at least an external check of stored pressure units on an annual basis. OSHA is requiring that an accurate record of the annual maintenance checks be maintained. The changes made by OSHA will make the final standard consistent with the NFPA's document.

In proposed paragraph (e)(5), OSHA required employers to empty and to subject stored pressure dry chemical and Halon 1211 extinguishers requiring a 12-year hydrostatic test to applicable maintenance checks every 6 years.

Several commenters (Ex. 7: 38, 94, 148) suggested that the reference to Halon 1211 be deleted. United Technologies commented (Ex. 7: 38 p. 3):

> It is agreed that dry chemical extinguishers should be subjected to maintenance procedures every six years. This is because of the possibility of the caking of the powder or corrosion of internal parts if moisture is introduced. Halon 1211 exhibits neither of these properties and, therefore, the

requirements for maintenance procedures every six years seems excessive.

The DuPont Company (Ex. 7: 93) suggested using the two exceptions found in the NFPA 10–1978 standard. One exception exempts dry chemical extinguishers having nonrefillable disposable containers from the requirement and the second exception permits flexibility in testing dates when an interim recharging or hydrostatic test is performed. OSHA agrees with the suggestion because it will make the NFPA and OSHA standards consistent on this point. Therefore, OSHA has changed the proposed language by adding the two exceptions recommended by DuPont in the final requirement (final paragraph (e)(4)) and by deleting the reference to Halon 1211.

In paragraph (e)(6) of the proposal, OSHA required that extinguishers removed from the workplace or from service for maintenance or recharging be replaced with extinguishers having the same classification and at least equivalent rating. Two commenters (Ex. 7: 66; 160) suggested that OSHA permit the substitution of "alternate equivalent protection." The American Iron and Steel Institute remarked (Ex. 7: 160 P. I–4):

> As stated the provision requires the employer to maintain an inventory of spare fire extinguishers. Depending upon the size of the establishment, the spare extinguisher inventory could be extensive and costly. Provision for an alternate system grants flexibility and cost-saving alternatives to the employer.

OSHA agrees with the comments and has changed the proposed language to permit alternative equivalent protection such as temporary use of hose lines for class A extinguishers, curtailment of work activities, or other methods instead of specifying "extinguishers of the same classification and at least equivalent rating." OSHA believes this change (final paragraph (e)(5)) will maintain employee safety because it provides the flexibility for employers to provide the various alternative forms of fire protection recognized in this subpart.

Hydrostatic testing: Paragraph (f). This paragraph contains the requirements for the hydrostatic testing of portable extinguishers. It contains the criteria, time intervals, and equipment for hydrostatic testing.

OSHA, in paragraph (f)(1), requires that hydrostatic testing be done by trained persons with suitable equipment.

In paragraph (f)(2) and Table L–1, OSHA proposed the time intervals for testing fire extinguishers. One commenter, Cities Service remarked (Ex. 7: 49 p. 3):

> OSHA should consider and investigate the current knowledge and experience in hydrostatic testing to determine appropriate test intervals . . . Improved design requirements and construction materials of portable fire extinguishers have drastically reduced employee exposure to any significant risk of the extinguisher structurally malfunctioning.

While OSHA can appreciate the new developments in extinguisher design, it is intent on having requirements compatible with the U.S. Department of Transportation which establishes the basic criteria for all compressed gas cylinder design. OSHA also recognizes the experience and supports the work of the NFPA 10 committee from whose standard Table L–1 is taken.

In light of this, OSHA does not believe that any changes, other than updating Table L–1 to reflect newer types of extinguishers and revising the language to permit the use of outside contractors are necessary.

In paragraph (f)(3) OSHA proposed that employers hydrostatically test extinguishers when they showed signs of corrosion or mechanical damage. NAFED strongly suggested that OSHA delete the proposed paragraph because (Ex. 7: 71 p. 4):

> * * * based on our wide experience on this subject. Both NFPA 10 and the Compressed Gas Association (CGA) Pamphlet No. C–6 specifically warn that corroded shells N–O–T be hydrostatically retested under certain conditions.

OSHA has decided to change the proposed language to reflect the language of the 1978 edition of the NFPA 10 standard because the specific cases when the shells should not be tested are listed by NFPA. OSHA recognizes the potential hazard with testing weakened shells and believes that the amendment will assure employee protection from injuries which could occur if the weakened shell failed under actual use or under hydrostatic test conditions.

The five exceptions when shells should not be hydrostatically tested are as follows:

(1) When the unit has been repaired by soldering, welding, brazing or use of patching compounds;

(2) When the cylinder or shell threads are damaged;

(3) When there is corrosion that has caused pitting including corrosion under removable nameplate assemblies;

(4) When the extinguisher has been burned in a fire; or

(5) When a calcium chloride extinguishing agent has been used in a stainless steel shell.

Paragraph (f)(4) of the proposal contained a hydrostatic test requirement for hose assemblies equipped with shut-off nozzles. One commenter (Ex. 7: 56) questioned the need for the proposed requirement. OSHA believes the requirement is necessary to assure employee safety from injuries which may occur due to failure or rupture of the hose under pressure; flexion or mechanical damage can weaken hose materials to the point where they will rupture under pressure.

Hose failure at the time of a fire would render an extinguisher useless and could expose an employee to a hazardous situation. Therefore, OSHA has decided to adopt the proposed language as paragraph (f)(5) of the final standard.

Paragraph (f)(5) of the proposal provided for a test pressure and interval for the testing of carbon dioxide extinguisher cylinders and nitrogen or carbon dioxide cylinders used with extinguishers. OSHA is adding the exception found in NFPA 10–1978 for cylinders complying with U.S. Department of Transportaton (DOT) regulations. The exception in NFPA 10 permits cylinders (except those charged with carbon dioxide) complying with § 173.34(e)(15), Title 49, Code of Federal Regulations, to be hydrostatically tested every 10 years instead of at the test specified in the paragraph (NFPA 10–1978; 5–3.1, Ex. 8: 213). OSHA is recognizing the exception because it will make the OSHA standard (final paragraph (f)(10)) consistent with both the NFPA and the DOT regulations without reducing employee safety.

Paragraph (f)(6) of the proposal (final paragraph (f)(11)) established a test pressure for stored pressure and Halon 1211 fire extinguisher shells. One commenter (Ex. 7: 11) questioned why OSHA limited the proposed requirement to Halon 1211 and did not include Halon 1301. OSHA did not include Halon 1301 because this type of extinguisher is not considered a stored pressure unit but rather is a self-expelling type similar to carbon-dioxide extinguishers.

In paragraph (f)(7) of the proposal (final paragraph (f)(12)) OSHA establishes a test pressure for acceptable soda-acid and foam type extinguishers.

In proposed paragraph (f)(8) OSHA established a test pressure for carbon dioxide hose assemblies. Two commenters (Ex. 7: 94; 168) suggested that OSHA correct the metric conversion for the pressure to read "8620 kPa." OSHA has made the correction in the rule (final paragraph (f)(6)). OSHA has also decided to amend the proposed language by requiring the tests to be performed on extinguishers with shut-off nozzles. OSHA believes this change will more specifically describe the type of hose to be tested than the language used in the proposal.

In proposed paragraph (f)(9) (final paragraph (f)(7)), OSHA establishes the test pressure for dry chemical and dry powder hose assemblies and corrects the metric conversion figure.

In paragraph (f)(10) of the proposal (final paragraph (f)(13)) OSHA prohibits the use of air or gas pressure for testing cylinders.

In paragraph (f)(11) of the proposal (final paragraph (f)(14)) OSHA mandates that portable fire extinguishers which fail hydrostatic testing be removed from service and the workplace. OSHA has decided to modify the proposed language to require that extinguisher shells that are found unfit for testing under the criteria of paragraph (f)(4) of the final rule also be removed from service and the workplace. This change is being made to clarify the original intent of proposed paragraph (f)(11).

In paragraph (f)(12) of the proposal, OSHA specified the type of equipment to be used in hydrostatic testing of cylinders. The NFPA (Ex. 7: 161) contended that the proposal was appropriate for compressed gas cylinders, but was too stringent for non-compressed gas cylinders. Accordingly, they requested that OSHA adopt the guidelines established in NFPA 10-1978 for non-compressed gas cylinders, including the use of a hydrostatic test pump, a flexible connection for connecting the cylinder to the pump, and a protective cage or barrier. OSHA agrees that NFPA 10-1978 more clearly and specifically addresses the separate procedures and equipment to be used in testing non-compressed and compressed gas cylinders, respectively. Therefore, the proposed language is modified to cover only compressed gas cylinders, and new provisions based on NFPA 10-1978 are added to cover non-compressed gas cylinders. These testing requirements are contained in final paragraphs (f)(15)(i) and (f)(15)(ii).

Paragraph (f)(13) of the proposal (final paragraph (f)(9)) OSHA mandates that a protective cage be used when testing carbon dioxide hose assemblies.

Paragraph (f)(14) of the proposal (final paragraph (f)(3)) OSHA requires that, in addition to a visual examination, an internal examination of extinguisher shells must be conducted prior to testing.

In paragraph (f)(15) of the proposal OSHA mandated that the employer maintain records of required hydrostatic testing for 12-years. Several commenters (Ex. 7: 49; 73; 96; 113; 160; 173) questioned the need to retain records of 5-year test intervals for 12-years. A typical comment came from Western Electric (Ex. 7: 96 p. 3):

> The requirement to retain hydrostatic test records for a period of 12-years is not consistent with the actual test frequency as shown in Table L-1. The record retention should be in agreement with the test frequency interval for each particular type of extinguisher shown in Table L-1.

OSHA agrees with the comments and has amended the proposed language (final paragraph (f)(16)) to require that test records be maintained until the extinguisher is hydrostatically tested again. This change will reduce the burden of recordkeeping for employers and more accurately reflect the test frequency intervals.

In proposed paragraph (f)(16) (final paragraph (f)(8)), OSHA provides for an exemption from test marking for hose assemblies.

Training and education: Paragraph (g). This paragraph contains the requirements for training and educating employees in the proper techniques of incipient stage fire fighting.

These requirements are being promulgated to fill a gap in the standards that was identified during the development of the proposal. Several commenters (Ex. 7: 33; 41; 98; 122) suggested that if OSHA is going to permit employees to fight fires, then OSHA should also require employers to train and educate employees concerning the proper methods.

In proposed paragraph (g)(1) OSHA proposed that employers develop an educational program to familiarize employees with the general principles of fire extinguisher use. One commenter, Babcock-Wilcox, stated (Ex. 7: 73 p. 3):

> Providing an educational program for all employees as outlined here, and described in definition 15 (1910.156), is a process which goes beyond what is necessary to indoctrinate general employees. We think periodic reminders to all employees to know where extinguishers are located, to read the labels on extinguishers, and to know the difference between classes of fires is all that is necessary where the established procedure calls for using an extinguisher on small fires only where an employee feels confident in doing so.

Paragraph (g)(1) does not require an extensive educational program for all employees. OSHA believes that these basic principles of fire protection and prevention can be periodically transmitted to employees through various media.

Periodic reminders such as pay check envelope supplements, inter-office memos, or other administrative techniques including group instruction directed to employees who may use fire extinguishers would be helpful as parts of educational programs.

The goal of the educational program requirement is to assure that those employees who may use fire extinguishers are made aware of and kept familiar with the types and locations of extinguishers in the workplace, what fires they are effective on, the way to correctly operate them, and the company's fire protection and prevention policies.

The educational program does not include hands-on training, but where the employer decides to provide a training program this will be deemed acceptable as meeting the requirement for an education program. Employers are encouraged to develop educational programs that cover a wide spectrum of fire protection and prevention principles rather than programs that are limited to one or two principles. OSHA believes that the expanded type training will enhance employee awareness of fire protection and prevention policies.

Therefore, OSHA has decided to adopt paragraph (g)(1) as proposed, with several editorial corrections for clarification.

In paragraph (g)(2) OSHA provides for employee educational programs at initial employment and at least annually thereafter. Some commenters (Ex. 7: 73; 74; 119; 148; 168; 173) believed that an annual review was too frequent and created an undue burden on the employer. OSHA has decided to keep the requirement for annual review as proposed because the requirement is not an excessive burden on employers and does not mandate hands-on training or time away from a job. The annual requirement to educate employees is reasonable because it can be accomplished through administrative means such as written reminders to employees. Fire insurance carriers and fire equipment distributors provide useful educational materials to policyholders or customers at limited or no cost.

Since OSHA believes that an effective educational program can be carried out on an annual basis without imposing a substantial burden on employers, OSHA is keeping the annual review requirement in the final standard.

In paragraph (g)(3) OSHA established a training requirement for those designated employees who would be expected to use portable fire suppression equipment as part of an emergency action plan. OSHA believes that those employees who must fight fires in the workplace should be given first-hand experience in what to expect

MCD 000013892

if such equipment is used. OSHA has established a requirement that employees who are designated to fight fires be provided with hands-on training in the use of the portable fire suppression equipment that they will be expected to use. OSHA believes that hands-on training is the best method to acquaint employees with the operation of the available equipment. Hands-on training does not require actual fire fighting, but it must include operation of the equipment employees are to use. Employers can contract for training services or conduct their own. The lack of a training requirement has often been cited as one of the gaps in the existing OSHA standards.

Paragraph (g)(4) requires that training sessions be given upon initial assignment and at least annually thereafter. OSHA has determined that an annual requirement is necessary to be consistent with the training requirements for fire brigades. Annual training will also keep employees familiar with equipment and hazards in the workplace. OSHA does not expect employers to take employees out to a fire training ground or parking lot to discharge the same type of extinguisher every year. OSHA believes that the training program should be developed to give employees as much exposure to the different types of fire extinguishing devices and tactics available for use in the workplace. Once employees have mastered the use of the particular piece or pieces of equipment that they are to use, the employer should see that employees are given additional information to increase the employee's knowledge of fire protection and prevention techniques.

Section 1910.158 Standpipe and hose systems.

This section contains the minimum requirements for standpipe equipment, water supplies, inspection, testing, and maintenance. The requirements establish design and installation criteria for those systems installed to meet a particular OSHA standard, but this section does not actually require the employer to install a standpipe system. Another OSHA standard must cross-reference this section to make it mandatory.

For example, if a standpipe system is required by an OSHA standard for a sawdust bulk storage plant, then the specific standard covering the sawdust bulk storage plant will require the standpipe system to be installed. The standpipe system will then have to meet the requirements of § 1910.158. PPG Industries summarized the majority of comments when it stated (Ex. 7: 97 p. 2):

> PPG agrees with the proposal that design and installation criteria for fire protection equipment and systems, required by other OSHA standards, should not be repeated in those standards; *rather*, these standards should reference OSHA Subpart L, Fire Protection for those criteria.

OSHA has decided to follow the recommendations of the commenters, because the approach will provide significant flexibility in determining the type of fire protection systems that can be installed in various workplaces. For example, as OSHA develops standards for various workplace fire hazards, the specific standard will either reference the entire section in Subpart L that covers the desired fire protection equipment, or it can reference only those parts of a section that are relevant to that workplace.

In this manner, OSHA will require by reference to Subpart L, the most effective fire protection equipment or system necessary for a specific fire hazard. This will eliminate the need for employers to refer to outside references. This reference to Subpart L in other subparts of Part 1910 will be used for all the standards for fixed and portable fire suppression systems and equipment.

Therefore, in § 1910.158, OSHA has decided to establish design and installation criteria for those standpipe systems required by other OSHA standards. This section does not require the employer to install the system.

The following changes in § 1910.158 paragraph numbering have been made to reflect deletions made in the final standard:

Proposed	Final	Proposed	Final
(a)(1)	(a)(1)	(c)(2)(i)	(c)(2)
(a)(2)	(a)(1)	(c)(2)(ii)	(1)
(a)(3)	(a)(2)	(c)(2)(iii)	(1)

[1] Deleted.

Scope and application: Paragraph (a). In paragraph (a)(1) of the proposal OSHA established the scope as including the requirements for the components, the water supply, the testing and the maintenance of standpipe systems installed to meet a particular OSHA standard. In changing the proposed language in paragraph (a)(1), OSHA included the proposed language of (a)(2) in the final language for (a)(1).

The final language in (a)(1) states that the section covers all small hose, Class II, and Class III standpipe systems installed to meet a particular OSHA standard.

Paragraph (a)(3) of the proposal (final paragraph (a)(2)) exempts from this section, Class I standpipe systems which are installed for use by full-time fire fighters trained in the handling and use of heavy hose streams. Generally Class I systems have no hose attached to the connection and are not ready for immediate use. The hose is generally provided by the responding fire department and is connected by them. OSHA does not believe that regulation of such systems is necessary for employee safety.

Protection of standpipe systems: Paragraph (b). In paragraph (b) OSHA requires that standpipes be located or otherwise protected against mechanical damage. It is also required that damaged standpipes be repaired promptly. One commenter, the Monsanto Company (Ex. 7: 110), suggested that employers should not be required to provide protective barriers around all standpipes. It was not OSHA's intention to require such barriers. The protection required by this paragraph can be afforded in many ways including guarding by location away from mechnical impacts.

Equipment: Paragraph (c). This paragraph contains the requirements for equipment used in standpipe systems installed for employee use. The paragraph covers hose cabinets and reels, hose connections, hose, and nozzels.

Paragraph (c)(1) requires that the employer design hose reels and cabinets in a manner that will not interfere with the operation of the standpipe system. It also requires that the employer identify the hose cabinets and use them only for fire equipment.

Final paragraph (c)(2)(i), establishes the criteria for hose outlets and connections.

In paragraph (c)(2)(ii) of the proposal, OSHA proposed criteria for the installation of pressure reducing devices at hose outlets.

Several commenters (Ex. 7: 38; 65; 94; 104; 150) suggested that the language be changed or deleted. OSHA believes that the regulation of excessive pressure in standpipe systems is better covered in the requirements for hose in paragraph (c)(3) which also addresses the pressure range acceptable at the nozzle end of hose lines. Therefore OSHA is deleting proposed paragraph (c)(2)(ii) and will address the hazard of excessive pressure in paragraph (c)(3)(iii) of this section.

In proposed paragraph (c)(2)(iii), (final paragraph (c)(2)(ii)), OSHA establishes a requirement that hose coupling screw threads be standardized or be compatible through the use of adapters. OSHA believes that standardized threads are highly advisable. The purpose of this provision is to assure

Published by THE BUREAU OF NATIONAL AFFAIRS, INC., WASHINGTON, D.C. 20037

that hose connections can be made at the time of a fire. If an employer can achieve this goal with the use of adapters or through the use of standardized screw threads, that will be acceptable to OSHA.

In paragraph (c)(3)(i) OSHA proposed a requirement for 1½" standpipe hose to be attached to the hose outlet and to be ready to use. OSHA has decided to change the language in response to several comments (Ex. 7: 40; 94: 150). First, OSHA is deleting the specific reference to 1½" hose because OSHA is recognizing hose diameters from ⅝" up to 1½" for use on standpipe systems. Second, OSHA is requiring that only those hose outlets being used to meet the standard have hose attached and ready for use. In cases where employers have hose outlets which serve as secondary water supplies or are not being used to meet the standard, these hose outlets need not have hose attached to them. Those hose outlets being used as substitutes for portable fire extinguishers require hose attached and ready for use.

Third, OSHA is permitting hose to be stored away from exterior hose outlets whenever outdoor environmental conditions would adversely affect hose stored at such outlets. OSHA has decided to make this change to the proposed language based on a consideration of specific problems found in extremely cold climates such as those on the Alaskan North Slope.

In paragraph (c)(3)(ii) OSHA proposed a requirement that lined hose be installed on all hose systems installed after July 1, 1981. In Issue 14 of the Notice of Proposed Rulemaking (43 FR 60050), OSHA raised the question of whether unlined linen and hemp hose should be prohibited by OSHA. OSHA raised the issue because of the potentially hazardous condition that can exist with unlined linen or hemp hose that is improperly maintained. Unlined linen or hemp hose requires a good maintenance program and is subject to dry-rotting when it is not stored properly or when it is not thoroughly dried after use. Dry-rotted hose can fail unexpectedly when it is charged with water at the time of a fire.

Several commenters (Ex. 7: 18; 33; 66; 98; 109; 160; 173) addressed this issue. Some suggested that there is no problem with unlined hose if it is properly maintained. The General Motors Corporation (GM) stated (Ex. 7: 98 p. 4):

> Unlined linen hose should not be prohibited by OSHA. If existing standards do not contain adequate requirements for inspection and maintenance, then adequate requirements should be made. Lack of maintenance by itself is no reason for prohibition of the unlined hose.

OSHA agrees with the GM comment that lack of maintenance requirements is no reason to prohibit unlined hose. Therefore, OSHA is changing the proposal by not prohibiting unlined hose until it becomes unserviceable. If an employer can, through an effective maintenance program as required in paragraph 1910.158(e) of the final rule, assure the reliability of unlined hose, then the continued use of the hose is acceptable to OSHA. This amendment is consistent with the language in the current NFPA standard on standpipe systems, NFPA 14–1978.

The present NFPA standard requires that lined hose be used on all systems installed after June, 1976. Further, OSHA believes that unlined linen hose leaks excessively and wastes limited water supplies, and that the strength integrity of an unlined linen hose jacket is not as strong as a lined hose jacket. OSHA also believes that unlined hose will not be serviceable either with the test pressure requirements for hose in paragraph (e)(1)(ii) or with the use of shut-off nozzles where the hose may be subjected to high pressure when the nozzle is shut off. Therefore, upon failure of unlined hose to meet the requirements of 1910.158(e) unlined hose systems will necessarily be phased out.

Many commenters (Ex. 7: 6; 41; 42; 43; 55; 56; 97; 122; 161; 175) support a requirement to either phase-out or replace unlined hose when it is no longer serviceable. Therefore, OSHA has decided to adopt the proposed language as the final standard because it will permit continued use of serviceable unlined hose, but will require lined hose on new systems and on those systems where unlined hose has become unserviceable. OSHA believes that this approach will assure employee safety when using unlined hose.

In paragraph (c)(3)(iii) OSHA establishes 30 psi as the minimum water pressure acceptable at the nozzle of standpipe systems. Paragraph (c)(3)(iii) also addresses the maximum and minimum water pressure levels which were proposed as paragraph (c)(2)(ii).

In proposed paragraph (c)(2)(ii), OSHA limited the maximum water pressure under static or dynamic conditions to 100 psi. OSHA received several comments (Ex. 7: 65; 75; 87; 93; 94; 97) addressing the proposed 100 psi maximum limit.

The commenters noted that it was not uncommon to find water pressures greater than 100 psi and that employees trained in the use of fire hose could handle greater pressures. In paragraph (c)(3)(iii) of the final standard, OSHA is changing the maximum pressure level from 100 psi (as proposed in (c)(2)(ii)) to 125 psi. OSHA is aware that variable stream nozzles are designed to operate at 100 psi pressure. However, the higher pressure is acceptable because trained employees using shut-off nozzles can handle 125 psi safely, and because the greater pressure limit will both accommodate pressures found in some standpipe systems and enhance design flexibility for standpipe systems. Further, OSHA has added a sentence to limit dynamic flow pressures to a range between 30 psi and 125 psi inclusive at the nozzle.

In paragraph (c)(4) of the proposal OSHA mandated that all standpipe hose used to meet this standard be equipped with shut-off type nozzles beginning July 1, 1981. In addition to the proposed language, OSHA raised an issue in the Notice of Proposed Rulemaking, which asked whether OSHA should mandate variable stream shut-off nozzles (Issue No. 12, 43 FR 60050).

The majority of commenters (Ex. 7: 33; 72; 97; 98; 169; 175) addressing Issue 12 and the proposed language in paragraph (c)(4) supported the requirement for shut-off nozzles but did not believe that variable stream nozzles were necessary.

The comments indicated that while variable stream nozzles may provide additional water patterns to use in fighting fires, there was no need to specifically require them since a straight stream nozzle with a shut-off valve could provide adequate water to control or extinquish the types of fires with which OSHA is concerned.

OSHA believes that only shut-off nozzles are necessary for employee safety, because it gives the employee adequate control over the flow of water for better tactical use. It also allows the employee to shut off a nozzle and move it to a new vantage point while it is charged with water, to use the water for the best effect. This option is not usually available to employees using a straight stream open bore type nozzle. With straight stream open bore type nozzles, the employee has no way to control the water supply if the pressure becomes too great for proper handling of the hose. If it becomes necessary to drop the nozzle and run, the straight stream open bore nozzle can "whip" around and injure employees. Therefore, OSHA has decided to adopt the proposed language as the final standard with some minor editiorial changes.

OSHA wishes to emphasize that the final standard requires a shut-off type nozzle. For the purpose of compliance, employers may use a ball valve or similar valve placed in the hose line between a straight-stream open bore nozzle and the hose. OSHA believes this approach can reduce the burden of replacing nozzles where such valves are available.

Water supplies: Paragraph (d). In proposed paragraph (d) OSHA established the minimum water supply of 30 minutes duration at 100 gallons per minute for standpipe systems. OSHA also proposed a minimum residual pressure at the topmost outlet. OSHA raised a related issue in the Notice of Proposed Rulemaking (Issue "d", 43 FR 60051) which asked whether single source water supplies would be adequate for employee safety. The majority of commenters (Ex. 7: 11; 32; 34; 37; 43; 55; 65) supported the concept of single source supplies in low and ordinary occupancy workplaces where the supply will adequately protect employees during evacuation or incipient stage fire fighting operations. OSHA has decided that a water supply meeting the proposed 30 minute duration, 100 gallon per minute criterion is necessary for employees safety regardless of the number of sources. If the employer can assure that a single water supply will provide 100 gallons per minute for 30 minutes, then OSHA will consider it an acceptable supply.

Employers should be aware that a number of fire protection systems could simultaneously draw from a single source. In providing a single source supply, the employer must be able to assure that the water supply criteria for the standpipe system can be met when the source is supplying all of the systems connected to it.

OSHA is adopting the proposed language of paragraph (d) except the residual pressure criteria for the topmost outlet; standpipe pressures are adequately addressed in paragraph (c)(3)(iii) of the final standard.

Tests and maintenance: Paragraph (e). Paragraph (e) contains the minimum criteria for acceptance tests and maintenance to be performed on standpipe systems used to meet this standard.

Final paragraph (e)(1)(i) establishes criteria for hydrostatically testing piping in Class II and Class III standpipe systems installed after January 1, 1981. There were some comments (Ex. 7: 44; 99) which suggested additions to the acceptance tests. However, OSHA believes that the language, which is consistent with NFPA 14–1978, adequately covers the tests needed to assure system reliability.

In paragraph (e)(1)(ii) of the proposal OSHA established the criteria for hydrostatically testing fire hose to be used on standpipe systems installed after January 1, 1981.

Several commenters (Ex. 7: 41; 55; 72; 173; 175) suggested that OSHA adopt the appropriate provisions of the current NFPA 14–1978 standard on standpipe systems. After reviewing the proposal for consistency with the NFPA standard, OSHA has decided to adopt the proposed language as the final standard with the following minor changes. OSHA has deleted the specific reference to Class II and Class III standpipe systems and replaced it with the term "standpipe systems" because OSHA recognizes hose systems other than Class II and Class III. Hose on all standpipe systems must comply with these requirements.

In paragraph (e)(2)(i), OSHA establishes the requirement to keep water supply tanks filled to the proper level.

Paragraph (e)(2)(ii) establishes the requirement that valves in the main piping connections of automatic water supplies be kept fully open at all times.

OSHA received one comment (Ex. 7: 44) which suggested that OSHA require the valves to be supervised in order to monitor whether they are in the open position. Although OSHA agrees that supervision of valve assemblies may be one way to assure the reliability of a system, OSHA also recognizes that it is possible to keep valves open without a true electrical supervision program through a good preventive maintenance program conducted by trained technicians.

In paragraph (e)(2)(iii) OSHA proposed semi-annual physical inspections of standpipe hose. The NFPA (Ex. 7: 161) suggested that OSHA adopt a requirement for annual rather than semi-annual inspection of fire hose, as contained in NFPA Standard No. 1962–1979. OSHA agrees that the OSHA standard should be consistent with the NFPA standard in this regard.

OSHA does not believe that this change from semi-annual to annual inspection will reduce employee safety.

Where employers are providing hose systems in lieu of portable fire extinguishers, such systems are to be treated as "portable extinguishers" for the purpose of inspection, and § 1910.157 requires a monthly inspection check of such systems.

In proposed paragraph (e)(2)(iv) OSHA required that unserviceable components of systems be removed from service and replaced with equivalent protection. OSHA has clarified the proposed language in the final standard by citing examples of equivalent protection such as fire watches and portable extinguishers.

In paragraph (e)(2)(v) OSHA proposed that unlined hose be un-racked, physically inspected, and re-racked annually. OSHA also proposed that defective hose be replaced in accordance with this standard. One commenter (Ex. 7: 6) suggested that OSHA require that a different fold pattern be used when re-racking the hose. OSHA has decided to add such a requirement because it assures that the yarns in the hose casing do not become worn or weakened due to continued folding at the same places.

Paragraph (e)(2)(vi) provides that all inspections required in this paragraph be conducted by trained persons designated to perform the task.

Section 1910.159 Automatic Sprinkler Systems

This section contains the minimum design and installation criteria for automatic sprinkler systems installed to meet an OSHA standard. The section, by itself, does not require sprinkler systems to be installed. For example, in § 1910.106(h)(6)(ii)(D), OSHA requires processing plants to be protected by "an approved automatic sprinkler system." The required system must be installed and maintained in accordance with the requirements of this section.

Scope and application: Paragraph (a). Paragraph (a) explains which systems are covered by the requirements of this section and which requirements apply to those systems.

Paragraph (a)(1) requires the employer to install, maintain, and test automatic sprinkler systems installed to comply with OSHA standards in accordance with the requirements of this section.

In paragraph (a)(2) OSHA proposed to continue to accept automatic sprinkler systems installed prior to the effective date of this standard and in accordance with a previous NFPA or National Board of Fire Underwriters (NBFU) standard if the system is kept in compliance with the earlier NFPA or NBFU standard. Several commenters (Ex. 7: 65; 66; 160) suggested that OSHA delete all references to the NBFU since that organization no longer exists. OSHA is aware of the termination of NBFU and of the fact that the NBFU generally republished the NFPA standard in effect at the time they promulgated their standards booklet. However, OSHA will still recognize older installations as being acceptable if they comply with the NBFU standard in effect at the time of installation. Similarly, compliance with the NFPA standard in effect at the time of installation will also be recognized as acceptable compliance with this OSHA standard.

Published by THE BUREAU OF NATIONAL AFFAIRS, INC., WASHINGTON, D.C. 20037

MCD 000013895

Therefore, OSHA has made no changes to the proposed language.

Exemptions: Paragraph (b). In paragraph (b) OSHA proposed to exempt automatic sprinkler systems installed in the workplace for the sole purpose of property protection. Some commenters (Ex. 7: 42; 74) asked who makes the determination that a system is installed solely for property protection. The J. I. Case Company stated (Ex. 7: 74 p. 8):

> Who is to ascertain the exemption? Virtually all Case facilities are protected by automatic sprinkler systems and (they) are there, for the most part, for property protection.

OSHA has decided to amend the proposed language to clarify the interpretation of "for the sole purpose of property protection." OSHA has taken the position that only those systems required by OSHA should be regulated by this standard.

Other systems installed in the workplace can be considered property protection systems and subject to the control of local fire officials. Therefore, OSHA has modified the proposed language to more clearly reflect this view.

General requirements: Paragraph (c). Paragraph (c) contains the minimum requirements for the design, maintenance, and testing of automatic sprinkler systems.

OSHA has renumbered some of the proposed paragraphs as follows because of deletions made in the final standard:

Proposed and Final

(c)(8) is deleted.
(c)(9)(i) now (c)(8)(i).
(c)(9)(ii) now (c)(8)(ii).
(c)(9)(iii) now (c)(8)(iii).
(c)(10) now (c)(9).
(c)(11) now (c)(10).
(c)(12) now (c)(11).

In paragraph (c)(1)(i) OSHA establishes the minimum design criteria for automatic sprinkler systems. The proposed language required that systems provide the necessary waterflow, water densities, and water discharge patterns to provide complete coverage of the hazard area. OSHA has decided to adopt the proposed language as the final rule with a change which does not affect the substance of the proposed requirement but will clarify the language.

OSHA is deleting the phrase, "whether hydraulic or pipe schedule," from the final language because all sprinkler systems are based on either one or the other type of design.

Paragraph (c)(1)(ii) requires that only approved equipment and devices be used in the design and installation of a sprinkler system.

Paragraph (c)(2) OSHA requires that employers properly maintain systems installed to comply with this section. The U.S. Department of Energy (Ex. 7: 142), suggested that repairs only be performed on systems when employee exposure is at a minimum. OSHA agrees with the suggestion and has decided to include it in the appendix as a guideline. OSHA has also added a requirement that employers must assure that an annual main drain flow test is conducted and that the inspector's test valve is opened at least every two years. OSHA believes that this provision will further assure the reliability of the system and the adequacy of the maintenance program.

In paragraph (c)(3) OSHA proposed certain acceptance tests that must be performed on sprinkler systems to assure they will function properly when needed. One commenter, Southwest Research Institute (Ex. 7: 33), questioned the need for elaborate tests. OSHA does not believe that the tests required by the standard should be characterized as elaborate. Because of the recognized excellent performance of systems installed and tested in accordance with the NFPA standard on Automatic Sprinkler Systems, NFPA 13, OSHA proposed the same tests that are recommended by the NFPA. OSHA has decided to adopt the proposed tests in the final standard because of the degree of safety that they will provide employees in assuring that the system will function as designed. OSHA has also revised the proposed language by changing the effective date for the requirement to give employers additional time to comply.

In paragraph (c)(4) OSHA proposed that each automatic sprinkler system be provided with at least one automatic water supply capable of providing the designed flow for at least 30 minutes. OSHA also proposed that an auxiliary water supply be available or an emergency evacuation plan be prepared for use when the system is out of service.

Several commenters (Ex. 7: 38; 51; 68; 72) questioned the need for an auxiliary water supply if employees are assured of alternative means of safety such as hose lines and fire watches when the primary water supply is not available. Other commenters (Ex. 7: 37; 38; 72; 74) found the requirement for an emergency evacuation plan to be too burdensome and suggested that other alternative means of safety are available. OSHA has decided to change the proposed language to reflect that an emergency evaculation plan is only one of many alterntive means of providing employee safety when the primary water supply is out of service. These alternatives may include auxiliary water supplies, fire watches, or increased standpipe hose or extinguisher coverage. OSHA believes that the change to the proposed language will provide the employer with a greater degree of flexibility in determining alternative means of providing employee safety without reducing the level of safety.

In paragraph (c)(5) OSHA proposed that employers may attach hose connections for fire fighting use to wet pipe sprinkler systems in other than high hazard occupancies if the water supply could satisfy the designed waterflow demand for both the hose connections and sprinkler systems. Some commenters (Ex. 7: 94; 168; 173) suggested deleting the proposed restriction on high hazard occupancies. OSHA believes as long as a combined system provides an adequate water supply for both the hose connections and the sprinkler systems, then such a combined system should be acceptable, even in high hazard occupancies. The Organization Resource Counselors, Inc. (ORC) stated (Ex. 7: 94 p. A-10):

> Where hose outlets are attached to sprinkler systems especially in case of high hazard spacing this should be permissible providing the hydraulic calculation includes the water supply demand for hose outlets.

The Xerox Corporation further supports the deletion (Ex. 7: 173 p. 6):

> We feel this reference to "high hazard" should be deleted from the standard.
>
> National consensus standards do not restrict fire hoses for this reason. If the concern is employee safety, is the hazard greater using a hose at a high hazard workplace? Also, if the employee is properly trained and protected, it should not matter what the degree of workplace hazard.

In addition, it should be noted that NFPA 13-1978 does not restrict the use of 1½" hose line connections to wet pipe sprinkler systems provided that the water supply is sufficient for both. Therefore, OSHA has decided to delete the high hazard restriction from the final standard. Although NFPA does prohibit 2½" fire department connections in high hazard occupancies, OSHA is not adopting that provision because OSHA is not regulating connections for fire department use.

Paragraph (c)(6) requires that sprinkler piping be protected against freezing and exterior surface corrosion.

Paragraph (c)(7) provides that all dry sprinkler system piping be installed so that it can be drained. This is necessary so that water which could freeze or cause interior pipe corrosion can be drained after each use or test.

MCD 000013896

Paragraph (c)(8) of the proposal prohibited torch cutting as a means of modifying or repairing sprinkler systems because of the potential for obstruction of the waterflow. Several commenters (Ex. 7: 18; 33; 73; 94; 102; 173) suggested that there is no problem with torch cutting if the employer can assure unrestricted waterflow after the repairs are completed and if the performance of the system can be assured. Since OSHA is shifting toward performance type standards, OSHA believes that this proposed requirement is not necessary if the employer can assure unrestricted flow of water through the system. This can be determined by testing the system. Therefore, OSHA has decided to delete the proposed requirement because it is not necessary to limit the methods of modifying or repairing sprinkler systems if the employer can assure that the system will operate effectively.

Proposed paragraph (c)(9)(i), (final paragraph (c)(8)(i)), requires that only approved sprinklers be used on acceptable sprinkler systems.

In paragraph (c)(9)(ii) of the proposal OSHA permitted use of older style sprinklers as replacements in systems using the old style sprinklers or the replacement of standard sprinklers if a complete engineering review is done on the system. (The water patterns of older style sprinklers do not provide uniform density over the protected area as compared to the water patterns of standard sprinklers which do provide uniform density over the protected area.) Some commenters (Ex. 7: 74; 93) questioned the need for a complete engineering review. DuPont remarked (Ex. 7: 93 p. 5) "A complete engineering review is unnecessary, an engineering review of the altered part of the design is all that is necessary." The J. I. Case Company (Ex. 7: 74) discussed the costs that would be related to such a requirement. OSHA has decided to change the proposed language (final paragraph (c)(8)(ii)) by requiring an engineering review of only the altered part or parts of the system. OSHA agrees that an engineering review of the unaltered part of the system would serve no function for employee safety.

Proposed paragraph (c)(9)(iii), (final paragraph (c)(8)(iii)), requires that sprinklers located where they are subject to mechanical damage be protected with effective guards to prevent mechanical damage.

Proposed paragraph (c)(10), (final paragraph (c)(9)), requires a local water flow alarm on all systems having more than 20 sprinklers which activates with a flow equal to that of a single sprinkler. One commenter (Ex. 7: 97) suggested that alarms other than water motor gongs should be permitted. OSHA did not intend to limit alarm selection to water motor gongs. Any type of approved alarm that indicates waterflow equal to that from a single sprinkler is acceptable.

Paragraph (c)(11) of the proposal (final paragraph (c)(10)) establishes the performance criteria for sprinkler spacing.

In proposed paragraph (c)(12), (final paragraph (c)(11)), OSHA establishes identification requirements for hydraulically designed systems.

Section 1910.160 Fixed Extinguishing Systems, General

This section contains the minimum general requirements for all fixed extinguishing systems except automatic sprinkler systems. Automatic sprinkler systems are covered in § 1910.159. The format of this section differs significantly from the previous OSHA fire protection sections because it applies to all fixed systems rather than one single system. The general requirements of this section are to be applied along with the more specific requirements of this subpart for a particular agent, to regulate fixed extinguishing systems which are required by other OSHA standards.

For example, if a Halon 1301 system is required by OSHA or is used to meet an OSHA standard, then that Halon system would have to meet the requirements of both §§ 1910.160 (general requirements) and 1910.162 (gaseous systems). OSHA believes that this format will make the standard easier to understand as it eliminates the need to repeat the general requirements in each section. In addition, as noted in paragraph (a)(2), certain portions of this section apply to those extinguishing systems, regardless of whether they are required by an OSHA standard, with extinguishing agents which could expose employees to possible injury, death, or adverse health consequences.

Scope and application: Paragraph (a). Paragraph (a) explains what fixed systems are covered and what requirements apply to them.

In paragraph (a)(1) OSHA proposed that the section apply to all fixed systems. OSHA has decided to amend the language of the final rule to make it clear that automatic sprinkler systems are not covered by this section. Section 1910.159 adequately regulates automatic sprinkler systems.

In paragraph (a)(2) OSHA proposed that all fixed systems that could, by means of their operation, expose employees to possible injury, death, or adverse health consequences were covered by paragraphs (b)(4) through (b)(7) and (c) of this section.

OSHA has decided to adopt the proposed language as the final requirement except for adding the phrase "caused by the extinguishing agent" to the final language to clarify those adverse health consequences about which OSHA is concerned.

Paragraph (a)(3) exempts those systems otherwise covered in (a)(2) from the requirements of this section if there is no employee exposure.

General requirements: Paragraph (b). This paragraph contains the minimum general requirements for the design, maintenance, and inspection of fixed extinguishing systems. It also contains the minimum requirements for employee alarms related to fixed extinguishing systems.

In paragraph (b)(1) OSHA proposed that all fixed extinguishing systems, components and agents must be approved for their intended use.

OSHA has decided to change the proposed language because systems, while comprised of approved components, are not generally approved as total systems. Therefore, OSHA is changing the proposed language by eliminating the requirement that "systems" be approved and to require only that system components and agents be approved for use on specific hazards.

In paragraph (b)(2) OSHA proposed that employees be notified when fixed systems are inoperative and that the employer take the necessary temporary precautions to assure employee safety until the system is repaired and restored to service. There were no substantive comments which addressed the proposed language and OSHA is adopting the proposed language as the final rule.

In paragraph (b)(3) OSHA proposed the requirement for the installation of a discharge alarm to indicate when a fixed extinguishing system is discharging.

OSHA has changed the proposed language to permit the use of alternative signaling systems which comply with § 1910.165 and to clarify that the alarm or other system is only to activate in that portion of a workplace covered by the system. This change will provide flexibility in alarm selection and will require that the alarm be in the area covered by the system rather than in a remote area. OSHA has also changed the language to exempt systems where discharge is immediately apparent to anyone in the area. The purpose of the alarm is to assure that employees in an area where discharge is not immediately apparent are made aware that the system is discharging.

MCD 000013897

In proposed paragraph (b)(4) OSHA required the employer to provide an alarm to prevent employees from entering discharge areas where the atmosphere remains hazardous to employee safety and health. OSHA has changed the proposed language to permit the use of safeguards other than alarm systems rather than specifically limiting the means of warning.

OSHA believes this performance-type language will give the employer the flexibility necessary to provide safeguards such as barriers or door guards.

In paragraph (b)(5) of the proposal OSHA required the employer to post hazard warning signs in areas where extinguishing agents known to be hazardous exist. One commenter (Ex. 7: 65) suggested that the requirement should apply only to total flooding systems and not to local application systems. It is true that a hazardous concentration of an agent is most likely to occur in total flooding areas; however, there is a possibility that hazardous concentrations of certain agents could occur near local application systems.

OSHA has changed proposed paragraph (b)(5) to clarify that OSHA is concerned about the concentration of the agent and not the type of system. For example, Halon 1301 can be used in concentrations ranging from 5 percent to greater than 10 percent. In a 5 percent concentration the agent is not known to be hazardous; however, in concentrations greater than 10 percent the agent becomes hazardous to employees. OSHA is concerned about warning employees of the higher, more hazardous concentrations. Therefore, the final standard reads as follows: "The employer shall post hazardous warning or caution signs at the entrance to, and inside of, areas protected by fixed extinguishing systems which use agents in concentrations known to be hazardous to employee safety and health."

Paragraph (b)(6) requires an annual inspection of fixed extinguishing systems.

In paragraph (b)(7) OSHA proposed that the weight and pressure of refillable containers be checked semi-annually. The proposed language also established criteria for maintenance checks and recordkeeping. Several commenters (Ex. 7: 9; 38; 40; 66; 93; 94; 119) suggested changes to the proposed language that would permit dry-chemical containers to be checked annually and gaseous-type agent containers to be checked semi-annually.

OSHA has reviewed the applicable NFPA standards for dry chemical and gaseous agents (NFPA 17-1975; NFPA 12-1977; NFPA 12A-1977; NFPA 12B-1977) and has determined that a semi-annual pressure and weight check for both types of agents is necessary for employee safety and is consistent with the consensus standards. OSHA has deleted the recordkeeping requirement because it is adequately covered in paragraph (b)(9) of this section.

Paragraph (b)(8) requires that employers weigh factory-charged nonrefillable containers which have no means of pressure indication at least semi-annually.

In paragraph (b)(9), OSHA establishes a recordkeeping requirement for maintenance and inspection checks.

OSHA has changed the proposed language to permit records to be kept in a central location, on the container or on a tag attached to the container. OSHA believes that this change will make the requirement consistent with other recordkeeping requirements and will provide the employer with additional flexibility in recordkeeping. OSHA has also established a maximum time period for maintaining the record which is consistent with the other recordkeeping standards in this subpart. OSHA does not believe that it is necessary to retain the maintenance and inspection records beyond the life of the container being tested or maintained.

In paragraph (b)(10) of the proposal OSHA mandated that employers train and periodically review the inspection, maintenance, operation, and repair procedures with employees designated to perform those functions. The only change in the language as proposed is to require an "annual" review of the functions rather than a periodic review, in order to clarify OSHA's intent as to the meaning of "periodically."

In paragraph (b)(11) OSHA proposed that carbon tetrachloride and chlorobromomethane be prohibited as an extinguishing agent on fixed systems. Several commenters (Ex. 7: 11; 38; 52; 94; 98) suggested that OSHA exempt explosion suppression systems from the requirement because a large number of these systems use chlorobromomethane as the agent. As noted earlier, paragraph (a)(3) of this section exempts from the standards on fixed systems those otherwise hazardous systems which do not expose employees to the hazardous agent. Those explosion suppression systems using chlorobromomethane which operate in milliseconds within an enclosed space and pose no threat to employees are, therefore, exempted under paragraph (a)(3).

In paragraph (b)(12) OSHA proposed that the employer "coat" those system components installed out of doors or in the presence of corrosive atmospheres. Several commenters (Ex. 7: 9; 11; 93; 94; 173) suggested alternative ways of preventing corrosion of system components to coating or painting. The Ansul Company (Ex. 7: 9) claimed that some components, by means of their construction, may not be subject to corrosion. Another commenter (Ex. 7: 11) suggested the use of construction materials such as stainless steel for prevention of corrosion. OSHA believes that it is possible to protect system components from corrosion through means other than "coating." Therefore, the proposed language has been changed to permit system components to be protected by use of non-corrosive materials or other means.

Paragraph (b)(13) requires that automatic detection equipment be installed in accordance with 29 CFR 1910.164.

In paragraph (b)(14) OSHA proposed that all fixed systems be designed to operate within the range of −20° F (−40° C) to 130° F (54° C). There was also a proposed requirement that systems designed for extreme temperature operation be capable of functioning at the extreme temperature. Several commenters (Ex. 7: 9; 10; 11; 38; 49; 52) questioned the need for a specific range of temperatures if OSHA is concerned about establishing performance criteria. Some of the commenters suggested that the last sentence of the proposed requirement would suffice for employee safety. OSHA has decided to change the proposal by deleting the requirement that all systems function within the specified range because the purpose of the requirement is to assure that a system will operate correctly in the temperature range in which it is used. It is not necessary to design a system to operate at −20° F (−40° C) if the temperature never reaches that level where the system is located. OSHA believes this change will provide increased flexibility in the design of fixed systems particularly in areas of extreme temperature variations. The final requirement reads, ". . . that where systems are installed in areas with climatic extremes, they shall operate effectively at the expected extreme temperatures."

In paragraph (b)(15) OSHA proposed that the design concentration of an engineered system be reached within 30 seconds of initial discharge. An engineered system is one which is designed for the specific conditions present in a workplace. Several commenters (Ex. 7: 9; 32; 93; 120) identified inconsistencies between the

MCD 000013898

proposed OSHA standard and the present NFPA standards applicable to fixed Halon systems. NFPA 12A–1977 and NFPA 12B–1977 presently require designed concentration to be achieved within 10 seconds.

OSHA has decided to cover this topic in the individual sections which address the different systems. For example, the discharge time for dry chemical systems to reach the design concentration will be covered in § 1910.161 and the discharge time to achieve the design concentration for CO_2 and Halon systems will be covered in § 1910.162. Therefore, OSHA is deleting proposed paragraph (b)(15) because of the variable discharge rates for different types of agents as contained in the NFPA standards.

In paragraph (b)(16) OSHA proposed that automatic actuation on systems that exceed the maximum safe concentration of agent be by means of approved detecting devices and that an employee alarm be interconnected with the discharge system to assure employees can safely leave the area prior to discharge. OSHA has decided to move this requirement to paragraph (c) of this section which applies to total flooding systems with potential health and safety hazards to employees.

In paragraph (b)(17) of the proposal (final paragraph (b)(15)) OSHA mandates that one manual activation device be provided for each fixed extinguishing system.

Paragraph (b)(18), (final paragraph (b)(16)), OSHA requires that the employer identify manual operating devices as to the hazard they protect.

In paragraph (b)(19) of the proposal OSHA mandated that employers provide and make personal protective equipment readily available near the protected area for employee rescue from hazardous atmospheres. Some commenters (Ex. 7: 9; 11) questioned the meaning of "near the protected area." OSHA has decided to delete the phrase from final paragraph (b)(17) because it is vague and to change the remaining language to require that the equipment be available and used for immediate rescue of employees. OSHA believes that these changes will clarify where the equipment is required. The employer can determine where to store the equipment as long as it is immediately available to be used in rescuing employees stranded in the protected area.

In paragraph (b)(20) of the proposal, OSHA required the employer to provide a means of egress from the discharge area in accordance with 29 CFR Part 1910, Subpart E. One commenter (Ex. 7: 49) questioned the need for the requirement in this section since means of egress are more appropriately covered in Subpart E. OSHA agrees and is therefore deleting proposed paragraph (b)(20) from the final standard.

Total flooding systems with potential health and safety hazards to employees: Paragraph (c). Paragraph (c) contains minimum requirements for the protection of employees from hazards associated with the discharge of hazardous concentrations of extinguishing agent from total flooding systems. The requirements of this paragraph apply to any system installed in the workplace regardless of the purpose of the system. If the system, through its operation, exposes employees to hazardous concentrations of an extinguishing agent, then that system must meet the requirements of this paragraph.

Paragraph (c)(1) requires that the employer provide an emergency action plan in accordance with § 1910.38 for each discharge area protected by a total flooding system which provides an agent in concentrations greater than the maximum safe level for the agent as established in paragraphs (b)(5) and (b)(6) of § 1910.162.

Paragraph (c)(2) establishes an exemption from the requirements of paragraph (c) for those systems in areas which employees cannot enter either during or after the system discharge.

In paragraph (c)(3) OSHA proposed that the employer provide a pre-discharge alarm on total flooding systems covered by this paragraph. The proposed language stated that the alarm must operate at least 30 seconds before system discharge. Several commenters (Ex. 7: 6; 38; 49; 65; 120) suggested that the 30-second alarm is too restrictive. They indicated that 30 seconds between an alarm and discharge might allow too great a pre-burn time before flooding takes place, particularly in areas where employee egress can be completed within 30 seconds. OSHA recognizes that the purpose of a pre-discharge alarm is to assure that employees have sufficient time to evacuate the work area before the flooding system discharges. Therefore, paragraph (c)(3) is being revised to require that the alarm comply with § 1910.165 and provide sufficient time for employees to leave the area before discharge. The alarm must be perceived above ambient noise and light levels in the workplace.

OSHA has also changed the proposed language by calling the alarm a pre-discharge employee alarm rather than a pre-discharge alarm. A pre-discharge alarm may serve many functions, but a pre-discharge employee alarm notifies employees of impending discharge.

Paragraph (c)(4) of the final standard, which was proposed as paragraph (b)(16), requires the employer to provide automatic actuation of total flooding systems so that employees will have sufficient time to safely exit the discharge area.

Section 1910.161 Fixed extinguishing systems, dry chemical.

This section contains the minimum design and installation requirements which are specifically applicable to fixed extinguishing systems using dry chemical as the extinguishing agent. Dry chemical systems installed to meet a particular OSHA standard must comply with the requirements of this section and § 1910.160.

Scope and application: Paragraph (a). Paragraph (a) establishes the scope and application for these requirements to be all fixed dry chemical systems installed in accordance with § 1910.160 and required by a particular OSHA standard.

Specific requirements: Paragraph (b). In paragraph (b) of the proposal OSHA proposed the minimum requirements for fixed dry chemical systems.

In paragraph (b)(1) of the proposal, OSHA required that dry chemical agents used in combination with foam and wetting agents be approved for that use. One commenter (Ex. 7: 9) stated that the only known standards for foam/dry chemical compatibility were military specifications and that if foam compatibility is necessary, then OSHA should provide a specific method for determining it in the standard.

The purpose of the proposed language was to assure that employers use agents that will not break down or become ineffective because of incompatibility with other agents. Therefore, OSHA has changed the proposed language by requiring the employer to determine agent compatibility when the agent is purchased to assure that the combination of agents will be effective on the fire concerned. OSHA believes the changes will assure employee safety and give employers the flexibility of selecting agents without having to refer to a specific standard.

In paragraph (b)(2) OSHA proposed that dry chemicals of different compositions not be mixed together. Some commenters (Ex. 7: 33; 97) questioned the need to restrict the mixing of different types of dry chemicals. Mr. John W. Gunny stated (Ex. 7: 3 p.8): "Sodium carbonate (dry chemical) and potassium carbonate (Purple K) will mix and can be used as replacements." PPG Industries requested a clarification of the proposed language. They agreed that (Ex. 7: 97 p.2):

Systems designed for use with one chemical shall not be refilled with any other type, however, this should not be construed to mean a specific brand.

The Underwriters' Laboratories, Inc. (Ex. 7: 120) suggested that OSHA only permit the chemical stated on the nameplate of the container.

OSHA believes that intermixing of different dry chemical extinguishing agents must be prohibited where such intermixing could cause unwanted chemical reactions or produce excessive pressures within storage containers. These pressures or reactions could cause the system to operate ineffectively or not at all.

However, OSHA recognizes that certain types of equivalent compatible chemicals can be interchanged or mixed effectively within a system. Therefore, OSHA is changing the proposed language to permit the employer to use chemicals specified on the approval nameplate or those with equivalent qualities which are compatible. While OSHA encourages the use of the chemicals listed on the approval nameplate, it also recognizes that any chemical of equivalent composition and physical properties could be used and still be effective as an extinguishing agent. OSHA believes this change will provide employers with the flexibility to use equivalent materials in containers when unexpected shortages of specific brands occur.

It is important to note that while OSHA may permit the use of equivalent materials, local fire code enforcement agencies may not. Therefore, employers are encouraged to check with local authorities before making any changes in chemicals currently used in their containers.

In paragraph (b)(3) OSHA proposed a 30-second pre-discharge alarm on systems which would create obscured vision upon discharge. Some commenters (Ex. 7: 33; 49) questioned the priority for delayed discharge, which could cause larger fire spread. Other commenters (Ex. 7: 65; 87; 30; 121) suggested that the 30-second alarm was too long for some workplace systems. OSHA believes the comments reflect the problems associated with employee safety versus property protection. OSHA's primary responsibility lies with assuring that employees have sufficient time to safely evacuate discharge areas which subject them to obscured vision. If, because of delayed discharge, a possibility for greater property damage exists, then the employer may have to provide alternative fire protection systems. OSHA has decided to change the proposed language by deleting the 30-second time limit. The final standard requires that the pre-discharge alarm which must comply with § 1910.165 and which must provide sufficient time for safe egress from total flooding or local application areas where obscured vision may occur. OSHA has also changed the name of the pre-discharge alarm to "pre-discharge employee alarm" to be consistent with the term used elsewhere in the subpart.

In paragraph (b)(4) OSHA proposed a specific test for determining the formation of lumps or caking in the dry chemical agents. The purpose of the requirement is to assure that dry chemical supplies are kept free of moisture. If an employer can assure that dry chemical agents are free of moisture by some other test method, OSHA does not believe that a specific method of testing has to be required. Therefore, while the proposed test would be considered an acceptable test, OSHA has decided not to specifically require it. Therefore, OSHA has changed the proposed language to provide the employer flexibility in selecting the test method for determining that a dry chemical is free of lumps and caking.

OSHA has also added a new paragraph (b)(5) to the section that requires that the rate of agent application be sufficient to achieve the design concentration within 30 seconds. This requirement was initially proposed in § 1910.160(b)(15) as a general requirement; however, some commenters (Ex. 7: 9; 93; 120) in addressing § 1910.160(b)(15), suggested that the rates of discharge for the various classes of agents vary and that the rate should be covered in the specific section for the particular class of agent. OSHA agrees with these comments and therefore is placing the requirement for the rate of discharge for dry chemical systems in § 1910.161.

Section 1910.162 Fixed extinguishing systems, gaseous agent.

This section contains the minimum design and installation requirements for fixed extinguishing systems using gaseous agents such as carbon dioxide and Halon 1211 and 1301. Gaseous agent systems must comply with this section as well as the general requirements in § 1910.160.

Scope and application: Paragraph (a). Paragraph (a) establishes which systems are covered by this section and which requirements apply to these systems.

OSHA proposed to include the scope and application of the section in a single paragraph (a). However, OSHA has decided to exempt certain local application systems from the proposed requirements of the section. In order to specifically describe the requirements from which local application systems are exempt, OSHA has divided the proposed scope and application provisions into two paragraphs.

Paragraph (a)(1) carries forward the language from proposed paragraph (a) which states that this section applies to all fixed extinguishing systems installed in accordance with § 1910.160 and using a gaseous agent.

In paragraph (a)(2) of the final standard OSHA has required that only total flooding systems must comply with paragraphs (b)(2) and (b)(4) through (b)(7). This change is in response to the suggestions made by United Technologies (Ex. 7: 38) and the Organization Resource Counselors, Inc. (Ex. 7: 94). Paragraph (b)(2) and (b)(4) through (b)(7) are not appropriate for local application systems.

Specific requirements: Paragraph (b). Paragraph (b) contains the minimum design and installation criteria for gaseous agent systems. As described above, paragraphs (b)(2) and (b)(4) through (b)(7) apply only to total flooding systems.

Paragraph (b)(1) establishes the criteria for agents to be used in the initial supply and replenishment of fixed gaseous agents.

In paragraph (b)(2) OSHA proposed that the employer maintain gaseous agent concentrations by minimizing leakage from an enclosure or by adding extra agent. One commenter, Organization Resource Counselors, Inc. stated (Ex. 7: 94 p. A-14):

It is thereby inferred that the existing extinguishing concentration is to be sustained even after re-entry. Many employers favor ventilation before employee re-entry and they would be unable to do this if the above change were not made.

Several comments (Ex. 7: 2; 65; 93) advocated ventilating the discharge area before employees re-enter to conduct salvage and overhaul.

Once the fire is extinguished or under control, OSHA does not expect employers to maintain extinguishing concentrations when employees re-enter the discharge area for overhaul. Therefore, OSHA has changed the proposed language by adding the phrase "Except during overhaul" to the beginning of the sentence. OSHA has also changed the proposed wording by deleting the references to preventing leakage or applying extra gas because a requirement of such specific methods of maintaining proper concentrations would limit employer flexibility. OSHA does not believe that the specific methods of maintaining concentrations need to be established in the final standard.

MCD 000013900

In paragraph (b)(3) OSHA proposed that designed concentrations be achieved with the minimum generation of toxic decomposition products. OSHA has changed the proposed language to require that employees not be exposed to toxic levels of a gaseous agent or its decomposition products. Two commenters (Ex. 7: 3; 65) indicated that the proposed language was too vague and unenforceable. OSHA believes that the revised language more clearly states OSHA's intent that employers may use toxic concentrations in areas where they are necessary because of design extinguishment concentrations, but only where employee exposure will be safely controlled or prevented.

In paragraph (b)(4) of the proposal OSHA established specific design criteria for deep-seated fires and for maintaining concentrations to prevent reignition. OSHA believes that this paragraph is not necessary because the hazards are adequately covered by the performance language in paragraph (b)(2) of the final standard. Therefore, OSHA has decided to delete paragraph (b)(4).

In paragraph (b)(5) of the proposal OSHA established a maximum discharge time of 30 seconds for all fixed gaseous systems. Some comments (Ex. 7: 11; 120; 168) questioned the proposed language and suggested that OSHA recognize a 10-second time limit for certain gaseous agents such as Halon 1301. It was not OSHA's intent to specifically limit the discharge time to 30 seconds. The 30-second limit was intended to be the maximum limit; thus, any system that could reach an extinguishing concentration within 10 seconds would obviously have met the 30-second criteria. However, after reviewing the comments, OSHA has decided to change the proposed language so that, in paragraph (b)(4) of the final standard, carbon dioxide systems must reach design concentrations within 30 seconds, and Halon 1211 and 1301 systems must reach design concentration within 10 seconds. OSHA believes the 10-second limit is necessary to prevent excessive pre-burn times and it is consistent with the applicable NFPA standards.

In paragraph (b)(6) of the proposal OSHA required that the employer maintain agent concentrations for a sufficient period of time to permit emergency actions by fire brigade members. OSHA has decided to delete the proposed paragraph because final paragraph (b)(2) now provides for overhaul operations in areas where fixed systems protect the area. Several comments (Ex. 7: 2; 65; 93) support the decision to delete the proposed language since maintainance of agent concentrations will not enhance employee safety.

In paragraph (b)(7) OSHA proposed that the employer provide a pre-discharge alarm on systems that use agent concentrations exceeding the maximum safe level for the agent. OSHA further established the maximum safe levels for the various agents. Some comments (Ex. 7: 2; 11; 100) questioned the levels set by OSHA. OSHA has decided to change the proposed language by deleting the list of maximum safe levels and by clearly indicating which gaseous systems OSHA requires to be equipped with a pre-discharge alarm. The final standard (paragraph (b)(5)) requires pre-discharge alarms for those systems which have design concentrations above the maximum safe levels of agent concentration to which employees can be exposed without the use of personal protective equipment. OSHA has also changed the proposed language by changing the name of the alarm to a pre-discharge employee alarm to be consistent with the term as defined in § 1910.155 and used elsewhere in the subpart. OSHA has also changed the proposed language by requiring that the alarm provide sufficient time for employees to safely leave the area before the system discharges the agent.

In paragraph (b)(8) OSHA proposed requirements for the permissible design concentrations of Halon 1301 based on the possible time of employee exposure. There were no substantive comments which addressed the proposed language. However, OSHA has decided to change the proposed language to clearly delineate the design concentration ranges and time intervals which are permissible for Halon 1301 systems. The percentage of concentrations and the escape time intervals in the final standard (paragraph (b)(6)) are also consistent with NFPA 12A–1977 Standard on Halon 1301 systems.

In paragraph (b)(9) of the proposal OSHA prohibited the use of Halon 1211 and carbon dioxide in areas normally occupied by employees if egress cannot be accomplished in 30 seconds. OSHA had decided to delete the proposed requirement because the requirement is adequately covered by the performance language in paragraph (b)(5) of this final section.

In paragraph (b)(10) OSHA proposed specific design criteria for inerting type gaseous agents. Several commenters (Ex. 7: 18; 51; 65) suggested deleting this paragraph because the design criteria related to extinguishment concentrations are adequately covered in paragraph (b)(1) of § 1910. 160. OSHA agrees and has decided to delete the proposed paragraph.

Section 1910.163 Fixed extinguishing systems, water spray and foam

This section contains the minimum design and installation requirements for extinguishing systems using water or foam solution as the extinguishing agent which are installed to comply with OSHA standards. Water spray and foam systems must comply with this section as well as the general requirements in § 1910.160. This section does not apply to automatic sprinkler systems covered by § 1910.159.

Scope and application: Paragraph (a). Paragraph (a) states that the section covers and applies to all fixed extinguishing systems using water or foam solution as the extinguishing agent which are installed to comply with a particular OSHA standard. The language also exempts automatic sprinkler systems which are covered by § 1910.159 of this subpart.

Specific requirements: Paragraph (b). In this paragraph OSHA establishes the design and installation criteria for water spray or foam extinguishing systems. These requirements are to be used together with the general requirements of § 1910.160 to regulate fixed water spray and foam extinguishing systems installed to meet a particular OSHA standard.

In paragraphs (b)(1) through (b)(5) of the proposal OSHA established rather specific design criteria for the design of water spray and foam systems. Some commenters (Ex. 7: 2; 33; 65) questioned the need for such specific requirements when performance language could effectively provide employee safety. OSHA has decided to delete proposed paragraphs (b)(1) through (b)(5) and to use a more performance oriented requirement instead, to assure employee safety. The proposed requirements being deleted are prohibitions that can be more adequately addressed in the appropriate sections of the OSHA standards which may require water spray and foam systems. These systems are generally used in areas where employee safety can be adequately assured through alternative means of fire protection or by evacuation.

In paragraph (b)(6) OSHA proposed that water spray systems be designed so that extinguishment or control can be accomplished and prevent flashback. Several commenters (Ex. 7: 58; 65; 93) suggested that preventing flashback may not always be possible, nor can an employer assure that a system will extinguish or fully control a fire in all cases. OSHA has decided to change the

MCD 000013901

proposed coverage to make it a more performance oriented requirement by requiring these systems to be so designed as to be effective in at least controlling a fire on the protected equipment or in the protected area. OSHA believes this new requirement (final paragraph (b)(1)) will provide the employer with the flexibility to design a system that can best protect employees.

In paragraph (b)(7) of the proposal OSHA required that employees assure that the drainage of water spray systems is directed away from employee work areas. OSHA has changed the proposed language by requiring the employer to assure that drainage is directed away from areas where employees are working, and that no emergency egress is directed through the drainage path.

OSHA believes that the revised provision (final paragraph (b)(2)) will improve employee safety because it further limits employee exposure to system drainage which could be carrying hazardous wastes.

Section 1910.164 Fire detection systems.

This section contains the minimum requirements for the installation, restoration, maintenance, testing and protection of fire detection systems and the criteria for response time.

Scope and application: Paragraph (a). Paragraph (a) establishes that the requirements of this section cover and apply to all automatic fire detection systems installed to meet a particular OSHA standard.

Installation and restoration: Paragraph (b). This paragraph covers the minimum requirements for the installation and restoration of fire detection systems.

In paragraph (b)(1) of the proposal OSHA required that all devices, combinations of devices, and equipment constructed and installed to comply with this section be approved. OSHA has decided to change the proposed language by deleting the phrase "combination of devices" because it could be misunderstood as requiring approval of an entire system as installed instead of just the individual elements of that system. OSHA recognizes that entire systems may not be approved or capable of being approved because no criteria exist to make such determination. OSHA believes that the phrase "devices and equipment" adequately covers the components of a system.

In paragraph (b)(2) of the proposal OSHA required that the employer restore all fire detection systems and components to operational condition as promptly as possible after each test or alarm. OSHA also proposed that spare devices and components normally destroyed in giving an alarm be kept available in sufficient quantities and locations for prompt restoration of the system. Two commenters (Ex. 7: 64; 73) suggested that the requirement to keep spare parts and devices stocked and available on plant premises be deleted. OSHA does not require the stocking of the parts in the workplace. OSHA is concerned with restoring detection systems to service as soon as possible after a test or alarm. The proposed language does not preclude the use of a local fire detection system supplier to provide the needed parts. OSHA places the responsibility of prompt restoration with the employer. Therefore, OSHA is using the proposed language as the final language for the requirement.

Maintenance and testing: Paragraph (c). This paragraph contains the minimum requirements for maintaining and testing fire detection devices.

Paragraph (c)(1) require that all systems be maintained in an operable condition except when they are undergoing repair or maintenance.

In paragraph (c)(2) of the proposal OSHA required the employer to test and adjust the sensitivity and reliability of fire detectors as often as necessary to maintain proper operating conditions. One commenter (Ex. 7: 9) suggested that the proposed language be changed to recognize that factory calibrated detectors need not be adjusted after installation. While the proposed language required that devices be adjusted only when they need it, OSHA agrees that factory calibrated detectors should not be tampered with and has changed the proposed language to remove them from coverage in the final requirement.

In paragraph (c)(3) OSHA proposed that all pneumatic and hydraulically operated detection systems be supervised. The purpose of the requirement was to assure detection of any situation which may cause the system to malfunction. Some comments (Ex. 7: 9; 49; 65; 74) questioned the need for electical supervision of all pneumatic and hydraulic systems. However, the proposed language does not limit employers to electrical supervision. OSHA believes the requirement is necessary and permits any type of supervision that will detect a failure or malfunction of the system. Therefore, OSHA is adopting the proposed language as the final requirement.

In paragraph (c)(4) OSHA proposed that the servicing, maintenance, and testing of fire detectors be done by a person trained to do the work. OSHA has decided to clarify the proposed language of (c)(4) by providing some examples of proper maintenance activities. OSHA believes this change will clarify the duties of the person who is expected to service fire detectors because it outlines the duties which must be carried out to assure the reliability of the systems. Therefore, OSHA has changed paragraph (c)(4) by adding the following in the final standard which states:

> The employer shall assure that servicing, maintenance, and testing of fire detection systems, including cleaning and sensitivity adjustments be performed by a trained person knowledgeable in the operations and functions of the system.

In paragraph (c)(5) the proposal required in the second sentence that a trained person perform the maintenance work. This sentence has been deleted because it is covered in the final language of (c)(4). Therefore the final standard paragraph (c)(5) states:

> The employers shall also assure that fire detectors that need to be cleaned of dirt, dust, or other particulates in order to be fully operational are cleaned at regular and periodic intervals.

Protection of fire detectors: Paragraph (d). This paragraph contains the requirements for protecting detectors from environmental and mechanical damage.

Paragraph (d)(1) OSHA requires fire detection equipment installed outdoors or in the presence of corrosive atmospheres to be protected from corrosion.

In paragraph (d)(2) OSHA proposed that every employer, by location or otherwise, protect detection equipment from mechanical or physical impact. One commenter (Ex. 7: 51) suggested that it is impossible to totally protect detectors from impact or mechanical damage. OSHA recognizes that detectors may be subject to occasional impact or damage; it was not the intent of the proposal to require absolute protection of every detector. OSHA is concerned about protecting detectors from such harm that might render the detectors inoperable. Therefore, this language has been added to the final standard.

Paragraph (d)(3) requires employers to mount detectors without the use of circuitry wires or tubing because such wires and tubing are not intended to support the detector, and they may break and interrupt the detector's circuit.

Response time: Paragraph (e). In paragraph (e) OSHA establishes the minimum performance criteria related response time of detectors.

MCD 000013902

Paragraph (e)(1) requires that fire detection systems installed to actuate a fire suppression system be designed to operate in time to control or extinguish a fire. Several commenters (Ex. 7: 87; 94; 121) suggested that OSHA delete the paragraph because proposed paragraph (e)(2) covers the requirement. OSHA disagrees with the comments because proposed paragraph (e)(1) applies to detectors on extinguishing systems and paragraph (e)(2) applies to detectors on alarm systems. OSHA believes that the standard is necessary to assure that employees whose safety may depend on the timely operation of a suppression system are properly protected.

Paragraph (e)(2) requires that detection systems installed for the purpose of activating the employee alarm for evacuation be installed to allow sufficient time for safe escape of employees.

OSHA has decided to substitute the phrase "provide a warning for employee action" for the phrase "allow sufficient time" because it is difficult to specify what "sufficient" means in this context. OSHA also believes that the substitution will provide the employer with options other than escape when a warning for employee action is given.

In paragraph (e)(3) OSHA proposed that alarms or devices initiated by detector actuation not be delayed for more than 30 seconds unless the delay is necessary for immediate safety of employees. OSHA proposed that in cases where extensive delay is necessary, the emergency action plan must assure that employees be notified, or extinguishment be actuated in sufficient time to assure employee safety. OSHA has changed the proposed language which required the emergency action plan to address employee notification and extinguishing system activation. The standard now requires that any necessary delay be addressed in an emergency action plan meeting the requirements of § 1910.38. OSHA believes this change will improve the requirement in that all aspects of the delay, including but not limited to employee notification and system activation, are to be addressed in the plan. The reference to § 1910.38 makes clear what OSHA requires in emergency action plans.

Number, location and spacing of detecting devices: Paragraph (f).

Paragraph (f) requires the employer to assure that spacing, location, and numbers of detectors are based upon design criteria obtained from field experience or testing, engineering surveys, the manufacturer's recommendations or a recognized testing laboratory's listing.

Section 1910.165 Employee alarm systems.

This section contains the minimum requirements for the design, installation, restoration and manual actuation of all types of emergency employee alarm systems installed to meet a particular OSHA standard. The section's maintenance, testing and inspection criteria also apply to all local fire alarm signaling systems used to alert employees of fires in the workplace regardless of the other functions of the system. This section applies only to those employee alarm systems which warn employees of emergencies, such as fires, tornadoes, toxic atmospheres, etc. This section is not intended to apply to warning alarm systems such as back-up alarms, alarms used on cranes, etc.

Scope and application: Paragraph (a). This paragraph establishes which alarm systems are regulated by the requirements of this section and the requirements that apply to those regulated systems.

In paragraph (a)(1) OSHA proposed that the section apply to all emergency alarms or alarm systems installed to meet a particular OSHA standard. OSHA proposed to exempt those pre-discharge, discharge or supervisory alarms required on various fixed extinguishing or other fire protection systems because they were adequately covered in the specific fire suppression system section. OSHA is changing the proposed language to clarify the scope of the requirements as follows: First, OSHA has deleted the term "pre-discharge" from the exemption since that type of alarm is an employee alarm system used with specific fire suppression systems required by various sections in Subpart L. Requirements for pre-discharge alarms will be contained in new paragraph (a)(3) of this section. Second, OSHA has added the phrase "unless they are intended to be employee alarm systems" to the end of the paragraph which exempts various types of alarms, such as those used only to alert maintenance personnel. OSHA believes this change will clarify the scope of the section which is to cover all alarm systems intended to provide employees with a warning that some emergency action by them is necessary.

Paragraph (a)(2) provides that the requirements of the section apply to all local fire alarm signaling systems used for alerting employees regardless of the system's other purposes.

Paragraph (a)(3) has been added to this section to clarify that there are certain requirements of this section which apply to pre-discharge alarms. All pre-discharge employee alarms installed to meet a particular OSHA standard must meet the following requirements of this section: the general requirements of paragraphs (b)(1) through (b)(4), the installation and restoration requirements of paragraph (c), and the maintenance requirements of paragraph (d)(1).

General requirements: Paragraph (b). This paragraph contains the minimum requirements for the design criteria of employee alarm systems covered by this section.

In paragraph (b)(1) OSHA proposed that the employer provide employees with an alarm system that would give them time to safely escape from a life threatening emergency. There were no substantive comments which addressed the proposed language; however, OSHA has decided to change the proposed language to clarify the requirement: First, OSHA has deleted the language "employees with" from the proposal because the requirement is intended to require that the employer provide an alarm, not that the employer provide an alarm to employees. Second, OSHA has reworded the proposed language by changing the second description of the time criteria for the alarm. OSHA proposed that the alarm provide sufficient reaction time to safely evacuate from a life threatening emergency. OSHA has decided to clarify the requirement and provide additional options to the employer. OSHA now requires that the alarm provide employees with a warning to take appropriate emergency actions which may or may not include evacuation. OSHA believes the two changes made to the proposed language will better explain the intent of the requirement and provide an alternative to those employers who may prefer actions short of evacuation when the alarm is given. OSHA has also added the term "immediate work area" to the final language so that different plans can be developed for the various portions of large workplaces. The final paragraph (b)(1) states: "The alarm system shall provide warning for necessary emergency action as called for in the emergency action plan, or for reaction time for safe escape of employees from the workplace or the immediate work area, or both."

Paragraph (b)(2) requires that employee alarms be capable of being perceived above ambient noise and light levels, and allows tactile devices, such as electric fans, to be used when necessary.

Paragraph (b)(3) of the proposal provided that employee alarms be distinctive and recognizable to employees as signals to perform actions designated in the emergency action plan. OSHA has decided to adopt the proposed language with minor corrections as the final requirement. In addition, OSHA does not intend that the final requirement mean that each signal must be generated by a separate device or system; rather, OSHA will recognize a single system with distinctive code signals or a voice communication system.

In Paragraph (b)(4) OSHA proposed that the employer explain the preferred means of reporting emergencies to employees and that emergency telephone numbers be posted. One commenter (Ex. 7: 150) recommended that OSHA accept, in addition to telephones and manual pull box devices, the use of portable radios as a satisfactory method to initiate an employee alarm system. OSHA has clarified the proposed language in this regard by specifically listing public address systems and radios as other alternative means of reporting emergencies. OSHA has also changed the proposed language by requiring that emergency telephone numbers be posted only when telephones are used. The proposed language implied that telephone numbers had to be posted even when telephones were not included in the plan as a means of reporting emergencies. The purpose of this requirement is to assure that multi-use communication systems be operated to allow emergency messages to have priority over all non-emergency messages.

OSHA has decided to add a new paragraph (b)(5) to the final standard to provide direct voice communication as an alternative means of giving alarms in small workplaces. This area that was not adequately discussed in the proposal. The new paragraph gives the employer greater flexibility in complying with OSHA standards.

Paragraph (b)(5) permits employers with 10 or fewer employees to use direct voice communication, without a back-up system, as an acceptable alternative for sounding an alarm. Several commenters (Ex. 7: 33; 43; 66; 72; 97; 98) supported the use of alternative methods for sounding alarms in their comments addressing Issue 17. Issue 17 asked whether OSHA should allow alternatives to manual pull box alarms such as whistles, voice, visual or tactile communication systems. The comments supported the use of alternative alarm methods as long as the methods are reliable and recognized by employees. OSHA believes that the new paragraph recognizes the work environment found in small workplaces where direct voice communication is often the quickest and most recognized source of alarm.

Installation and restoration: Paragraph (c). Paragraph (c) contains the minimum requirements for the installation and restoration of alarm systems.

Paragraph (c)(1) requires that the components, devices, and systems constructed and installed to comply with the requirements of this standard be approved. Alternative signaling devices such as air horns and strobe lights not generally "approved" are also acceptable.

In paragraph (c)(2) OSHA proposed that all systems be restored to normal operating condition as promptly as possible after each use or test. OSHA also proposed to require a stock of spare parts or devices to be maintained in the workplace. Several commenters (Ex. 7: 73; 93; 113; 148) suggested that the employer be able to use the services of a local contractor or supply store to provide service, parts, spare devices and components. OSHA believes that it is the employer's responsibility to return the system to operating condition as promptly as possible and in a manner the employer finds appropriate. In many workplaces where local suppliers can meet the need promptly, this may not require the stockpiling of spare parts. Therefore, OSHA has changed the proposed language by deleting the requirement that spare parts be stocked in the workplace and by changing the provision to require that the parts be available in sufficient quantities and locations for prompt restoration of the system.

Maintenance and testing: Paragraph (d). Paragraph (d) contains the minimum requirements for the maintenance and testing of employee alarm systems.

Paragraph (d)(1) requires that all employee alarm systems be maintained in operable condition except when undergoing repairs or maintenance.

In paragraph (d)(2) OSHA proposed that employee alarm systems be tested for reliability and adequacy at bi-monthly intervals. OSHA also proposed that a different actuation device be used for each test.

Several commentere (Ex. 7: 11; 73; 74; 87; 121) suggested changes to the proposed language. One commenter (Ex. 7: 73) advocated that supervised employee alarm systems do not need to be tested with the same frequency as those systems which are not supervised. Another comment (Ex. 7: 11) asked what is to be done if the alarm system has only one actuation device. OSHA has decided to clarify the final requirement by changing the proposed language. First, OSHA has changed the paragraph to clarify that only non-supervised employee alarm systems are covered. It is not OSHA's intent to require that supervised systems be tested as frequently as non-supervised systems, as presented in paragraph (d)(4). Second, OSHA has changed the word "bi-monthly" to read "every two months" to avoid confusion. Third, OSHA has added the phrase "of a multi-actuation device system" to the final requirement to emphasize that OSHA is also concerned about those systems with more than one actuation device. OSHA believes that these three changes in the final standard will clarify the meaning and purpose of the requirement.

Paragraph (d)(3) requires that the employer keep power supplies of alarm systems fully operational.

In paragraph (d)(4) OSHA proposed that all alarm systems installed after July 1, 1980, be supervised. Two commenters (Ex. 7: 51; 114) suggested that it may not be possible to supervise all alarm systems because of their design and method of operation. OSHA has changed the proposed language to provide that only employee alarm circuitry capable of being supervised is required to be supervised and to extend the date of compliance to July 1, 1981. The new language will assure that system circuitry capable of being supervised is operational and capable of transmitting alarm signals and that employers are given a sufficient time to comply with the final standards. OSHA has also established an annual test requirement for supervised employee alarm systems to assure their reliability. This is in recognition of the comment (Ex. 7: 11) presented in the earlier discussion of paragraph (d)(2). OSHA believes that an annual test is necessary to assure the reliability of the entire system. The new requirement is consistent with other test criteria in the subpart and it further adds to employee safety by assuring the reliability of the system.

Paragraph (d)(5) requires that all servicing, testing and maintenance of employee alarm systems be done by trained persons.

Manual operation: Paragraph (e). Paragraph (e) contains the requirements for the location and accessibility of manual actuation devices.

In paragraph (e)(1) OSHA proposed that manually operated pull boxes be mounted so that they are unobstructed, conspicuous, and readily accessible. OSHA also proposed to limit the travel distances to the pull boxes to 200 feet. Several commenters (Ex 7: 54; 65; 66; 87; 121; 160) suggested that the 200-foot travel distance requirement for pull-box stations is too specific and should be replaced with a performance oriented standard. OSHA has decided to change the proposed language by deleting the specific travel distance limit. This change reflects OSHA's intention that the pull boxes be readily accessible, without setting a required distance.

However, OSHA has decided to include the 200-foot travel distance recommendation in the appendix. OSHA has also used the term "manually operated actuation devices" in the final requirement rather than "manually operated pull-boxes" because there may be types of actuation devices other than pull-boxes. OSHA believes that these specific changes to the final standard will clarify the requirements.

In paragraph (e)(2) of the proposal OSHA required that pull-boxes be approved. OSHA has decided to delete the proposed language because the approval of alarm system components is adequately covered in paragraph (c)(1) of this section.

IV. Regulatory Assessment

Executive Order No. 12044 (43 FR 12661, March 24, 1978), directs regulatory agencies to simplify and clarify regulations and to minimize compliance costs, paperwork and other burdens. Section 4 of the Executive Order requires review of existing regulations in order to simplify language, reduce regulatory burdens, assure conformance with new and evolving technologies, and to eliminate overlapping and duplicative requirements.

The revised standard reduces burdens and is not a "major" action as defined by the Executive Order and by economic identification criteria contained in Department of Labor Guidelines for improving Government regulations (44 FR 5575, January 26, 1979).

JRB Associates, Inc., has prepared an economic assessment for OSHA entitled "Economic Impact Assessment of 29 CFR Part 1910 Subpart L—Fire Protection." The study includes assessment of the technological feasibility of compliance as well as an estimate of compliance costs. The effects on other variables, such as employment productivity and market structures, are considered.

According to the study, compliance costs are not expected to exceed $20 million for any of the years 1979–1983. In 1984, compliance costs are expected to peak at $21 million, but after 1984, these costs will decline considerably. The study concludes that at present time, compliance with the proposed standard is both economically and technically feasible. Additionally, the proposed modifications to Subpart L are not expected to have any other economic impact that might be considered major. Due to training requirements, the proposed standard could possibly result in a marginal increase in employment. This effect will not be significant when distributed across the entire economy. No significant market structure effects are projected from the regulatory restraints proposed on certain products. The study therefore concludes that, based on data available at the time of the analysis, the proposed changes will not have a major economic impact as defined by Executive Order 12044 and criteria proposed by the Department of Labor pursuant to this order.

Several commenters (Ex. 7: 33; 74; 88; 108) challenged the study findings and stated their belief that the cost of compliance estimates were too low. Reasons given by these commenters were based on (1) the additional wage costs of company paid firemen who would have no other duties and (2) the cost of conforming all fire protection systems to the proposed standard.

Although these issues were raised during the rulemaking, the revised standard does not prohibit the assignment of other duties to employees who are members of company fire brigades nor does it require that employers have fire brigades. Therefore, the cost estimates contained in the economic impact assessment are considered reasonable.

Concern that compliance costs were understated also arose from the misunderstanding that all fire protection systems are covered by the standards. The standards do not apply to systems designed to protect property or the general public. The cost estimates in the economic assessment were properly determined solely upon the application of the standards to employee safety and health in the workplace.

The economic impact assessment has identified several benefits that will be realized as a result of promulgation of the proposed changes to Subpart L. Some changes are intended to reduce accidents; others give the employer added flexibility. For example, the proposed regulation will prohibit the use of carbon tetrachloride and chlorobromomethane fire extinguishers in OSHA regulated workplaces. This will prevent injuries related to the discharge of toxic substances from fire extinguishers. The proposed regulation also requires the replacement of soda-acid and inverting foam extinguishers. Thus, these extinguishers, which have a tendency to rupture in testing or while in use, will be prevented from causing injuries. Further, the initial replacement cost of these extinguishers will be offset by long-run savings in reduced maintenance costs of the new extinguishers and in the scrap value of the old ones.

The revised regulation provides for training and equipment for worker protection for those employees who are assigned as fire brigade members to fight interior structural fires. This is expected to reduce the number of injuries to employees involved in fire fighting.

The revised regulation includes several relaxations of current requirements which will provide added flexibility and possible additional cost savings. These include the exemption from portable fire extinguisher requirements for some employers; and the fact that most sprinkler systems, other fixed systems, employee alarm systems and fire detection systems which are not installed to meet other OSHA regulations are not covered by the revised standards in Subpart L.

Although it is not possible to compare the estimated cost of compliance to quantifiable benefits, it is possible to compare the estimated cost of compliance to the cost of fire losses in OSHA regulated workplaces. The National Association of Fire Equipment Distributors estimates 87 percent of fire incidents that workers extinguish are not reported to public fire departments. For the fires that are reported, the National Fire Protection Association estimates U.S. structural fires and property loss by property use. Based on NFPA statistics for 1977, it has been determined that $2.242 billion in property losses were incurred by OSHA regulated workplaces during that period. Therefore, estimated compliance costs for these regulations are less than 1 percent of the 1977 estimated property loss as a result of structural fires. Thus, if a 1 percent reduction in total fire losses can be realized, the estimated cost of the regulation is completely offset. In addition to reducing injuries associated with fire fighting, the regulation will also have a positive effect in the control of fires by increasing the reliability of fire extinguishers and by providing for fire brigades that are better equipped and trained.

Before the proposal was published, OSHA concluded that the subject matter of this proposal was not a "major" action which would necessitate the preparation of a Regulatory Analysis (43 FR 60062). In the development of the final standard, based on a review of the JRB document and the record as a whole, OSHA has determined that [illegible]

MCD 000013907

final standard is not a "major" action under E.O. 12044 and the Secretary's guidelines (44 FR 5575, January 26, 1979).

The assessment is available for inspection and copying at the OSHA Docket Office, Room S6212, Frances Perkins Department of Labor Building, Third Street and Constitution Avenue, NW., Washington, D.C. 20210.

V. Effective Date

The effective date is December 11, 1980. The 90 day period between the issuance of the standards and their effective date is intended to provide sufficient time for employers and employees to become informed of the existence of the standards and their requirements.

The standards currently found in §§ 1910.35–1910.38, §§ 1910.107–1910.109, and the existing Subpart L (1910.156–1910.165(b)), will remain in effect until the standards contained in this document actually go into effect. Should the new standards be stayed, judicially or administratively, or should the standards not sustain legal challenge under section 6(f) of the Act, the current standards in §§ 1910.35–1910.38, §§ 1910.107–1910.109, and Subpart L will remain in effect.

Any petitions for administrative reconsiderations of these standards or for an administrative stay pending judicial review must be filed with the Assistant Secretary of Labor for Occupational Safety and Health within 45 days of the publication of these standards in the **Federal Register**. Any petitions filed after this date will be considered to be filed untimely. This requirement is considered essential to permit the Agency to give full consideration to each petition and respond in advance of the effective date of the standards.

VI. Appendices

Six appendices have been included in this final standard for informational purposes. The purpose of the appendices is to provide guidelines for employers who wish to know specifically what constitutes compliance with the performance standards. In addition, the appendices contain other information which may assist employers in providing fire protection. If an employer complies with the specific guidelines in the appendices, that employer will be considered in compliance with the performance standards. At the same time, an employer may be in compliance with the standard although not complying with the specific requirements of the guidelines. In construing the meaning of the performance language in the standards in circumstances where the employer chooses not to comply with the specific provisions of the guidelines, OSHA will look at the specific guidelines among other things to determine whether the employer has complied with the standards' performance requirements. However, nothing contained in the appendices should be construed as establishing a mandatory requirement not otherwise imposed by the standard, or as detracting from an obligation which the standard does impose. In view of the nature of the appendices, changes in their contents may subsequently be made without rulemaking.

The information in the Appendix to Subpart E addresses employee emergency plans and fire prevention plans. Appendix A to Subpart L contains information to assist employers in complying with the requirements of Subpart L. Appendix B to Subpart L presents a cross index of national consensus standards which may be used to assist in compliance with specific sections in Subpart L. Appendix C to Subpart L is a listing of documents that employers may refer to for additional information. Appendix D to Subpart L contains information concerning the availability of publications incorporated by reference into the standard. Appendix E to Subpart L contains test methods for determining if protective clothing affords the required level of protection.

VII. Authority

This document was prepared under the direction of Eula Bingham, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, Third Street and Constitution Avenue, N.W., Washington, D.C. 20210.

* * *

Signed at Washington, D.C., this 4th day of September, 1980.

Eula Bingham,

Assistant Secretary of Labor.

Journal

MEETINGS SCHEDULED

October 1-2 — Supervisors Development Program, Jamesburg, N.J. (Mary S. Hill, N.J. State Safety Council, 50 Park Place, Newark, N.J. 07102; tel: (201) 642-3123).

October 2-3 — Hazardous Chemical Safety Seminar, Phoenix, Ariz. (Carol Morris, J.T. Baker Chemical Company, Phillipsburg, N.J. 08865; tel: (201) 454-2500).

The course also will be held October 6-7 in Los Angeles, Calif., and October 9-10 in San Francisco, Calif.

October 6-8 — Safety in Chemical Laboratories and Pilot Plants, Atlanta, Ga. (Rosanne Razzano, Dept. NR, Center for Professional Advancement, P.O. Box H, East Brunswick, N.J. 08816; tel: (201) 249-1400).

The course also will be held October 27-29 in San Francisco, Calif.

October 6-8 — Utah Conference on Industrial Hygiene: Sampling and Analysis, Salt Lake City, Utah (Katharine C. Blosch, RMCOEH, Bldg. 112, Univ. of Utah, Salt Lake City, Utah 84112; tel: (801) 581-5710).

October 6-10 — Basic Safety Management, Houston, Tex. (International Safety Academy, P.O. Box 19600, 10575 Katy Freeway, Houston, Tex. 77024; tel: (713) 932-9400).

October 7-8 — Managing Safety in the '80s, Dallas, Tex. (Jim Broughton, Texas Safety Association, P.O. Box 9345, Austin, Tex. 78766; tel: (512) 451-7421).

October 7-9 — Accident Potential Recognition, Somerset, N.J. (Mary S. Hill, N.J. State Council, 50 Park Place, Newark, N.J. 07102; tel: (201) 642-3123).

October 8-9 — Supervising for Safety, Lubbock, Tex. (Jim Broughton, Texas Safety Association, P.O. Box 9345, Austin, Tex. 78766; tel: (512) 451-7421).

The course also will be offered October 14-15 in Beaumont, Tex., and San Antonio, Tex.